NEW AGE

Accounting and Financial Management

for

BCA & MCA




M.E. THUKARAM RAO

NEW AGE INTERNATIONAL PUBLISHERS

Accounting and Financial Management
for
BCA & MCA

THIS PAGE IS BLANK

Accounting and Financial Management for BCA & MCA

M.E. Thukaram Rao
Head, Department of Commerce,
Sathya Sai Institute of Higher Learning,
Whitefield Campus, Bangalore

PUBLISHING FOR ONE WORLD

NEW AGE INTERNATIONAL (P) LIMITED, PUBLISHERS

New Delhi • Bangalore • Chennai • Cochin • Guwahati • Hyderabad
Jalandhar • Kolkata • Lucknow • Mumbai • Ranchi

Visit us at **www.newagepublishers.com**

Published by New Age International (P) Ltd., Publishers

ISBN (10) : 81-224-2325-6

ISBN (13) : 978-81-224-2325-9

PUBLISHING FOR ONE WORLD

NEW AGE INTERNATIONAL (P) LIMITED, PUBLISHERS
4835/24, Ansari Road, Daryaganj, New Delhi - 110002
Visit us at **www.newagepublishers.com**

PREFACE

I have great pleasure in placing this book on Accounting and Financial Management into the hands of esteemed readers. Although several books are available on the subject, the need for a comprehensive volume covering all the important aspects of Accounting and Financial Management has been felt for a long time.. My long experience in teaching and the knowledge I have acquired over these years has made it possible for me to satisfy this need.

The book is written in a simple and lucid style. At the end of the each chapter, a few theoretical questions and exercises are given to test the understanding ability of students.

This book meets the requirements of B.C.A. and M.C.A. students and other technical courses in management.

We will be failing in our duty if we do not thank Mr. Saumya Gupta of New Age International (P) Ltd., in taking active interest in the publication.

Author

THIS PAGE IS BLANK

CONTENTS

THIS PAGE IS BLANK

1

CHAPTER

ACCOUNTING THEORY

NEED FOR ACCOUNTING

Business is one of the sources of earning income. Whenever a business is started, it requires investment of certain amount which is called as capital. With this amount of capital the businessman may deal either with trading business or manufacturing business. In a trading business, he will buy goods at a lesser price and sells the same to others at a higher price. In case of manufacturing business, he has to buy raw materials and incur other expenses in the form of wages and salaries, rent, power, insurance, tax, transport, postal and telephone expenses and so on, in the course of production and distribution of goods. In a small sized business the transactions are simple and less in number. But in a large sized business the transactions are numerous. These business transactions enable the businessman to know the result of his business which can be profit or loss for a given period of time. In order to know the result of his business, a businessman has to remember all the transactions of his business. However, owing to lack of memory it is not possible for anybody to remember all the transactions over a period of time. This has given rise to maintenance of a set of accounting books in which business transactions are chronologically recorded. The systematic recording of business transactions enable the businessman to account for every transaction without missing any item. Such a system of maintenance of a set of accounting books to record business transactions is known as book keeping system.

ORIGIN OF BOOK KEEPING

The practice of record keeping existed ages before the formal recording of history. Barbarians began to keep records by scratching them on rocks. From there crude forms of picture writing, the process of rudimentary bookkeeping began. The Italians were the leading bookkeepers and record makers for centuries. As early as 813 A.D., Bookkeepers were recognised in Italy and from these men came many of the fundamentals of the modern double entry bookkeeping.

In 1911, a Florentine banker devised the first complete bookkeeping system as distinguished from the simple devices previously used. It had all the rudiments of a set of books including a rough plan of cross entries. The first known system of complete double entry was discovered in Genoa in 1340.

The first text book on bookkeeping was written in 1414 by Pacioli, a monk of the order of St. Francis at Venice. Many present day methods were described by this old world mathematician and the ideas he expressed have lived to the present day. Pacioli's treatise is based on the premise that where one wishes to conduct his business properly, he must first have sufficient cash or credit. Secondly, he must be a good bookkeeper. Thirdly, he must possess a proper book keeping system.

The years following Pacioli's treatise were marked by the refinement of the double entry bookkeeping system and by the use of the position of the accountant in the commercial world. Publications were released and some accountants association were formed, but it was not until the 19th century that accounting really became a profession.

It was not until the dawn of the 20th Century that the invention and perfection of the business machines of today took the business of record keeping from the "Shadow of the Pen". A new conception of accounting valuation began to take form and the bookkeeper really became on Accountant. The keeping of books was no longer restricted to the preparation of financial statement. Because of the ease with which facts could be recorded, accumulated and analysed, the accountant began to devote his time to the interpretation of "booked" facts and as a result, became a member of management's team.

MEANING AND DEFINITION OF BOOK KEEPING

The art of recording business transactions in a systematic manner is termed as bookkeeping. It is the name given to a system which is concerned with recording and summarising business transactions accurately so as to know the true state of affairs of a business.

Definition of Book Keeping. R.N. Carter in his book on Advanced Accounting defines book keeping as the Science and art of correctly recording in books of accounts all those business transactions that result in the transfer of money or money's worth". This definition reveals the following features of book keeping.

(*a*) **It is a Science.** Book Keeping is a science as it represents systematised knowledge. It is based upon a set of well defined principles which are followed throughout so that the reason for recording a transaction in a particular manner can be explained fully.

(*b*) **It is an Art.** Book keeping is an art as it deals with a system in which human skills and ability is involved in recording the business transaction according to principles of book keeping.

(*c*) **Money Consideration.** This implies recording of all transactions which can be expressed in terms of money.

Kohler in his "Dictionary for Accountants" defined book keeping as "the process of analysing, classifying, and recording transactions in accordance with preconcieved plan". This definition brings forth the following three aspects of accounting.

(*a*) **Analysis.** It refers to identifying various expenses incurred during a period of time.

(*b*) **Classification.** It refers to grouping of like items of expenses into a common group.

(c) **Recording.** It refers to entering transactions in the basic books and later on posting them into another set of book known as ledger.

B.G. Vickery in his book 'Principles and Practice of Book Keeping' defines book keeping as "the art of recording pecuniary or business transactions in a regular and systematic manner". This definition emphasises the recording of monetary transactions of the business on day-to-day basis and in a systmeatic manner, i.e., according to the set rules and regulations of book keeping.

Scope of Book Keeping

Book Keeping is concerned with two important steps involved in the procedure of accounting. They are : (i) recording of all business transactions in a book known as Journal and (ii) posting all recorded transactions into another book known as a ledger. Subsequently, the various accounts in the ledger are balanced to know the net effect of all transactions. In brief, the subject matter of book keeping includes preparation and maintenance of all records up to the stage of preparation of a statement known as Trial Balance.

DEFINITION OF ACCOUNTING

The American Accounting Association defines accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgements and decisions by users of the information". This definition highlights the following aspects :

(*a*) **Identifying the Business Transactions.** Identification of transactions are useful for proper recording of them in books of accounting without missing any of the transactions.

(*b*) **Measurement of Business Performance.** Measurement or evaluation of business performance is necessary to know the progress of business.

(*c*) **Communication of Information.** Communication of information relates to reporting the results of business to all those interested in the business. This enables them to judge the efficiency of the business and to take suitable decisions to improve the business.

According to the American Institute of Certified Public Accountants Terminology committee ; "Accounting is the art of recording, classifying and summarising in a significant manner and in terms of money transactions and events which are in part atleast of a financial character and interpreting the results thereof.

This definition emphasises the following aspects :

(*a*) It is an art

(*b*) It involves recording transactions in a set of books

(*c*) Classifying which refers to grouping of transactions according to their similarities.

(*d*) Summarising the transactions facilitate easy understanding of results by management of the business and others interested in the business. This step involves preparation of two important statements known as (i) Trading and Profit and Loss Account and (ii) Balance Sheet.

(*e*) Accounting is concerned with transactions capable of expressing in terms of money value. All business transactions of different nature are expressed in respect of money. Thus all assets such as land and building, plant and machinery, stock of goods etc., when expressed in terms of money can give total value of business. The value of a business can be compared with the value of another business.

(*f*) Only transactions of financial characters are recorded in the books of accounts. For example, the good health of a general manager is very essential for the success of a business. But this transaction is not recorded in accounting books. Similarly, cooperation of employees, good working environment etc., are essential for the success of a business. But they are not recorded as they are not of a financial character.

(*g*) Interpreting the results helps in evaluating and in making a rational judgement about the performance of business. For example, an Accountant will estimate the advertising required for increasing the sales. Subsequently, he will judge whether the advertisement expesnes yielded the desired sales. This will help him to decide whether the same amount of advertising expense result in the desired sales for the forth-coming years.

OBJECTIVES OF BOOK KEEPING

The objectives of book keeping can be summarised under the following headings :

(A) ***Main Objectives :***

The main objectives of book keeping are as follows :

(*a*) To know the result of the business over a period of time. The result of a business may be profit or loss.

(*b*) To know the financial position of business at a point of time. This can be known by presenting all assets and liabilities in the form of a statement known as a Balance Sheet.
(*c*) To maintain all records for a given period to serve as permanent reference in future.
(*d*) To know the amount which a business owes to others for having bought goods on credit basis.
(*e*) To know the amount due to business by others on account of goods sold on credit basis.
(*f*) To meet provisions of various laws as in the case of Joint Stock Comapnies which have to prepare accounts according to the Provisions of Companies Act 1956.

(B) ***Other Objectives :***

These include :

(*a*) To improve the business on the basis of past performance.
(*b*) To know the composition of capital in terms of size, the causes for change in capital structure and whether maximum use of the same is made.
(*c*) To exercise control over expenses thereby to increase profitability of the business.
(*d*) To know the position of cash so that in case of need further amount can be arranged.
(*e*) To meet the requirements of tax and legal authorities.

ADVANTAGES OF BOOK KEEPING

Accounting information is useful to the following categories of persons :

(A) ***To the Management of a Business :***

(*a*) In evaluating various alternative proposals so as to take maximum benefit from the best alternative.
(*b*) In deciding matters such as elimination of an unprofitable activity, department or product, replacement of fixed assets, expansion of business etc.
(*c*) Planning the various activities and planning of revenues and expenses and arranging for finance in case of need.
(*d*) Comparing various year's account to know the progress or deterioration of the business and take actions to improve the business.
(*e*) Accounting information helps in providing evidence in a court of law in case of legal action taken by others.
(*f*) Accounting information helps in assessing the income tax, sales tax and property tax of the business.
(*g*) Accounting information consitututes one of the basis for borrowing loans from external source.
(*h*) It helps to detect errors and frauds that have taken place in the business.

(B) ***To the Investors :***

Accounting provides information regarding :

(*a*) Types of property owned by the business.
(*b*) Sources and amount of earnings made or losses incurred by the business.
(*c*) Particulars such as stock position, debts owed, debts due etc.
(*d*) Whether rate of earnings is high or low.

(C) ***To the Employees :*** It provides information to employees so as to claim fair wages, bonus, and other welfare facilities.

(D) ***To the Government :***

(*a*) Accounting information helps Government to extend subsidies and incentives and other exemptions to certain types of business.

(*b*) The industrial progress can be known by the Government of the country. It can formulate industrial policies for further growth and development of industries.

(*c*) It enables the Government to assess the income from the industrial sector.

(*d*) It helps in amending various laws or enacting laws governing the functioning of business enterprises.

(*e*) It helps the Government in deciding price control, wage fixation, excise duties, sales tax etc.

(E) ***To the Consumers :*** Customers are not overcharged as selling price is fixed on the total expenses incurred by adding a reasonable rate of profit.

(F) ***To the Prospective Investors :*** It helps the propsective investors in choosing the right type of investment depending upon the profit earning capacity of the business entreprises and the profit earned during past few years.

(G) ***To the Creditors and Suppliers :*** Creditors can decide the solvency position of the business through the accounting information. Similarly, suppliers can also decide whether goods can be sold in future on credit basis.

SYSTEM OF BOOK KEEPING

Book keeping can be prepared and maintained under two systems. They are known as (*a*) Single Entry System ; and (*b*) Double Entry System.

(*a*) **Single Entry System :** Kohler in his book Dictionary for Accountants has defined single entry system as a system of book keeping in which as a rule only records of cash and personal accounts are maintained, it is always incomplete double entry varying with circumtances. This system is adopted by small business enterprises for the sake of their convenience. Under this system only personal accounts of debtors and creditors and a cash book is maintained. This system ignores the two-fold aspect of each transaction. As only one aspect of the transaction is recorded under this system, it is called a Single entry system. So this system is considered as incomplete and unsatisfactory accounting system. Accurate information of the operations of the business is also lacking under this system.

(*b*) **Double Entry System :** This system of accounting is based upon exchange value of money or money's worth. As such we find two aspects in every business transaction viz., the receiving aspect and the giving aspect. Under this system, every transaction is recorded twice, one on the debit side, *i.e.*, the receiving and the other on the credit side, *i.e.*, giving aspect. For example, when a businessman buys goods worth Rs. 10000, he exchanges money for goods. Similarly, when he hires the services of a manager, he gives the money for having derived the service. Thus every transaction has two aspects. One receiving of benefit and another giving the benefit and both these aspects are recorded under this system of book keeping. The features of double entry system can be summarised under the following points :

(*a*) It records the two aspects of a transaction.

(*b*) It records both personal and impersonal aspects of a transaction.

(*c*) While one aspect is debited, its corresponding aspect is credited.

(*d*) Because debit and credit aspects of all transactions are recorded, the total of debit and credit columns are always equal. This ensures the arithmatical accuracy of accounts.

ADVANTAGES OF DOUBLE ENTRY SYSTEM OF BOOK KEEPING

(*a*) It records all the transactions considering both the aspects of the transactions. Hence it gives the complete information about the business.

(*b*) By recording both the debit and credit aspects it ensures the mathematical accuracy or correct preparation of accounts.

(*c*) It enables to prevent misappropriation and frauds involved in recording the transactions.
(*d*) By recording all types of transactions it reveals the correct result of the business for a year.
(*e*) By recording all assets, liabilities and capital it reveals the true financial position of the business.
(*f*) The accounting system satisfies external parties including government, tax authorities etc.

DISADVANTAGES

(*a*) It involves maintenance of many books and ledgers which are very expensive.
(*b*) It involves more of clerical labour.

DIFFERENCES BETWEEN BOOK KEEPING AND ACCOUNTING

Very often the terms Book Keeping and Accounting are used interchangeably. However these two concepts are not identical. They differ from each other in the following aspects.

Book Keeping	*Accounting*
1. In book keeping, financial transactions are recorded in a set of books.	1. In accounting the errors are detected and they are rectified through adjustment.
2. It is the first stage of maintaining accounts and as such it cannot give any conclusions about the performance of business.	2. It is second stage which gives useful information to draw conclusions about the performance of business.
3. Book keeping does not show the result and financial position of the business.	3. Accounting shows the results and financial position of the business.
4. Book keeping is undertaken by clerks whose responsibility is less.	4. The accounting is undertaken by accountant whose responsibility, is more.
5. It is concerned with posting the entries in the ledgers.	5. It is concerned with checking whether posting is accurately done.
6. It is concerned with totalling of Journal and ledgers and to find out balances in all the accounts.	6. It is concerned with preparation of a Trial Balance with the help of balances of ledger accounts.
7. Book keeping does not require special knowledge and ability.	7. Accounting requires special knowledge and ability.

BRANCHES OF ACCOUNTING

There are three branches of accounting. They are :

(1) **Financial Accounting.** Financial accounting refers to a branch of accounting which deals with financial transactions of a business. It is mainly concerned with preparation of two important statements, viz.,

(*a*) *Income statement or profit and loss account.*
(*b*) *Positional statement or Balance Sheet.* This information serves the needs of all those who are not directly associated with the management of business. Thus financial accounts are concerned with external reporting as it provides information to external authorities. In this book the entire study relates to financial accounting. However financial accounting suffers from certain limitations. These limitations are as follows :

(*a*) It provides only past data.
(*b*) It reveals only over all result of the business.
(*c*) It is static in nature.
(*d*) There is a possibility of manipulation of financial account.
(*e*) It fails to exercise control over resources of the business.

(*f*) It fails to provide adequate data for managerial decision making.

(*g*) It fails to provide adequate data for price fixation.

(*h*) It does not use any technique to reduce expenses which is responsible for decrease in profit.

To overcome there disadvantages the other branches of accounting was evolved.

(2) **Cost Accounting.** Kohler in his Dictionary for Accountants defines cost accounting as that "branch of accounting dealing with the classification, recording, allocation, summarisation and reporting of amount and prospective costs". An analysis of this definition reveals the following aspects of cost accounting.

(*a*) Classification which refers to grouping of like items of costs into a common group.

(*b*) Recording, which refers to posting of cost transactions into various ledgers maintained under cost accounting system.

(*c*) Allocation, which refers to allotment of costs to various products or departments.

(*d*) Summarisation which refers to condensing cost information for quick interpretation and for taking prompt action for improving the inefficiencies.

(*e*) Reporting, which refers to furnishing of cost data on a regular basis so as to meet the requirements of management.

(3) **Management Accounting.** The terminology published by the Institute of Cost and Management accounting, London, defined management accounting as "the application of professional knowledge and skill in the preparation and presentation of accounting information in such a way as to assist management in the formulation of policies and in the planning and control of the operation of the undertaking. It is a branch of accounting which furnishes useful data in carrying out the various management functions such as planning, decision making and controlling the activities of a business enterprise.

ACCOUNTING CONCEPTS AND CONVENTIONS

Before accounting concepts and conventions are discussed, it will be appropriate to know the meaning of the term "accounting principle". In olden days when size of the business was small and less complicated, the accounting information was felt only by the proprietor of a business. In modern days, with the growth of the business organisations, the transactions have become more in number. Unless these transactions are recorded according to a definite principle by all the business enterprises it is difficult to maintain uniformity in accounting system. Such uniformity is also necessary because many parties such as investors, creditors, employees, government and general public are interested to know the affairs of the business. If every business follows its own accounting practices, the final accounts may not be understandable to all such parties. So there is a scope for misinterpreting the position of the business by all persons interested in the business. Hence there is a need to follow a uniform accounting principles from the stage of recording the transactions up to the stage of preparing final accounts.

Definition of Accounting Principle

The terminology committee of American Institute of Certified Public Accounts defines the term principles as a general law or rule adopted or preferred as a guide to action, a settled ground or business of conduct or practice.

In the words of A.W. Johnson accounting principles are the assumptions and rules of accounting, the methods and procedures of accounting and the application of these rules, methods and procedures to the actual practice of accounting.

Accounting principles are accepted by all if they possess the following characteristics :

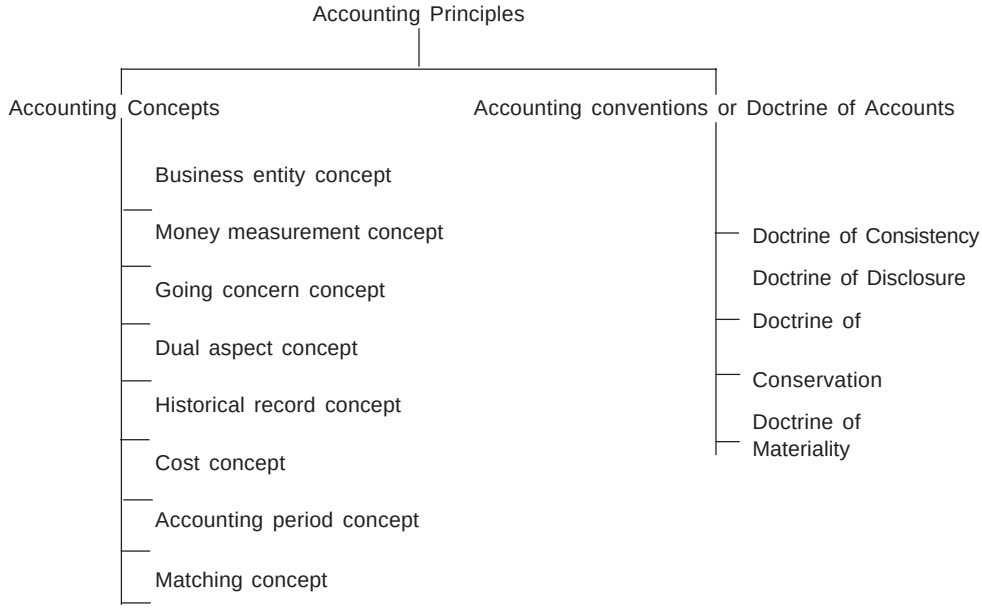
(*a*) ***Objectivity.*** It must be based on facts and impartial attitude ought to have been adopted by it. If it is so, the principle is said to possess objectivity.

(*b*) ***Application.*** If the application of the principle is possible, it is regarded as a good principle. In case theoretically principle is sound but its application is difficult, then the principle has no value.

(*c*) ***Use.*** The principle should be such by whose "use" utility of accounting record is increased. Suppose a principle has objectivity and it is applicable also but there is no use of this principle in accountancy record then the principle is useless.

(*d*) ***Simplicity.*** The principles should be simple and easily understood by all.

Accounting principles are divided into two classes. This is shown in the following chart :



ACCOUNTING CONCEPTS

The term concept refers to assumptions and conditions on which accounting system is based. It denotes the propositions on which principles are formulated. The principles are formulated on the basis of economic and political environment of the business. There is no exhaustive list of accounting concepts. However, the following are considered as the important accounting concepts.

1. Business Entity Concept. The business enterprise is treated as a separate organisation which is quite distinct from the owner of the business. It implies that the business transactions must be kept completely separate from the private affairs of the proprietor. This enables the proprietor to ascertain the true picture of the business.

2. Money Measurement Concept. While preparing accounts in a business, only those transactions which are capable of expressing in terms of money alone are recorded. Other transactions which are not capable of measuring in terms of money consideration are outside the purview of accouting. For example, efficient leadership is essential for the success of the business. But leadership ability cannot be expressed in terms of money. Hence leadership aspect is ignored in accounting. Another important aspect of this accounting concept is that the transactions are recorded only at their original value of money. Subsequent change in the value of money or the purchasing power of the money is ignored. This is based on the assumption that the value of money remains always stable and does not fluctuate from time to time. However, this assumption does not hold good today. Recording of transactions at its original value is justified as it facilitates the addition of all assets of the business to know the total value of assets as on a given period of time.

3. Going Concern Concept. While maintaining accounts it is presumed that the business enterprise will continue to exist for an indefinite period of time. This assumption helps in two respects. Firstly, it facilitates classification of expenditure into capital expenditure and revenue expenditure. While capital expenditure benefits the business for a longer duration, revenue expenditure relates to short duration. If this classification is not made, all expenditure is treated at revenue expenditure which is not proper while preparing accounts. Secondly, because of this assumption, fixed assets are shown at its original cost, less its depreciation.

4. Dual Aspect Concept or Equation Concept. Under this concept, each and every transaction is split up into two aspects. One aspect relates to receiving the benefit and other aspect relates to giving the benefit. For example, when a machinery is bought by the business it receives the machinery with the help of which it can produce goods or services. For having bought the machinery, the business has to pay cash to the supplier of machinery. Thus every business transaction involves two fold aspects and both these aspects are recorded without exception whatsoever. This concept is based on the maxim that for every action there is always an equal and opposite reaction. According to this concept assets of a business will be equal to liabilities and capital. Expressed in the form of an equation,

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

or $$\text{Capital} = \text{Assets} - \text{Liabilities}.$$

5. Historical Record Concept or Realisation Concept. According to this concept the sale proceeds of goods or services are realised only when the buyer is legally bound to pay for the delivery of goods or rendering of service. This concept is based on historical events of business transactions and therefore it is also known as historical record concept. To take an example suppose a businessman receives an order on 1st January, 2004 and supplies goods on 10th January and he receives payment on 15th January. In this transaction, the revenue from sale of goods is recorded on 10th January but neither at 1st January nor on 15th January.

6. Cost Concept. According to this concept all transactions are recorded in the books of accounts at the cost price or purchase price. For example, if a building is bought for Rs. 75000 which is actually worth Rs. 100000 then the cost price of Rs. 75000 will only be entered in the books of accounts.

7. Accounting Period Concept. Although it is assumed that the business will exist for a longer duration it is necessary to maintain accounts with reference to a convenient period so that results are ascertained and financial position presented for that period. Usually accounts are prepared for a period of one year which may be a calendar year or a financial year.

8. Matching Concept. One of the objectives of every business organisation is to know its results as on a given period of time. In order to know the profit or loss of the business the costs incurred during a given period is matched against the revenue earned during that period. This helps to know the profit or loss of the business during a period of time. If the revenue exceeds the cost it represents the profit. On the other hand, if the costs exceed the revenue, it represents the loss.

ACCOUNTING CONVENTIONS OR DOCTRINE OF ACCOUNTS

Accounting convention refers to the customs and traditions followed by Accountants as guidelines while preparing accounting statement. They are followed so as to make accounting information more meaningful and clear. The important accounting conventions are as follows :

1. Doctrine of Consistency. This doctrine implies that the basis followed in different accounting period should be same. In other words, methods adopted in one accounting year should not be changed in another year. If a change becomes necessary, the change and its effect should be mentioned clearly.

2. Doctrine of Disclosure. According to this doctrine all significant information about the business should be disclosed. The accounting statement should be scrupulously honest. This doctrine implies that the accounting records and statements conform to generally accepted accounting principle.

3. Doctrine of Conservation. According to this doctrine the accounting information should not show a better position than what it actually is. Further the accounting information must include all reasons responsible for a reduction in profit or to incur losses. Such transactions relate to provision for doubtful debts, provision for discount on debtors etc. On the other hand the prospective profits should be ignored as it is uncertain to earn such profit.

4. Doctrine of Materiality. According to this doctrine, only transactions which are more important to the business are recorded. Trivial transactions which do not affect the result of the business drastically should be ignored as the cost of ascertaining such insignificant expenses is more than such a trivial expense incurred.

BASIS OF ACCOUNTING

There are two bases for accounting of business transactions. They are as follows :

(*a*) **Accrual Basis or Mercantile System of Accounting.** It is a system of classifying and summarising transactions into assets, liabilities, capital, cost and resources and recording there of. A transaction is recognised when either a liability or asset is created or impaired. Whether payment is made or received is immaterial in accrued basis accounting. The following are the essential features of accrual basis :

(*i*) Revenue is recognised as it is earned.

(*ii*) Costs are matched either against revenues so recognised or against the relevant time period to determine periodic income.

(*iii*) Costs which are not charged to income are carried forward and are kept under continuous review. Any cost that appears to have lost its utility or its power to generate future revenue is written off as a loss.

(*b*) **Cash Basis of Accounting.** It is a basis of accounting by which a transaction is recognised only if cash is received or paid.

However, accrual basis of accounting is the only generally accepted accounting method for business organisations which are supposed to operate for a long period. Cash basis of accounting is suitable for such business organisations which operate for a short term duration.

ACCOUNTING EQUATION

Accounting equation may be defined as an accounting formula expressing equivalence of the two expressions of assets and liabilities. Expressed in the form of an equation,

$$\text{Assets} = \text{Capital} + \text{Liabilities or}$$
$$\text{Capital} = \text{Assets} - \text{Liabilities or}$$
$$\text{Liabilities} = \text{Assets} - \text{Capital.}$$

The idea behind expressing accounting equation is that business is considered quite different from its proprietor. Whenever a proprietor provides the capital to a business he has a claim over it. It follows from the above statement that whenever an asset comes into business an equal claim arises. The accounting equation has two aspects or two sides, viz., left hand side to record any increase or decrease in the value of asset and right hand side to record any change in the value of liabilities.

Because of two-fold aspect of every business transaction, the following changes in the value of assets and liabilities will take place.

(*a*) Increase in the value of one asset will increase the value of a liability
(*b*) Increase in the value of one asset will reduce the value of other asset.
(*c*) Decrease in the value of one asset will decrease the value of a liability.
(*d*) Decrease in the value of one liability will increase the value of another liability.

The accounting equation as mentioned earlier remains unchanged. The only change that takes place is in the totals on the "Left Side" and "Right Side" of the equation.

Relationship of Accountancy with Other Disciplines

The need for and importance of accounting is felt by all the organisations—whether trading or non-trading. The relationship of accounting with various disciplines are explained below :

(*a*) **Accounting and Business.** Business organisations are run with an object of earning profit. They deal with various persons and other organisations. Unless all the business transactions are properly recorded it is not possible to know the true result of the business. Similarly, unless all assets and liabilities are properly recorded it will not be possible to prepare the financial position of the business. The importance of accounting is so much felt in large sized business, wherein accounting is considered as a separate function of the business. Hence a separate department by name accounting department is created which is incharge of the chief Accountant.

(*b*) **Accounting and Government.** Government which is considered as the biggest form of organisation also makes use of accounting discipline. Budgeting which is one of the important aspect of accounting is prepared by every state and central government. Every government is interested in knowing the total revenue and total expenditure and the balance amount available in the government treasury. In case of deficit balance, the government can raise funds through issue of bonds, bills, etc., for financing projects of national importance. In case of surplus funds it can divert to other key sectors where it lacks adequate funds. The importance of accounting is so much felt by the government that in modern days a new branch of accounting called as government accounting is involved and adopted by most of the government.

(*c*) **Accounting and Medical Science.** Medical science also heavily relies upon accounting information. Hospitals and clinics will maintain accounting books in order to know the rates to be charged to patients. They record all the expenses incurred and revenue received for a given period to know whether hospitals and clinic is run with profit or otherwise.

(*d*) **Accounting and Research.** Research organisations also will maintain a set of accounting books to know the research expenses in conducting various experiments. They evaluate the success of the research activities by knowing the corresponding benefit derived by the production and sale of new products.

(*e*) **Accounting and Education.** The promoters of education and educational institutions also will maintain a detailed accounts of various expenses incurred under different heads such as library, laboratory, sports and cultural activities, salaries payable etc. They also record the fees and donations received from students so as to know maintenance cost of educational institutions.

ROLE OF ACCOUNTANT IN SOCIETY

The accountancy profession is considered to be one of the noblest profession and is held in high esteem in public eyes. By making use of science and art of accountancy an accountant will enable public to know the exact position of a business. The profession of accountancy also enables the management to discharge its functions efficiently based upon the information provided by Accountant. The Accountant also serves the society by virtue of his education, training, analytical mind and experience. A modern Accountant can render

useful service not only in the field of taxation, costing, management accounting and company legislation, but also in allied areas such as finance, budgeting, economic aspects.

The various services rendered by an accountant are summarised below

1. **Maintenance of Books of Accounts.** By maintaining the books of accounts, it is possible to know the result of the business and its financial position.

In the process of maintaining the books of accounts, an Accountant renders the following services :

(*a*) Helps management in planning, decision-making and controlling.
(*b*) Facilitate comparative study to know the efficiency or otherwise of the business.
(*c*) In calculating the tax liability of the business
(*d*) To furnish evidence in court in terms of conflict.
(*e*) To ascertain purchase price of business when it is sold to outsiders.
(*f*) To deal on behalf of an insolvent business.

2. **To Conduct Statutory Audit.** Auditing the accounts of a Joint Stock Company is compulsory. A Chartered Accountant serves as an auditor to verify the correctness of accounts of a Joint Stock Company.
3. **To Conduct Internal Audit.** Internal audit is conducted to know whether there is any leakage of revenue or misappropriation of property of the business.
4. **Taxation.** An Accountant can represent the business or person before tax authorities and settle the tax liability as per the Income Tax Act.
5. **Management Accounting.** A management Accountant assists management in performing various functions by way of collecting, analysing, interpreting and presenting all accounting information which is useful to the management.
6. **Financial Service.** These includes :

   (*a*) Investment
   (*b*) Insurance
   (*c*) Business expansion, mergers, acquisitions etc.
   (*d*) Investigation, which includes :
      (*i*) Make or buy decision
      (*ii*) Detecting fraud
      (*iii*) Valuation of Shares
      (*iv*) Achieve greater efficiency on management
      (*v*) Pension and provident fund scheme
      (*vi*) Use of mechanical equipments.

7. **Management Consultancy Service**

   This includes :

   (*i*) Management information service
   (*ii*) Expenditure control and evaluation
   (*iii*) M.B.O.
   (*iv*) Management of working capital and its best possible use
   (*v*) Advising management about O & M studies for effective delegation and planning of work.
   (*vi*) Formulating long term plan and setting up objectives of the business
   (*vii*) Assist management in conducting feasibility study of new projects

(*viii*) Advise management on the benefits of mechanised accounting system
(*ix*) Use of statistical techniques for business forecasting.

8. Other Services

This includes :

(*a*) Registering share transfers and new issues
(*b*) Company formation
(*c*) Liquidation
(*d*) Arbitration.

QUESTIONS

1. Define Book keeping.
2. Define accounting.
3. What do you mean by single entry system of book keeping ?
4. What do you mean by double entry system of Book keeping ?
5. Define accounting principle.
6. List out the four characteristics of accounting principle.
7. What do you mean by accounting concept ?
8. What do you mean by accounting convention ?
9. Define accounting equation.

SHORT ANSWER QUESTIONS

1. Explain the need for accounting.
2. State the objectives of book keeping.
3. State the advantages of book keeping.
4. State the differences between book keeping and accounting.
5. Explain the various accounting concepts.
6. Explain the various accounting conventions.
7. Examine the relationship of accounting with various other disciplines.
8. Explain the role of Accountant in a society.

2

CHAPTER

JOURNAL

THE ACCOUNTING CYCLE OR ACCOUNTING PROCEDURE

In the process of preparing accounts of any organisation, five important steps are involved. These steps are as follows :

1. **Recording in Memorandum Book or Waste Book.** First of all, the various transactions are recorded in a book which is known as a memorandum book or waste book. This book serves as a statistical book to know the number of transactions recorded in a crude form. This type of book is maintained by small traders such as petty shopkeepers.
2. **Recording in the Journal.** From the memorandum book the transactions are recorded into another book known as a Journal. In this book transactions are recorded more systematically by following principles of double entry system of book keeping. This facilitates chronological recording of all transactions without ignoring any transaction.
3. **Recording in the Ledger.** The third step involved in accounting system is to post all the entries from the journal into another book known as ledger. This book shows the balance in each account for a given period and facilitates in further processing of accounts.
4. **Preparation of Trial Balance.** All the balances which are shown by the various accounts in the ledger are then transferred to a statement known as Trial Balance. The preparation of a trial balance also ensures the arithmatical accuracy of the accounts prepared in various ledgers.
5. **Preparation of Final Accounts.** The last step involved in the preparation of accounts is to prepare the final accounts. The final accounts consists of the trading and profit and loss account and a balance sheet. The trading account reveals the gross profit or gross loss of the business, whereas the profit and loss account reveals the net profit or net loss of the business. The balance sheet discloses the financial position of the business.

After the accounting period for which accounting record is closed, again journal, ledger, trial balance, and final accounts are prepared. Thus, the cyclic movement of the transactions through the books of accounting is a continuous process. It goes on for the whole period of business in yearly cycle. This cyclic movement is briefly called the accounting cycle.

CLASSIFICATION OF ACCOUNTS

There are two basis of classification of accounts, viz., (*i*) Traditional or English System and (*ii*) Modern or American System.

1. Traditional or English System of Classification of Accounts :

Under this system accounts are broadly classified into two types, viz., (*i*) Personal account and (*ii*) Impersonal account.

(A) **Personal Account.** Personal accounts are accounts of persons with whom the business deals. Personal accounts may take the following forms :

(*a*) Natural personal accounts such as Ashok's a/c, Vivek's account, Naveen's a/c, Sunil's a/c etc.
(*b*) Artificial persons or body of personal accounts such as State Bank of Mysore a/c, M.C.C. Publications a/c, Associate Traders a/c. etc.
(*c*) Representative personal accounts representing outstanding expenses, prepaid income a/c. Examples : Salary outstanding a/c, prepaid insurance a/c, interest received in advance a/c.

(B) Impersonal Account. Impersonal account is classified into two types : viz., (*a*) Real account and (*b*) Nominal account.

(*a*) *Real Account :* Accounts of Assets and possessions or things owned by business are called real accounts. Real accounts are again classified into two types viz., (*i*) Tangible asset a/c and (*ii*) Intangible asset a/c.
  (*i*) *Tangible Asset a/c :* Tangible asset a/c is an a/c relating to things which can be touched, felt, measured, purchased, sold etc. Examples are Land a/c, Building a/c, Stock a/c etc.
  (*ii*) *Intangible Asset a/c* represent such things which cannot be touched, but can be measured in terms of money. Examples are goodwill a/c, trade mark a/c, patent a/c.
(*b*) *Nominal Account :* Accounts in which expenses, losses, income or gain of business are recorded are known as nominal accounts. Examples of nominal accounts are wages a/c, discount received a/c, interest paid a/c.

Problem 1. Classify the following accounts :

1. Buildings a/c
2. Royalty a/c
3. Loan a/c
4. Murthy's a/c
5. Garden English School a/c
6. Avinash a/c
7. Vasavi Trading a/c
8. Goodwill a/c

Solution

1. Building a/c—Real a/c
2. Royalty a/c—Nominal a/c
3. Loan a/c—Personal a/c
4. Murthy's a/c—Personal a/c
5. Garden English School a/c—Personal a/c
6. Avinash a/c—Personal a/c
7. Vasavi Trading a/c—Personal a/c
8. Goodwill a/c—Real a/c.

Rules of Debit and Credit under English System

1. **Personal Account :**
   Debit the Receiver
   Credit the Giver
2. **Real Account :**
   Debit what comes in
   Credit what goes out.
3. **Nominal Account :**
   Debit all expenses and losses
   Credit all incomes and gains.

Problem 2. Examine the following transactions and determine the two accounts affected according to the double entry book keeping.

(*a*)	Bought goods for cash	Rs. 2000
(*b*)	Sold goods for cash	Rs. 1000
(*c*)	Received cash from Kulkarni	Rs. 500
(*d*)	Received interest on loan	Rs. 180
(*e*)	Paid salary to Manager	Rs. 5000
(*f*)	Paid rent	Rs. 1500
(*g*)	Purchased goods from Desai & Co.	Rs. 1500
(*h*)	Goods sold on credit to Lalit	Rs. 1000
(*i*)	Purchased motor car equipment from Mumbai Motor Agency and paid	Rs. 8900
(*j*)	Purchased machinery from India Tools Limited	Rs. 7000
(*k*)	Withdrew cash for household expenses	Rs. 300
(*l*)	Introduced further Rs. 50000 into business in cash.	

Solution

The two account involved in the transactions are :

(*a*) Purchases a/c and cash a/c
(*b*) Sales a/c and cash a/c
(*c*) Kulkarni's a/c and cash a/c
(*d*) Interest a/c and cash a/c
(*e*) Salary a/c and cash a/c
(*f*) Rent a/c and cash a/c
(*g*) Purchases a/c and Desai & Co. a/c
(*h*) Sales a/c and Lalit's a/c
(*i*) Motor car equipment a/c and cash a/c
(*j*) Machinery a/c and India Tools Ltd. a/c
(*k*) Drawings a/c and cash a/c
(*l*) Capital a/c and cash a/c.

Problem 3. State, giving reasons, the accounts you would debit and credit for each of the following transactions :

1.	Mr. Rao commenced business with a capital	Rs. 1,00,000
2.	Bought machinery	Rs. 30000
3.	Bought goods for cash from Ram Manohar	Rs. 5000
4.	Sold goods for cash to Harish	Rs. 4000
5.	Purchased goods from Jailal on credit	Rs. 22000
6.	Opened an account with Canara Bank and Deposited cash	Rs. 20000
7.	Credit sales to Hari	Rs. 1700
8.	Bought office furniture from Modern Furniture Ltd.,	Rs. 3050
9.	Sold a spare part of Motor car and inverted proceeds in business	Rs. 3500
10.	Paid cartage to Deluxe Roadlines	Rs. 700
11.	Paid trade expenses	Rs. 200
12.	Paid advertisement expenses to Anil agencies	Rs. 200
13.	Received interest from Anil	Rs. 500
14.	Deposited cash into Bank	Rs. 1000
15.	Paid Rent Rs.1500	

Solution

S.No	*Account involved*	*Nature of A/c*	*Debit and credit*	*Rule for Dr & Cr*
1.	Cash a/c	Real a/c	Debit	Debit what comes in
	Capital a/c	Personal a/c	Credit	Credit what goes out
2.	Machinery a/c	Real a/c	Debit	Debit what come in
	Cash a/c	Real a/c	Credit	Credit what goes out
3.	Purchases a/c	Nominal a/c	Debit	Debit expenses
	Cash a/c	Real a/c	Credit	Credit what goes out
4.	Cash a/c	Real a/c	Debit	Debit what come in
	Sales a/c	Nominal a/c	Credit	Credit income
5.	Purchases a/c	Nominal a/c	Debit	Debit expenses
	Jaslal's a/c	Personal a/c	Credit	Credit the giver
6.	Bank a/c	Personal a/c	Debit	Debit the receiver
	Cash a/c	Real a/c	Credit	Credit what goes out
7.	Hari's a/c	Personal a/c	Debit	Debit the receiver
	Sales a/c	Nominal a/c	Credit	Credit income
8.	Furniture a/c	Real a/c	Debit	Debit what come in
	Cash a/c	Real a/c	Credit	Credit what goes out
9.	Cash a/c	Real a/c	Debit	Debit what come in
	Capital a/c	Personal a/c	Credit	Credit the giver
10.	Cartage a/c	Nominal a/c	Debit	Debit expenses
	Cash a/c	Real a/c	Credit	Credit what goes out
11.	Trade expenses a/c	Nominal a/c	Debit	Debit expenses
	Cash a/c	Real a/c	Credit	Credit what goes out
12.	Advertisement a/c	Nominal a/c	Debit	Debit expenses
	Cash a/c	Real a/c	Credit	Credit what goes out
13.	Cash a/c	Real a/c	Debit	Debit what come in
	Interest a/c	Nominal a/c	Credit	Credit income
14.	Bank a/c	personal a/c	Debit	Debit the receiver
	Cash a/c	Real a/c	Credit	Credit what goes out
15.	Rent a/c	Nominal a/c	Debit	Debit expenses
	Cash a/c	Real a/c	Credit	Credit what goes out

MODERN OR AMERICAN SYSTEM OF CLASSIFICATION OF ACCOUNTS

Under American system accounts are classified into the following types

(*i*) *Assets :* It refers to the property owned or possessed by the businessman. Assets can be of the following types

(*a*) *Fixed assets :* Such assets are used for carrying on the business but not for immediate sale. Some examples of fixed assets are land and building, macheinery, furniture etc.

(*b*) *Currents assets :* These are the assets which are capable of converting into cash immediately without much difficulty, usually within a period of one year. These are the assets which are used in the business in the normal course of running the business. Current assets change from period to period. Hence they are also called as fluctuating assets. Examples of current assets are stock of materials, Debtors, cash, bills receivable etc.

(*c*) *Tangible Assets :* These are the assets which can be touched and felt. Examples of tangible assets are stock of materials, vehicles, building etc.

(*d*) *Intangible Assets* : These assets cannot be touched and felt but they have money value to the business. Examples of intangible assets are goodwill, trade mark, patent rights.

(*e*) *Wasting Asset* : These assets exhaust as they are continuously used. Mineral ores such as iron ore, quarries etc., are common examples of wasting asset.

(*f*) *Liquid Asset* : These are a type of current assets which are in the form of cash or readily convertible into cash. Examples of liquid assets are cash, bills receivables etc.

(*g*) *Fictitious Assets* : These refer to worthless assets. They cover expenses and losses which are shown for the sake of meeting legal requirements or for technical purpose. Examples of such assets are preliminary expenses, advertisement expenses etc.

2. **Liability.** It refers to the amount due by the business to others. Liabilities may be of the following types :
   (*a*) *Current Liabilities :* They represent short term liabilities which are to be paid within a period of one year.
   (*b*) *Fixed Liabilities :* They represent long term liabilities payable after a long period of time.
3. **Capital.** Capital generally refers to the amount or resources invested by the owner in the business. In accounting language it is taken to mean excess of assets over liabilities.

   Capital = Assets – Liabilities.
4. **Revenue and Profit.** Revenue and profit is taken to mean income earned by a business during a given period of time. These two items constitute the liability of the business as profit is given to business-man as a reward for the risk taken by the proprietor.
5. **Expenses and Losses.** The cost incurred during the course of running the business is known as expense. The excess of expense over income constitute loss.

Rules of Debit and Credit under American System

The rules of debit and credit under American system is based on Accounting equation. The rules are as follows :

1. **Asset :**
   Debit increase in asset
   Credit decrease in asset.
2. **Liabilities :**
   Debit decrease in liability
   Credit increase in liability.
3. **Capital :**
   Debit decrease in capital
   Credit increase in capital.
4. **Income and Gain :**
   Debit decrease in income and gain
   Credit increase in income and gain.
5. **Expenses and Losses :**
   Debit increase in expenses and losses
   Credit decrease in expenses and losses.

It is to be noted that expenses and losses and income and gain are not the components of accounting equation. Their effect is shown through capital account. The rules given for them is only for an easier understanding.

Problem 4. Identify the debit and credit aspects of the following transactions under American system giving reasons for the same.

1. Mr. Soumya Gupta started business with a capital Rs. 5,00,000
2. He purchased machinery on credit from Ram Rs. 40,000
3. He purchases goods for cash Rs. 1,00,000
4. He sold goods to Satish for Rs. 50,000
5. He paid rent for the month Rs. 5,000
6. He received commission Rs. 10,000
7. He received cash from Satish Rs. 20,000
8. He withdrew for personal use Rs. 5,000
9. He purchased goods from Ratan Rs. 40,000
10. He returned goods to Ratan Rs. 6,000

Solution

S. No.	*Aspects*	*Debit or Credit*	*Reason*
1.	Cash Capital	Debit Credit	Increase in asset Increase in capital
2.	Machinery Ram	Debit Credit	Increase in asset Increase in liability
3.	Goods (Tangible asset) Cash	Debit Credit	Increase in asset Decrease in asset
4.	Satish Goods (Tangible asset)	Debit Credit	Increase in asset Decrease in asset
5.	Rent Cash	Debit Credit	Increase in expense Decrease in asset
6.	Cash Commission	Debit Credit	Increase in asset Increase in income
7.	Cash Satish	Debit Credit	Increase in asset Increase in liability
8.	Capital (Drawings) Cash	Debit Credit	Decrease in capital Decrease in asset
9.	Goods (Asset) Ratan	Debit Credit	Increase in asset Increase in liability
10.	Ratan Goods (Asset)	Debit Credit	Decrease in liability Decrease in asset.

Journal. Journal is a tabular record in which business transactions are analysed in terms of debits and credits and recorded in a chronological order prior to being transferred to the ledger accounts. Because transactions are initially recorded in the journal, it is also referred to as the book original entry or book of prime entry.

Journalising. The process of recording transactions in the journal is called journalising. Before a transaction is recorded in the journal the accounts involved and the debit and credit aspects are to be decided. Journalising includes an analysis and an actual recording.

Journal Entry. The record of the transaction in the journal is called a journal entry.

Narration : The statement written to explain a transaction is called narration.

Simple and Compound Journal Entry : If a journal contains only one debit and one credit it is called a simple journal entry.

A journal entry which includes more than one debit or more than one credit is called compound journal entry. A compound journal entry is a combination of two or more simple journal entries.

Procedure for Recording Transactions in the Journal :

The procedure for recording transactions in the journal are as follows :-

1. **The Date.** The year, month and date of transaction are written in the date column. The year is recorded at the top of the date column of each journal page. The month is written in the first line of the date column. Neither the month nor the year is repeated on the page unless the month or year changes. The date of each transaction is recorded in the journal.
2. **Particulars.** The title of the account to be debited is listed at the left of the particulars column and traditionally recorded first. The abbreviation "Dr" is written after the name of the account debited. The title of the account to be credited is listed on the line below the account debited and is indented, *i.e.*, placed about an inch to the right of the date column. The abbreviation "To" is to be written before the name of the account credited.
   The narration is written below the account credited. The narration should be as brief as possible consistent with disclosure of all the information necessary to understand the transaction being recorded.
3. **Amount.** The debit amount is recorded in the debit column opposite the title of the account debited. The credit amount is recorded in the credit column opposite the title of the account credited.
4. **Writing Folio Number.** The ledger folio refers to page number of the ledger account to which debits and credits are transferred from the journal. This column is not used at the time transactions are recorded in the journal. When the debits and credits are later transferred to ledger accounts the page number of the ledger account is listed in this column to provide a convenient cross reference with the ledger.

A specimen form of a journal is shown below :

Journal

Date	*Particulars*	*Ledger Folio*	*Debit Rs.*	*Credit Rs.*

Problem 5. Srinivas started his business with the following assets and liabilities.

Cash in Hand	15,000
Goods in Hand	25,000
Furniture	6,000
Buildings	20,000
Due by A. Raman	6,000
Due to Kameshwaran	8,000
Due to Mohan	12,000

2004 January

1.	Purchased goods from Mohan subject to trade discount of 5%	10,000
3.	Sold goods to Murthy subject to a trade discount of 2%	5,000
5.	Received from A. Raman	5,800
	Discount allowed	200
10.	Received from Murthy in full settlement of account	4,500
15.	Paid Kameshwaran in full settlement of account	7,750
20.	Paid Mohan	10,000

Discount allowed 500

Journalise the above transactions :

Solution

Journal Entries

Date	*Particulars*		*LF*	*Dr.*	*Cr.*
2004	Cash a/c	Dr.		15,000	
Jan 1,	Goods a/c	Dr.		25,000	
	Furniture a/c	Dr.		6,000	
	Buildings a/c	Dr.		20,000	
	Debtor's a/c (Raman)	Dr.		6,000	
	To creditors a/c				
	(Kameshwaran and Mohan)				20,000
	To Capital				52,000
	(Being commencement of business with above assets and liabilities and the difference between these credited to capital a/c.				
1.	Purchases a/c	Dr		9,500	
	To Mohan's a/c				9,500
	(Being goods purchased at a trade discount of 5%)				
3.	Murthy's a/c	Dr.		4,900	
	To Sales a/c				4,900
	(Being credit sales to Murthy at a trade discount of 2%)				
5.	Cash a/c	Dr.		5,800	
	Discount a/c	Dr.		200	
	To A. Raman's a/c				6,000
	(Being cash received from A. Raman and discount allowed)				
10.	Cash a/c	Dr.		4,500	
	Discount a/c	Dr.		400	
	To Murthy's a/c				4900
	(Being cash received in full settlement of a/c)				
15.	Kameshwaran a/c	Dr.		8,000	
	To Cash a/c				7,750
	To Discount a/c				250
	(Amount paid to Kameshwaran in full settlement)				
20.	Mohan a/c	Dr.		10,500	
	To Cash				10,000
	To Discount				500
	(Being payment made on account)				

Problem 6. Show how the following transactions appear in the Journals of Ram and Rahim.

1. Ram bought goods from Rahim Rs. 1,000.
2. Rahim bought goods for cash Rs. 8,000 from Ram.
3. Rahim received from Ram Rs. 5,000 and allowed him discount Rs. 250.
4. Ram sold goods to Rahim Rs. 7,000
5. Rahim supplied goods worth Rs. 2500 for Ram's domestic use.
6. Ram received Rs. 5,000 from Rahim for repairing the private car of Rahim.

Solution

(In the books of Ram)
Journal Entires

Date	*Particulars*	*LF*	*Debit*	*Credit*
1.	Purchases a/c Dr. To Rahim's a/c (Being goods purchased from Rahim)		1,000	 1,000
2.	Cash a/c Dr. To Sales a/c (Being cash sales to Rahim)		8,000	 8,000
3.	Rahim's a/c Dr. To Cash To Discount (Being payment made and discount received)		5,250	 5,000 250
4.	Rahim's a/c Dr. To Sales a/c (Being goods sold)		7,000	 7,000
5.	Drawings a/c Dr. To Rahim's a/c (Being goods bought from him for domestic use)		2,500	 2,500
6.	Repairs a/c Dr. To Cash (Being repair charged of car paid to Ram)		5,000	 5,000

In the books of Rahim

Date	*Particulars*	*LF*	*Debit*	*Credit*
1.	Ram's a/c Dr. To Sales a/c (Being credit sale of goods)		1,000	 1,000
2.	Purchases a/c Dr. To Cash a/c (Being cash purchase of goods)		8,000	 8,000

Date	Particulars	LF	Debit	Credit
3.	Cash a/c Dr.		5,000	
	Discount a/c		250	
	To Ram's a/c			5,250
	(Being cash received from Ram and discount allowed to him)			
4.	Purchases a/c Dr.		7,000	
	To Ram's a/c			7,000
	(Being credit purchases from Ram)			
5.	Ram's a/c Dr.		2,500	
	To Sales a/c			2,500
	(Being goods sold to Ram)			
6.	Repairs a/c Dr.		5,000	
	To Cash a/c			5,000
	(Being repair charges of car paid to Ram)			

Problem 7. Show how the following transactions would appear in the journal of John and Joseph.

2004 Jan.

1. John bought goods from Joseph Rs. 1,000
2. Joseph bought goods from John for cash Rs. 1,500
3. Joseph received from John Rs. 780 and allowed him discount Rs. 20
8. John made cash sales of Rs. 700 to Joseph.
15. Joseph supplied goods worth Rs. 300 for John's domestic use.
19. John supplied to Joseph machinery worth Rs. 2,000 in exchange for furniture worth Rs. 1,000, goods of Rs. 800 and cash of Rs. 200
22. Joseph charged John commission of Rs. 50
25. Joseph received a cheque for Rs. 1,000 from John in full settlement of Rs. 1,050
27. John's cheque was paid into the Bank.
31. John advanced a loan of Rs. 2,000 to Joseph.

Solution

In the Books of John
Journal Entires

Date	Particulars	LF	Debit	Credit
2004 Jan 1,	Purchases a/c Dr.		1,000	
	To Joseph's a/c			1,000
	(Being goods purchased from Joseph on credit)			
2.	Cash a/c Dr.		1,500	
	To Sales a/c			1,500
	(Being goods sold for cash)			

Date	Particulars	LF	Debit	Credit
3.	Joseph's a/c Dr.		800	
	To Cash a/c			780
	To Discount received A/c			20
	(Being cash paid to Joseph and discount received from him)			
8.	Cash a/c Dr.		700	
	To Sales a/c			700
	(Being goods sold for cash)			
15.	Drawings a/c Dr.		300	
	To Joseph's a/c			300
	(Being goods received from Joseph on credit for domestic use)			
19.	Furniture a/c Dr.		1,000	
	Purchases a/c Dr.		800	
	Cash a/c Dr.		200	
	To Machinery a/c			2,000
	(Being machinery exchanged for furniture, goods and cash)			
22.	Commission a/c Dr.		50	
	To Joseph's a/c			50
	(Being commission due to Joseph)			
25.	Joseph's a/c Dr.		1,050	
	To Bank a/c			1,000
	To Discount received a/c			50
	(Being the cheque issued to Joseph and discount received from him)			
31.	Joseph's Loan a/c Dr.		2,000	
	To Cash a/c			2,000
	(Being loan advanced to Joseph)			

Note :

The transactions of 27th January, 2004 will not affect John ; so no entry will be passed for that transactions in John's books

In the Books of Joseph
Journal Entires

Date	Particulars	LF	Debit	Credit
2004 Jan 1,	John's a/c Dr.		1,000	
	To Sales a/c			1,000
	(Being goods sold to John on credit)			
2,	Purchases a/c Dr.		1,500	
	To Cash a/c			1,500
	(Being goods purchased for cash)			

Date	Particulars		LF	Debit	Credit
3.	Cash a/c	Dr.		780	
	Discount allowed a/c	Dr.		20	
	To John's a/c				800
	(Being cash received from John and discount allowed to him)				
8.	Purchases a/c	Dr.		700	
	To Cash a/c				700
	(Being goods purchased for cash)				
15.	John's a/c	Dr.		300	
	To Sales a/c				300
	(Being goods sold to John on credit)				
19.	Machinery a/c	Dr.		2,000	
	To Furniture a/c				1,000
	To Sales a/c				800
	To Cash a/c				200
	(Being furniture, goods and cash exchanged for machinery purchase)				
22.	John's a/c	Dr.		50	
	To Commission a/c				50
	(Being commission charged to John)				
25.	Cash a/c	Dr.		1,000	
	Discount allowed a/c	Dr.		50	
	To John's a/c				1,050
	(Being cheque received from John and discount allowed to him)				
27.	Bank a/c	Dr.		1,000	
	To Cash a/c				1,000
	(Being John's cheque deposited into bank)				
31.	Cash a/c	Dr.		2,000	
	To John's loan a/c				2,000
	(Being loan received from John)				

Problem 8. Write transactions for the following journal entires :-

Date	Particulars		LF	Debit	Credit
1.	Cash a/c	Dr.		5,000	
	To Capital a/c				5,000
2.	Cash a/c	Dr.		2,000	
	To Mrs. Manohar's a/c				2,000
3.	Interest on Loan a/c	Dr.		200	
	To Cash a/c				200

Date	Particulars		LF	Debit	Credit
4.	Prepaid Rent a/c	Dr.		80	
	To Cash a/c				80
5.	Cash a/c	Dr.		30	
	To Rent a/c				30
6.	Mrs. Manohar's loan a/c	Dr.		2,000	
	Interest on loan a/c	Dr.		100	
	To Cash a/c				2100
7.	Office equipment a/c	Dr.		1,500	
	To Cash a/c				1,500
8.	Sen's a/c	Dr.		30	
	To Commission a/c				30
9.	Drawings a/c	Dr.		50	
	To Cash a/c				50
10.	Loss by Theft a/c	Dr.		3,000	
	To office equipment a/c				3,000
11.	Cash a/c	Dr.		500	
	To Ashok's a/c				500

Solution

1. Invested in the business an amount of Rs.5,000
2. Received loan from Mrs. Manohar Rs.2,000
3. Paid interest on loan for Rs.200
4. Paid advance rent to landlord for Rs.80
5. Received rent from sub-tenant
6. Repaid Mrs. Manohar's loan with interest Rs.500
7. Paid cash for office equipment Rs.1,500
8. Commission due from Sen Rs.30
9. Cash withdrawn for personal use Rs.50
10. Office equipment stolen Rs.3,000
11. Ashok paid us on account Rs.500

Problem 9. Write transactions for the following entires :

Date	Particulars		LF	Debit	Credit
1.	Cash a/c	Dr.		40,000	
	Stock a/c	Dr.		10,000	
	To Capital a/c				50,000
2.	Machinery a/c	Dr.		2,000	
	To Cash a/c				500
	To Loan a/c				1,500
3.	Srinivas a/c	Dr.		50	
	To Purchase returns a/c				50

Date	Particulars		LF	Debit	Credit
4.	Cash a/c	Dr.		1,000	
	To Sridhar's a/c				1,000
5.	Bank a/c	Dr.		1,000	
	To Cash a/c				1,000
6.	Drawings a/c	Dr.		50	
	To Purchases a/c				50
7.	Sridhar's a/c	Dr.		1,000	
	To Bank a/c				1,000
8.	Cash a/c	Dr.		980	
	Discount allowed			20	
	To Arun's a/c				1,000
9.	Cash a/c	Dr.		500	
	To Capital a/c				500
10.	Mahesh's a/c	Dr.		100	
	M.O. Commission a/c	Dr.		4	
	To Cash a/c				104
11.	Harish's a/c	Dr.		100	
	To Sales a/c				100
12.	Purchase a/c	Dr.		1,000	
	To Ravindra's a/c				1,000
13.	Sales Returns a/c	Dr.		30	
	To Cash a/c				30
14.	Investment a/c	Dr.		1,000	
	To Cash a/c				1,000
15.	Cash a/c	Dr.		1,000	
	To Investment a/c				1,000

Solution

1. Started business with cash for Rs. 40,000 and goods for Rs. 10,000
2. Purchased machinery for Rs. 2,000 giving Rs. 500 in cash and the balance through a loan.
3. Returned damaged goods to Srinivas for Rs. 50
4. Received cheque from Sridhar for Rs. 1,000
5. Deposited cheque into bank for Rs. 1,000
6. Goods drawn for use at home for Rs. 50
7. Cheque deposited into bank for collection was returned disohonoured for Rs. 1,000
8. Received cash from Arun in full settlement of his account for Rs. 1,000
9. Introduced further capital for Rs. 500
10. Sent money order to Mukesh for Rs. 100
    M.O. commission paid Rs. 4.
11. Harish bought goods from us for Rs. 100, or sold goods to Harish for Rs. 100
12. Purchased goods from Ravindra for Rs. 1,000
13. Received goods returned and paid value in cash for Rs. 30
14. Purchased securities worth for Rs. 1,000
15. Securities sold for Rs. 1,000

Problem 10. Complete the following Journal Entires :

1. Cash a/c Dr.
   To _____
   (Being cash introduced to start the business)

2. _____ Dr.
   To Sales a/c
   (Being cash sales)

3. Purchases a/c Dr.
   To _____
   (Being credit purchases from Naryan)

4. _____ Dr.
   To Purchase Return's a/c
   (Being goods returned to Nagaraj)

5. _____ Dr.
   To Nirupam's a/c
   (Being goods returned by Nirupam)

6. _____ Dr.
   To Capital a/c
   (Being additional capital paid into bank)

7. _____ Dr.
   To Cash a/c
   (Being commission given to Nitin)

8. _____ Dr.
   _____ Dr.
   To Harish a/c
   (Being cheque received for Rs. 955 in full settlement of the account for Rs. 1,000)

9. _____ Dr.
   To Bank a/c
   (Being income tax and house rent paid)

10. Bank a/c Dr.
    To _____
    (Being Harish's cheque sent to bank)

11 _____ Dr.
   To Bank a/c
   (Being cheque issued to repair the plant)

Solutions

Journal Entries

Date	*Particulars*	*LF*	*Debit*	*Credit*
1.	Cash a/c Dr.			
	To Capital a/c			
	(Being cash brought in to start the business)			
2.	Cash a/c Dr.			
	To Sales a/c			
	(Being cash sales)			
3.	Purchases a/c Dr.			
	To Narayan's a/c			
	(Being credit purchases from Narayan)			
4.	Nagaraj's a/c Dr.			
	To Purchase Returns a/c			
	(Being goods returned to Nagaraj)			
5.	Sales Returns a/c Dr.			
	To Nirupam's a/c			
	(Being goods returned by Nirupam)			
6.	Bank a/c Dr.			
	To Capital a/c			
	(Being additional capital paid into bank)			
7.	Commission a/c Dr.			
	To Cash a/c			
	(Being commission given to Nitin)			
8.	Cash a/c Dr.			
	Discount a/c Dr.			
	To Harish a/c			
	(Being cash received in full settlement of the account)			
9.	Drawings a/c Dr.			
	To Bank a/c			
	(Being income tax and house-rent paid)			
10.	Bank a/c Dr.			
	To Cash a/c			
	(Being Harish's cheque sent to bank)			
11.	Repairs a/c Dr.			
	To Bank a/c			
	(Being cheque issued for repairs to plant)			

QUESTIONS

Simple Questions :

1. What do you mean by accounting cycle ?
2. What is journal ?
3. What do you mean by journal entry ?
4. What do you mean by journalising ?
5. What is narration ?

6. What do you mean by simple journal entry ?
7. What do you mean by compound journal entry ?
8. State the steps involved in accounting cycle.

EXERCISE 1

Pass Journal Entries in the books of Sachin :

(*a*) Sachin started business with cash Rs. 5,00,000
(*b*) He bought goods from Dravid on credit Rs. 50,000
(*c*) He opened a current a/c in a bank and deposited Rs. 1,50,000 therein.
(*d*) Sold goods to Joshi Rs. 20,000
(*e*) Returned damaged goods to Dravid Rs. 1,000
(*f*) Received goods returned by Joshi for Rs. 500
(*g*) He received a cheque from Joshi for Rs. 19,000 in full settlement of his account.
(*h*) Joshi's cheque was paid into the bank.
(*i*) Paid college fees of the proprietor's daughter Rs. 5,000
(*j*) Drew from bank Rs. 10,000
(*k*) Drew from bank for household expenses Rs. 10,000
(*l*) Sold goods to Kanitkar Rs. 10,000
(*m*) Kanitkar directly paid into the bank a/c Rs. 10,000
(*n*) Met travelling expenses Rs. 10,000

EXERCISE 2

Gangadhara commenced business as a merchant on 1st April, 2004. The following are the transactions for the month of April

1. Started business with cash Rs. 10,000, building Rs. 60,000 ; bank loan of Rs. 5,000
2. Bought furniture for cash Rs. 2,000 from Grace & Co., goods Rs. 4,000 and paid carriage Rs. 100
4. Cash sales Rs. 1,000 and credit sales to Ganesh Rs. 500
6. Bought goods from Ganesh for cash Rs. 2,000 Sold goods to Ganapathy for Rs. 6,000 paid rent of Rs. 200
9. Commission received from Dhanpal for Rs. 200 withdrew, cash for personal use of Rs. 1,000
12. Ganapathy sent an order of goods worth Rs. 3,000 .
18. Appointed Goynam as Salesman on monthly salary of Rs. 4,000
24. Supplied goods to Ganapathy as per order received on April 12, and paid Rs. 30 as freight on them.
26. Selected a building for the shop at a monthly rent of Rs. 1,500. Returned goods to Ganesh Rs. 1,000 and furniture to Grace & Co. Rs. 1,000
27. Ganapathy returned defective goods Rs. 1,000 Gajanana resigned and his salary Rs. 1,200 was paid.
29. Sent for domestic use furniture worth Rs. 500 and goods worth Rs. 500
30. Bought a motor van for the business for Rs. 1,00,000 and paid from the personal account.

EXERCISE 3

Write transactions for the following journal entries :-

1.	Cash a/c To Mrs. Nayak's Loan a/c	Dr.	20,000	 20,000
2.	Syndicate Bank a/c To Cash a/c	Dr.	10,000	 10,000
3.	Vikram's a/c To Cash a/c	Dr.	1,000	 1,000
4.	Saurav's Loan a/c To Cash a/c	Dr.	8,000	 8,000
5.	Furniture a/c To Cash a/c	Dr.	800	 800
6.	Cash a/c To Vikram's a/c	Dr.	1,000	 1,000
7.	Prabhakar's a/c To Sales a/c	Dr.	6,000	 6,000
8.	Bank a/c To Prabhakar's a/c	Dr.	6,000	 6,000
9.	Drawings a/c To Cash a/c	Dr.	300	 300
10.	Vehicles a/c To Cash a/c	Dr.	1,000	 1,000
11.	Travelling expenses a/c To Cash a/c	Dr.	100	 100
12.	Prepaid Insurance a/c To Cash a/c	Dr.	500	 500
13.	Charity a/c To Cash a/c	Dr.	1,000	 1,000
14.	Bank a/c To Bank loan a/c	Dr.	1,000	 1,000
15.	Bank a/c To Interest on Bank deposit a/c	Dr.	20 20	

EXERCISE 4

Complete the following journal entries

1. Cash a/c Dr.
   To _____
   (Being capital introduced)

2. _____ a/c Dr.
   To Cash a/c
   (For purchase of plant and machinery from Mohan for cash)

3. _____ a/c Dr.
   To Outstanding salary a/c
   (For outstanding salary adjusted)

4. _____ a/c Dr.
   To Sales a/c
   (Being cash sales to Mohan)

5. _____ a/c Dr.
   To Commission a/c
   (Commission received from Sohan)

6. Stock a/c Dr.
   To _____ a/c
   (Being the transfer of closing stock)

7. _____ a/c Dr.
   To Goods a/c
   (Being goods used by the trader for private use)

8. Kalidas a/c Dr.
   To _____ a/c
   (Returned goods to Kalidas)

9. Wages a/c Dr.
   To _____ a/c
   (Paid wages by cheque)

10. Prepaid Insurance a/c Dr.
    To _____ a/c
    (For adjustment of insurance prepaid)

EXERCISE 5

Correct the incorrect entries in terms of the narration :

1.	Purchases a/c To Cash a/c (Being office furniture purchased for cash)	Dr.	5,000	5,000
2.	Drawings a/c To Bank a/c (Being the cash withdrawn from office for personal use)	Dr.	1,000	1,000
3.	Purchases a/c To Cash a/c (Being the goods bought from Raman)	Dr.	500	500
4.	Drawings a/c To Bank a/c (Being the amount withdrawn from bank for office use)	Dr.	200	200

5.	Cash a/c To Bharath's a/c (Being the cash received from Bharath on account of commission)	Dr.	500	500
6.	Govind's a/c To Cash a/c (Being the cash paid to Govind on account of his salary)	Dr.	800	800
7.	Cheque a/c To Chandran a/c (Being the cheque received from Chandran account)	Dr.	500	500
8.	Machinery a/c To Cheque a/c (Being the cheque issued for machinery repair)	Dr.	250	250
9.	Cash a/c To Murali's a/c (Being the additional capital introduced by the proprietor Murali)	Dr.	2,000	2,000
10.	Income Tax a/c To Cash a/c (Being the income tax paid)	Dr.	500	500
11.	Bank Charges a/c To Cash a/c (Being the amount charged by bank as bank charges)	Dr.	100	100
12.	Cash a/c To Interest a/c (Being the interest due from Ramesh)	Dr.	50	50

3

CHAPTER

LEDGER

ACCOUNT

An account is a summarised record of all transactions relating to a person, property, or a class of income or expenditure. Accounts are of three types, viz (*a*) Personal account (*b*) Real account and (*c*) Nominal account.

LEDGER

The ledger is the principal book of accounts where similar transactions relating to a particular person or thing are recorded. It is a set of accounts. It contains personal, real or nominal accounts with which business deals with. A ledger enables to knows cumulative effect of entries for each individual account and also for the entire business.

Need for ledger

Journal records all the transaction in a chronological order as they occur. As the Journal contains numerous transactions it is not possible to ascertain the net effect of transactions on each individual asset, liability, owners equity, revenue and expense account. For example, there may be 100 or more transactions affecting cash spread throughout the journal. So to ascertain net change in cash all these effects are to be brought together in the cash account. This is accomplished through ledger. The focus of the ledger is on the individual accounts of the business. In this manner we can show for each account the cumulative effect of all the transactions which affect that account. A specimen form of ledger account is shown below.

Dr **Name of the Account** **Cr**

Date	*Particulars*	*JF*	*Amount*	*Date*	*Particulars*	*JF*	*Amount*

Differences between Journal and ledger :

The main points of differences between a journal and a ledger are as follows :

1. Journal is the book of prime entry while ledger is the book of final entry. This is because all transactions are entered first in the Journal and then are transferred to the appropriate accounts in the ledger.

2. Journal records transactions in a chronological order while ledger records transactions in an analytical order i,e, the components of each transaction that effect individual asset, liability, owner's equity, revenue and expense account are grouped together.
3. The unit of organisation for the Journal is the transaction, whereas the unit of organisation for the ledger is the account.
4. The process of recording transactions in the journal is called "Journalising", while the process of recording transactions in the ledger is called "posting".

Sub-division of a Ledger

A ledger is a group of accounts. Hence on the basis of accounts, ledger may be sub-divided into three categories :

1. **Debtors ledger or customers ledger or Sales ledger :** It is a section of the ledger containing accounts of trade debtors, i.e, persons to whom goods are sold on credit.
2. **Creditors ledger or suppliers ledger or Bought ledger :** It is a section of ledger containing accounts of the trade creditors i,e, persons from whom goods are purchased on credit.
3. **Impersonal ledger or General ledger :** It contains all the accounts that are not recorded in the cash book, the creditors ledger and the debtors ledger. To be more specific it contains all other personal accounts (excluding those of trade debtors and trade creditors), accounts of asset, expenses, revenues and similar accounts.

Posting

The process of transferring the debit and credit items from the journal to their appropriate ledger accounts is known as posting. Each amount listed in the debit column of the Journal is posted by entering it on the debit side of an account in the ledger and each amount listed in the credit column of the Journal is posted to the credit side of a ledger account. The following procedure is commonly used in posting process.

(*a*) Locate in the Journal the account named in the debit portion of the Journal entry.
(*b*) Enter the date of the transaction in the ledger account.
(*c*) Enter the name of the account to be debited in the particular column. The world "To" is prefixed to the debit entries and the word "By" is written before the credit entries.
(*d*) Enter in the debit column of the ledger account the amount of the debit as shown in the journal.
(*e*) Enter in the folio column of the ledger account the number of the journal page from which the entry is posted.

The recording of the debit in the ledger account is now complete. Repeat the steps mentioned above for the credit portion of the journal entry.

Balancing of an Account

The difference between the sum of the debits of an account and the sum of its credits at any particular time is the balance of an account". The balance of an account is always known by the side which is greater. The process of ascertaining the difference is known as "balancing of an account".

If the sum of the items on the debit side of an account exceeds those on the credit side, then the difference is called "debit balance". If the sum of credits in an account exceeds the sum of the debits, the resulting balance is known as "credit balance".

Balancing Figure

Balancing figure is one which makes two sides of an account equal. If the totals of two sides of an account are unequal the difference is inserted on the side having the lesser total to make the two sides equal. The figure so inserted is known as the "balancing figure". The normal balances that one customarily expects to find in different categories of accounts are as follows :

Type of a/c	*Normal balance*
Asset	Debit balance
Liability	Credit balance
Capital	Credit balance
Revenue	Credit balance
Expenses	Debit balance
Owner's drawings	Debit balance

Problem 1. Rama, a businessman, entered into the following transactions with Krishna on the following dates. Draft the ledger account of Krishna and balance the same.

January 2004,

1. Opening debt of Krishna to Rama — Rs. 100
3. Sold goods to Krishna subject to 10% trade discount — Rs. 1000
8. Krishna returned goods — Rs. 100
9. Sold goods to Krishna and received a bill accepted by him — Rs. 200
10. Krishna became insolvent and Rama realised from his assets — Rs. 850

Solution

In the books of RAMA
KRISHNA'S A/C

Date	*Particulars*	*Amt.*	*Date*	*Particulars*	*Amt.*
2004				2004	
Jan 1.	To Balance b/d	100	Jan 8.	By sales returns	100
3.	To Sales a/c	900	10.	By cash	850
	(1000-100)			By P & L a/c	250
9.	To Bills Receivable	200		—loss amounts not realisable	
		1200			1200

Problem 2. Record the following transactions in the personal account of Mr. Srinivas

2004 Jan.

1. Debit balance of Srinivas a/c — Rs. 1000
2. Sold goods on credit to Srinivas — Rs. 5400
6. Received from Srinivas — Rs. 6300
   Allowed him discount — Rs. 100
10. Srinivas bought goods an credit — Rs. 1500
15. Received cash from Srinivas — Rs. 1450
   Allowed him discount — Rs. 50
20. Purchased goods on credit from Srinivas — Rs. 1040
25. Paid cash to Srinivas — Rs. 500
28. Returned goods to Srinivas — Rs. 140
31. Paid cash to Srinivas in full settlement of his account — Rs. 390

Solution

Srinivas A/c

Date	*Particulars*	*Amt.*	*Date*	*Particulars*	*Amt.*
2004				2004	
Jan 1.	To Balance b/d	1000	Jan.6.	By cash a/c	6300
2.	To Sales a/c	5400	6.	By discount a/c	100
10.	To Sales a/c	1500	15.	By cash a/c	1450
25.	To cash a/c	500	15.	By discount a/c	50
28.	To Purchases Returns a/c	140	20.	By purchases a/c	1040
31.	To Cash a/c	390			
	To Discount (Balancing figure)	10			
		8940			8940

Problem 3. From the following particulars, prepare the personal a/c of St. Thomas Trading Company :

October 2004,

1.	Credit balance b/d	Rs. 25000
5.	Bought goods from St Thomas Trading Company	Rs. 6500
10.	Returned goods to them	Rs. 1600
14.	Sold goods for Rs 7500 to them.	
15.	Received goods returned by St. Thomas Trading Company	Rs. 450
30.	Paid to St. Thomas Trading company	Rs. 22600
	Discount allowed by them	Rs. 250

Solution

St. Thomas Trading Co.

Date	*Particulars*	*Amt.*	*Date*	*Particulars*	*Amt.*
2004			2004		
Oct 10.	To purchase Returns a/c	1600	Oct 1.	By Balance b/d	25000
			5.	By purchases a/c	6500
12.	To Sales a/c	7500	15.	By Sales Returns a/c	450
30.	To Cash a/c	22600			
	To discount	250			
		31950			31950

Problem 4. From the following information, prepare (*i*) Satish a/c in the ledger of Chaitanya and (*ii*) Chaitanya a/c in the ledger of Satish.

2004 June,

1.	Amount due from Chaitanya to Satish	Rs. 4500
8.	Satish sold goods to Chaitanya	Rs. 6000
14.	Chaitanya sold machinery to Satish	Rs. 7500

19. Chaitanya received machinery returned by Satish Rs. 1500
20. Satish received goods returned by Chaitanya Rs. 250
25. Satish received a cheque from Chaitanya Rs 1000 and allowed a discount of Rs. 100
29. Commission due from Chaitanya Rs 1060 interest charged by Satish Rs. 60
30. Received goods returned by Chaitanya and issued a cheque for Rs 200 to Chaitanya for the goods returned

Solution

In the Ledger of Satish
Chaitanya A/c

Date	*Particulars*	*Amt.*	*Date*	*Particulars*	*Amt.*
2004			2004		
June 1.	To Balance b/d	4500	June 14,	By Machinery a/c	7500
8.	To Sales a/c	6000	20	By Sales Returns a/c	250
19.	To Machinery a/c	1500	26	By Cash a/c	1000
29.	To Commission a/c	1060		By Discount a/c	100
	To Interest a/c	60	30	By Balance a/c	4270
		13120			13120

In the Ledger of Chaitanyna
Satish A/c

Date	*Particulars*	*Amt.*	*Date*	*Particulars*	*Amt.*
2004					
June 14.	To Machinery a/c	7500	June 1.	By Balance b/d	4500
20.	To Purchases		8.	By Purchases a/c	6000
	Returns a/c	250	19.	By Machinery a/c	1500
26.	To Bank a/c	1000	29.	By Commission a/c	1060
	Discount a/c	100		By Interest a/c	60
30.	To Balance c/d	4270			
		13120			13120

Problem 5. Journalise the following transactions, post them into ledger and prepare the Trial Balance.

2004 Jan.,

1. Commenced business with cash Rs. 80000
6. Paid into bank Rs. 40000
13. Bought goods for cash Rs 6000 and through cheque Rs. 7000
18. Cash Sales Rs. 8000
22. Cash purchases Rs. 5000
29. Paid rent Rs. 2000

Solution

Journal Entries

Date	*Particulars*		*LF*	*Debit*	*Credit*
2004. Jan 1.	Cash a/c To Capital a/c (Being cash introduced into the business)	Dr		80000	 80000
6.	Bank a/c To Cash a/c (Being cash deposited into the bank)	Dr		40000	 40000
13.	Purchases a/c To Cash a/c To Bank a/c (Being goods purchased for cash and paid by cheque	Dr		13000	 6000 7000
18.	Cash a/c To Sales a/c (Being cash sales)	Dr		8000	 8000
22.	Purchases a/c To Cash a/c (Being goods purchased)	Dr		5000	 5000
29.	Rent a/c To Cash a/c (Being rent paid)	Dr		2000	 2000

Ledger Accounts

Cash A/c

To capital a/c	80000	By Bank a/c	40000
To Sales a/c	8000	By purchases a/c	6000
		By purchases a/c	5000
		By Rent a/c	2000
		By Balance c/d	35000
	88000		88000

Capital A/c

To Balance cld	80000	By cash a/c	80000

Bank A/c

To cash a/c	40000	By purchases a/c	7000
		By Balance c/d	33000
	40000		40000

Purchases A/c

To Cash a/c	6000	By Balance c/d	18000
To Bank a/c	7000		
To Cash a/c	5000		
	18000		18000

Sales A/c

To Balance c/d	8000	By cash a/c	8000

Rent A/c

To cash a/c	2000	By Balance c/d	2000

Trial Balance

	Dr	Cr
Cash a/c	35000	
Capital a/c		80000
Bank a/c	33000	
Purchases a/c	18000	
Sales a/c		8000
Rent	2000	
	88,000	88,000

Problem 6. Journalise the following transactions, carry out the posting in the ledger, and prepare a trial balance.

2004 July,

1. Commenced business with cash Rs. 10000, goods Rs 5000, plant and machinery Rs. 5000
2. Deposited in the bank Rs. 6000
5. Purchased raw materials for Rs 2000 and furniture for Rs. 250
7. Paid wages Rs. 250
9. Sold goods to A for Rs 5000 at 12% trade discount.
12. Sold goods to B of Rs. 500
13. B returned goods worth Rs. 100
15. Purchased goods for Rs 2800 and paid by cheque
17. Purchased goods from C for Rs 3500 and sold the same to D for Rs 4000 immediately
19. Furniture purchased for Rs 900 for private use and paid by cheque
24. Bought goods and paid by cheque Rs. 1000
26. Sold goods to E for Rs. 2800
28. Paid electricity charges Rs 280, paid water bill Rs 60 by cheque
30. Paid salary Rs. 500 and rent Rs. 200

Solution

Journal Entries

Date	*Particulars*		*LF*	*Debit*	*Credit*
2004.					
July 1.	Cash a/c	Dr		10000	
	Goods a/c	Dr		5000	
	Plant and Machinery a/c	Dr		5000	
	To capital a/c				20000
	(Being assets brought units business as capital)				
2.	Bank a/c	Dr		6000	
	To cash a/c				6000
	(Being cash deposited into bank)				
5.	Purchases a/c	Dr		2000	
	Furniture a/c	Dr		250	
	To cash a/c				2250
	(Being materials and furniture purchased)				
7.	Wages a/c	Dr		250	
	To cash a/c				250
	(Being wages paid)				
9.	A's a/c	Dr		4400	
	To Sales a/c				4400
	(Being goods sold to A on credit)				
	Note : Trade discount should not be entered in accounts				
12.	B's a/c	Dr		500	
	To Sales a/c				500
	(Being goods sold to B on credit)				
13.	Sales returns a/c	Dr		100	
	To B's a/c				100
	(Being goods returned by B)				
15.	Purchases a/c	Dr		2800	
	To Bank a/c				2800
	(Being goods purchased and paid by cheque)				
17.	Purchases a/c	Dr		3500	
	To C's a/c				3500
	(Being purchases on credit)				
17.	D's a/c	Dr		4000	
	To Sales a/c				4000
	(Being goods sold to D on Credit)				
19.	Drawings a/c	Dr		900	
	To Bank a/c				900
	(Being furniture purchased for private use paid from office a/c)				

Date	Particulars		LF	Debit	Credit
24.	Purchases a/c	Dr		1000	
	To Bank a/c				1000
	(Being purchases paid by cheque)				
26.	E's a/c	Dr		2800	
	To sales a/c				2800
	(Being goods sold on credit to E)				
28.	Electricity charges a/c	Dr		280	
	Water bill a/c	Dr		60	
	To Bank a/c				340
	(Being expenses paid by cheque)				
30.	Salary a/c	Dr		500	
	Rent a/c	Dr		200	
	To cash a/c				700
	(Being expenses paid in cash)				

Capital A/c

To Balance c/d	20000	By cash a/c	10000
		By goods a/c	5000
		By plant and machinery a/c	5000
	20000		20000

Cash A/c

To Sales a/c	10000	By Bank a/c	6000
		By purchases a/c	2000
		By furniture a/c	250
		By wages a/c	250
		By salary a/c	500
		By rent a/c	200
		By balance c/d	800
	10000		10000

Drawings A/c

To Bank a/c	900	By Balance c/d	900

Purchases A/c

To cash a/c	2000	By Balance c/d	9300
To Bank a/c	2800		
To C's a/c	3500		
To Bank a/c	1000		
	9300		9300

Sales A/c

To Balance c/d	11700	By A's a/c	4400
		By B's a/c	500
		By D's a/c	4000
		By E's a/c	2800
	11700		11700

Goods A/c

To capital a/c	5000	By Balance c/d	5000

Sales Returns A/c

To D's a/c	100	By Balance a/c	100

Plant and Machinery A/c

To capital a/c	5000	By Balance c/d	5000

Furniture A/c

To Cash a/c	250	By Balance c/d	250

Wages A/c

To Cash a/c	250	By Balance c/d	250

A's A/c

To Sales a/c	4400	By Balance c/d	4400

B's A/c

To Sales a/c	500	By Sales Returns a/c	100
		By Balance c/d	400
	500		500

C's A/c

To Balance c/d	3500	By purchases a/c	3500

D's A/c

To Sales a/c	4000	By Balance c/d	4000

E's A/c

To Sales a/c	2800	By Balance c/d	2800

Electricity Bill A/c

To Bank a/c	280	By Balance c/d	280

Water bill A/c

To Bank a/c	60	By Balance c/d	60

Salary A/c

To cash a/c	500	By Balance c/d	500

Rent A/c

To cash a/c	200	By Balance c/d	200

Trial Balance

	Dr	Cr
Capital		20000
Cash	800	
Bank	960	
Drawings	900	
Purchases	9300	
Sales		11,700
Sales Returns	100	
Goods	5000	
Plant & machinery	5000	
Furniture	250	
Wages	250	
A	4400	
B	400	
C		3500
D	4000	
E	2800	
Electricity charges	280	
Water bill	60	
Salary	500	
Rent	200	
	35200	35200

QUESTIONS

1. What is an account ?
2. What is a ledger ?
3. State the differences between the journal and ledger.
4. What is meant by debtors ledger.
5. What is meant by creditors ledger
6. What do you mean by general ledger.
7. What is meant by “posting”.

EXERCISE 1

Record the following transaction in the personal accounts of Mr. Brown and balance the account at the end of each month

2004 Jan

1.	Solid goods to Brown	Rs. 62250
6.	Received from Brown	Rs. 60225
	Allowed him discount	Rs. 2025
20.	Brown bought goods worth	Rs. 80000
23.	Received from Brown cash on account	Rs. 30000

2004 Feb,

1.	Balance from last month	Rs. 50000
15.	Purchased goods from Brown	Rs. 85000
23.	Received from Brown	Rs. 49020
	Allowed him discount	Rs. 980
24.	Sold goods to Brown	Rs. 155500
25.	Paid to Brown	Rs. 84000
	Discount allowed by him	Rs. 1000

[**Answer :** For the year 2004, Jan. 31st, the balancing figure is Rs. 50,000 and on 28th February, the balancing figure is 1,55,000.]

EXERCISE 2

From the following transaction prepare Anand's ledger account in the books Bhaskar

2004 March

1.	Due from Anand	Rs. 4000
10.	Sold goods worth	Rs. 2000
16.	Received cheque for Rs. 4000 and allowed a discount of	Rs. 100
22.	Purchased furniture from Anand	Rs. 600
25.	Anand returned goods	Rs. 100
30.	Received commission from Anand	Rs. 125

[**Answer :** Balancing figure is Rs. 1200]

EXERCISE 3

Journalise the following transactions, post them into ledger and balance the same 2004 Jan

1.	Rao commenced business with cash	Rs. 10000
5.	Bought goods for cash from Raghu for	Rs. 2000
6.	Returned damaged goods to Raghu	Rs. 200
8.	Purchased machine from M/s HMT	Rs. 25000
10.	Paid for wages for installation of machine	Rs. 1200
15.	Purchased goods for Rs. 8000 from Suresh, paid cash Rs. 2000 and gave acceptance on a bill for the balance.	
16.	Paid salary to manager Ram	Rs. 1000

EXERCISE 4

Prepare Anjan's a/c in the ledger of Bhairav and Bhairav's account in the ledger of Anjan from the following transaction between them.

2004 Jan,

1.	Opening debit of Bhairav to Anjan	Rs. 500
5.	Anjan sold goods to Bhairav	Rs. 2000
10.	Bhairav returned goods to Anjan	Rs. 100
12.	Anjan received cash from Bhairav Rs. 700 and allowed Bhairav discount	Rs. 50
15.	Bhairav sold goods to Anjan on account	Rs. 1000
20.	Anjan returned goods to Bhairav	Rs. 70
24.	Bhairav paid cash to Anjan	Rs. 300
31.	Anjan received cash from Bhairav in full settlement	Rs. 400

[**Answer :** Total of Anjan a/c Rs. 2570.
Total of Bhairav a/c Rs. 2570.]

EXERCISE 5

Journalise the following transactions. Prepare ledger accounts and a Trial balance.

(*a*)	T started business with	Rs. 50000
(*b*)	Deposited in the bank	Rs. 40000
(*c*)	Purchased goods from A for Rs. 20000 for which issued a cheque for	Rs. 12000
(*d*)	Sold goods to B for Rs. 18000 for which received cash Rs. 5000 and a cheque for Rs. 7000. The cheque was deposited in the bank.	
(*e*)	Expenses incurred	Rs. 300
(*f*)	Goods remained unsold	Rs. 3000

[**Answer :** Total of Trial balance Rs. 76000]

EXERCISE 6

Journalese the following transaction. Prepare ledger accounts and a trial balance.

(*a*)	'S' started business with cash	Rs. 15000
(*b*)	Purchased goods from A on credit for	Rs. 10000
(*c*)	Sold good to 'B' on credit	Rs. 7000
(*d*)	'N' took goods worth Rs. 1000 for his personal use.	
(*e*)	Paid office expenses	Rs. 800
(*f*)	Paid Rs. 6000 to A an account.	
(*g*)	Received from B Rs. 2000 an account.	
(*h*)	Goods remained unsold	Rs. 1000

[**Answer :** Total of trial balance Rs. 26000]

4

CHAPTER

SUBSIDIARY BOOKS

INTRODUCTION

The traditional method of book-keeping envisages that all transactions be initially recorded in a Journal and then posted individually to the appropriate account in the ledger. However applying such detailed procedures to a large number of transactions is impractical for two major reasons. First, recording all transactions in a single journal would seriously curtail the number of transactions that could be processed in a day simply because only one person at a time could make entries. Secondly transactions recorded in the Journal must be posted individually to the ledger and this results in a great deal of labour.

Practical System or English System of Book Keeping

In order to overcome the limitations of the Journal, a separate subsidiary book is maintained to record a particular type of transaction. After recording the transactions in the subsidiary book concerned they are posted into the ledger accounts. This system of maintaining subsidiary books is known as practical system or English system of book keeping.

Advantages of Subsidiary Books

1. Passing Journal entries for every single transaction is avoided. This saves time and energy.
2. Subsidiary books are divided according to the transactions like purchases, sales, purchase return, sales return etc. The periodical totals of these transactions can easily be ascertained.
3. Transactions of similar nature are available in one book. Therefore, it is easy to locate any entry for verification and corrections of errors.
4. Two entries to be made in a Journal, one to be debited and the other to be credited is avoided. Only one entry is made.
5. Detection and rectification of errors become easy and the system itself is a simplified one.
6. The maintenance of accounts become easy and comfortable as the work can be distributed to different persons to maintain different subsidiary books.

Sub-division of Journal or Various Subsidiary Books

The various subsidiary books maintained by a business are as follows :

1. Purchase book
2. Purchase returns book
3. Sales book
4. Sales returns book
5. Cash book
6. Bills receivable book
7. Bills payable book
8. Journal proper

Invoice

An invoice is a statement which contains details of goods, their quantity, price, total value, discount, advance received, packing charges etc. It is prepared by the seller and sent to the buyer. From the point of view of the seller it is known as "outward invoice" and from buyer's point of view, it is known as "Inward invoice".

1. Purchase Book. Purchase book is known by various other names such as purchase day book, purchase Journal, Bought day book, Inward invoice book. This book is used to record only credit purchases of goods meant for selling at a profit. Credit purchases of any fixed assets or stationery items on credit should not be entered in this book. This items should be taken to Journal proper. The ruling of a purchase book is given below :

Purchase Book

Date	*Particulars*	*LF*	*Invoice No.*	*Amount*

1. **Date :** The date of the transaction is entered in this column.
2. **Particulars :** The names of the vendor from whom the goods have been purchased is recorded in this column.
3. **Ledger folio :** This records the page number of the ledger where account of the supplier is found.
4. **Invoice Number :** Invoice received from suppliers against purchases are numbered serially and these numbers are entered in this column against the name of the concerned supplier.
5. **Amount :** Net amount of the invoice is shown here.

Posting From The Purchase Book

For posting entries from the purchase book, separate account should be opened in the name of each of the suppliers (creditors) and also a purchase account. Individual entries appearing in the purchase book should be posted each day to the credit of creditors account in the subsidiary ledger for accounts payable and at the end of the month total of the purchase journal shall be posted as a debit to purchases account.

Problem 1. Enter the following transactions in the purchase book of Arun Kumar :

2004 May

May 1. Bought from Mr 'A' 10 boxes of Nirma soap @ Rs 150 per box @ discount of 20%.
8. Purchased from Mr. 'B' 5 boxes of Vim detergent powder Rs 60 per box, for cash.
10. Received from Mr. 'C' 120 pieces of sandalwood soap @ Rs 8 per piece, less discount 20%.
15. Purchased furniture from Mr. 'D' Rs 5548.
18. Received invoice from Mr. 'E' for 15 cases of "Wash bar" @ Rs 180 per box. 12 cases of washing powder Rs 60 per cake.
Forwarding charges Rs 20 less 25% discount.
30. Purchased office stationery from Mr. 'A' Rs 180.

Solution

Purchase Book of Arun Kumar

Date	*Particulars*		*LF*	*Amount*
2004				
May 1.	Mr. 'A'			
	10 boxes of Nirma soap			
	@ Rs 150	1500		
	Less : 20% Trade discount	300		
				1200
10.	Mr. 'C'			
	120 pieces of sandalwood			
	soap @ Rs 8	960		
	Less 20% trade discount	192		
				768
28.	Mr 'E'			
	15 cases of Wash bar			
	@ Rs 180	2700		
	12 cases of washing			
	powder @ Rs 60	720		
		3420		
	Less : Trade discount			
	@ 20%	855		
		2565		
	Add : Forwarding			
	charges	20		2585
				4553

Purchases A/c

To Sundries	4553	By Balance c/d	4553

A's a/c

To Balance c/d	1200	By purchases a/c	1200

C's a/c

To Balance a/d	768	By purchases a/c	768

E's a/c

To Balance c/d	2585	By purchases a/c	2585

2. Purchase Returns Book. This book is also called a Purchase Returns Journal or Return Outward Book. When the buyer returns the goods purchased to the seller, that transaction is called purchase returns. Goods are returned to the seller due to many reason, such as poor quality, supply of more goods then indented etc. At times the purchaser may claim allowance from the seller for shortage, breakage or damage of goods in transit. These allowances are recorded in the purchase return book. Entries are made in this book based on DEBIT NOTE sent to the supplier. A debit note is prepared by the purchaser regarding the details of the goods returned or allowance claimed in duplicate. The original is sent to the supplier and the entries are made from the duplicate copy. It is called debit note because the purchaser is informing the supplier that his account is debited on account of the goods returned or allowances claimed.

A specimen of purchase returns book is shown below :

Purchase Return Book

Date	*Particulars*	*LF*	*Debit Note No.*	*Amount*

Posting from Purchase Returns Book

Posting from purchases returns book is made in two stages. First the personal account of suppliers to whom goods are returned or from whom allowance is claimed are individually debited in the ledger. Secondly at the end of the period the total of purchase returns book is credited to the purchase returns a/c in the general ledger.

Problem 2. Record the following transactions in the purchase returns book of Giridhar.

2004

Jan 1. Returned to Amarnath goods worth Rs. 6000
5. Returned cutting machine to Bharath Rs. 8750
10. Sent back goods to Swaminanthan Rs. 455
15. Claimed allowance from Hariharan Rs. 65
30. Allowance claimed from Eshwar is admitted and received a cheque for Rs. 143.

Solution

Purchase Return Book

Date	*Particulars*	*LF*	*Debit Note No.*	*Amount*
1-1-2004	Amarnath	—	—	6000
10-1-2004	Swaminathan	—	—	455
15-1-2004	Hariharan	—	—	65
				6520

Note :

1. Transaction of January 5 relates to an asset. Hence it is not entered in purchase return book.
2. Transaction of January 30 is a cash transaction. Supplier paid the claim by a cheque. Hence, it is not recorded in purchase return book.

Purchase Returns A/c

To Balance c/d	6520	By Sundries	6520

Amaranth A/c

To purchase returns a/c	6000	By Balance c/d	6000

Swaminathan's A/c

To purchase returns a/c	455	By Balance c/d	455

Hariharan's A/c

To purchase returns a/c	65	By Balance c/d	65

3. **Sales book.** Sales book or sales journal is a book of original entry designed to record sale of goods on credit. No other transaction should be recorded in the sales book. For example, sale of goods for cash should be recorded in the cash book. Similarly sale of an asset not a part of the stock-in-trade is to be recorded in the cash book or journal proper depending on whether the sale was made for cash or on credit.

Whenever goods are sold on credit few copies of a sales invoice is prepared. The information listed on a sales invoice usually includes the date of sale, customer's name, amount of sale, the serial number of the invoice and the credit terms. A copy of the sales invoice provides the authority and the information to record the transaction in the sales book.

A specimen of sales book is given below :

Sales Book

Date	*Particulars*	*Invoice No.*	*LF*	*Amount*

Posting from sales book

For posting the sales book entries, separate accounts are opened in the name of each of the customers and also a sales account. Each transaction should be posted individually to the debit of the customer's account in the subsidiary ledger and at the end of the month the amount column of the sales journal is to be added and the total posted to the credit of the sales account in the general ledger.

Problem 3. Write up the sales book of prasad from the following information.

2004 Aug

Aug 6. Sold to Raj Kumar goods worth Rs 4000 at a discount of 10%.
14. Sent goods to Ramesh, goods of the value of Rs. 6000, Packing charges Rs 100.
18. Shankar bought one Motor car for Rs 65000
22. Mohan bought goods Rs 4000 at a discount of 20% and paid cash.

Solution

Sales Book

Date	*Particulars*		*LF*	*Outward Invoice*	*Amount*
2004					
Aug 6.	Raj Kumar	4000			
	Less : Trade discount	400			
					3600
14.	Ramesh	6000			
	Add; Paching charges	100			
					6100
					9700

Note :

1. Transaction of August 18, relates to an asset (Motor car). Hence it is not entered in the sales book
2. Transaction of August 22, is a cash transaction. Therefore it is not entered in the sales book.

Sales A/c

To Balance c/d	9700	By sundries	9700

Raj Kumar A/c

To Sales a/c	3600	By Balance c/d	3600

Ramesh A/c

To sales a/c	6100	By Balance c/d	6100

4. Sales Returns Book : This book is also known as Returns inward book. Entry in this book is make only for return of goods which are sold on credit basis. Returns of goods sold on cash should not be entered in this book because cash is normally paid for such returns. While taking back the goods returned the seller prepares a credit note in duplicate sending the original to the buyer who returned the goods. The duplicate copy is retained with him. Entries are made in the sales returns book based on the information contained in the credit note. It is called credit note because the seller informs the buyer that buyers account is credited for having returned the goods. This is also applicable to the allowances granted to the buyer.

Posting from Sales Returns Book into the Ledger

Posting from sales returns book into the ledger involves two steps. First the personal accounts of customers are to be individually credited in the subsidiary ledger with the value of goods returned or allowance made. Secondly, monthly total of the Sales Returns Book is to be debited to Sales Returns Account in the general ledger.

Problem 4. Write the sales returns book from the following :

2004,

July 10. Prabhu returned goods — Rs. 6500
18. Allowance claimed by Murthy — Rs. 9500 accepted
26. Received a debit note from Narayan for — Rs. 600
30. Received the goods returned by Anand and paid — Rs. 1600 in full settlement

Solution

Sales Returns Book

Date	*Particulars*	*LF*	*Credit Note*	*Amount*
2004				
July 10	Prabhu		—	6500
18	Murthy		—	9500
				16000

Note

1. **Transaction of July 26 :** Receiving a debit note is not a transaction. Sales returns book is written on the basis of credit note.

2. Transaction of July 30 : It is a cash transaction. It is not to be entered in sales returns book.

Sales Returns A/c

To sundrie	16000	By Balance c/d	16000

Prabhu's A/c

To Balance c/d	6500	By Sales Returns a/c	6500

Murthy's A/c

To Balance c/d	9500	By Sales returns a/c	9500

Problem 5. Enter the following transactions in suitable subsidiary books and post them into ledger.

2004 Jan,

1. Bought goods from Mamatha less 10% Rs. 10000
5. Sold goods to Savitha Rs. 5000
7. Govinda purchased goods from us Rs. 3000
10. Suma bought goods from us Rs. 800
12. Goods returned to Mamatha Rs. 100
18. Allowance granted to Suma Rs. 50
20. Sandhya sold goods to us Rs. 2000

Solution

Purchase Book

Date	*Particulars*		*Invoice No.*	*Amount*
2004				
Jan 1.	Mamatha :			
	Goods	10000		
	Less : Discount	1000		
				9000
20.	Sandhya :			
	Goods			
				2000
				11000

Purchases A/c

To Sundries	11000	By Balance c/d	11000

Mamatha's A/c

To Balance c/d	9000	By purchases a/c	9000

Sandhya's A/c

To Balance c/d	2000	By purchases a/c	2000

Purchases Returns Book

Date	*Particulars*	*Debit Note*	*Amount*
2004 Jan 12.	Mamatha	—	100

Mamatha's A/c

To purchases returns a/c	100	By Balance c/d	100

Purchase Returns A/c

To Balance c/d	100	By Mamatha's a/c	100

Sales Book

Date	*Particulars*	*Invoice No.*	*Amount*
2004,			
Jan 5.	Savitha — goods	—	5000
7.	Govinda — goods	—	3000
10.	Suma — goods	—	800
			8800

Sales A/c

To Balance c/d	8800	By Sundries a/c	8800

Savitha A/c

To sales a/c	5000	By Balance c/d	5000

Govinda's A/c

To sales a/c	3000	By Balance c/d	3000

Suma's A/c

To sales a/c	800	By Balance c/d	800

Sales Returns Book

Date	*Particulars*	*Credit Note*	*Amount*
2004 Jan 18.	Suma	–	50

Sales Returns A/c

To Suma	100	By Balance c/d	100

Suma's A/c

To Balance c/d	100	By sales returns a/c	100

5. Bill Receivable Book. Sometimes the seller sells the goods on credit for the amount to be paid by the buyer, the seller draws a bill, sending it to the buyer for his acceptance. The purchaser signs the bill. This means that he accepts the liability of repaying the amount after a stipulated period. After the buyer (Debtor) signs the bill it comes back to the seller. This bill is a Bills Receivable for the seller. All transactions relating to Bills Receivable are entered in this book. At the end of an accounting period, the amount remaining in the Bill Receivable book will be taken to the debit side of the trial balance and also to the asset side of the balance.

6. Bill Payable Book. Sometimes the buyers buy goods an credit. The seller draws a bill which is duly accepted by the buyer and sends it to the seller (creditor). This bill is Bills Payable to the buyer He has to pay the amount after a stipulated period. The bill will be in the possession of the seller. But the buyer has to pay the amount. When the amount is paid the bills payable comes back to the acceptor (i.e, buyer or debtor). All transactions relating to the bills accepted for having purchased goods on credit will be entered in this book. The balance remaining in this book is a credit Balance which is taken to the liabilities side of the Balance Sheet.

7. Journal proper. For a small business concern Journal proper is the only book of original entry. The use of Journal proper is much restricted. Those transactions which cannot be entered in any other subsidiary books only are recorded in this book. The following types of transactions are entered in Journal proper.

(*a*) Opening entries
(*b*) Closing entries
(c) Adjusting entries
(*d*) Transfer entries
(*e*) Rectifying entries
(*f*) Credit purchases and credit sales of things that are not meant for selling at a profit
(*g*) Entries regarding dishonour of bills
(*h*) Goods taken by the proprietor for his personal use
(*i*) Loss of goods by theft, smuggling, fire etc

8. **Cash book :** This subsidiary book is discussed in detail in the next chapter.

QUESTIONS

Simple Questions

1. State the limitations of recording transactions in the Journal.
2. What do you mean by Practical system or English system of book keeping,
3. List out the various subsidiary books.
4. State the advantages of subsidiary books.
5. What do you mean by purchase book ?
6. What is a purchase returns book ?
7. What is a debit note ?
8. What do you mean by credit note ?
9. What is meant by sales book.
10. What is a sales return book ?
11. What is bills receivable book ?
12. What is a bills payable book ?
13. What is a Journal proper ?

EXERCISE 1

X, a businessman, enters into the following transactions in the month of January 2004. You are required to record them in the subsidiary books and post them into ledger.

2004 Jan.,

2.	Sold goods to Y subject to a trade discount of 10%	Rs. 3000
4.	Received a debit note from Y in respect of an overcharge in the bill	Rs. 200
6.	Y returned damaged goods	Rs. 100
10.	Sold goods to P	Rs. 600

[**Answer :** Total of sales book Rs. 3300
Total of returns inwards book Rs. 300.]

EXERCISE 2

Enter the following transactions in the purchase book and sales book of Mr. Nanda.

2004 Feb.,

1. Purchased goods from Sonal for Rs. 6000 at a discount of Rs. 200.
3. Purchased furniture an credit from Das bros. for Rs. 10000.
5. Sold goods on credit to Keshav Rs. 6000.
7. Sold goods for cash to Chandra Rs. 8600.
10. Sold goods to Tina Traders for Rs. 4500, less discount Rs. 300.
15. Withdrew from bank Rs. 2500
19. Bilwara Traders supplied goods to Nanda worth Rs. 3600 on credit.
25. Purchased stationary for Rs. 600.

[**Answers :** Total of purchases book 9400;
Total of sales book Rs. 10200.]

EXERCISE 3

From the following transactions, prepare necessary subsidiary books and prepare purchases a/c. sales a/c, purchase returns a/c and sales returns a/c.

2004 Nov.,

1. Purchased 20 carpets from Madanlal at Rs. 800 each.
5. Mr. Champalal sold 15 special carpets to us @ Rs. 1300 each.
9. Purchased from Mr. Kesarilal 10 carpets @ Rs. 1000 each.
13. Sold 10 carpets to Mr. Chandanlal at Rs. 1000 each.
16. Returned 2 carpets to Mr. Champalal .
25. Sold to Miss Fatima 8 special carpets at Rs. 1200 each.
28. Chandanlal returned 2 carpets to us.

[**Answers :** Total of purchases book Rs. 45500.
Total of sales book Rs. 21400.
Total of purchases returns book Rs. 2600.
Total of sales returns book Rs. 2200.]

EXERCISE 4

Enter the following transactions in the proper subsidiary books and post the same in the ledger.

2004 March,

1.	Purchased goods from Shankar traders	Rs. 10000

2.	Sold goods to Mr 'R'	Rs. 9000
3.	Sold goods to Mr. 'G'	Rs. 6000
4.	Bought goods from Lucky traders	Rs. 8000
6.	Received goods returned from Mrs 'G'	Rs. 2000
10.	Mr. 'R' returned us goods	Rs. 500
16.	Returned goods to Lucky traders	Rs. 1000
20.	Mr 'X' returned goods	Rs. 200
21.	Bought goods from Mr. 'A'	Rs. 6500
22.	Bought goods from 'S'	Rs. 4800
27.	Sold goods to Mr. 'H'	Rs. 4800
28.	Returned goods to Mr. 'A'	Rs. 700
30.	Mr. 'H' returned goods	Rs. 500

[**Answers :** Total of purchases book Rs. 2930
Total of sales book Rs. 1980
Total of purchase returns book Rs. 1700
Total of sales returns book Rs. 3200]

5

CHAPTER

CASH BOOK

1. NATURE AND OBJECTIVES

As the name implies the cash book is a book in which receipts and payments of cash are recorded. It is one of the important books of accounts as it enables the businessman to record all cash transactions both cash receipts and payments and in knowing the cash balance on hand. The cash balance on hand represents the difference between total cash received and payments made.

Among many transactions which occur in a business, cash transactions occur in a large number. All such cash transactions are recorded in the cash book. A cash book is one of the subsidiary book. It can be sub-divided into several subsidiary books as in the case of a Journal. A cash book can be sub-divided into : (*a*) cash book for recording payment to creditors, (*b*) a cash book for recording collection from debtors, (*c*) a cash book for recording remittance from the branches, (*d*) a petty cash book for recording petty cash payment and so on. In this respect the cash book is regarded as a book of prime entry or book of original entry. A cash book resembles to the book of prime entry in the following respects :

(*a*) All the cash transactions are primarily recorded as is done in the case of other primary books.
(*b*) Ledger accounts are prepared with the help of cash book as are done with the help of other primary books.
(*c*) Narrations are also given at the foot of each entry as it is done in case of a Journal. But in practice it is ignored.
(*d*) Cash book is regularly maintained as in the case of other primary books.

A cash book is also treated as a principal book or a book of final entry when it serves as the cash account in which case the balances are directly recorded in the trial balance. In this respect it resembles to that of a ledger or a book of final entry. A cash book has the following similarities with that of book of final entry.

(*a*) The proforma, i.e., specimen, of a ledger account is used in writing the cash book.
(*b*) The left hand side is used as debit side and the right hand side is used as credit side.
(*c*) Cash book is also balanced like a ledger account.
(*d*) Cash book is also a ledger account. In the ledger no separate cash account is maintained.

A cash book has the features of both the journal and ledger. Hence it is also called as "Journalised ledger".

Objectives of Cash book :

Cash book serves three important purposes. They are as follows :

(*a*) To know the total cash received and total cash paid during a given period of time.
(*b*) To know the cash balance for a given period of time.
(*c*) To know whether cash balance on hand and at Bank are correct.

Method of Maintaining a Cash Book : Cash book can be maintained in the form of a ledger account or in the form of a Journal. If it is maintained in the form of ledger account it takes the 'T' form, account having a debit side and credit side. A proforma of this type is given below :

Dr Cash Account Cr

Date	*Particulars*	*LF*	*Amount*	*Date*	*Particulars*	*LF*	*Amount*
1	2	3	4	1	2	3	4

As can be seen from the above ruling the cash account has two sides, viz. (*a*) debit side and (*b*) credit side. All cash receipts are entered on the debit side. It is so called because when a businessman receives money, he becomes a debtor to the person who pay him. This side is therefore prefixed as "To" before the name of the account is written up. All cash payments are recorded on the credit side. It is so called because when the businessman pays money to others he is credited by them with the amounts he pays them. Therefore, this side is always prefixed as "By".

A cash account as per the above proforma shows four columns on each side of the cash account. The date column on the debit side in meant for recording the date of cash receipt. The particulars column is used for recording the name of the person from whom money is received. Sometimes, the name of an asset is written under this column instead of writing the name of the person. The ledger folio column is used for writing the page of the ledger. In the amount column, the cash received is recorded.

Similarly on the credit side the various aspects of cash transactions such as date of payment, person to whom cash is paid, the ledger folio number and amount paid, is recorded. But the current trend in maintaining a cash book is in the form of a Journal. Accordingly we have two types of Journals, viz. cash receipt journal and cash payment Journal. The maintenance of cash book in the form of a Journal facilitates division of labour and helps in internal checking of these transactions.

Cash Receipt Journal : This journal records all cash received by the businessman from different sources. Some of the important sources of cash are cash from sales, cash on borrowings, cash collected from customers, interest received in cash etc. A proforma of such Journal is shown :

Cash Receipt Journal

Date	*Particulars*	*LF*	*Amount*
1	2	4	5
(Narration 3)			

(*a*) Column 1 is meant for recording the date of cash receipt.
(*b*) Column 2 is meant for recording the name of the person from whom cash is received or source of cash receipt.

(*c*) Column 3 is used for writing brief explanation about the source of cash receipt.
(*d*) Column 4 is meant for recording page number of the ledger on which the amount of that transaction is posted.
(*e*) Column 5 is meant for recording the amount of cash received.

Cash Payment Journal : This Journal records all cash payment made on several accounts. For example, payment for purchase of goods, payment of expenses such as rent, wages, salaries, electricity etc., payment to creditors from whom goods were bought on credit basis, payment for the purchase of assets like plant, furniture, repayment of loans etc. This book is maintained as a separate book to record all payments of cash. The proforma of this book is shown below :

Cash Payment Journal

Date	*Particulars*	*LF*	*Amount*
1	2	4	5
	(Narration 3)		

(*a*) Column 1 is meant for recording the date of cash payment.
(*b*) Column 2 is meant for recording the name of the person to whom cash is paid or reason for cash payment.
(*c*) Column 3 is meant for writing brief explanation for having paid cash.
(*d*) Column 4 is meant for recording page number of the ledger on which the amount of that transaction is posted.
(*e*) Column 5 is meant for recording the amount of cash paid.

2. TYPES OF CASH BOOK

The cash book can be of four types. They are : (1) Simple or single cash book (2) Two column cash book or cash book with cash and discount column. (3) Three column cash book or cash book with discount, cash and bank column and (4) Cash book with bank and discount column.

3. SIMPLE OR SINGLE CASH BOOK

This book is used to record all receipts and payments of cash. It contains the cash column on either side of the cash book apart from other columns. It is normally maintained by small business concerns. A simple cash book can be maintained either in the form of an account or in the form of a journal. The proforma of a single cash book is already given under the sub-topic of method of maintaining a cash book.

Balancing the Single Column Cash Book : After posting all the cash entries in the cash account the businessman can know the balance of cash on hand. The process of ascertaining and recording the balance on hand is known as balancing the cash book. This involves the following procedures :

(*a*) Total the amount column an either side of cash account and find out the difference. It is to be noted that the amount column on the debit side is always heavier than the credit side. It can never be less because a trader cannot spend more than what he has. However if the businessman borrows any loans to meet expenses, the sum borrowed will have to be first recorded on the debit side before he can record any payment from it on the credit side. There is also the possibilty of having a nil balance in cash account. Then happens when the businessman pays all the amount he has.

(*b*) The difference in the amount, being the excess of debit column amount over credit column amount is then placed on credit side which has less amount. The two sides on further totalling will show the same amount.

Problem 1. Enter the following in Sri Shanbhog's cash book and show the balance.

1. 1-10-2000 Balance of cash Rs. 1,500
2. 8-10-2000 Purchased goods for cash from X for Rs. 320.
3. 15-10-2000 Sold goods Rs. 480 to Y
4. 20-10-2000 Received commission of Rs. 65.
   Paid commission of Rs. 55.
5. 28-10-2000 Paid Shantharam on account Rs. 715.
6. 31-10-2000 Paid salary to office clerk, Rs. 100 and office rent, Rs. 60.

Solution

Cash Book

Date	*Particulars*	*LF*	*Amt.*	*Date*	*Particulars*	*LF*	*Amt.*
1-10-2000	To Balance b/d		1,500	8-10-00	By Purchases a/c		320
20-10-2000	To Commission a/c		65	20-10-00	By Commission a/c		55
				28-10-00	By Shantaram a/c		715
				31-10-00	By Office salary a/c		100
					By Office rent		60
					By Balance b/d		315
			1,565				1,565
1-11-70	To Balance b/d		315				

Problem 2. Enter the following transactions in a single cash book.

1995 Jan,	Rs.
1. Cash in hand	1,200
5. Received from Ram	300
7. Paid rent	30
8. Sold goods for cash	300
10. Paid Shyam	700
27. Purchased furniture	200
28. Paid salaries	100
31. Rent due not yet paid for January	30

Solution

Single Cash Book

Date	*Particulars*	*LF*	*Amt.*	*Date*	*Particulars*	*LF*	*Amt.*
1-1-95	To Balance b/d		1,200	7-1-95	By Rent a/c		30
5-1-95	To Ram's a/c		300	10-1-95	By Shyam's a/c		700
8-1-95	To Sales a/c		300	27-1-95	By Furniture a/c		200
				28-1-95	By Salaries a/c		100
				31-1-95	By Balance b/d		770
			1,800				1,800
1-2-95	To Balance b/d		770				

Problem 3. Shri Arvind commenced business with Rs 10,000 in cash on 1-1-2005. His cash receipts and payments for the month of January are as follows :

2005 Jan,

2.	Purchased goods for cash	Rs. 5,000
5.	Sold goods for cash	Rs. 2,000
7.	Paid office expenses	Rs. 200
10.	Purchased goods for cash	Rs. 2,000
12.	Postage	Rs. 25
15.	Gave cash to Ramesh	Rs. 3,000
17.	Received cash from Mahesh	Rs. 200
20.	Sold goods for cash	Rs. 1,000
21.	Purchased goods for cash	Rs. 900
25.	Purchased furniture for cash	Rs. 560
31.	Paid wages	Rs. 300
31.	Paid salaries	Rs. 500
31.	Paid rent	Rs. 100

Solution

Cash Book

Date	*Particulars*	*LF*	*Amt.*	*Date*	*Particulars*	*LF*	*Amt.*
1-1-95	To Capital a/c		10,000	2-1-95	By Purchase a/c		5,000
5-1-95	To Sales a/c		2,000	7-1-95	By Office expenses a/c		200
17-1-95	To Mahesh a/c		200	10-1-95	By Purchases a/c		2000
20-1-95	To Sales a/c		1,000	12-1-95	By Postage a/c		25
				15-1-95	By Ramesh a/c		3,000
				22-1-95	By Purchases a/c		900
				25-1-95	By Furniture a/c		560
				31-1-95	By Wages a/c		300
				31-1-95	By Salaries a/c		500
				31-1-95	By Rent a/c		100
				31-1-95	By Balance b/d		615
			13,200				13,200
Feb 1, 95	To Balance b/d		615				

4. CASH BOOK WITH CASH AND DISCOUNT COLUMNS

In this book an additional column is provided to record cash discount in addition to cash column on either side of the cash account. On the debit side the discount allowed column is provided and on the credit side discount received column is provided. This book is also called as two column cash book.

Cash Discount : Cash discount is an inducement given to a credit customer in order to encourage him to pay the debt promptly or within a certain time limit, the amount of cash discount is deducted from the amount

due to the businessman. It may be represented as 4% for cash or 2% within a month. The former means that if a customer pays promptly 4% deduction is allowed. The latter means that if he pays within a month from the date of transaction, 2% deduction will be allowed. The cash discount is also known as "sale discount" from the seller's point of view and purchases discount form the purchaser's point of view. A separate column is provided on the cash book or cash receipt journal when the amount is received from a customer who has availed the cash discount. The actual amount (amount due minus discount) is recorded in cash column and discount allowed is recorded in the discount column. Similarly actual cash paid is entered in the cash column and discount received under discount column on the credit side. Discount allowed being a loss is debited and discount received being a gain is credited. A proforma of such cash book is shown below :

Cash Book with Cash and Discount Column

Date	*Particulars*	*LF*	*Discount*	*Cash*	*Date*	*Particulars*	*LF*	*Discount*	*Cash*

Balancing of Two Column Cash Book : The discount columns of this book are not balanced. They are merely totalled. The discount column on the receipt side shows the total discount allowed to customers. This amount is debited to the discount account. The discount column on the payment side shows the total discount received. This amount is credited to discount. However the cash columns are balanced as explained under simple cash book.

Problem 4. Gokulnath commenced business on 1st April 2004 with Rs. 2,000 as capital. He had the following cash transactions in the month of April. Prepare a cash book.

2004 April,

1.	Purchased furniture and paid cash	Rs. 250
2.	Purchased goods	Rs. 300
4.	Sold goods for cash	Rs. 150
5.	Purchased goods	Rs. 200
5.	Paid cash to Rama	Rs. 560
5.	He allowed discount	Rs. 10
6.	Received cash from Krishna	Rs. 600
	Allowed discount	Rs. 20
7.	Paid for petty expenses	Rs. 15
8.	Cash purchases	Rs. 150
9.	Cash sales	Rs. 200
11.	Received from Mohan	Rs. 600
13.	Paid for typewriter	Rs. 800
15.	Paid for telephone	Rs. 200
30.	Paid Anand	Rs. 400
	Discount allowed	Rs. 8

Solution

Cash Book with Cash and Discount Column

Date		*Particulars*	*LF*	*Dis-count*	*Cash*	*Date*		*Particulars*	*LF*	*Dis-count*	*Cash*
April	1.	To Capital a/c			2000	April	1.	By Furniture a/c			250
	4.	To Sales a/c			150		2.	By Purchases a/c			300
	6.	To Krishna		20	600		5.	By Purchases a/c			200
	9.	To Sales a/c			200		5.	By Ramesh a/c		10	560
	11.	To Mohan's a/c			600		7.	By Petty expense a/c			15
							8.	By Purchases a/c			150
							13.	By Typewriter a/c			800
							15.	By Telephone a/c			200
							30.	By Anand's a/c		8	400
							30.	By Balance a/c			675
				20	3,550					18	3,550
May	1.	To Balance b/d			675						

Problem 5. Enter the following transactions of Prakash in a Double Column Cash Book

2004 July,

1. Balance of cash in hand — Rs. 1,600
2. Paid to Mohan — Rs. 780
   Discount allowed — Rs. 20
3. Cash sales — Rs. 400
4. Sale of old newspaper — Rs. 20
5. Paid for duplicator — Rs. 1,000
6. Withdrawn from Bank — Rs. 400
7. Received from Anand (in full settlement of his debt of Rs. 600) — Rs. 570
8. Sale of old furniture — Rs. 300
9. Received from Raghu — Rs. 400
   Discount allowed — Rs. 15
10. Paid wages — Rs. 500
11. Received from Raja against debt personally written off — Rs. 150

Solution

Cash Book with Cash and Discount Columns

Date		*Particulars*	*LF*	*Dis-count*	*Cash*	*Date*		*Particulars*	*LF*	*Dis-count*	*Cash*
July	1.	To Balance b/d			1,600	July	2.	By Mohan's a/c		20	780
	3.	To Sales a/c			400		5.	By Duplicators a/c			1,000
	4.	To Sales a/c			20		10.	By Wages			500
	6.	To Bank a/c			400		11.	By Balance b/d			1,560
	7.	To Anand		30	570						
	8.	To Furniture			300						
	9.	Ram		15	400						
	11.	Bad debts recovered a/c			150						
				45	3,840					20	3,840

Problem 6. Rakesh commenced business on 1-1-05 with Rs. 15,000 cash. Prepare two column cash book taking into consideration the following :

2005 Jan.,

3. Paid cash to Suresh Rs. 800
   Allowed discount Rs. 10
5. Received from Mohan Rs. 900
   allowed him discount Rs. 15
7. Purchased goods for cash Rs. 6,000
10. Sold goods for cash Rs. 4,000
12. Purchased goods for cash Rs. 3,000
15. Sold goods for cash Rs. 2,000
17. Amount of Rs. 600 was payable to Suresh which has been paid after deducting 2% discount.
20. Goods Purchased for cash Rs. 4,410
25. Deposited in bank Rs. 500
28. Received from Dinesh Rs. 2,000
    Allowed him discount Rs. 30
29. Paid Rs. 340 to Mahesh in full settlement of his account of Rs. 400
29. Withdrew for personal use Rs. 150
30. Purchased goods for cash Rs. 9,600
31. Purchased goods from Dinesh for cash Rs. 588
31. Sold goods to Mohan for cash Rs. 2,850

Solution

Cash Book

Date	*Particulars*	*LF*	*Dis-count*	*Amt.*	*Date*	*Particulars*	*LF*	*Dis-count*	*Amt.*
Jan 1.	To Capital a/c			15,000	Jan 3.	By Suresh		10	800
5.	To Mohan's a/c		15	900	7.	By Purchases			6,000
10.	To Sales a/c			4,000	12.	By Purchases			3,000
15.	To Sales a/c			2,000	17.	By Suresh *1		12	588
28.	To Dinesh a/c		30	2,000	20.	By Purchases a/c			4,400
31.	To Sales a/c			2,850	25.	By Bank a/c			500
					29.	By Mahesh*2		60	340
					29.	By Drawings			150
					30.	By Purchases a/c			9,600
					31.	By Purchases a/c			588
					31.	By Balance c/d			774
			45	26,750				82	26,750
Feb 1.	To Balance b/d			774					

Working Note – 1

1. $\frac{600 \times 2}{100} = 12\ (600 - 12 = 588)$
2. $(400 - 340 = \text{Rs. } 60)$

5. THREE COLUMN CASH BOOK OR CASH BOOK WITH CASH BANK AND DISCOUNT COLUMNS

This book contains three columns to record discount, cash and bank on either side of the cash book. It is to be noted that discount account is a nominal account, cash account is a real account and Bank account is a personal account. This book is more important to a businessman who deals with cash and bank transactions. Sometimes a businessman deals simultaneously with cash and bank transactions As both cash and bank columns exist side by side, it is possible to record and trace transactions without delay. Some examples of transactions affecting both cash and bank accounts simultaneously are cash deposits, cash withdrawn, cheques issued, cheques deposited, etc.

Most of the medium and large sized business enterprises make use of a bank by opening an account with it for facilitating cash receipts and cash payments. Especially large sums of money is usually paid by cheques. Similarly, surplus cash which is not required for regular dealings in the business is also deposited with the bank for ensuring its safety. The type of account opened by the businessman with a bank is commonly the current account. The amount is deposited with the help of pay-in-slips and cash is withdrawn by means of cheques. Cash payments are also made by issuing cheques to the suppliers of goods. So a bank column is inserted in the cash book of a businessman.

Contra Entry : If the same entry appears on both debit and credit side then the entry is referred to as contra entry. In the ledger folio column the letter 'C' is written against such contra entry.

A specimen of a three column cash book is given below :

Three Column Cash Book

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*

Guidelines for preparing a three column cash book :

1. **Cheque or Bank draft received on some account which is not deposited into the bank on same day.** It is to be treated as cash and recorded in the cash column on the debit side.
2. **Cheque, Bankdraft or cash received on some account and is deposited into the same date.** It is to be entered in the bank column on the debit side.
3. **Cheque, Bankdraft or cash deposited into bank by others.** It has to be recorded in the bank column on the debit side.
4. **Cheque, Bankdraft or cash deposited into the bank by the businessman.** Such transaction appears on both sides of the cash book. Hence it is a contra entry.
   Under the cash column on the credit side an entry is to be made as "By Bank account".
   Under the bank column on the debit side an entry is made as "To Cash account".
5. **Payment made by cheque.** Record it under the bank column on the credit side.
6. **Cheques drawn for business use.** It is a contra entry. Record it on the debit side under cash column as "To Bank a/c" to indicate withdrawal from the bank
   Record on the credit side under Bank Column as "By cash account" to record the payment made by the bank.

7. **Cheques drawn for personal use.** It is to be recorded on the credit side under bank column as "By Drawings".
8. **Bank charges debited by the bank.** It is to be recorded on the credit side under bank column as "Bank charges a/c".
9. **Income earned from Bank.** It is to be recorded on the debit side under bank column as "Interest a/c".
10. **Cheque endorsed to others.** It is to be recorded on the debit side under cash column as " To concerned parties account".
    When it is endorsed it is to be recorded on the credit side under cash column.
11. **Dishonours of the cheque issued to others.** It is to be recorded on the debit side under bank column to cancel the payment made to the party.
12. **Dishonours of the cheque issued by others.** It is to be recorded on the credit side under the bank column as "By concerned person's a/c".

6. BALANCING THE THREE COLUMN CASH BOOK

As in the case of two column cash book the discount columns are totalled but not balanced. The cash columns are balanced exactly in the same manner as indicated in the single column cash book. The process is similar for balancing the bank column also. However it is possible that the bank may allow the businessman to withdraw more than the amount deposited i.e., to have an overdraft. In such a case, the total of the bank column on the credit side is bigger than the one on the debit side. The difference is written on the debit side as "To balance c/d". Then the totals are written on the two sides opposite one another. The balance is then entered on the credit side as "By balance b/d". The usual case is that payments into the bank will exceed the withdrawals or payments out of the bank. Then the bank columns are balanced just like the cash column.

Problem 7. Enter the following transactions in the cash book with discount cash and bank columns and show the balance.

1-1-2001 Cash in hand Rs. 250 and at Bank Rs. 10,650.
1-1-2001 Sold goods for cash and banked the proceeds Rs. 5,700.
2-1-2001 Received a cheque from Govind for Rs. 775 in full settlement of his account for Rs. 790.
3-1-2001 Sent Govind's cheque to bank for collection.
6-1-2001 Bought goods and paid by cheque Rs. 5,000.
10-1-2001 Paid rent for the month of November by cheque Rs. 500.
15-1-2001 Received a cheque for commission earned from Mr. Kalidas of Dharwar and sent the same to bank for collection Rs. 600.
20-1-2001 Bought postage stamp Rs. 50.

Solution

Cash Book with Cash Bank and Discount Column

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
1-1-01	To Balance b/d			250	10,650	3-1-01	By Bank			775	
1-1-01	To Sales a/c				5,700	6-1-01	By Purchases				5,000
2-1-01	To Govind's a/c		15	775		10-1-01	By Rent a/c				500
15-1-01	To Commission a/c				600	20-1-01	By Postage a/c			50	
						31-1-01	By Balance c/d			200	11,450
			15	1,025	16,950					1,025	16,950
1-2-01	To Balance b/d			200	11,450						

Problem 8. Prepare a three column cash book of the following.

2002 Jan.,

1.	Commenced business with cash	Rs. 10,000
2.	Paid into bank	Rs. 8,000
7.	Purchased goods by cheque	Rs. 3,000
8.	Paid Rent	Rs. 150
12.	Purchased furniture and paid by cheque	Rs. 180
15.	Cash sales	Rs. 650
16.	Issued Gopal a cheque for	Rs. 970
	Discount received	Rs. 25
18.	Received a cheque from Narayan	Rs. 1,500
	Discount allowed to him	Rs. 30
21.	Paid into bank	Rs. 1,500
25.	Paid Wages	Rs. 60
28.	Drew for office use	Rs. 400
30.	Received from Gopu	Rs. 100
31.	Withdrew for personal use by cheque	Rs. 150

Solution

Cash Bank with Cash Bank and Discount Columns

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
2002						2002					
Jan 1.	To Capital a/c			10,000		Jan 2.	By Bank	C		8,000	
2.	To Cash	C			8,000	7.	By Purchases a/c				3,000
15.	To Sales a/c			650		8.	By Rent a/c			150	
18.	To Naryan a/c		30	1,500		12.	By Furniture a/c				180
21.	To Cash a/c	C			1,500	16	By Gopal a/c		25		970
28.	To Bank a/c	C		400		21	By Bank a/c	C		1,500	
30.	To Gopu's a/c			100		25	By Wages			60	
						28	By Cash a/c	C			400
						31	By Drawing a/c				150
						31	By Balance c/d			2,940	4,800
			30	12,650	9,500				25	12,650	9,500
Feb 1.	To Balance b/d			2,940	4,800						

Problem 9. Prepare a three column cash book of Sri Chandran from the following.

2002 Jan.,

1.	Cash received from sale of building	Rs. 6,000
2.	Paid into bank of opening an account	Rs. 5,600
3.	Paid Albert by cheque	Rs. 2,470
	Discount allowed by him	Rs. 20
4.	Paid wages	Rs. 150
8.	Received from Balan cheque	Rs. 980
	Allowed him discount	Rs. 20
10.	Paid into bank Balan cheque	Rs. 980
15.	Paid for stationery in cash	Rs. 50
18.	Bought goods for cash	Rs. 120

20. Paid Madhavan by cheque Rs. 370
    Discount allowed by him Rs. 10
21. Drew from bank Rs. 150
23. Drew from bank for private expenses Rs. 200
24. Received for cash sales Rs. 170
25. Received from Raman Rs. 1,800
    Allowed him Discount Rs. 40
27. Paid into bank Rs. 2,000

Solution

Cash book with Discount, Cash and Bank Columns

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
2002						2002					
Jan, 1.	To Buildings a/c			6,000		Jan 2.	By Bank	C		5,600	
2.	To Cash a/c	C			5,600	3.	By Albert		20		2,470
8.	To Balance a/c		20	980		4.	By wages			150	
10.	To Cash a/c	C			980	10.	By Bank	C		980	
21.	To Bank a/c	C		150		15.	By Stationary			50	
24.	To 24 Sales			170		18.	By Purchases			120	
25.	To Raman		40	1,800		20.	By Madhavan		10		370
27.	To Cash	C				21.	By Cash	C			150
					2,000	23.	By Drawings				200
						27.	By Bank	C		2,000	
						31.	By Balance c/d			200	5,390
			60	9,100	8,580				30	9,100	8,580
Feb 1	To Balance b/d			200	5,390						

Problem 10. The Cash book of Gopal Krishna is accidentally burnt. It is known that on 1st Jan 2005, there was Rs. 100 cash on hand and Rs. 4,000 in Bank.

The Counterfoil of the Receipt Book Shows.

		Rs.	Discount
Jan 2.	Thomas & sons	2,000	5
4.	Krishna & Co.	1,000	10
5.	Menon & Co.	600	3

The counter foil of the cheque book shows

		Rs.	Discount
Jan 2.	Petty expenses	30	
	Rally & Bros	1,500	8
6.	Office Cash	400	
7.	Wilson & Co.	1,600	8

The receipt account file shows receipts given by the following :

		Rs.	Discount
Jan 3.	Sitaram Mills	500	3
5.	Addison & Co.	140	2

The Bank paying-in-Book contains memorandum of accounts passed with bank

		Rs.	Discount
Jan 3.	Cash	200	
4.	Cheque	2,000	

Write up a new cash book incorporating the above data and show the amount of cash in hand and at bank on Jan 7, 2005.

Solution

New Cash Book of Gopal Krishna

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
2005						2005					
Jan 1.	To Balance b/d			100	4,000	Jan 2	By Petty expenses				30
2.	To Thomas & Sons		5	2,000			By Rally & Bros		8		1,500
3.	To Cash	C			200	3	By Sitaram Mills		3	500	
4.	To Krishna & Co.		10	1,000			By Bank	C		200	
5.	To Menon & Co.		3	600		5	By Addison & Co.		2	140	
	To Cash	C			2,000	6	By Office cash	C			400
	To Bank	C		400		7	By Wilson & Co.		8		1,600
							By Balance c/d			3,260	2,670
			18	4,100	6,200				21	4,100	6,200

Problem 11. Enter the following transactions in cash book with discount and bank columns. Cheques are first treated as cash receipts.

2005 Jan,

1.	Chandrashekar commenced business with cash	Rs. 20,000
3.	He paid into Bank account	Rs. 19,000
4.	He received cheque from Kirti & Co. on account	Rs. 600
7.	He pays in bank Kirti & Co's cheque	Rs. 600
10.	He pays Rattan & Co. by cheque Rs. 330 and is allowed discount	Rs. 20
12.	Tripathi & Co. pays into his bank a/c	Rs. 475
15.	He receives cheque from Warshi for Rs. 450 & allows him discount	Rs. 35
20.	He receives cash Rs. 75 and cheque Rs 100 for cash sale.	
25.	He pays into Bank including cheques received on 15th and 20th	Rs. 1,000
27.	He pays by cheque for cash purchase	Rs. 275
30.	He pays sundry expenses in cash	Rs. 50
30.	He pays John & Co. in cash Rs. 375 and is allowed discount	Rs. 35
31.	He pays office rent by cheque	Rs. 200
31.	He draws a cheque for personal use	Rs. 250
31.	He pays staff salaries by cheque	Rs. 300
31.	He draws a cheque for office use	Rs. 400
31.	He pays cash for stationery	Rs. 25
31.	He purchases goods for cash	Rs. 125
31.	He gives cheque to Ramcharan for Cash purchases of furniture for office	Rs. 1,575
31.	He receives cheque for commission from Raghu & Co and immediately pays the same into bank	Rs. 500
31.	Receives cheque from kesari & Co	Rs. 450

Solution

Cash Book with Cash Discount and Bank Columns

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
1995						1995					
Jan 1.	To Capital a/c			20,000		Jan 3.	By Bank a/c	C		19,000	
3.	To Cash a/c	C			19,000	7.	By Bank a/c	C		600	
4.	To Kirti & Co. a/c			600		10.	By Ratan & Co.		20		330
7.	To Cash a/c	C			600	25.	By Bank a/c	C		1,000	
12.	To Tripathi & Co. a/c				475	27.	By Purchases a/c				275
15.	To Warshi a/c		35	450		30.	By Sundry expenses a/c			50	
20.	To Sales a/c			175		31.	By John & Co.		35	375	
25.	To Cash a/c	C			1,000	31.	By Rent a/c				200
31.	To Bank a/c	C		400		31.	By Drawings a/c				250
31.	To Commission a/c				500	31.	By Salaries a/c				300
31.	To Kesari & Co.			450		31.	By Cash	C			400
						31.	By Stationery a/c			25	
						31.	By Purchases a/c			125	
						31.	By Commission a/c				300
						31.	By Furniture a/c				1,575
						31.	By Balance c/d			900	1,794
			35	22,075	21,575				55	22,075	21,575

Problem 12. Suresh started business as a coal merchant on 1st October, 2004. He put into the business Rs. 5,500 cash which he put in to the Bank . His other transactions were

Oct 1. Drew cheque for office use Rs. 250
4. Purchased account books and stationery Rs. 50
6. Sold for cash 5 cwt of coal @ Rs. 20 year cwt
8. Paid wages Rs. 25
12. Paid by cheque to Narasimhan the amount due less 5% cash discount
16. Norwood paid his account by cheque less $2\frac{1}{2}$% cash discount.
17. Paid rent out of cash Rs. 100
31. Paid salaries out of Bank Rs. 150
31. Drew for Domestic use cheque Rs. 200

Write up a three column cash book incorporating the above transactions.

Solution

Cash Book with Discount Cash and Bank Columns

Date	*Particulars*	*LF*	*Discount*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Discount*	*Cash*	*Bank*
2004						2004					
Oct 1.	To Capital a/c				5,500	Oct 1.	By Cash a/c	C			250
1.	To Bank a/c	C		250		4.	By Stationery a/c			50	
6.	To Sales a/c			100		8.	By Wages a/c			25	
16.	To Norwood a/c		8		312	12.	By Narshimhan's a/c		125	2,375	
						17.	By Rent a/c			100	
						31.	By Salaries a/c				150
						31.	By Drawing				200
						31.	By Balance c/d			175	2,337
			8	350	5,312				125	350	5,312

Problem 13. Enter the following transactions into a three column cash book and balance the same.

2005		Rs.
Jan 1.	Cash in hand	3,000
2.	Cash at Bank	10,000
3.	Sold goods for cash	10,000
4.	Deposited into Bank	8,000
5.	Received from Nandalal	4,000
	Allowed him discount	100
6.	Paid house rent by cheque	1,000
7.	Paid to Shyamlal	5,000
	Received Discount	50
9.	With drawn from bank for office use	5,000
10.	Received a cheque of Rs. 407 from Mohan in full settlement of his account of	500
11.	Cash sales deposited into Bank	2,500
12.	Cash Sales	1,000
13.	Paid Mr. Agarwal by cheque against his claim of Rs. 2,000 at a discount of 5%	
14.	Paid travelling expenses	700
15.	Drawn cheque for personal use	1,000

Solution

Cash Book with Discount, Cash and Bank Columns

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
2005						2005					
Jan 1.	To Balance b/d			3,000		Jan 4.	By Bank a/c	C		8,000	
2.	To Balance b/d				10,000	6.	By House rent a/c				1,000
3.	To Sales a/c			10,000		7.	By Shyamlal a/c		50	5,000	
4.	To Cash a/c	C			8,000	9.	By Cash a/c	C			5,000
5.	To Nandalal's a/c		100	4,000		13.	By Agarwala a/c		100		1,900
9.	To Bank a/c	C		5,000		14.	By Travelling expenses			700	
10.	To Mohan's a/c		30		470	15.	By Drawings				1,000
11.	To Sales				2,500	31.	By Balance c/d			9,300	12,070
12.	To Sales			1,000							
			130	23,000	20,970				150	23,000	20,970

Problem 14. Enter the following transactions in a cash book with cash discount and bank columns and balance the same.

2005 Jan.,

1.	Balance of cash in hand Rs. 400 and at Bank	Rs. 2,000
3.	Paid Ramlal by cheque Rs. 950 in full settlement of his account for	Rs. 1000
5.	Purchased goods for cash	Rs. 100
5.	Purchased goods and paid by cheque	Rs. 300
7.	Withdrew cash from Bank for office use	Rs. 300
8.	Paid wages	Rs. 200

10. Paid Modi by cheque Rs. 150
15. Rajeev purchased goods from us for cash Rs. 1,000
18. Received cheque from Murthy Rs. 320 in full settlement of his account for Rs. 350
22. Paid Rs. 1,000 into the bank.
25. Paid Gulam Rs. 175 in full settlement of his account Rs. 180
31. Drew cheque for period use Rs. 50

Solution

Cash Book with Discount and Bank Columns

Date	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*	*Date*	*Particulars*	*LF*	*Dis-count*	*Cash*	*Bank*
2005						2005					
Jan 1.	To Balance b/d			400	2,000	Jan 3.	By Ramlal a/c		50		950
7.	To Bank	C		300		5.	By Purchases a/c				300
15.	To Sales			1,000		7.	By Cash a/c	C			300
18.	To Murthy's a/c		30	320		8.	By Wages a/c			200	
22.	To Cash				1,000	10.	By Modi's a/c				150
						22.	By Bank a/c	C		1,000	
						25.	By Gulam's a/c		5	175	
						31.	By Drawings				50
						31.	By Balance c/d			545	1,250
			30	2,020	3,000				55	2,020	3,000

6. CASH BOOK WITH BANK AND DISCOUNT COLUMNS

This type of cash book is maintained by large sized business organisations which deposit all the cash into the bank and all payments are made by cheque. Even petty cash expenses are paid by cheques to the petty cashier. This type of cash book contains columns for Bank and discount an either side of the cash account i.e., debit and credit sides. The proforma of such type of cash book is shown below.

Cash Book with Bank and Discount Columns.

Date	*Particulars*	*Discount*	*Bank*	*Date*	*Particulars*	*Discount*	*Bank*

Problem 15. Arun Kumar of Bangalore deposits all his daily receipts in a bank and makes all payments through bank. Following transactions took place in April 2004. Prepare cash book with bank and discount columns.

2004 April,

1. Debit balance of bank Rs. 8,000
5. Received Rs. 2,000 from Mohan in full settlement of the amount of Rs. 2,050

7. Paid Rs. 2500 to Suresh, he allowed discount of Rs. 25
10. Purchased goods Rs. 4,950
15. Paid Rs. 200 for wages and Rs. 700 for salaries.
20. Received Rs. 1000 from Mohan
25. Purchased furniture for Rs. 500
27. Received Rs. 300 from Dinesh and allowed him discount Rs. 15
28. Received Rs. 900 from Mr. 'X' and allowed him discount Rs. 10
29. Paid Rs. 3,000 to Mr. 'B' by cheque.

Solution

Cash Book With Bank and Discount Columns

Date	*Particulars*	*Discount*	*Bank*	*Date*	*Particulars*	*Discount*	*Bank*
2004				2004			
April 1.	To Balance b/d		8,000	April 7.	By Suresh	25	2,500
5.	To Mohan's a/c	50	2,000	10.	By Purchases		4,950
20.	To Mohan's a/c		1,000	15.	By Wages a/c		200
27.	To Dinesh	15	300	15.	By Salaries		700
28.	To Mr. 'X'	10	900	25.	By Furniture a/c		500
				29.	By B's a/c		3,000
				30.	By Balance a/c		350
		25	12,200			25	12,200

Problem 16. Enter the following transactions in a cash book with discount and bank columns assuming that all receipts are banked immediately and all payments are made by cheque and post them into ledger.

2005 March,

1. Capital paid into bank Rs. 10,000
2. Bought goods for cash Rs. 2,000
4. Sold goods for cash Rs. 1,500
6. Purchased office furniture Rs. 500
6. Received commission Rs. 50
10. Received a cheque from Sastri for Rs. 490 in full settlement of his account for Rs. 500
12. Gave Chand & Co. a cheque for Rs. 500 in full settlement of their account for Rs. 520
15. Drew for personal use Rs. 500
17. Sold goods to Johnson for Rs. 800 and received a cheque for the same
20. Drew a cheque for petty cash Rs. 100
22. Made cash purchases Rs. 300
25. Paid office rent Rs. 200
28. Mohan paid us Rs. 195 in full settlement of his account for Rs. 200
31. Paid office salaries Rs. 300

Solution

Cash Book with Bank and Discount Columns

Date	*Particulars*	*Discount*	*Cash*	*Date*	*Particulars*	*Discount*	*Cash*
2005				2005			
Mar 1.	To Cash a/c		10,000	Mar, 2.	By Purchases a/c		2,000
4.	To Sales a/c		1,500	6.	By Furniture a/c		500
6.	To Commission a/c		50	12.	By Chand & Co.	20	500
10.	To Sastri's a/c	10	490	15.	By Drawings a/c		500
17.	To Sales		800	20.	By Petty expenses		100
28.	To Mohan's	5	195	22.	By Purchases a/c		300
				25.	By Rent a/c		200
				31.	By Salaries a/c		300
				31.	By Balance b/d		8,635
		15	13,035			20	13,035

7. PETTY CASH BOOK

A petty cash book is used to record all cash payments of smaller denominations. Examples of such payments are printing and stationery, postage and telegrams, carriage and cartage, travelling expenses etc. All transactions of this type if recorded in the cash book amounts to overloading it. To reduce the burden of the chief cashier, a petty cashier is appointed and he is given a small amount of cash say Rs. 200 or 500 which is quite sufficient to meet expenses of above nature for a given period of time, say, a month. The petty cashier incurs the petty expenses and makes the entry in the petty cash book. The payment of such expenses is supported by vouchers or receipts at the end of the period, say a month. The petty cashier submits the accounts to the chief cashier. After examining the accounts of the petty cashier, the chief cashier will again pay him the actual amount spent by him. Thus it will he seen that the petty cashier will have the same amount of cash balance which he had on the first day of the previous month.

Types of Petty Cash Book : Petty cash book can be maintained under two types, viz (1) Simple petty cash book and (2) Analytical petty cash book with impress system.

Simple petty Cash book : This type of petty cash book resemble to a simple cash book discussed earlier with one difference. Instead of providing separate columns for date and particulars on both debit and credit side, a single column is provided for date and particulars. In other words this type of petty cash book will not have two sides and therefore it does not resemble to an account. However a column is provided on the left extreme of the page to record the petty expenses amount received by the petty cashier from the chief cashier. One distinct feature of this book is all expenses are recorded in the particulars column. This book is closed at the end of a given period to know the balance. The balance is then carried forward to the next month and transactions for that month is subsquently recorded.

Problem 17. Prepare a simple petty cash book in the books of Saranath from the following particulars for January 2005.

1. Balance with the petty cashier Rs. 50
1. Received a cheque of Rs. 450 from the chief cashier.
3. Paid for stationery Rs. 75
8. Paid for refreshments Rs. 35
12. Paid for newspaper Rs. 35
13. Paid for carriage and cartage Rs. 50

14. Paid for postage Rs. 40
19. Paid conveyance to a clerk Rs. 15
31. Paid for telegram Rs. 80

Solution

Simple Petty Cash Book

Amount Received	*Cash Book folio*	*Date*	*Particulars*	*Voucher No.*	*LF*	*Amount*
50.00		Jan 1.	To Balance b/d			
450.00		1.	To Bank a/c			
		3.	To Printing & stationery a/c			75.00
		8.	To Sundry expenses a/c			35.00
		12.	To Sundry expenses a/c			35.00
		13.	To Carriage & cartage a/c			50.00
		14.	To Postage a/c			40.00
		19.	To Conveyance a/c			15.00
		31.	To Telegram a/c			80.00
		31.	To Balance c/d			170.00
500.00						500.00

8. ANALYTICAL PETTY CASH BOOK WITH IMPREST SYSTEM

This is a modified type of simple petty cash book. It consists of two sides as in the case of any other type of cash book, i.e., debit and credit sides. The debit side is used to record the imprest or petty cash received by the petty cashier from the chief cashier at the beginning of the month. The credit side is used to record various petty expenses. These petty expenses are analysed into various columns to indicate the nature of petty expenses. Hence this type of petty cash book is also known as analytical petty cash book. In other words a separate column is provided for each item of petty expenses. So this type of petty cash book is also known as columnar petty cash book. Whenever any petty expense is incurred it is first recorded in the total payment column. Subsequently they are recorded under the relevant expense column. This facilities the total amount of petty expenses of different types incurred every month by adding up the relevant columns. It also facilities posting of periodical total of each column to the ledger instead of posting individual expenses . It is also possible to know the total petty expenses of all types incurred for a given period of time. This system is also known as imprest system of petty cash book. Under this system the chief cashier hands over a certain amount of cash to the petty cashier for a specific period, say, a month. At the end of the month, the petty cashier will submit the account to the chief cashier, who will inturn hand over the exact amount spent by the petty cashier in the preceding month. Thus the petty cashier will have the same balance of cash as he had in the previous month to start with. This balance of amount which remains same throughout the commencement of every month is known as imprest amount and the type of cash book using this principle is called as imprest system of cash book.

Problem 18. Write up the following transactions in the analytical petty cash book and balance the same.

2000 Jan.,

1. Advanced to petty cash by cheque Rs. 600
4. Paid cartage Rs. 50
6. Purchased postage stamps Rs. 30

Solution

Analytical Petty Cash

Amount Received	*Cash book folio*	*Date*	*Particulars*	*Voucher Number*	*Total of payment*	*Analysis of Payments*						
						Carriage	*Postage stamps*	*Telegram*	*Lamps*	*Packing*	*Advt.*	*letter paper*
600	–	1-1-2000	To Bank	–	–	–						
		4-1-2000	By Carriage	1	50	50	–					
		6-1-2000	By Postage stamps	2	30		30					
		10-1-2000	By Telegrams	3	20			20				
		15-1-2000	By Wicks for lamps	4	30				30			
		18-1-2000	By Packing	5	20					20		
		20-1-2000	By Advertisement	6	60						60	
		30-1-2000	By Letter paper	7	30							30
		30-1-2000	By Oil for lamps	8	60				60			
		31-1-2000	By Balance c/d		300	50	30	20	90	20	60	30
					300							
600					600							
		1-2-70	To Balance b/d		300							

10.	Spent for telegrams	Rs. 20
15.	Wicks for lamps purchased	Rs. 30
16.	Paid packing charges	Rs. 20
20.	Paid advertisement charges	Rs. 60
30.	Paid for letter paper	Rs. 30
30.	Bought oil for lamps	Rs. 60

POSTING OF CASH BOOK

The entries from the cash book are posted into the concerned ledger accounts. When an entry is posted from the cash book to the ledger book account the number of the page of the cash book is written in the Folio column against the amount in the ledger. At the same time the page of the ledger on which the entry has been posted is entered in the ledger folio column against the entry in the cash book.

Posting the entries from Cash receipt journal or debit items in the Cash Book :

The transactions from the cash receipt journal or from the debit side of cash book are posted daily to the credit side of the respective accounts. For example, if interest is received cash account is debited and interest account is credited. Similarly if cash is received from Govind, cash account is debited and Govind's account is credited. If cash is received on account of cash sales, cash account will be debited and sales account is credited. In other words all accounts which are recorded in the cash receipt Journal or the debit items of the cash book are credited to their respective accounts.

Problem 19. Enter the following transactions in a cash receipt Journal and post them into the concerned ledger accounts.

1-1-05	Sold goods for cash	Rs. 200
5-1-05	Received cash from Arjun Rs. 96 and allowed him discount	Rs. 4
10-1-05	Cash sales	Rs. 300
14-1-05	Received from Bhima Rs. 98 in full settlement of claim	Rs. 100
15-1-05	Received on cash sales	Rs. 500
20-1-95	Received cash from Nakula Rs. 145 and allowed cash discount of	Rs. 5

Solution

Cash Receipt Journal

Date	*Particulars*	*Lf*	*Cash Discount*	*Amount*
1-1-05	Sales a/c			200
5-1-05	Arjuna's a/c		4	96
10-1-05	Sales a/c			300
14-1-05	Bhima's a/c		2	98
15-1-05	Sales a/c			500
20-1-05	Nakula's a/c		5	145
			11	1,339

Ledger Accounts

[Posted at the end of the Month] **Discount A/c**

To Sundries a/c	11

[Posted at the end of the month] **Cash A/c**

To sundries a/c	1,339

Sales A/c **[Posted daily]**

	By Cash a/c	200
	By Cash a/c	300
	By Cash a/c	500

Arjun's A/c [Posted Daily]

	By Cash a/c	96
	By Discount a/c	4

Bhima's A/c [Posted Daily]

	By Cash	98
	By Discount	2

Nakula's A/c [Posted Daily]

	By Cash	145
	By Discount	5

Note :- When the cash book is maintained in the form of ledger account i.e., with receipts and payments column, the monthly total is not posted to cash account because the cash book itself serves the purpose of cash account.

Posting from Cash Payment Journal. The various accounts appearing in the cash payment Journal or credit items of cash book are posted daily into various accounts on their debit sides. The total of this Journal is posted monthly into the cash and discount accounts. Cash discount received on payment is in the nature of revenue. Hence, this is credited into discount account and debited to the person to whom the payment is made.

Problem 20. Enter the following transactions in a cash payment journal and post them into concerned ledger accounts.

1-2-05.	Purchased goods for cash	Rs. 5,000
10-2-05.	Paid Rent for the month of January	Rs. 500
15-2-05.	Paid to Nandagopal Rs. 280 ; Cash discount	Rs. 20
20-2-05.	Paid to Madangopal Rs. 145 ; Cash discount	Rs. 5
25-2-05.	Purchased goods for cash	Rs. 2000.
28-2-05.	Paid salary	Rs. 1,500

Solution

Cash Payment Journal

Date	*Particulars*	*Lf*	*Cash Discount*	*Amount*
1-2-05	Purchases a/c			5,000
10-2-05	Rent			500
15-2-05	Nandagopal		20	280
20-2-05	Madangopal		5	145
25-2-05	Purchases			2,000
28-2-05	Salary			1,500
			25	9,425

Ledger A/c

Discount A/c [Posted at the end of the month]

	By Sundries	25

Cash A/c [Posted at the end of the month]

	By Sundries	9,425

Purchases A/c

1-2-05	To Cash a/c	5,000	
25-2-05	To Cash a/c	2,000	

Rent Ac

	To Cash a/c	500	

Nandagopal's A/c

	To Cash a/c	280	
	To Discount a/c	20	

Madangopal's A/c

	To Cash a/c	145	
	To Discount a/c	5	

Salaries A/c

	To Cash	1,500	

Recording of Discounts Subsequently Disallowed

A trader may at times wrongly deduct a cash discount though it might not have been allowed to him. In such a situation the discount amount deducted should be rectified by passing the following entry.

Discount received Dr.
To Creditor's a/c

Creditor here stands for the person to whom the payment is made by the trader.

Similarly, when the customer deducts any discount which is not actually allowed by the trader, only the amount received is to be recorded without recording the discount so deducted. The customer is informed about the discount which is in fact disallowed.

Disallowing of Discount Due to Dishonours of Cheque

When a cheque is presented into the bank it may be dishonoured by the bank for some reasons. The discount of such dishonoured cheques should not be recorded in cash book. It must be instead recorded in the Journal. The following entries are passed to set right the discount on dishonour of a cheque.

For cancelling the discount received due to dishonour of cheques issued personally :

Discount received a/c Dr.
To creditors a/c

For cancelling the discount allowed due to dishonour of cheque received previously :

Debtor's a/c Dr
To Discount allowed a/c

Bank Overdraft

While balancing the cash book it was mentioned earlier that the debit side of the cash book (cash column) will always be more than or equal to credit side as it is not possible to pay or incur more expenses than what is available with the trader. However the bank column of cash book may at time show a credit balance by virtue of an overdraft facility sanctioned by the bank. An overdraft is a temporary arrangement provided by the banker to his customers to draw more than the amount deposited with the bank. The bank column of cash book may even show a credit balance when withdrawal is more than the deposits made into the bank.

KEY WORDS

1. **Cash book :**
   It is a book in which receipts and payments of cash are recorded.
2. **Cash Receipt Journal :**
   It records all cash received by the trader from different sources.
3. **Cash payment Journal :**
   It records all cash payment made by the trader on several accounts.
4. **Single cash book :**
   It is used to record all receipts and payment of cash. It contains columns for cash transactions only.
5. **Cash book with cash and discount column :**
   It records both cash receipts and payments and also discount received and allowed.
6. **Three column cash book :**
   In this book an additional column is included for bank account an either side of cash book in addition to cash and discount columns.
7. **Petty cash book :**
   It is book which is used to record small items of expenses and to avoid overburdening of the main cash book.
8. **Analytical petty cash book :**
   It is a modified type of petty cash book which contains columns for various items of expenses.

QUESTIONS

1. What do you mean by a cash book ?
2. Mention three objects of cash book .
3. Mention two methods of maintaining a cash book.
4. Give the proforma of a simple cash book.
5. What do you mean by a cash receipt journal ?
6. What do you mean by a cash payment Journal ?
7. Distingush between a cash receipt journal and cash payment journal.
8. List out the various types of cash book
9. What do you mean by petty cash book ?
10. What is imprest ?
11. Mention two types of petty cash book.
12. What do you mean by contra entry ?

Answer the following questions in about a page each.

1. What is a petty cash book ? How is it maintained ?
2. Explain the imprest system of petty cash.
3. What is the object of cash book ? Further, explain the imprest system of petty cash.
4. What is a petty cash ? How is it best recorded in the books of account ?
5. What is a three column cash book ? What is its advantage ? And how is posting done from the cash book ?
6. State the points of similarities between a journal and a cash book.
7. “A cash book is both a Journal and a ledger” Do you agree. Explain.
8. What is a cash receipt Journal. Give a ruling of a cash receipt Journal.
9. What is a cash payment Journal. Give a ruling of a cash payment Journal ?
10. What is a simple cash book. How is it balanced ?
11. What do you mean by a two column cash book ? How is it balanced ?

EXERCISE 1

(Simple Cash Book)

Enter the following transactions of Aruna in a single column cash book.

2005 Jan.,	Rs.
1. Commenced business with	15,000
2. Paid into bank	13,000
3. Purchased goods for cash	1,500
4. Sold goods for cash	1,100
5. Paid for stationary	60
6. Received from Narain	1,500
7. Paid to Gupta	500
8. Purchased office furniture	600

EXERCISE 2

(Simple Cash Book)

Enter the following transactions in a cash book and balance it.

2005 Mar.,	Rs.
1. Shri Avinash started business with.	4,000
3. He purchased goods for cash	2,155
9. Received cash for sale of goods	1,495
10. Opened an account with Canara Bank by paying in.	1,000
14. Purchased office furniture for cash	135
21. Received from Manohar by postal order	475
23. Sent by M.O. Rs. 200 to Shankar and paid of M.O. commission for the same	4
27. Cash sales	380
28. Paid Advertisement charges	70
31. Trunk call expenses	5

EXERCISE 3

(Two Column Cash Book)

From the following transactions prepare a double column cash book with cash and discount columns.

2005 Mar.,	Rs.
1. Opening balance of cash	4,500
3. Received from Krishna	3,800
Allowed him discount	200
5. Received from Rama	2,900
Allowed him discount	100
7. Paid Hari	3,150
Allowed discount	150
9. Received from investment interest	2,500
12. Paid Lal	2,000

17.	Sold goods for cash	1,850
20.	Received from Singh	1,150
25.	Purchased goods from Pitambar for cash	850
31.	Paid Salaries	1,900
31.	Paid Rent	1,500
31.	Paid Advertisement	450

EXERCISE 4

(Two Column Cash Book)

Enter the following transactions in the appropriate type of cash book.

2004 July,

1. Started business with an Investment of Rs. 1,00,000
2. Deposited in state bank of India Rs. 95,000
4. Acquired a building by issuing a cheque Rs. 60,000
10. Paid the bill of the furniture by cheque Rs. 10,000.
15. Purchased Rs. 20,000 of merchandise by cheque.
18. Withdrew Rs. 2,000 from the bank.
20. Sold merchandise for Rs. 25,000 each.
22. Deposited Rs. 22,000 into the bank.
25. Bought Rs. 5,000 merchandise for cash.
26. Sold Rs. 8,000 merchandise by crossed cheque.
27. Paid Rs. 100 cheque as the premium for insuring building against fire.
28. Paid freight Rs. 50.
30. Withdrew from bank for personal use Rs. 500.
31. Paid electricity bill Rs. 90.

[**Hint :** Prepare a two column cash book with cash and bank columns. Problem involves contra entries. Balance c/d under bank column is Rs. 32,400 and under cash column Rs. 4,860 Total of Bank column is Rs. 1,25,000 and cash column is 1,27,000].

EXERCISE 5

(Two Column Cash Book)

Write up the cash book from the following transactions.

1-1-05.	Balance of cash on hand	Rs. 2,000
3-1-05.	Received from Keshav Rs. 580 and allowed him discount	Rs. 20
6-1-05.	Bought goods for cash	Rs. 500
8-1-05.	Sold goods for cash	Rs. 800
12-1-05.	Paid Joshi Rs. 310 in full settlement of account for	Rs. 400
15-1-05.	Paid wages	Rs. 40
19-1-05.	Bought goods for cash	Rs. 300
21-1-05.	Sold goods for cash	Rs. 400
25-1-05.	Received from Gopal Rs. 190 in full settlement of account for	Rs. 200
28-1-05.	Paid Arun Rs. 360 and was allowed discount	Rs. 40
30-1-05.	Paid salaries	Rs. 100

30-1-05.	Paid office rent	Rs. 50
31-1-05.	Received commission	Rs. 100

EXERCISE 6

(Two Column Cash Book)

Enter the following Transactions in a cash book without bank columns.

2005 April,

1. Tulasiram commences business with cash Rs. 10,000. He pays Rs. 2,300 for goods purchased. Rs. 500 for furniture purchased. Rs. 400 for office equipment.
2. He paid for stationary Rs. 100 and postage Rs. 10.
3. He sold goods to Norton on credit Rs. 800.
4. He sold goods for cash Rs. 1,800.
5. He paid wages Rs. 15, and cartage Rs. 5.
6. He bought goods for cash Rs. 700 and pays a creditor 'S' Rs. 425 in full settlement of a claim of Rs. 460.
7. He received cash from Norton Rs. 789 in full settlement of debt.
8. He sold goods for cash Rs. 50.

6

CHAPTER

BANK RECONCILIATION

1. INTRODUCTION

Businessmen maintain current accounts in Bank. He makes payment through cheque. Similarly all receipt of cheques will be deposited in the bank. For this purpose a separate column is provided in cash book to record the transactions of the Bank account. The Bank column in the cash book therefore, refers to the transactions relating to bank deposits and with drawals.

Pass Book or Computerised Statement of Bankers. Banks maintain the accounts of individual customers in their personal ledgers. For verification of the bank balance of the customers banks issue pass books or computerised statements wherein the customers transactions as found in the bank ledgers are entered by the bankers. Periodically, the customers may check the balance entered in the pass book with that in the cash book. Other things remaining same, the balance found in the cash book as well as the pass book must tally. But they may not. Discrepancies could arise from various reasons.

Reasons for Disagreement in the Pass Book and Cash Book Balance. The following are the reasons for the disagreement in the pass book and cash book balance :

1. **Cheques deposited into the bank for collection.** The customer makes an entry in the cash book as soon as he deposits a cheque in the bank, whereas the bank gives credit to the customers only when the cheque is realised. In the meantime, if the customer wants to compare the balance in the bank with that in his cash book he finds a difference.
2. **Cheques issued but not presented for payment.** When the customer issues a cheque he immediately enters it in the bank column of the cash book. Entry will be made by the bank regarding that cheque only when the person to whom the cheque is issued presents it for encashment or gets it encashed through his banker. In the meantime there will be a discrepancy between the balance found in the cash book and that in the pass book.
3. **Interest allowed by the bank.** Bankers credit customers accounts with interest on current accounts. This will be entered in the pass book but a corresponding entry will not be found in the cash book for some time. The customers will make the entry only after seeing the pass book.
4. **Interest on overdrafts and other bank charges.** The bank may debit the customers account with interest on overdraft or for bank charges. These items will not be entered in the cash book immediately.
5. **Dishonour of cheques and bills deposited for collection.** The cheques or bills may be deposited by the customer into the bank for collection. These may be dishonoured by the party liable to make payment. The customer might have debited his bank account as soon as he deposited these instruments. He comes to know the fact of dishonour only when the bank informs him on getting the information a credit entry is passed in the cash book. Until this the cash balance will disagree with the pass book balance.

6. **Collection of Interest, Dividend etc by the bank.** Sometimes customers may keep their securities with the bank either for safe custody or as security against overdrafts. The bank may directly receive interest or dividend on these securities and this fact may not be known to the customers. In this case there will be an entry in the pass book but no corresponding entry in the bank column of the cash book of the customer.
7. **Direct payment by the bank on behalf of the customer.** At times customers may issue standing instructions to their bankers to make payments at stipulated intervals, towards insurance premium, rent, telephone bill, electricity bill etc. In such cases the banks will debit the customers account and such entries will not be found in the cash book.
8. **Error in the pass book.** The ledger clerks at the bank may commit mistakes in posting accounts of the customers. In such cases there will be wrong entries in the pass book which will naturally not correspond with entries in the cash book.
9. **Error in the cash book.** Similarly, mistakes might occur in the maintenance of the cash book. This would also result in differences between the balances of the cash book and the pass book.
10. **Mistakes and Frauds.** Mistakes are unintentional whereas frauds are intentional. Any fraud committed either by the bank officials or the accountants of the customers would also result in discrepancies between the balance of the cash book and the pass book. One object of preparing the Bank reconciliation statement is to detect such frauds or forgeries, if any, in the transaction of the bank account. For example, if a cheque is forged and the amount is withdrawn from the bank, this can easily be detected while preparing the Bank Reconciliation statement. In this case there will be a debit entry (reduced balance) in the pass book without having any relevance to business transactions and no entry will be found in the cash book. In this case the cash book balance will be more than the pass book balance. This will provide a clue to the fraud and further investigation must be made to find the person who has drawn the amount from the bank wrongfully.

Bank Reconciliation Statement. A bank reconciliation statement is a statement wherein the causes responsible for the difference between the cash book balance and the pass book balance are established and suitable adjustments are made to eliminate them so that the two balances can agree with each other.

Steps Involved in Preparing Bank Reconciliation Statement

The following steps are involved in preparing bank reconciliation statement.

1. The date on which the reconciliation statement is to be prepared should be selected. Usually the last date of the month is chosen for the purpose.
2. The balance as shown by any one book (*i.e.*, either the cash book or the pass book) should be taken as the base. It is the starting point. This balance is to be compared with the other balance.
3. The items which cause the difference should be ascertained.
4. The effect of causes that lead to the difference is to be analysed.
5. The causes that have resulted from an increase in the balance are to be deducted from the bank balance.
6. The starting balance is thus adjusted and the balance as per the other book is arrived at the following proforma is suggested.

Bank Reconciliation Statement
as at-------

Particulars	*Rs.*	*Rs.*
Debit balance as per cash book or bank OD as per pass book.		X X X
Add :		
1. Cheques issued but not presented for payment	X X X	
2. Cheques received and entered in the cash book but not sent to bank for collection	X X X	
3. Direct payments by customers into bank a/c.	X X X	
4. Amount collected by bank as interest, dividend etc. entered only in pass book	X X X	
5. Cheques not entered in cash book deposited into bank	X X X	
6. Wrong credit made in the pass book	X X X	
7. Wrong credit in the cash book	X X X	
8. Cheques issued but dishonoured	X X X	
		X X X
Less :		
1. Cheques deposited but not credited in the pass book	X X X	
2. Cheques entered in the cash book but not deposited with the bank	X X X	
3. Bank charges interest etc. debited in the pass book not entered in cash book	X X X	
4. Cheques, Bill dishonoured not entered in cash book	X X X	
5. Payment made by bank under standing orders not entered in cash book	X X X	
6. Cheques discounted but dishonoured	X X X	
7. Wrong debit in the cash book	X X X	
8. Wrong debit in the pass book	X X X	X X X
Balance as per Pass Book/Cash Book		**X X X**

Problem 1. On 31st March 2002, the cash book of Rahul showed a bank overdraft of Rs. 7,640. On the same date Rahul received the Bank statement. On perusal of the statement, Rahul ascertained the following information :

1. Cheques deposited but not credited by the bank 10,000
2. Interest on securities collected by the bank but not recorded in the cash book 1,280
3. Dividend collected by the bank directly, but not recorded in the cash book 1,000
4. Cheques issued but not presented for payment 37,400
5. Bank charges not recorded in the cash book 340

From the above information, you are required to prepare a bank reconciliation statement to as certain the balance as per bank statement. **(CS Foundation Course, December 2002)**

Solution

Bank Reconciliation Statement

Particulars		*Rs.*	*Rs.*
	Overdraft as per Cash book		7,640
Add :	Cheques deposited but not credited by the bank	10,000	
	Bank charges not recorded in the cash book	340	
			10,340
			17,980
Less :	Interest on securities collected by the bank but not recorded in the cash book.	1,280	
	Dividends collected by the bank but not recorded in the cash book	1,000	
	Cheques issued but not presented for payment	37,400	
			39,680
	Credit balance as per bank statement		21,700

Problem 2. From the following information supplied by Anil. Prepare the Bank Reconciliation Statement as on 31st March 2001, after amending the cash book.

1. Bank overdraft as per cash book — Rs. 16,500
2. Cheques issued but not presented for payment — Rs. 8,750
3. Cheques deposited with the bank but not collected — Rs. 10,500
4. Cheque recorded in the bank column of the cash book but not sent to the bank for collection — Rs. 2,000
5. Bank charges debited in the bank statement — Rs. 250
6. A bill for Rs 3,000 (discounted with the bank in February 2001) dishonoured on 31st March and noting charges paid by the bank — Rs. 30
7. Premium on the life insurance policy of Anil paid by the bank as per standing instructions — Rs. 1,800

(CS Foundation Course, June 2001)

Solution

Cash Book (Bank Column Only)

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	21,580	By Balance b/d	16,500
		By Bank charges	250
		By Acceptor of Bill	3,030
		By Drawing a/c (Premium on life Insurance policy paid)	1,800
	21,580		21,580

Bank Reconciliation Statement

Particulars		*Rs.*	*Rs.*
	Overdraft as per cash book		21,580
Add :	Cheques deposited with the bank but not collected	10,500	
	Cheques recorded in the cash book but not sent to bank for collection	2,000	
			12,500
			34,080
Less :	Cheques issued but not yet presented for payment		8,750
	Overdraft as per pass book		25,330

Problem 3. Following are the transactions recorded in the bank column of the cash book of Shri Madhav for the month ending 31st December 1998.

Cash Book (Bank Column)

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1998 Dec			1998 Dec		
19.	To Cash	54,000	1.	By Balance b/d	60,000
24.	To Buddha	36,000	8.	By Ram	3,000
26.	To Chaitanya	15,000	10.	By Lakshman	600
			19.	By Bharat	360
31.	To Balance c/d	11,460	24.	By Satrughna	52,500
		1,16,460			1,16,460

On the receipt of the Bank statement on 31st December 1998 Shri Madhav collected the following information.

(*a*) Credit transfer not recorded in the cash book Rs. 300.
(*b*) Interest on Government bond collected by the bank but not entered in cash book Rs. 1,620.
(*c*) Cheques for Rs. 20,000 deposited but the bank collected only Rs. 5,000.
(*d*) Dividend collected by the bank directly but not intimated the same to Shri Madhav Rs. 1,500.
(*b*) Bank charges recorded twice in the cash book Rs. 510.
(*f*) Interest on overdraft charged by the bank but not entered in the cash book Rs. 1,500.
(*g*) Cheques for Rs. 66,100 issued by the trader but presented to the bank for payment only Rs. 10,000.

You are asked to amend the cash book and prepare a Bank Reconciliation Statement from the above information **(Calcutta University B. Com (Hons) 1999)**

Solution

Cash Book (Amended)
(Bank Column)

Particulars	*Amount*	*Particulars*	*Amount*
To Credit transfer	300	31-12-98	
To Interest on Govt. Bond	1,620	By Balance b/d	11,460
To Dividend	1,500	(Incorrect)	
To Bank charges	510	By Interest on overdraft	1,500
To Balance c/d (correct)	9,030		
	12,960		12,960

Bank Reconciliation Statement

Particulars		*Rs.*
	Bank balance as per cash book (overdrawn)	9,030
Add :	Cheques deposited but not collected by bank (20000 – 5000)	15,000
		24,030
Less :	Cheques issued but not presented (66100–10000)	56,100
	Bank balance as per pass book (favourable)	32,070

Note : It is assumed that bank charges of Rs 510 recorded twice in November, which has not been detected till 31-12-98. Therefore it is rectified on that date.

Problem 4. The cash book of a firm showed an overdraft of Rs. 30,000 on 31st March, 1999. A comparison of the entries in the cash book and pass book revealed that .

1. On 22nd March, 1999 cheques totalling Rs. 6,000 were sent to bankers for collection. Out of these a cheque for Rs. 1,000 was wrongly recorded on the credit side of the cash book and cheques amounting to Rs. 300 could not be collected by bank before 1st April 1999.
2. A cheque for Rs. 4,000 was issued to a supplier on 28th March 1999. The cheque was presented to bank on 4th April 1999.
3. There were debits of Rs. 2,600 in the pass book for interest on overdraft and bank charges but the same had not been recorded in the cash book.
4. A cheque for Rs. 1,000 was issued to a creditor on 27th March 1990 but by mistake the same was not recorded in the cash book. The cheque was however, duly encashed by 31st March 1999.
5. As per standing instructions the banker collected dividend of Rs. 500 on behalf of the firm and credited the same to its account by 31st March 1999. The fact was however, intimated to the firm on 3rd April 1999.

You are required to prepare a Bank Reconciliation Statement as on 31st March. 1999.

(C S Foundation Course, June 1999)

Solution

Bank Reconciliation Statement as on 31-3-1999.

Particulars		*Rs.*	*Rs.*
	Bank overdraft as per cash book		30,000
Add :			
(*i*)	Cheques deposited but not collected	300	
(*ii*)	Interest on overdraft and bank charges not recorded in cash book	2,600	
(*iii*)	Cheques issued to creditors but not recorded in cash book	1,000	
			3,900
			33,900
Less :			
(*i*)	Cheques wrongly recorded on the credit side of the cash book (1000 × 2)	2,000	
(*ii*)	Cheques issued but not presented for payment	4,000	
(*iii*)	Dividend collected by bank but not yet recorded in cash book	500	
			6,500
	Bank overdraft as per pass book		**27,400**

Problem 5. Prepare a Bank Reconciliation of M/s Benarasi Kuthi as on 31st December 1997 from the following particulars.

(*a*) Bank overdraft as per cash book Rs. 8,900
(*b*) A cheque for Rs. 1,200 issued to supplier on 28th December but the cheque was not presented to bank till 5th January 1998.
(*c*) Cheque for Rs. 3,400 paid into bank, but cheque of Rs. 1,600 only were cleared and credited by the bankers.
(*d*) A bill for Rs. 4,000 discounted for Rs. 3,980 returned dishonoured by the bank, noting charges being Rs. 20.
(*e*) Dividends amounting to Rs. 500 had been paid direct to the bank and not entered in the cash book.
(*f*) A cheque of Rs. 1,200 was issued to creditor was inadvertently destroyed it. A duplicate cheque was issued and recorded in the cash book as a new payment.
(*g*) Interest for Rs. 100 charged by the bank recorded twice in the cash book.
(*h*) A cheque from a customer entered in the cash book as Rs. 75 has been correctly entered by the bank as Rs. 275. **(Calcutta University, B.Com (Pass) 1998)**

Solution

Bank Reconciliation Statement

Particulars	*Rs.*	*Rs.*
Bank overdraft as per cash book		8,900
Add :		
(*i*) Cheques deposited but not collected by bank (3400 – 1600)	1,800	
(*ii*) Bills discounted not entered in cash book (including noting charges)	4,020	
		5,820
		14,720
Less :		
(*i*) Cheque issued to supplier not presented for payment	1,200	
(*ii*) Dividends collected by bank not entered in cash book	500	
(*iii*) Cheque paid to creditor cancelling the old one but same was not cancelled in the cash book	1,200	
(*iv*) Interest on bank overdraft recorded twice in cash book	100	
(*v*) Cheque received from customer wrongly entered in the cash book (275 – 75)	200	
		3,200
Bank overdraft as per pass book		11,520

Problem 6. Following are the entries recorded in the bank column of the cash book of Mr. X for the month ending on 31-3-1997.

Cash Book (Bank Column)

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
15-3-97	To Cash	36,000	1-3-97	By Balance b/d	40,000
20-3-97	To Roy	24,000	4-3-97	By John	2,000
22-3-97	To Kapoor	10,000	6-3-97	By Krishnan	400
31-3-97	To Balance c/d	7,640	15-4-97	By Kavilash	240
			20-3-97	By Joshi	35,000
		77,640			77,640

On 31-3-97 Mr. X received the Bank statement. On perusal of the statement Mr. X ascertained the following information.

1. Cheque deposited but credited by the bank Rs. 10,000.
2. Interest on securities collected by the bank but not recorded in cash book Rs. 1,080.
3. Credit transfer not recorded in the cash book Rs. 200.
4. Dividend collected by the bank directly but not recorded in the cash book Rs. 1,000.
5. Cheques issued but not presented for payment Rs. 37,400.
6. Interest debited by the bank but not recorded in the cash book Rs. 1,000.
7. Bank charges not recorded in the cash book Rs. 340.

From the above information you are asked to prepare a bank reconciliation statement to ascertain the balance as per bank statement (C. A Foundation course May 1997).

Solution

Bank Reconciliation Statement

Particulars		*Rs.*	*Rs.*
	Overdraft as per cash book		7,640
Add :	Cheques deposited but not credited by the bank	10,000	
	Interest debited by the bank but not recorded in the cash book	1,000	
	Bank charges not recorded in the cash book	340	
			11,340
			18,980
Less :	Interest on securities collected by the bank but not recorded in cash book	1,080	
	Credit transfer not recorded in the cash book	200	
	Dividend collected by the bank directly but not recorded in the cash book	1,000	
	Cheques issued but not presented for payment	37,400	
			39,680
	Credit balance as per Bank statement		20,700

Problem 7. In respect of Bank account No. 1, on 30th September 1996 my cash book showed a bank overdraft of Rs. 98,700. On going through the bank statement for reconciling the balance, I find the following :

Out of cheques drawn on 26th September 1996 those for Rs. 7,400 were cashed by the bankers on 2nd October 1996 and a crossed cheque of Rs. 1,500 given to Antony was returned by him and a bearer one was issued to him in lieu on 1st October 1996.

Cash and cheques amounting to Rs. 6,800 were deposited in bank on 29th September 1996 but cheques worth Rs. 2,600 were cleared by the bank on 1st october 1996 and one cheque for Rs 500 was returned by them as dishonoured on the later date.

According to my standing orders, the bankers have on 30th September 1996 paid Rs. 640 as interest to my creditors, paid quarterly premium on my policy amounting to Rs. 320 and have paid a second call of Rs. 1,200 on shares held by me and lodged with the bankers for safe custody. They have also received Rs. 300 as dividend on my shares and recovered an insurance claim of Rs. 1,600 ; their charges and commission on the above being Rs. 30. On receipt of information of the above transactions, I have passed necessary entries on

1st October 1996. My bankers seem to have given to me a wrong credit for Rs. 1,000 paid in by me in No 2 account and a wrong debit in respect of a cheque for Rs. 600 drawn against my No 2 account. Prepare the Reconciliation statement of bank account No 1 as on 30th September 1996.

(I.C.W.A, Intermediate June 1997)

Solution

Bank Reconciliation Statement (A/c No. 1)

Particulars			*Rs.*	*Rs.*
	Overdraft as per cash book			98,700
Add :	Cheques deposited but not cleared (2600 + 500)		3,100	
	Payments made by bank not entered in cash book :			
	Interest to creditors	640		
	Premium on policy	320		
	Call on shares	1,200		
			2,160	
	Bank Commission & charges		30	
	Amount wrongly debited bank to this account instead of No 2 a/c		600	
				5,890
				1,04,590
Less :	Cheques issued but not presented (7400 + 1500)		8,900	
	Amount received by bank but not entered in cash book :-			
	Dividend on shares	300		
	Insurance claim	1,600		
			1,900	
	Amount wrongly credited by the bank to this a/c instead of No. 2 a/c		1,000	
				11,800
	Bank overdraft balance per pass book			92,790

EXERCISE 1

From the following particulars prepare a Bank Reconciliation statement as on 31st December 1995 :-

Cash at bank as per cash book as on 31-12-95	Rs. 8,700
Cheques issued but not presented at the bank	Rs. 3,550
Interest credited by bank but not entered in cash book	Rs. 125
Bank charges not entered in cash book	Rs. 30
Cheques deposited but not credited by bank	Rs. 1,700
Direct deposit by a customer into the bank	Rs. 450
Cheques dishoured by bank but not entered in cash book	Rs. 250
Income Tax (advance) paid by the bank under standing order but not entered in cash book	Rs. 200

In balancing the pass book a credit balance of Rs. 352 was cast as Rs. 325.

(Calcutta University, B. Com (Pass) 1996)

[**Answer :** Bank balance as per pass book Rs. 10618]

EXERCISE 2

According to the cash book of Gopi. There was a balance of Rs. 44,500 standing to his credit in bank on 30th June 1996. On investigation you find that :

(*i*) Cheques amounting to Rs 60,000 issued to creditors have not been presented for payment till that date.
(*ii*) Cheques paid into bank amounting to Rs. 1,05,000 out of which cheques amounting to Rs. 55,000 only collected by the bank upto 30th June 1996.
(*iii*) A dividend of Rs. 4,000 and rent amounting to Rs. 6,000 received by the Bank and entered in the passbook but not recorded in the cashbook.
(*iv*) Insurance premium (upto 31st December 1996) paid by the bank Rs. 2,700 not entered in the cash book.
(*v*) The payment side of the cashbook had been under cast by Rs. 50.
(*vi*) Bank charges Rs. 50, Shown in the pass-book had not been entered in the cash-book.
(*vii*) A bill payable for Rs. 2,000 has been paid by the bank but is not entered in the cashbook and the bill receivable for Rs. 6,000 has been discounted with the bank at a cost of Rs. 100 which has also not been recorded in cash book. You are required :
(*viii*) To make the appropriate adjustment in the cash book.
(*ix*) To prepare a statement reconciling with the Bank pass book.

(C A Foundation Course November 1996)

[**Answer :** Cash book (Bank balance column)
Balance c/d Rs. 55,600
Balance as per pass book Rs. 65,600]

EXERCISE 3

On 31st December 1993, the Bank account of Suman Bros. according to the cash book showed an overdraft balance of Rs. 1,500. On the same date the bank statement showed a balance in their favour of Rs. 2,050. An examination of the Cash book and Bank statement reveals the following.

(*i*) The total of the credit side on one page of the cash book amounting to Rs. 10,200 was wrongly carried forward to the next page as Rs. 12,000.
(*ii*) A cheque for Rs. 1,500 deposited with the bank on 30th December 1993, was recorded in the bank statement on 4th January 1994.
(*iii*) An instalment payment of Rs. 150 made directly by the bank had not been recorded in the cash book.
(*iv*) Bank charges amounting to Rs. 75 had not been entered in the cash book.
(*v*) Two cheques amounting to Rs. 975 issued prior to 31st December 1993 were not presented to the bank for payment until after that date.
(*vi*) A deposit of Rs. 2,500 made by Suman Bros, was wrongly credited by the bank to Suman Bros a/c.

Ascertain the correct balance as per the cash book of Suman Bros and then prepare the Bank Reconciliation Statement. **(Calcutta University B. Com (Pass) 1994)**

[**Answer :** Cash book (Bank column) Balance c/d Rs 225.
Bank balance as per pass book Rs 2050.]

EXERCISE 4

From the following particulars prepare a Bank Reconciliation Statement as on 31st December 1993 :-

1. On 31st December, 1993 the cash book of a firm showed a bank balance of Rs.6,000 (Debit balance).
2. Cheques had been issued for Rs 5000, out of which cheques worth Rs 4000 only were presented for payment.

3. Cheques worth Rs. 1,400 were deposited in the bank on 28th December 1993 but had not been credited by the bank. In additions this one cheque for Rs. 500 was entered in the cashbook on 30th December 1993, but was banked on 3-1-1994.
4. A cheque from Susan for Rs. 400 was deposited in the bank on 26th December 1993 but was dishonoured and the advice was received on 2-1-1994.
5. Pass book showed bank charges of Rs. 20 debited by the bank.
6. One of the debitors deposited a sum of Rs. 500 in the bank account of the firm on 20th December 1993 but the intimation in this respect was received from the bank on 2-1-1994.
7. Bank passbook showed a credit balance of Rs. 5,180 on 31st December, 1993.

(C A Foundation Course, June 1994)

[**Answer :** Bank balance (Cr) as per pass book Rs. 5,180]

EXERCISE 5

From the following particulars, calculate the cash book balance of a merchant as on 31st March 1991, by means of a Bank Reconciliation Statement.

(*i*) Balance as per Bank pass book (Dr) Rs. 4,475.70.
(*ii*) A cheque for Rs. 399.50 was deposited on 24th March but the same was returned by the bank on 29th for which no entry was made in the cash book.
(*iii*) A Bill for Rs. 1,020 received from a Debtor previously discounted for Rs. 1,000 was dishonoured and the bank debited the account of the merchant, but the same was not recorded in the cash book.
(*iv*) Two cheques issued on 27th March, but not encashed before 5th April : Rs. 640.40 and Rs. 498.30.
(*v*) A cheque for Rs. 300 was debited twice in the cash book.
(*vi*) Interest an overdraft for Rs. 56 and bank charges for Rs. 17 were not passed through the cash book.
(*vii*) Dividend of Rs. 200 collected by the bank on behalf of the merchant but the matter was not recorded in the cash book.

(Calcutta University B Com (Pass) 1991)

[**Answer :** Bank balance as per cash book (over drawn) Rs. 4,020.90]

7

CHAPTER

FINAL ACCOUNTS OF SOLE TRADERS

1. INTRODUCTION

The main objective of an accounting system is to reveal the results and financial position of the business. With this objective in view every trader will prepare accounts at the end of each year. Such accounts which are prepared to know the profit or loss and the financial position are known as final accounts. Final accounts can also be prepared in between two accounting years, in which case it is called as interim final accounts. These accounts are called as final accounts as these constitutes the ultimate accounts of the business. Preparation of final accounts is the last step involved under the accounting cycle. The final accounts of a trading concern involves preparation of two statements known as (*a*) Income statement and (*b*) Position statement. The Income statement shows the details of incomes and expenditures and the profit earned or loss suffered by the business. The income statement of a trading concern consists of : (*a*) trading account (*b*) profit and loss account. In case of manufacturing concerns, it also includes preparation of manufacturing account in addition to the above accounts. The position statement also known as balance sheet discloses the financial position of the business. The preparation of final accounts depend upon the nature of the business. In a manufacturing concern all the four accounts are prepared whereas, in a trading concern only the first mentioned three accounts are prepared. In service rendering organisation like banking and insurance companies, the final accounts will include only two accounts *viz*, profit and loss account and balance sheet. However, in this book only final account of a trader and a manufacturer are prepared.

2. MEANING OF FINAL ACCOUNTS

The trading and profit and loss account and Balance Sheet prepared at the end of the year is collectively known as final accounts. It is not proper to call these accounts as final accounts because balance sheet is only a statement but not an account. However in actual practice these accounts and statements are together called as final accounts. The final accounts are prepared on the basis of various ledger balances incorporated in the trial balance and other adjustments made at the time of preparation of trial balance.

3. TRADING ACCOUNT

Trading account constitutes the first section of the income statement . It is an account which is prepared to ascertain the gross profit or loss of the business. It is called as trading account as it reveals the trading result

of the business. As in the case of other ledger accounts, it also has two sides, *viz*, debit side and credit side. On the debit side, the following items usually appear ; (*a*) Opening stock (*b*) Purchases of goods and returns outwards or purchase returns and (*c*) Direct expenses. On the credit side usually two items appear ; (*a*) Sales and Returns inwards or Sales returns and (*b*) Closing Stock. The excess of credit side over debit side is known as gross profit. On the other hand, the excess of debit side over credit side is known as gross loss.

Debit Side of the Trading Account

1. Opening Stock of goods : The stock of goods unsold for the previous year is known as opening stock for the current year. This constitutes the first item on the debit side of the trading account. This may relate to opening stock of raw materials, semi-finished goods or work in progress and finished goods.

2. Purchases of goods : This includes only purchases of goods which are meant for resale. It includes both cash and credit purchases. Usually the total purchases of goods are recorded in the inner column of the trading account. The purchase returns, *i.e.*, goods returned by the trader to the supplier owing to dissatisfaction are deducted from the total purchases and net purchases are then extended to outer column of the trading account. Sometimes the purchase returns are added in the credit side instead of deducting from the purchases. This is not recommended as it is not correct to show returns outwards on the credit side of the trading account. If the purchased goods are still in transit, such goods should not be recorded in the trading account. Instead a separate entry is to be passed by debiting "goods-in-transit a/c" and crediting suppliers account. The goods-in-transit represents an asset and suppliers account a liability in the balance sheet. Sometimes the trader may withdraw goods purchased for the business. In such a case the usual recording of the purchased goods is to be made in the trading account. A second entry is then to be passed for withdrawing the goods by debiting the drawings account (or capital a/c) of the proprietor and crediting the purchase account. It is to be emphasised that goods withdrawn should not be treated as a sale because goods are withdrawn at cost price and not at sale price.

The following transactions are to be excluded from treating as purchases.

(*a*) Purchase of assets other than goods which are meant for sale.
(*b*) Goods received on consignment.
(*c*) Receipt of Invoice in advance of actual delivery of goods.

3. Direct expenses : It refers to all those expenses which are incurred in acquring the goods and transporting the same to the godown for sales purpose. Direct expenses include the following.

(*a*) **Wages :** Wages are mostly incurred by a manufacturing concern and hence appear in a manufacturing account. When separate manufacturing account is prepared it is recorded on the debit side of trading account. Sometime the term "wages and salaries" are given together as an expense. This is also treated as a direct expense and therefore to be taken as trading item . But if it is worded as "Salaries and wages" it is to be treated as indirect expense and hence should be taken into the debit side of profit & loss account.

(*b*) **Dock charges :** It is a charge levied on ships and the goods carried by the ship. It is payable to dock authorities before taking delivery of goods. It is a direct expense and hence a trading item of expense.

(*c*) **Duty :** Duty payable by a trader may relate to customs duty, excise duty and octroi duty. Customs duty is lived on an imported goods whereas excise duty is levied on the goods manufactured within the country. Octroi duty is payable when goods are bought from another state of the same country. The duty payable on purchased goods appear on the debit side of the trading account.

(*d*) **Freight, carriage inwards and cartage inwards :** All these refers to transport expenses incurried on purchased goods until they reach the premises of the trader. All expenses incurred in transporting goods are treated as direct expenses and appear on the debit side of trading account. However, freight, carriage expenses

or cartage paid on purchase of assets should be capitalised by debiting asset account and crediting cash account and not to take into trading account.

(*e*) **Royalty :** It is the amount paid to the owner of the property or right or patents for using the property right or patent. This appears on the debit side of manufacturing account. When no manufacturing account is prepared, it is taken on the debit side of the trading account.

(*f*) **Gas, Coal, Electricity, Water :** All these expenses are related to manufacturing and as such taken on the debit side of manufacturing account. Where separate manufacturing account is not prepared, it is taken on the debit side of trading account.

(*g*) **Primary packing materials :** Primary packing materials such as bottles, tins, boxes etc. used to pack the finished goods such as ink, coffee powder, paint, Jam etc., are treated as direct expenses. Hence they are taken on the debit side of trading account.

Credit side of Trading Account

1. Sales : Sales of goods is always taken to mean purchased goods which are meant for sale. Therefore sale of any asset such as machinery, furniture etc., should not be included in the trading account. Sale of goods include both cash and credit sales. Whenever there are any sales returns or returns inwards, *i.e.*, goods returned by customers owing to their dissatisfaction, they should be deducted from total sales and the net sales are then extended to outer column. Sometimes sales returns are shown on the debit side and added along with other items. This procedure is not correct although it gives the same amount of gross profit or gross loss. Any sale of goods under hire purchase system should be shown separately and not to be included in the trading account. Similarly goods sold on approval basis should also be shown separately and not to be taken to trading account. Sometimes the term adjusted "sales" is given on the credit side of the trial balance. This means the value of closing stock is added to the sales and brought into books of accounts before preparing the trial balance. In such a situation the closing stock appear on the debit side of trial balance. As the closing stock is already added to sales it should not be recorded again on the credit side of the trading account. It should be recorded only on the asset side of the balance sheet. Any free distribution of samples to prospective customers and goods lost, damaged or destroyed are to be shown on the credit side of trading account. Alternatively, they may be deducted from purchases on the debit side.

2. Closing Stock : The unsold stock for the given period is known as closing stock. It is taken on the credit side of the trading account. It may relate to raw materials, work-in-progress, and finished goods.

The following is the proforma of a trading account.

Trading account for the period ending --------

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Cr.Amount*
	To Opening stock	—		By Sales —	
	To Purchases —			Less returns outwards —	—
	Less returns inwards —	—		By Closing stock	—
	To Direct expenses :-	—		By Gross loss	—
	To Carriage inwards	—			
	To Freight	—			
	To Wages	—			
	To Duty	—			
	To Power, Fuel	—			
	To Packing Material	—			
	To Gross profit	—			

Problem 1. Prepare trading account in the books of Ravi from the following particulars for the period ending 31-3-2005

Opening Stock	Rs. 20,000
Closing stock	21,000
Returns Inwards	300
Purchases	45,200
Sales	60,300
Wages	8,000
Returns outwards	200

Solution :

Trading A/c for the period ending 31-3-05

Particulars	*Rs.*	*Rs.*	*Particulars*	*Rs.*	*Rs.*
To Opening stock		20,000	By Sales	60,300	
To Purchases	45,200		Less returns inwards	300	60,000
Less returns outwards	200		By Closing stock		21,000
		45,000			
To Wages		8,000			
To Gross profit c/d		8,000			
		81,000			81,000

Problem 2. Prepare trading account in the books of Shri Anil Kumar from the following particulars for the period ending 31-12-04

Opening Stock	75,000
Closing Stock	84,200
Wages	80,000
Import Charges	15,000
Sales	5,49,000
Dock dues & octroi	820
Work expenses	4,200
Purchases	2,62,000
Duty and clearance charges	3,420
Freight	1,050

Solution :

Trading A/c for the period ending 31-12-04

Particulars	*Rs.*	*Particulars*	*Rs.*
To Opening stock	75,000	By Sales	5,49,000
To Purchases	2,62,000	By Closing stock	84,200
To Import charges	15,000		
To Duty & clearance charges	3,420		
To Freight	1,050		
To Dock dues & Octroi	820		
To Work expenses	4,200		
To Wages	80,000		
To Gross profit c/d	1,91,710		
	6,33,200		6,33,200

4. MANUFACTURING ACCOUNT

In case of a manufacturing concerns, first of all a manufacturing account is prepared, which is then followed by a trading account. A manufacturing account is prepared in order to know the cost of production of goods or services manufactured. The manufacturing account is prepared like any other account involving debit and credit side. The debit side of manufacturing account includes the following:

(*a*) Cost of raw materials consumed. This is ascertained by adding purchases of raw materials to opening stock of raw materials and deducting the closing stock of raw materials there from.

(*b*) Opening stock of work in progress which refer to semi-finished goods requiring further processing.

(*c*) Direct wages which means wages paid for employees who convert raw materials into finished goods.

(*d*) Direct expenses which refers to expenses of direct nature other than direct material cost and direct labour cost.

(*e*) Indirect expenses or factory expenses which are incurred in addition to direct expenses.

On the credit side two items will usually appear. They are (*a*) Sale of scrap, *i.e*., the sale value received after selling the scrapped materials and (*b*) Closing stock of work-in-progress. The excess of debit side over credit side is known as "cost of goods manufactured" and is transferred to trading account. A proforma of a manufacturing account is shown below.

Proforma of Manufacturing A/c
Manufacturing account for the year ended —

Particulars		*Dr. Amount*	*Particulars*	*Cr. Amount*
To opening stock of		___	By closing work-in progress	___
Raw materials	___		By Sale of scrap -	___
Add purchases	___		By Cost of production	
	___			
Less closing stock			(transferred to Trading a/c)	___
of raw materials	___			
To Opening stock of		___		
work-in-progress		___		
To Carriage inwards		___		
To Direct wages		___		
To Direct expenses		___		
To Indirect expenses		___		
Rent		___		
Electricity		___		
Coat & coke		___		
Repairs of plant		___		
Depreciation of		___		
Plant		___		
Other indirect expenses				

Problem 3. Manufacturing account

Prepare a manufacturing account for the period ending 31st March 2005 from the following particulars

Opening stock of raw materials	Rs. 10,000
Purchases of raw materials	60,000
Returns outwards of raw materials	500
Opening stock of work-in-progress	7,000
Closing stock of work-in-progress	8,000
Wages	4,500
Gas and water	1,000
Factory rent	500
Power	600
Consumable stores	700
Closing stock of raw materials	4,000
Closing stock of work-in-progress	8,000

MANUFACTURING A/c for the year ended 31/12/2005

Particulars		*Dr. Amount*	*Particulars*	*Cr. Amount*
To opening stock of raw materials	10,000		By closing stock of work-in-progress	8,000
Add : Purchase of raw materaisl	60,000		By cost of production	67,300
	70,000		(transferred to trading a/c)	
Less : Returns outwards	5,000			
	65,000			
Less : Closing stock of raw materials	4,000			
		61,000		
To opening stock of Work-in-Progress		7,000		
To wages		4,500		
To gas and water		1,000		
To factory rent		500		
To power		600		
To consumable stores		700		
		75,300		75,300

5. PROFIT AND LOSS ACCOUNT

This account constitutes the second section of the income statement. The object of this account as to reveal the net profit or loss of the business. The gross profit as shown by the trading account is transferred to the credit side of the profit and loss account and the gross loss if there is any recorded on the debit side of the profit and loss account. The profit and loss account is debited with the following expenses :

1. FINANCIAL EXPENSES :
   (a) Interest on loan
   (b) Discount allowed
   (c) Interest on capital
   (d) Bad debts

(e) Discount on bills discounted
(f) Bank expenses
(g) Charities and donations etc.

2. ADMINISTRATION EXPENSES :
   (a) Salaries of office staff
   (b) Printing and stationary
   (c) Office rent
   (d) Postage and Telegram expenses
   (e) Trade expenses
   (f) Office lighting expenses
   (g) Audit
   (h) Operating expenses of office
   (i) Insurance & Taxes
   (j) Repairs and maintenance expenses of office
   (k) Legal charges
   (l) Telephone expenses.
3. SELLING AND DISTRIBUTION EXPENSES :
   (a) Carriage outwards
   (b) Advertisement expenses
   (c) Export duty
   (d) Salaries to salesmen
   (e) Sales tax
   (f) Warehouse insurance
   (g) Warehouse rent
   (h) Delivery van expenses.
4. DEPRECIATION AND OTHER PROVISION :
   (a) Depreciation of various assets such as land and building, plant and machinery, furniture and fixture
   (b) Provision for doubtful debts
   (c) Provision for discount on debtors.

On the credit side of the profit and loss account, the following items are recorded.

1. Income received :
   (a) Rent received
   (b) Interest received
   (c) Commission received
   (d) Discount received
   (e) Income from investment
   (f) Profit on sale of asset
   (g) Bad debts recovered.
2. Reserve or provision for discount on creditors :
   (a) Reserve for discount on creditors :

The excess of credit side over debit side reveals net profit and the excess of debit side over credit side reveals the net loss. The net profit or net loss is transferred to the proprietor's capital account. A proforma of profit and loss account is shown below :

Profit & Loss A/c for the Period Ending .....

Particulars	*Amount*	*Particulars*	*Amount*
To Salaries	—	By Gross profit b/d	—
To Rent & rates	—	By Interest received	—
To Printing & stationery	—	By Discount received	—
To Lighting	—	By Commission received	—
To Insurance	—	By Income from investment	—
To Depreciation	—	By Apprentice premium	—
To Repairs	—	By Profit on sale of investment	—
To Postage & telephone	—		
To Bank charges	—		
To Interest	—		
To Audit fee	—		
To Advertisement expenses	—		
To Discount allowed	—		
To Commission	—		
To Carriage outwards	—		
To Bad debts	—		
To Provision for doubtful debts	—		
To Loss on sale of assets	—		
To Loss by fire	—		
To Net profit	—		

Problem 4. Trading and Profit & Loss A/c

From the following trial balance of Shri Arvind prepare a trading and profit & loss account for the year ending 31st Dec. 2004.

Trial Balance as on 31-12-04

	Dr.	*Cr.*
Purchases	21,750	
Discount allowed	1,300	
Wages	6,500	
Sales		30,000
Salaries	2,000	
Travelling expenses	400	
commission	425	
Carriage inwards	275	
Administration expenses	105	
Trade expenses	600	
Interest	250	
Building	5,000	
Furniture	200	
Debtors	4,250	
Capital		13,000
Creditors		2,100
Cash	2,045	
	45,100	45,100

Stock on 31-12-2004 was Rs. 6,000

Solution :

Trading and Profit & Loss Account
(For the year ending 31-12-04)

Particulars	*Amount*	*Particulars*	*Amount*
To Purchases	21,750	By Sales	30,000
To Wages	6,500	By Closing stock	6,000
To Carriage inwards	275		
To Gross profit	7,425		
	36,000		36,000
To Discount	1,300	By Gross profit	7,475
To Salaries	2,000		
To Travelling expenses	400		
To Commission	425		
To Administration expenses	105		
To Trade expenses	600		
To Interest	250		
To Net profit	2,395		
	7,475		7,475

Problem 5. From the following balances extracted from the books of Naveen on 31st Dec. 2004, prepare a Trading and Profit and Loss a/c

Trading and Profit & Loss Account

Stock (opening)	Rs. 9,600
Wages and Salaries	3,200
Commission on purchases	200
Freight	300
Purchases less returns	11,850
Sales less returns	24,900
Trade expenses	20
Rent	200
Horse expenses	500
Repairs to plant	160
Income tax	550
Discount on purchases	400
Closing stock	3,500

Solution :

Trading and Profit & Loss A/c
For the year ending 31-12-04

Particulars	*Amount*	*Particulars*	*Amount*
To Opening stock	9,600	By Sales	24,900
To Purchases less returns	11,850	By Closing stock	3,500

Particulars	*Amount*	*Particulars*	*Amount*
To Wages & Salaries	3,200		
To Commission on purchases	200		
To Freight	300		
To Gross profit	3,250		
	28,400		28,400
To Trade expenses	20	By Gross profit	3,250
To Rent	200	By Discount on Purchases	400
To Horse expenses	500		
To Repairs to plant	160		
To Net profit	2,770		
	3,650		3,650

Problem 6. The following particulars are extracted from the books of Dinesh. Prepare a trading and profit & loss account for the period ending 31-3-2005.

	Rs.
Factory fuel and power	542
office salaries	3,745
Factory lighting	392
Bad debts	300
Travelling expenses	925
Carriage on sales	960
Purchases	83,290
Wages	9,915
Rent and taxes	1,765
Office expenses	2,778
Carriage on purchases	897
Discount	422
Stock on 1-4-2004	21,725
Manufacturing expenses	2,680
Sales returns	7,422
Insurance	570
Sales	1,26,177
Purchase returns	3172
Commission	2,000
Rebate from Suppliers	1,000
Stock on 31-3-2005	16,580

Solution :

Trading and Profit & Loss A/c
(For the year ending 31-3-05)

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		21,725	By Sales	1,26,177	
To Purchases	83,290		Less returns	7,422	
Less returns	3,172	80,118			1,18,755

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Factory fuel & power		542	By Closing stock		16,580
To Factory lighting		392			
To Wages		9,915			
To Carriage on purchases		897			
To Manufacturing expenses		2,680			
To Gross profit		19,066			
		1,35,335			1,35,335
To office salaries		3,745	By Gross Profit b/d		19,066
To Bad debts		300	By Commission		2,000
To Travelling expenses		925	By Rebate from Suppliers		1,000
To Carriage on sales		960			
To Rent & Taxes		1,765			
To Office expense		2,778			
To Discount		422			
To Insurance		570			
To Net profit		10,601			
		22,066			22,066

6. BALANCE SHEET

A balance Sheet is a statement which portrays the financial position of the business. It is so called because it is a sheet of all ledger balances pertaining to assets and liabilities for a given period of time. Its purpose is to known the exact financial position, *i.e*., solvency or insolvency of a business for a specified time. After the preparations of trial balance and trading and profit & loss account all nominal accounts gets closed. In the ledger only personal and real accounts will show the balances. In other words they constitute liabilities and assets. The balance sheet is prepared showing the classified list of such balances. It should be noted that a balance sheet is a position statement and strictly speaking it is not a part of the double entry ledger account. Therefore no transfer of the ledger account balances are necessary. Only the relevant particulars are extracted from the ledger while preparing a balance sheet.

Feature of a Balance Sheet :

1. It is part of final accounts and is prepared along with trading and profit and loss account.
2. It is prepared on a particulars date to show the financial position on that date but not for a period .
3. It is a statement but not an account. This statement has two sides known as asset side and liability side. If the value of assets are more than the liabilities (third party liabilities) it indicates a sound financial position. On the other hand, if third party liabilities are more than assets it indicates a weak financial position.
4. The two sides of the Balance sheet *i.e*. asset side and liability side are always same.
5. The two sides of the Balance sheet is not prefixed with "To" and "By" as in the case of ledger accounts.

Arrangement of Assets and Liabilities in a Balance Sheet

The process of arranging assets and liabilities in a definite order is known as " marshalling of balance sheet". There are two ways of arranging assets and liabilities. *viz* (1) In the order of permanency and (2) in the order of liquidity. Under the first method, the assets are arranged on the basis of their permanent use in the business. This method is usually followed by higher forms of business organisation such as joint stock companies. Under the second method, assets and liabilities are arranged according to ability to convert an asset easily in the form of cash so as to enable payments to liability holders. This arrangement is followed by sole traders and partnership firms. The usual method of arranging assets by a trader takes the following forms:

(*i*) **Liquid assets :** These are the assets which are in the form of cash or which can be converted into cash easily. Examples are cash in hand, cash at bank, bills receivable, short term debtors.

(*ii*) **Fixed Assets :** These are the assets which are meant for use in the business and not for sale in the ordinary course of business. Examples are land & building, plant and machinery, furniture and fixtures.

(*iii*) **Wasting assets :** Fixed assets which are consumed in course of exploitation as in mines are termed as wasting asset.

(*iv*) **Current or Floating assets :** These are the assets which are acquired for sale or held for its conversion into cash in course of time. Example of such assets are stock, debtors etc.

(*v*) **Intangible Assets :** There are the assets which are not visible and touchable but business is benefited by such assets. Examples of such assets are goodwill , patents, Trade marks.

(*vi*) **Fictitions assets :** The assets arise from abnormal expenses which are not yet written off and which are not representative of tangible value. Examples of such assets are expenditure incurred in developing a new product, special advertising expenses incurred to promote a product, preliminary expenses in the formation of a company. The benefit of such expenditure will arise in future accounting period. Therefore it is not desirable to charge the expenses entirely to the period in which it is incurred.

The liabilities are classified into :

(*i*) **Capital :** It is the amount introduced into the business by the proprietor. While recording capital on the liability, side certain adjustment are to be made. These adjustment relate to (*a*) additional capital introduced (*b*) profit earned in the business (*c*) Interest on capital. From the total of the above amount, the amount of capital with drawn during the year and net loss if there is any is to be deducted. The balance of capital now represent net liability due by business to the proprietor.

(*b*) **Fixed or long-term liabilities :** They represent a type of liability which is to be repayable over long period of time Examples are long term loans borrowed from banks, debentures in case of companies.

(*c*) **Current liabilities :** They represent a type of liability which is to be paid back on demand or in the short term, which is usually within a period of one year. One more criterion used to identify a liability as current liability is, it is to be discharged from a current asset. Examples of a current liabilities are sundry creditors, Bank overdraft etc.

(*d*) **Contingent liabilities :** They represent a type of liability which arises for payment on the happening of an event. Examples are discounting of a bill before maturity, compensation payable in a court of law.

Differences between a Trial Balance and Balance Sheet

Trial Balance	*Balance Sheet*
1. It is the first step which is essential for the preparation of find account. In this regard it may be viewed as a "means" to achieve the end, *i.e.*, to know the financial position of the business.	1. It is the ultimate step. Hence it is the end of accounting procedure.
2. It's purpose is to check the arithmetical accuracy of accounts.	2. Its purpose is to know the financial position of the business.
3. It contains columns for debit and credit items.	3. It contains columns for assets and liabilities.
4. It contains all the three type of accounts *viz*, personal, real and nominal.	4. It contains accounts relating to personal and real.
5. It does not disclose profit or loss.	5. It discloses profit or loss.
6. It does not disclose closing stock.	6. It discloses closing stock.
7. It is not acceptable by tax and government authorities.	7. It is accepted by tax and government authorities.
8. It does to reveal outstanding and prepaid expenses or incomes.	8. Balance sheet discloses all such items.
9. It does not reveal various adjustments such as depreciation, interest, repairs, etc.	9. It reveals all the adjustment. Infact without making all the adjustments it is not possible to prepare a balance sheet.

Form of a Balance Sheet

There is no format laid down for preparing the balance sheet of a sole trading concern and partnership firm. However, higher forms of organisation such as joint stock companies must prepare balance sheet as per the statute regulating the business. A specimen form of balance sheet of a trader is given below :

Balance sheet of _____ as on _____

Liabilities	*Rs.*	*Assets*	*Rs.*
Capital a/c	××	Land & Buildings	××
Add additional capital invested	××	Plant & Machinery	××
Add Interest on Capital	××	Investment	××
	××	Furniture & fixture	××
Add net profit	××	Vehicles	××
	××	Goodwill	××
Less Drawings	××	Patents & Trade mark	××
	××	Patterns	××
Less Interest on Drawings	××	Closing stock	××
	××	Bills receivable	××
Less Net loss (if there is any)	××	Prepaid expenses	××
	××	Accrued income	××
Long term loan from Bank	××	Cash at bank	××
Loan on Mortgage	××	Cash in hand	××
Loan from wife	××	Fictious assets :-	
Sundry creditors	××	Preliminary expenses	××
Bills payable	××	Advertising expenses	××
Bank overdraft	××		
Outstanding expenses	××		
Income received in advance	××		

Problem 7. The business of Arun made a profit of Rs. 637 for the month ending Jan. 2005. From following balances, prepare a Balance sheet as on 31st January 2005.

	Rs.
Plant & Machinery	6,230
Cash in hand	895
Petty cash	56
Debtors	1,950
Bills receivable	2,730
Bank overdraft	4,000
Creditors	1,780
Bills payable	541
Capital	9,228
Furniture & Fixtures	670
Stock on 31-1-2005	3,700

Solution :

Balance Sheet of Arun as on 31-1-2005

Liabilities		*Rs.*	*Assets*	*Rs.*
Bank overdraft		4,000	Cash in hand	895
Creditors		1,780	Petty cash	56
Bills payable		541	Bills Receivable	2,730
Arun's capital	9,228		Debtors	1,905
Add net Profit	637	9,865	Closing stock	3,700
			Plant machinery	6,230
			Furniture & Fixtures	670
		16,186		16,186

Problem 8. The following particulars are extracted from the books of Suresh for the period ending 31-3-2005 for which period his business earned a profit of Rs. 13,469.

	Rs.
Cash in hand	3,600
Plant & Machinery	8,500
Cash at Bank	9,327
Sundry debtors	5,678
Bills payable	2,800
Sundry creditors	4,736
Drawings	2,400
Capital	15,000
Stock on 31-3-2005	6,500

Prepare a Balance Sheet from the above particulars.

Solution :

Balance Sheet of Mr. Suresh
For the period ending 31-3-2005

Liabilities		*Rs.*	*Assets*	*Rs.*
Capital	15,000		Plant & Machinery	8,500
Less drawing	2,400		Sundry debtors	5,678
	12,600			
Add net profit	13,469		Stock	6,500
		26,069	Cash at Bank	9,327
Sundry creditors		4,736	Cash in hand	3,600
Bills payable		2,800		
		33,605		33,605

7. CAPITAL AND REVENUE EXPENDITURE

The study of capital and revenue expenditure is very essential in connection with the preparation of final accounts. This is so because only revenue expenditure will appear in profit and loss account, whereas capital expenditure will appear in the Balance sheet.

Capital Expenditure

It consists of such expenses whose benefit is not derived in one accounting year but spread over many years. Such expenditure is non-recurring in nature. They include the following:

(*a*) Investments made in procuring fixed assets such as land and building, plant and machinery, furniture and fixture which are meant for long term use and not meant for resale.

(*b*) Expenses incurred in adding to the existing fixed assets. *e.g.*, cost of constructing a factory shed.

(*c*) Expenses incurred for increasing the income earning capacity of business either by reducing cost or by increasing productivity. For example, cost of replacing manual labour by machines.

(*d*) For acquiring a valuable right. For example cost of acquiring patent right or copyright.

All items of capital expenditure will appear on the assets side of balance sheet.

Revenue Expenditure

It refers to a type of expenditure by the incurrence of which the benefit is designed for the same period for which the expenses are incurred. It does not create any asset of an enduring nature. Such expenditure are incurred for

(*a*) buying assets which are meant for resale at a profit or for converting them into finished goods.

(*b*) maintaining fixed assets in good working order, *e.g.*, repairs.

(*c*) meeting day to day expenses such as rent and taxes, wages and salaries, carriage etc.

Revenue expenditure will appear on the debit side of trading and profit & loss account.

Capital Receipts and Revenue Receipts

A capital receipt represents an amount contributed by the proprietor and loans provided by others to the business. It also represents the sale value of a fixed asset. A capital reciept other than sale value of fixed assets create a liability either to owners or outsiders. Hence it is recorded on the liability side of the balance sheet.

Revenue receipt represents the income received on sale of goods or other income earned such as interest on investment, commission received, rent received etc. It appears on the credit side of trading and profit and loss account.

The classification of expenses and incomes into capital and revenue and correct recording of such items in the final account is very important. Otherwise it vitiates the result shown by final accounts. For example a capital expenditure wrongly taken to profit and loss account results in smaller profit than actual profit. Similarly, a revenue expenditure taken into balance sheet would inflate the profit or deflate the loss besides balance sheet showing wrong amount.

Differences between Revenue and Capital Expenditure

Capital Expenditure	*Revenue Expenditure*
1. It is incurred either for acquiring a new asset or improving the existing one. 2. It increases the production capacity of the business. 3. Its benefit is available over a long period of time.	1. It is incurred for maintaining an existing fixed asset or to meet normal business expenses. 2. It helps in increasing the tempo of the business. 3. Its benefit is available for the accounting period in which it is incurred.

8. ADJUSTMENTS TO BE MADE WHILE PREPARING FINAL ACCOUNTS

Preparation of a balance sheet very often involves certain adjustment. Some important adjustments which are most commonly involved are as follows :

1. Outstanding expenditure. Sometimes a few expense like wages, salaries, rent etc. relating to a particular period is not paid during the same period, but paid in subsequent period. Such expenses relating to one period and paid on some future period is known as outstanding expenses. For example rent of January is paid in the month of February and similarly salaries and wages of one month is paid in the subsequent month. Sometime expenses like printing and stationery is also met with on subsequent period. All outstanding expenses must be recorded in the accounting year in which they are incurred irrespective of the fact whether they are incurred or not. In other words with a view to get a correct result of the business all expenses relating to a particular year is to be recorded in that year whether such expenses are paid or not. Otherwise it leads to overstating of profit and understating the liabilities. The following entry is passed to make an adjustment relating outstanding expenses.

Expenses a/c Dr.
To Outstanding Expenses

The outstanding expenses is to be added to the concerned expense on the debit side of the trading or profit account. It will appear on the liability side of balance sheet to indicate that an outstanding expenses is a liability.

In the next year a reverse entry as given below is passed.

Outstanding expense a/c Dr.
To Expense a/c

This entry will close outstanding expenses account and adjust the next year's expense account.

2. Prepaid expense. This is also known as expenses paid in advance or unexpired expense. Sometimes expenses such as insurance, telephone bill, taxes, rent are paid in advance in the current period relating to the future period. Such expenses are known as prepaid expenses. Prepaid expense is adjusted in the final accounts by passing the following entry.

Prepaid expenses a/c Dr.
To Expense a/c

The prepaid expense is deducted from the concerned expense account on the debit side of trading or profit & loss account. It appears in the balance sheet on the asset to indicate that the person who has received benefit to the extent of prepaid expense is a debtor of the business. If this adjustment is not made it would understate profit and will have the effect of reducing the value of asset.

In the next year, a reverse entry is passed as given below

Expense a/c Dr.
To Prepaid expense a/c

This entry will close prepaid expense account and will correct the next year's expense account.

3. Accrued Income. This is also known as outstanding income or income earned but not received. Sometimes a business would have earned some income such as commission, interest, dividend relating to a period but would not have actually received. Such income is called as accrued income. Such transaction is to be adjusted in the final accounts by passing the following entry.

Accrued income a/c Dr.
To Income a/c

The accrued income account will appear on the credit side of profit and loss account by means of adding it to the concerned income account. It will also appear on the asset side of balance sheet to indicate that this much amount is still due to business from others. If this adjustment is not made, it will understate the profit and asset would not have been recorded in the balance sheet.

In the next year a reverse entry is passed as shown below

Income a/c Dr.

To Accrued income a/c

This entry would cancel the income accrued account and will have the effect of setting right next year's income account.

4. Income received in advance. This is also known as income received but not earned. Sometimes a business receives some amount much before rendering service. Such incomes which are received in the current period relating to a future period is known as income received in advance. Examples of such transactions are insurance premium received by an insurance company. Advertisement expenses received by an advertising agency, apprentice premium received from learners etc. The following entry is made for adjusting income received in advance.

Income a/c Dr.

To Income received in advance a/c

The income received but not earned is to be deducted from respective incomes on the credit side of the profit & loss account. This item also appears on the liability side of the balance sheet to indicate that this much money is owed by business to others. If this adjustment is not made it amounts to overstating of profit and liability is understated.

5. Depreciation. It refers to decrease in the value of an asset owing to its constant use. The asset would lose its value owing to wear and tear of the asset of passage of time. If the asset is not depreciated it does not show its true value. In fact depreciation is a loss of value of asset and hence it is to be adjusted in the final accounts by passing the following entry.

Depreciation a/c Dr.

To Asset a/c

The depreciation being nominal account appears on the debit side of profit and loss account. The same amount of depreciation is deducted from the concerned asset on the asset side of balance sheet.

6. Bad debts. Debts which are irrecoverable are known as bad debts. It constitutes a loss to the business and hence it is to be adjusted in preparing final account by passing the following Journal entry.

Bad debts a/c Dr.

To debtor's a/c

The bad debts amount is debited to profit and loss account. It is deducted from sundry debtors on the asset side of the balance sheet.

Some times additional bad debts are anticipated for the current year in which case it is mentioned as one of the adjustments. Such additional bad debts are given outside the trial balance. This additional bad debts is also to be shown on the debit side of profit & loss account. On the asset side of the balance sheet only the amount given as adjustment is to be deducted from sundry debtors.

7. Reserve for doubtful debts. In course of dealing with credit basis a trader may come to know that a part of debt is not likely to be recovered owing to failure on the part of some debtors. Such debts are called doubtful debts. This debts cannot be regarded as bad debts as its recovery is only uncertain. Doubtful debts are calculated as a certain percentage of debtors. A provision is made out of current years profit to meet losses arising out of doubtful debts. The following adjustment entry is passed to make provision for doubtful debts.

Profit & Loss a/c Dr.
To provision for doubtful debts a/c

The provision for doubtful debts is recorded in the profit & loss a/c depending upon the existence of old provision for doubtful debts.

(*a*) Where the total of bad debts for the year and the Provision for bad debts at the end of the year is more than old provision :

In this situation the difference will appear on the debit side of profit & loss a/c. The following calculation is involved.

Bad debts of the year	××
Add new provision for doubtful debts	××
	××
Less old provision for doubtful debts	××
Amount to be shown on debt side of balance sheet.	××

(*b*) When the old provision for doubtful debts is more than the total of bad debts and new reserve :

In this situation the difference will appear on the credit side of profit & loss account. The following calculations are involved :

Old provision for doubtful debts		××
Less bad debts for the year	××	
Less new provision for doubtful debts	××	××
Amount to be shown on the credit side of profit & loss a/c		××

In the balance sheet the new provision for doubtful debts is to be deducted from the sundry debtors.

8. Reserve for discount on debtors. Discount on debtors arise in case of credit sales. To encourage the debtors to pay the cash promptly, they may be allowed certain cash discount. But until they pay the cash it will be difficult to ascertain the discount to be allowed. So an estimate of discount on debtors is normally made and it is provided out of current year's profit. Such a discount which is created out of present year's profit in order to meet the loss arising out of discount is known as "provision for discount on debtors". This adjustment is made by passing a journal entry as given below.

Profit & Loss a/c Dr.
To provision for discount on debtors

The provision for discount on debtors is recorded in the profit & loss account. It depends upon the old provision of discount on debtors created earlier. Thus,

(*a*) Where total of cash discount allowed during the current year and the new provisions is more than old provision the difference will appear on the debit side of profit and loss account. The following calculations are involved

Cash discount allowed during the year	××
Add new provisions for discount on debtors	××
	××
Less old provisions for discount on debtors	××
Amount to be shown on debit side of of Profit & Loss a/c	××

(*b*) Where the old provision for discount on debtors exceed the total of cash discount allowed during the year and the new provision for discount on debtors, then the difference will appear on the credit side of profit & loss a/c. The following calculations are involved:

Old provisions for discount on debtors		××
Less cash discount allowed during the year	××	
Less new provisions for discount on Debtors	××	××
Amount to be shown on the credit side of profit & loss account.		××

In the Balance sheet, the new provision for discount on debtors is shown on the asset side as a deduction from sundry debtors. The following calculations are involved.

Sundry debtors	××
Less bad debts given as adjustment	××
	××
Less new provision for doubtful debts	××
	××
Less new provision for discount on Debtors	××
Balance amount to be shown on asset side of balance sheet.	××

9. Provision for discount on creditors. Whenever a business makes prompt payment to his creditor he will allow the cash discount to the business. So businessman can estimate the probable amount of discount which he can earn by paying the debts promptly to his creditors. The provision which is thus made in the current year relating to discount which is receivable in the subsequent year is known as provision for discount on creditors. On estimating the provision for discount on creditors as a percentage on creditors it is adjusted by passing the following entry.

Provision for discount on creditors a/c Dr.
To Profit & Loss a/c

The provision for discount on debtors is recorded in the profit and loss account depending upon the extent of old provision already created.

(*a*) Where the cash discount received during the year and the new provision exceeds the old provision the difference will appear on the credit side of profit & loss a/c. The following calculations are involved.

Cash discount received during the year	××
Add new provisions for discount on creditors	××
	××
Less new provision for discount on creditors	××
Amount to be shown on the credit side of profit & loss a/c	××

(*b*) Where the old provision is more than the total of cash discount received during the year and the new provision for discount on creditors, the difference will appear on the debit side of profit & loss account. The following calculations are involved.

Old provision for discount on creditors	××
Less cash discount received during the year	××
	××
Less new provisions for discount on creditors	××
Amount to be shown on the debit side of profit & loss a/c	××

In the Balance sheet, the provision for discount on creditors is shown as a deduction from sundry creditors.

10. Interest on capital. Sometimes a proprietor may decide to charge interest on capital out of the profit earned by the business. The amount of interest on capital is to be paid to proprietor in addition to profit which

belongs to the proprietor. Interest on capital is provided under the assumption that had the same capital is invested in some other form it would have fetched some interest or dividend to the businessman. Provision of interest on capital is calculated at the time of preparation of final account by means of the following adjusting entry.

Interest on capital a/c Dr.
To capital a/c

Interest on capital appears in two places. Firstly, it is debited to profit and loss account as this constitutes an expense to the business. Secondly, interest on capital is added to capital on the liability side of the balance sheet.

11. Interest on drawing. Whenever a businessman withdraws any amount from the business, interest on such drawings may also be provided in the books of accounts. This is on the assumption that if the same amount is invested by the business on some other form of investment it would have earned either interest or dividend. Interest on drawing is calculated based on amount withdrawn and period for which it is withdrawn. Interest on drawings is calculated at the time of preparation of final accounts and is recorded through the following adjusting entry.

Drawing a/c Dr.
To Interest on Drawing a/c

Interest on drawings appear in two places firstly it appears on the credit side of profit & loss account as it is an income to the business. Secondly, the interest on drawings is to be deducted from proprietor's capital on the liability side of the balance sheet.

Problem 8. Santosh commenced business on January 1, 2004 with a capital of Rs. 40,000. At the end of the year the following balances were obtained from the books of accounts.

	Dr.	***Cr.***
Plant and Machinery	12,500	
Purchases	48,500	
Wages	7,050	
Returns outwards		500
Sales		60,000
Furniture & fixtures	2,500	
Freight	1,000	
Carriage outwards	250	
Rent and taxes	2,300	
Printing and stationery	400	
Debtors	10,300	
Creditors		5,000
Postage and telegrams	400	
Discounts		600
Rent received		600
Insurance	350	
Salaries	3,600	
Cash in hand	3,050	
Cash at bank	13,300	
Returns inwards	1,000	
Trade expenses	200	

The stock at 31st December 2004 was worth Rs. 7,300. Make the following adjustments.

(*a*) Write off bad debts Rs. 300 and provide reserve for doubtful debts at 5% on debtors.
(*b*) Create a reserve for discount on debtors and creditors at 2%.
(*c*) Plant and Machinery are to be depreciated at 10%, Furniture at 5%.
(*d*) Insurance was prepared to the extent of Rs. 50.

Prepare trading and profit & loss account for the year and balance sheet as on 31st December 2004.

Solution :

Trading and Profit & Loss A/c for the year ended 31-12-2004

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Purchases	48,500		By Sales	60,000	
To less returns	500	48,000	By less returns	1,000	
To Freight		1,000			59,000
To Wages		7,050	By Closing Stock		7,300
To Gross Profit c/d		10,250			
		66,300			66,300
To Carriage outwards		250	By Gross profit b/d		1,050
To Rent & taxes		2,300	By Discount		600
To Printing & stationery		400	By Rent		600
To Trade expenses		200	By Reserve for discount on		
To Postage & telegrams		400	Creditors @ 2%		100
To Insurance	350				
To less prepared	50	300			
To Salaries		3,600			
To Bad debts		300			
To reserve for doubtful debts at 5%		500			
To reserve for discount on debtors at 2%		190			
To Depreciation on :					
Plant and Machinery		1,250			
Furniture		125			
To Net profit		1,735			
		11,550			11,550

Note : Calculation of reserve for Doubtful debts

Debtors	10,300
Less bad debts	300
	10,000

$$\frac{5}{100} \times 10{,}000 = 500$$

Calculation of reserve for discount on debtors

Good debts (as calculated above)	10,000
less provision for doubtful debts	500
	9,500

$$\frac{2}{100} \times 9{,}500 = 190$$

Balance Sheet as on 31 December 2004

Liabilities		*Rs.*	*Assets*		*Rs.*
Capital a/c	40,000		Cash in hand		3,050
Add net profit	1,735		Cash at bank		13,300
		41,735	Sundry Debtors	10,300	
Creditors	5,000		Less bad debts	300	
Less reserve for discount	100			10,000	
		4,900	Less reserve for bad debts	500	
				9,500	
			Less reserve for discount	190	
					9,310
			Closing stock	2,500	
			less depreciation	125	
					2,375
			Plant & Machinery	12,500	
			Less depreciation	1,250	
					11,250
			Prepaid insurance		50
		46,635			46,635

Problem 10. The following balances were extracted from the books of Sri Janardhan, a Trader as at 31-3-2004.

	Dr.	*Cr.*
Capital of Sri Janardhan		19,400
Purchases and sales	41,400	55,140
Trade debtors and creditors	7,250	3,860
Stock on 1-4-2003	4,120	
Purchase returns		100
Sales returns	120	
Balances at Bank	3,920	
Drawing	4,600	
Motor van expenses	510	
Motor van	6,250	
Rent & Rates	750	
Salaries	8,120	
Reserve for doubtful debts		250
Bad debts	230	
General expenses	1,120	
Discount allowed	1,050	
Discount received		930
Insurance	240	
	79,680	79,680

The following are the adjustments to be made :

(*a*) Salaries and rent accrued but not paid Rs. 820 and Rs. 150 respectively.

(*b*) Insurance paid in advance Rs. 40.

(*c*) Maintain the reserve for doubtful debts at Rs. 300.

(*d*) Depreciation on Motor van to be made at 10%.

(*e*) The stock in trade on 31st March 2004 was valued at Rs. 5,040.

You are required to prepare a trading, profit & loss account for the year ending 31st March 2004 and balance sheet as on that date.

Solution :

Trading, Profit & Loss A/c for the year ended 31-3-04

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		4,120	By Sales	55,140	
To Purchases	41,400		Less Returns	120	
Less returns	100	41,300			55,020
To Gross profit c/d		14,640	By Closing stock		5,040
		60,060			60,060
To Salaries	8,120		By Gross profit b/d		14,640
Add accrued	820	8,940	By Discount received		930
Rent & Rates	750				
Add accrued	150	900			
To Motor van expenses		510			
To General expenses		1,120			
To Discount allowed		1,050			
To Insurance	240				
To Less prepaid	40	200			
To Reserve for bad debts	300				
To Add bad debts	230				
	530				
To Less old reserve	250	280			
To Depreciation on Motor van at 10%		625			
To Net profit		1,945			
		15,570			15,570

Balance Sheet as on 31-3-2004

Liabilities		*Rs.*	*Assets*		*Rs.*
Capital balance	19,400		Cash at bank		3,920
Less drawings	4,600		Closing stock		5,040
	14,800		S. Debtors	7,250	
Add net profit	1,945		Less reserve	300	
		16,745			6,950
Creditors		3,860	Motor van	6,250	
Expenses accrued but			Less depreciation	625	
not paid					5,625
Salary	810		Prepaid insurance		40
Rent	150	970			
		21,575			21,575

Problem 11. The following trial balance of Desai & Co. was taken on 31-12-2004. Prepare trading account, profit & loss account and balance sheet taking the following facts into consideration.

(*a*) Allow interest on capital at 6%.
(*b*) The Insurance premium of Rs. 120 has been paid for the half year ending 31-3-2004.
(*c*) Depreciate building and furniture by 10%.
(*d*) A sum of Rs. 40 due for wages has not been paid.
(*e*) Reserve 10% of the book debts, for bad and doubtful debts and 5% discount on debtors and creditors.
(*f*) Stock of goods on 31-12-2004 is Rs. 7,060.

Trial Balance as on 31-12-2004

	Dr.	*Cr.*
Capital		15,000
Drawings	750	
Stock (1-1-2004)	6,920	
Bills receivable	1,000	
Purchase returns		320
Sales returns	300	
Bills payable		1,180
Sales		8,300
Purchases	4,500	
Wages	70	
Discount		30
Salaries	200	
Union Bank Shares	3,000	
Insurance	120	
Buildings	3,000	
Furniture	700	
Sundry Debtors	6,000	
Sundry Creditors		1,300
Cash in hand	470	
Overdraft at bank		900
	27,030	27,030

Solution :

Trading and Profit & Loss A/c for the year ended 31-12-2004

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		6,920	By Sales	8,300	
To Purchases	4,500		By Sales		
Less returns	320		Less returns	300	8,000
		4,180	By closing stock		7,060
To Wages	70				
Add O/s	40	110			
To Gross profit c/d		3,850			
		15,060			15,060

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Salaries		200	By Gross profit b/d		3,850
To Insurance	120		By Discount		30
Less prepaid	60	60	By Reserve for discount on		
To Interest on capital			Creditors at 5%		65
6% on 15,000		900			
To Depreciation					
Buildings @ 10%		300			
Furniture @ 10%		70			
To Reserve for doubtful					
Debts @ 10% on debtors		600			
To Reserve for discount on					
Debtors @ 5% on good					
Debts *i.e.* 5,400		270			
To Net profit c/d		1,545			
		3,945			3,945

Balance Sheet as at 31-12-2004

Liabilities		*Rs.*	*Assets*		*Rs.*
Capital	15,000		Cash on hand		470
Add Interest	900		Bill receivable		1,000
Add net profit	1,545		Closing stock		7,060
	17,445		Union Bank Shares		3,000
Less Drawings	750		S. Debtors	6,000	
		16,695	Less reserve for D. D	600	
Creditors	1,300			5,400	
Less reserve for Discount	65	1,235	Less reserve for discount	270	
Bills payable		1,180			5,130
Bank overdraft		900	Buildings	3,000	
Outstanding wages		400	Less dep.	300	2,700
			Furniture	700	
			less dep.	70	630
			prepaid Insurance		60
		20,050			20,050

Problem 12. The following balance sheet of a sole trader is badly prepared. Redraft in proper form rectifying the errors.

Balance Sheet for year ended 31-3-2004

Liabilities	*Rs.*	*Assets*	*Rs.*
Stock in trade	4,063	Lease of premises	1,800
Cash in hand	164	Loan an mortgage	3,000
Petty cash	24	Sundry creditors	5,670
Sundry debtors	3,520	Depreciation of	

Liabilities	*Rs.*	*Assets*	*Rs.*
Bank overdraft	1,525	Fixtures & fittings	40
Furniture & Fittings	800	Capital	2,500
Outstanding expenses	275		
P & L a/c Balance (loss)	2,639		
	13,010		13,010

Solution :

Balance Sheet as at 31-3-2004

Liabilities	*Rs.*	*Assets*		*Rs.*
Capital a/c	2,500	Cash in hand		164
Loan on mortgage	3,000	Petty cash		24
Sundry creditors	5,670	Sundry debtors		3,520
Bank overdraft	1,525	Closing stock		4,063
Outstanding expenses	275	Furniture	800	
		Less Dep.	40	760
		Premises		1,800
		P & L a/c loss		2,639
	12,970			12,970

Note : Since the amount of loss is more than the capital, loss is shown on the asset side.

Problem 13. Following is the trial balance of Raman as on 31st December 2004. Prepare a trading and profit & loss account and a balance sheet after taking into account the adjustments given below:

Trial Balance

	Dr.	*Cr.*
Capital		30,000
Drawings	5,000	
Purchases	40,000	
Carriage outwards	500	
Purchases returns		1,000
Sundry expenses	800	
Bad debts	300	
Sales		60,000
Postage	200	
Wages	1,000	
Bills payable		3,000
Discount paid	500	
Land & buildings	18,000	
Plant & Machinery	7,500	
Creditors		8,500
Debtors	10,500	
Salary	1,500	
Investments	3,000	
Opening stock	13,200	
Cash	500	
	1,02,500	1,02,500

Adjustments :

1. Closing Stock 10,300
2. Create reserve for debtors at 5%
3. Depreciation on Plant & Machinery at 6%
4. Salary outstanding 400
5. Interest on Investment accrued 90
6. Wages paid in advance 50

Solution :

Trading and Profit & Loss A/c for the year ended 31-12-2004

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		13,200	By Sales		60,000
To Purchases	40,000		By Closing stock		10,300
Less returns	1,000	39,000			
To Wages	1,000				
Less prepared	50	950			
To Gross profit c/d		17,150			
		70,300			70,300
To Salaries	1,500		By Gross profit		17,150
Add O/s	400	1,900	By Interest on		
To Carriage outwards		500	Investment accrued		90
To Bad debts		300			
To Postage		200			
To Discount		500			
To Depreciation on plant & Machinery at 6%		450			
To Reserve for debtors at 5%		525			
To Net profit c/d		12,065			
		17,240			17,240

Balance Sheet as on 31-12-2004

Liabilities		*Rs.*	*Assets*		*Rs.*
Capital	30,000		Cash		500
Add Net profit	12,065		Debtors	10,500	
	42,065		Less reserve	525	
Less drawings	5,000				9,975
		37,065	Closing stock		10,300
Creditors		8,500	Investments		3,000
Bills payable		3,000	Plant & Machinery	7,500	
Salary outstanding		400	less dep.	450	
					7,050
			Land & buildings		18,000
			Interest on Investment accrued		90
			Wages prepaid		50
		48,965			48,965

Problem 14. The following trading and profit & loss accounts prepared by a Junior Accountant have to be redrafted correctly into final accounts after taking into account the items given at the end.

Trading Account

Particulars	*Amount*	*Particulars*	*Amount*
To Opening stock	7,352	By Closing stock	9,368
To Purchases	63,681	By Sales	1,70,852
To Sundry creditors	25,375	By Sundry debtors	40,659
To Carriage inwards	2,654	By Gross loss c/d	8,182
To Carriage outwards	394		
To Salaries	24,370		
To Wages	51,963		
To Rent rates & taxes	3,981		
To Factory expenses	35,368		
To Insurance	13,923		
	2,29,061		2,29,061

Profit & Loss A/c

Particulars	*Amount*	*Particulars*	*Amount*
To Gross loss	8,182	By Bank O.D.	17,681
To Interest on loan	6,180	By Interest on Bank O D	123
To Dividend from Investment	9,375	By Net loss	39,914
To Furniture purchased	17,681		
To Telephone charges	985		
To Electric charges	2,756		
To Depreciation-Plant & Machinery	663		
Furniture	259		
To General charges	11,637		
	57,718		57,718

The items to be taken into account	Rs.
(*a*) Capital	1,42,692
(*b*) Loan	20,000
(*c*) Plant	2009
(*d*) Investments	1,00,000

Solution :

Trading and Profit & Loss A/c

Particulars	*Amount*	*Particulars*	*Amount*
To Opening Stock	7,352	By Sales	1,70,852
To Purchases	63,681	By Closing Stock	9,368
To Carriage Inwards	2,654		
To Wages	51,963		
To Factory expenses	35,368		
To Gross profit c/d	19,202		
	1,80,220		1,80,220

Particulars	*Amount*	*Particulars*	*Amount*
To Salaries	24,370	By Gross profit b/d	19,202
To Rent, Rates, Taxes	3,981	By Dividend from Investments	9,375
To Carriage outwards	394	By Net loss c/d	36,694
To Insurance	13,923		
To Telephone charges	985		
To Electric charges	2,756		
To General charges	11,637		
To Interest on loan	6,180		
To Interest on bank overdraft	123		
To Depreciation on			
Plant & Machinery	663		
Furniture	259		
	65,271		65,271

Balance Sheet

Liabilities		*Rs.*	*Assets*		*Rs.*
Sundry Creditors		25,375	Sundry debtors		40,659
Bank overdraft		17,681	Investments		1,00,000
Loan		20,000	Closing stock		9,368
Capital	1,42,692		Furniture		17,681
Less net loss	36,694		Plant & Machinery	2,009	
		1,05,998	Less dep.	663	
					1,346
		1,69,054			1,69,054

Problem 15. Redrawing correctly the trial balance given below, prepare the final accounts.

Trial Balance

Particulars	*Dr. Amount*	*Particulars*	*Cr. Amount*
Capital	8,000	Debtors	7,500
Bad debt received	250	Bank deposit	2,750
Creditors	1,250	Discount allowed	40
Returns outwards	350	Drawings	600
Bank overdraft	1,570	Returns inwards	450
Rent	360	Sales	14,690
Salaries	850	Bills payable	1,350
Trade expenses	300		
Cash in hand	210		
Stock – 1 January 2004,	2,450		
Purchases	11,870		
	27,460		27,460

Solution :

Redrafted Trial Balance

Particulars	*Amount*	*Particulars*	*Amount*
Rent	360	Capital	8,000
Salaries	850	Bad debts received	250
Trade expenses	300	Creditors	1,250
Cash in hand	210	Returns outwards	350
Stock on 1-1-2004	2,450	Bank overdraft	1,570
Purchases	11,870	Sales	14,690
Debtors	7,580	Bills payable	1,350
Bank deposits	2,750		
Discount allowed	40		
Drawings	600		
Returns inwards	450		
	27,460		27,460

Trading and Profit & Loss A/c

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		2,450	By Sales	14,690	
To Purchases	11,870		Less Returns	450	
Less returns	350				14,240
		11,520	By Closing stock		NIL
To Gross profit		270			
		14,240			14,240
To Salaries		850	By Gross Profit		270
To Rent		360	By Bad debts received		250
To Trade expenses		300	By Net loss		1,030
To Discount		40			
		1,550			1,550

Balance Sheet

Liabilities		*Rs.*	*Assets*	*Rs.*
Bills payable		1,350	Cash in hand	210
Bank overdraft		1,570	Bank deposit	2,750
Sundry creditors		1,250	Debtors	7,580
Capital a/c	8,000			
Less net loss	1,030			
	6,970			
Less drawings	600	6,370		
		10,540		10,540

Problem 16. From the following ledger balances of a trader, prepare trading, profit & loss a/c and Balance sheet as at 31st December 2004.

	Rs.
Opening Stock	48,000
Drawings	6,000
Sales	1,25,000
Sundry debtors	18,000
Capital	25,000
Wages	14,000
Salaries	2,800
Carriage on purchases	2,500
Rent	3,500
Purchases	60,000
Discount on purchases	2,000
Interest on Bank loan	100
Bills receivable	3,000
Plant & Machinery	10,000
Cash	1,000
Building	2,500
Bills payable	2,500
Bank loan	2,000
Reserve for bad debts	2,500
Returns outwards	750
Sundry Creditors	11,650

Adjustment :

Rent at Rs. 100 per month is not paid for 2 months. Wages and salaries are unpaid to the extent of Rs. 750 and Rs. 225 respectively. Depreciate plant by 10%. Stock at close was Rs. 17,500. Write off Rs. 1,500 as bad debts and maintain a reserve of 5% on debtors.

Solution :

Trading and Profit & Loss A/c
For the year ended 31st December 2004

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening Stock		48,000	By Sales		1,25,000
To Purchases	60,000		By Closing Stock		17,500
Less reserve	750				
	59,250				
Less discount on purchases	2,000	57,250			
To Carriage		2,500			
To Wages	14,000				
Add o/s	750	14,750			
To Gross profit c/d		20,000			
		1,42,500			1,42,500

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Salaries	2,800		By Gross Profit		20,000
Add outstanding	225	3,025	By Reserve for Bad Debts	2,500	
To Rent	3,500		Less new Reserve	825	
Add outstanding	200	3,700			1,675
To Interest on bank loan		100			
To Bad debts written off		1,500			
To Depreciation on Plant & machinery		1,000			
To Net profit c/d		12,350			
		21,675			21,675

Note : Calculation of reserve for bad debts

Sundry debtors	18,000
Less bad debts	1,500
	16,500

$$\frac{5}{100} \times 16{,}500 = \text{Rs. } 825$$

Balance Sheet as on 31-12-2004

Liabilities		*Rs.*	*Assets*		*Rs.*
Bills payable		2,500	Cash		1,000
Sundry creditors		11,650	Bills receivable		3,000
Outstanding creditors			Sundry debtors	18,000	
Wages	750		less bad debtors	1,500	
Salaries	225			16,500	
Rent	200	1,175	less reserve for bad debts	825	
Bank loan		2,000			15,675
Capital	25,000		Closing Stock		17,500
Add net profit	12,350		Plant & Machinery	10,000	
	37,350		Less Dep. @ 10%	1,000	
Less drawing	6,000				9,000
		31,350	Buildings		2,500
		48,675			48,675

Problem 17. Following are the balances extracted from the books of Sri Nataraj.

Balance as on 31-12-2003

	Rs.
Nataraj's capital	30,000
Nataraj's Drawings	5,000
Furniture & fittings	2,600
Bank overdraft	4,200
Creditors	13,300

Premises	20,000
Stock (1-1-2003)	22,000
Debtors	18,600
Rent from tenants	1,000
Purchases	1,14,000
Sales	1,50,000
Sales returns	2,000
Discounts (Dr.)	1,600
Discount (Cr.)	2,000
Taxes & Insurance	2,000
General expenses	9,000
Salaries	2,200
Carriage on purchases	1,800
Provision for doubtful debts	600
Bad debts written off	800
Commission received	500

Adjustments :

Stock in hand on 31st Dec. 2003 was valued at Rs. 2,000. Rent Rs. 300 it still due from the tenants. Salaries Rs. 750 are yet unpaid. Write off Rs. 600 as bad debts. Depreciate business premises by Rs. 300 and fittings by Rs. 260. Make a provision of 5% on debtors for bad and doubtful debts. Prepare final accounts.

Solution :

Trading and Profit & Loss A/c
For the year ended 31-12-2003

Particulars	*Amount*	*Amount*	*Particulars*	*Amount*	*Amount*
To Opening stock		22,000	By sales	1,50,000	
To Purchases		1,14,000	less returns	2,000	
To Carriage		1,800			1,48,000
To Gross profit c/d		30,200	By Closing stock		20,000
		1,68,000			1,68,000
To Discounts		1,600	By Gross profit b/d		30,200
To Taxes & Insurance		2,000	By Discount		2,000
To General expenses		9,000	By Commission		500
To Salaries	2,200		By Rent	1,000	
Add o/s	750	2,950	Add accrued	300	
To Depreciation :-					1,300
Buildings	300				
Fitting	260	560			
To Bad debts	800				
Add additions	600	1,400			
To Provision for Bad debts (*i.e.* 5% on) 18,000)	900				
Less old provision	600	300			
To Net profit c/d		16,190			
		34,000			34,000

Balance Sheet as on 31-12-2005

Liabilities		*Rs.*	*Assets*		*Rs.*
Nataraj's capital	30,000		Debtors	18,600	
Add net profit	16,190		Less bad debts	600	
	46,190			18,000	
Less drawings	5,000		Less provision	900	
		41,190			17,100
Creditors		13,300	Closing stock		20,000
Bank OD		4,200			
Outstanding salaries		750	Furniture	2,600	
			Less Dep.	260	
					2,340
			Premises	20,000	
			Less Dep.	300	
					19,700
			Rent o/s from Tenants		300
		59,440			59,440

Meaning of Concept

1. **Final Account :** The ultimate accounts prepared by the businessman to know the result and financial position of the business.
2. **Trading Account :** It is an account which is prepared to ascertain gross profit or gross loss of the business.
3. **Manufacturing Account :** It is an account which is prepared to ascertain the cost of production of goods or services in a business.
4. **Profit & Loss Account :** It is an account which is prepared to know the net profit caused or net loss incurred by a business.
5. **Balance sheet :** It is a statement which is prepared to know the financial position of a business.
6. **Capital Expenditure :** It refers to a type of expenditure whose benefit is not derived in one accounting year but spread over many years.
7. **Revenue expenditure :** It refers to a type of expenditure whose benefit is derived for the same period for which the expenses are incurred.
8. **Capital Receipt :** It refers to an amount contributed by the proprietor and loans provided by others to the business. It also represent the sale value of a fixed asset.
9. **Revenue Receipt :** It refers to an amount received on sale of goods or other routine income earned in carrying on a business.
10. **Outstanding expenses :** An expense relating to a previous period which is not yet paid is outstanding expenses.
11. **Prepaid expense :** An expense relating to a current period which is paid in advance is a prepaid expense.
12. **Accrued Income :** An income which is earned but not yet received is an accrued income.
13. **Depreciation :** It refers to a decrease in the value of an asset owing to its constant use.
14. **Bad debts :** Debts which are not recoverable is known as bad debts.

15. **Reserve for doubtful debts :** A provision made against a debt which is not likely to be received is a reverse for doubtful debts.
16. **Reserve for discount on Debting :** A provision created out of the divisible profit to meet the loss arising out of discount is a provision for discount on debtors.
17. **Provision for discount on Creditors :** Provision made in current year relating to discount which is receivable in the subsequent year is known of provision of discount on creditors.

QUESTIONS

Answer the following question in about 4 lines each.

1. Mention the three components of the final accounts of a sole trader.
2. What do you mean by Trading account ?
3. What do you mean by Gross profit ?
4. What do you mean by profit & loss account ?
5. What do you mean by net profit ?
6. What do you mean by manufacturing account ?
7. Distinguish between a manufacturing account and a Trading account.
8. Distinguish between a trading account and a profit and loss account .
9. Give four examples of Financial expenses.
10. Give four examples of Administrative expenses.
11. Give four examples of selling and distribution on expenses.
12. Mention four items of income which appear on the credit side of profit & loss a/c.
13. What do you mean by balance sheet ?
14. State four features of balance sheet.
15. How are assets arranged in balance sheet ?
16. What do you mean by Marshalling of assets and liabilities in balance sheet ?
17. What do you mean by capital expenditure ?
18. What do you mean by revenue expenditure ?
19. Why it is necessary to classify expenditure into capital and revenue at the time of preparing a balance sheet ?
20. What do you mean by capital receipt ?
21. What do you mean by a revenue receipt ?
22. Distinguish between a revenue receipt and a capital receipt.
23. What do you mean by outstanding expenses ? How is it treated in preparing final accounts ?
24. What do you mean by prepaid expense ? How is it treated in preparing final accounts?
25. What do you mean by accrued expenses ? How is it treated in preparing final accounts ?
26. What do you mean by income received in advance? How is it treated in preparing final accounts ?
27. What do you mean by Depreciation ? How is it treated in preparing final accounts ?
28. What do you mean by bad debts? How is it treated in preparing final accounts ?
29. What do you mean by reserve for doubtful debts accounts ? How is it treated while preparing final accounts ?
30. What do you mean by reserve for discount an debtors ?
31. What do you mean by provision for discount on creditors ?
32. What do you mean by interest on capital ? How is it treated in preparing final accounts ?
33. What do you mean by interest on drawings ? How is it treated in preparing final accounts ?
34. Give the proforma of a trading account of a trader.
35. Give a proforma of a manufacturing a/c of a trader.

36. Give a proforma for a profit & loss account of a trader.
37. Give a proforma of a balance sheet of a trader.

EXERCISE 1

From the following balances extracted from the books of Ram on 31st December 2004, prepare trading account.

	Rs.
Opening stock	20,800
Closing stock	18,700
Purchases	85,000
Carriage on purchases	2,300
Carriage on sales	3,000
Sales	1,40,000

EXERCISE 2

Prepare a trading and profit and loss account from the following particular.

	Rs.
Sales	1,60,000
Purchases	91,300
Wages	18,100
Factory rent	3,000
Selling Dept's sent	1,500
Opening stock	22,100
Purchases returns	4,000
Sales returns	5,000
Salaries (office)	6,000
General expenses	4,500
Discount on creditors	1,100
Discount to customers	1,800

EXERCISE 3

The following particulars are extracted from the books of Gopal for the year ending 31-12-04.

	Rs.
Opening stock (1-1-04)	10,000
Purchases	4,20,000
Purchase returns	2,000
Sales	76,000
Sales returns	4,000
Wages	6,000
Factory expenses	4,000
Closing stock (31-12-04)	8,000

EXERCISE 4

The information furnished below are taken from the books of Mr. Arun. Prepare trading a/c for the year ending 31-12-2004.

	Rs.
Sales	47,857
Sales returns	829
Factory rent	160
Electric power	34
Wages	3,764
Carriage inwards	360
Purchases	38,723
Purchase returns	823
Gas and water	91
Bad debts	125
Salaries	790
General expenses	1,255
Closing stock on 31-12-04	5,500

EXERCISE 5

From the following particulars extracted from the books of Mr. Hari, prepare profit and loss account for the period ending 31-12-2004.

	Rs.
Salaries & wages	3,950
Travelling expenses	1,250
Bad debts	1,820
Warehouse charges	675
Audit fee	1,000
Distribution expenses	1,250
Postage and telephone	620
Carriage outwards	1,050
Free samples distributed	2,020
Commission received	2,825
Rates & taxes	750
Interest paid to bank	890
Interest on Investments	500

EXERCISE 6

Prepare trading and profit & loss account for the year ending 31st December 2004 from the following information extracted from the books of Mr. Sampat.

	Rs.
Purchases	1,65,000
Sales	2,55,000

Returns inwards	5,000
Returns outwards	3,000
Stock (1-1-2004)	25,000
Wages	20,000
Salaries	7,400
Carriage inwards	4,000
Trade expenses	2,000
Sundry expenses	500
Postage	500
Insurance	2,000
Stationery	1,000
Rent & Taxes	2,000
Interest from investments	600
Commission received	1,400
Carriage outwards	1,600
Travelling expenses	3000
Miscellaneous receipts	1,000

EXERCISE 7

From the following balances extracted from the books of Shankar on 31st December, 2004 Prepare a balance sheet.

	Rs.
Bills receivable	600
Plant	2,000
Cash in hand	200
Debtors	4,000
Stock	3,500
Bills payable	500
Loan	900
Creditors	2,330
Capital	6,570

EXERCISE 8

Prepare final accounts from the following information.

	Rs.
Capital	10,000
Machinery	3,500
Debtors	2,700
Drawings	900
Purchases	9,500
Creditors	1,400
Wages	5,000
Bank	1,500
Stock in trade	2,000

Rent	450
Sales	14,500
Sundry expenses	200
Carriage	150

Additional information :-

	Rs.
1. Stock at the end	600
2. Rent outstanding	50
3. Wages prepared	200
4. Depreciation on Machinery at 10%	

EXERCISE 9

The following are the balances extracted from the books or Mr. Narahari.

	Rs.
Narahari's capital	30,000
Narahari's Drawings	5,000
Furniture & fittings	2,600
Bank overdraft	4,200
Creditors	13,300
Business premises	20,000
Stock on 1-1-2004	22,000
Debtors	18,000
Rent from tenants	1,000
Purchases	1,10,000
Sales	1,50,000
Sales returns	2,000
Discount - debits	1,600
Discount - credit	2,000
Taxes and Insurance	2,000
General expenses	4,000
Salaries	9,000
Commission - debit	2,200
Carriage on purchases	1,800
Reserve for band and doubtful debts	500
Bad debts written off	800

Stock on hand on 31-12-04 estimated at Rs. 20,060. Write off depreciation, business premises Rs. 300 and furniture & fittings Rs. 260. Make a reserve of 5% on debtors for bad and doubtful debts. Allow interest on capital at 5% and carry forward Rs. 700 for unexpired insurance.

Prepare trading account, profit & loss account and balance sheet as on 31-12-2004.

EXERCISE 10

From the following balances extracted from the books of Mohan on 20-6-2004, prepare a trading account, profit & loss account and a balance sheet.

	Dr.	Cr.
Mohan's capital and drawings	10,550	1,19,400
Bills receivable	9,500	
Purchases and sales	2,55,590	3,56,430
Returns Inwards	2,780	
Stock on 1-1-2004	89,680	
Commission		5,640
Plant & Machinery	28,800	
Salaries	11,000	
Travelling expenses	1,880	
Debtors (including Laxminarain's dishonoured cheque Rs. 1,000)	62,000	
Stationery	2,000	
Telephone Charges	1,370	
Interest and discount	5,870	
Bad debts	3,620	
Fixtures & fittings	8,970	
Creditors		59,630
6% loan		20,000
Wages	40,970	
Cash in hand	530	
Cash at bank	18,970	
Insurance (including premium of Rs. 300 per annum paid upto 31-12-04)	400	
Rent and Taxes	5,620	
	5,61,100	5,61,100

Stock in trade on 30-6-04 was Rs. 1,28,960 write off Laxminarains cheque. Create is reserve of 5% on debtors.

Manufacturing wages include Rs. 1,200 for creditors of new machinery purchased last year. Depreciate plant and machinery by 5% and fixture and fittings by 10% per annum. Commission accrued Rs. 600. Interest on loan for the last two months is not paid.

EXERCISE 11

Following are the balances in the ledger of Mr. Prakash for the year ending 31st Mar. 2004.

Stock (1-4-04) :	Rs.
Raw materials	10,000
Semi finished goods	5,000
Finished goods	26,000
Purchases :	
Raw Materials	80,000
Finished goods	17,000
Carriage Inwards on raw materials	3,000
Manufacturing wages	10,000
Salaries of the superior	3,600
Rent of the factory	7,000

Gas and water	3,000
Return of raw materials	1,300
Fuel and coal	3,300
Factory power	12,500
Fire insurance	1,300
Sales returns	12,000
Depreciation on factory buildings	1,000
Stock on 31-3-2004 :	
Raw materials	8,000
Semi-finished goods	13,000
Finished goods	22,000
Sales	2,20,000
Carriage outwards	3,500
Office salaries	15,000

Prepare manufacturing account and trading and profit & loss account for the year ending 31st March 2004.

EXERCISE 13

Following are the balances as on 31st Dec. 2004 taken from the books of Ramdas. You are required to prepare (a) Manufacturing account (b) Trading a/c and (c) Profit and Loss a/c.

Opening stock :

	Rs.
Raw materials	4,000
Work-in-progress	6,000
Finished goods	9,000
Closing stock :	
Raw materials	3,000
Work-in-progress	8,000
Finished goods	6,000
Purchases of raw materials	30,000
Factory expenses :	
Wages	24,000
Carriage inwards	1,000
Rent	3,200
Factory repairs	4,200
Plant repairs	7,800
Supervisors remuneration	10,000
Work's Manager's salary	4,000
Administration overheads :	
Salaries	4,000
Other expenses	6,000
Selling overheads :-	
Salaries	2,000
Commission	1,000
Advertising	5,000
Other expenses	1,600
Distribution overhead :	
Van expenses	1,800
Wages	1,000

8

CHAPTER

FINAL ACCOUNTS OF JOINT STOCK COMPANIES

INTRODUCTION

A Joint Stock company form of organisation was evolved with a view to overcome some of the disadvantages of the partnership such as lack of continuity, unlimited liability etc., and to meet the requirements of modern business such as large capital, professional managers, carrying on business on a large scale basis and so on.

Prof. Haney has defined a Joint Stock Company as a voluntary association of individuals for profit having a capital divided into transferable shares, the ownership of which is the condition of membership.

CHARACTERISTICS OF COMPANY

(1) It is a separate legal entity different from its shareholders.
(2) The liability of shareholders in a Joint Stock Company is limited.
(3) It has a perpetual Succession.
(4) It has a common seal.
(5) Management is undertaken by the elected representatives of shareholders known as Board of Directors.
(6) Shares of a public limited company are freely transferable.
(7) There are restriction relating to minimum and maximum number of members.
(8) Accounts and Audit is compulsory in case of companies.
(9) A Joint Stock Company is excessively regulated by the Government.

CAPITAL OF A COMPANY

The following are the main division of share capital.

1. **Authorised or Registered or Nominal Capital.** It is the amount mentioned in the memorandum as the maximum amount of capital a company is authorised to raise by issue of shares.
2. **Issued Capital.** It represents that part of the authorised capital which is offered to the public for subscription.
3. **Subscribed Capital.** That portion of the issued capital which is taken up by the public is known as "Subscribed Capital". The amount of subscribed capital must be equal to or less than the issued share capital.

4. **Called up Capital.** That part of the nominal amount of Shares which the subscribers are called upon to pay is "called up share capital".
5. **Paid up Capital.** That portion of the called up Capital which is actually paid by the shareholders is known as "paid up capital".
6. **Reserve Capital.** A limited company may by special resolution determine that any portion of its share capital which has not been called up shall not be called up except in the event of the company being wound up. The capital so earmarked is called "Reserve Capital".

SHARES

The capital of a Joint Stock Company is split into several units and each unit is called a 'Share'. A share represents an interest of a shareholders in the company measured by a sum of money and is made up of various rights contained in the contract. According to section 86 of the companies Act, the capital of a company may be of two kinds, *viz*., preference share capital and equity share capital.

Preference Shares

Shares which enjoy preference or priority over the equity shares as to

(*i*) Payment of dividend
(*ii*) Repayment of capital on winding up, are termed as preference shares.

A company may issue the following types of preference shares.

(*a*) *Cumulative Preference Shares.* These are shares entitled to dividend a fixed rate every year and if the company for any reason fails to pay dividend in any year, the same is to be carried forward and out of profits of the subsequent year or in the year in which there is sufficient profit is used for paying arrears of dividend.
(*b*) *Non-Cumulative preference Shares*. Holders of non cumulative preference shares are entitled to dividend only out of current years profit and if for any reason dividend is not paid in a particular year the same is lost.
(*c*) *Participating preference Shares.* Participating preference shares carry a fixed rate of dividend in priority to ordinary shares and further right to participate in the profits after satisfying normal claims of ordinary Shareholders.
(*d*) *Redeemable Preference Shares.* Generally capital raised by issuing shares is returnable only on winding up of a company. However if authorised by its Articles, a company may issue redeemable preference shares, which are repayable after expire of a fixed period as per terms of issue.

Equity Shares

All share capital not falling under the description of preference shares is equity capital. Equity Shares may be defined as "that part of the share capital which confers a right either to the whole or part of any residue of any assets remaining for distribution after satisfying the claims of any other shareholders".

Terms of Issue of Shares

Shares may be issued either at par or at premium or at a discount.

(*a*) *Issue of Shares at par*. When the amount payable on shares is equal to their face value it is said to be issued at par.
(*b*) *Issue of Shares at a premium.* When shares are issued for a consideration in excess of their face value it is issue of shares at a premium. The premium is the excess of issue price over nominal value of shares.
(*c*) *Issue of Shares at a discount.* When a buyer is required to pay less than face value of the shares, the share is said to have been issued at a discount.

IMPORTANT CONCEPTS IN PREPARING FINAL ACCOUNTS

Calls in Arrears

Whenever a shareholder defaults in paying the amount due on allotment or calls within the period specified therein, such amount which is not paid is called "calls in Arrears". The balance appearing as calls in arrears is shown in the Balance Sheet either as a deduction from the called up share capital on the liability side or as an item on the asset side.

Calls in Advance

The amount received by a company as payment on calls before the amount is called up is "Calls in Advance". In such a case, the money so received is shown separately under the heading "Calls in Advance" on the liabilities side of the Balance Sheet.

Forfeiture of Shares

A compulsory termination of membership by way of penalty for non-payment of calls or for non-payment of premium or any amount on shares which is payable after a fixed time is known as "Forfeiture of Shares".

Debentures

Section 2 (12) of the companies Act defines debentures as 'Debentures include debenture stock, bonds, and any other securities of a company whether constituting a charge on the assets of the company or not. In other words, it represents a document issued under the common seal of the company acknowledging the debt due to the debenture holders.

Profit and Loss Account

Profit and Loss Account of a company is its revenue account showing profit or loss incurred during the year.

Profit or Loss Appropriation Account

The net profit arrived at after preparing the profit and loss Account is utilised for appropriations, divisions, and dispositions. For example, transfer to reserve fund, payment of tax, payment of dividend creation of reserves etc., These appropriations of profit is done through profit and loss appropriation account.

Balance Sheet

A Balance Sheet is a statement of assets and liabilities of a company as at a particular date. It is prepared at the end of a period.

Dividend

Dividend is the share in the profits which is paid to its shareholders by a company according to their holdings.

Unclaimed dividend

Unclaimed dividend refers to dividend which has been declared but not been claimed by the shareholders. Unclaimed dividend is a credit item in the trial balance and is shown on the liability side of the Balance Sheet under the heading "Current Liabilities".

Interim Dividend

Dividend paid for the current year before the close of the year in anticipation of current years profit is known as "interim dividend". When it is justified by the profits and authorised by its articles, the directors are empowered to declare interim dividend at any time between two annual general meetings.

Contingent liability

A contingent liability is a liability which may or may not arise. It is a possible liability. When a contingent liability becomes an actually liability, it may result in acquisition of a liability of a corresponding value. It is not usual to record contingent liability in the books of account but a reference has to be made by way of foot note in the Balance Sheet.

Capital Loss

It is a loss which occurs not on account of buying and selling goods in the usual course of business but on account of fall in value of asset or sale of an asset at loss. e.g., A machinery bought for Rs. 40,000 may be now valued at Rs. 30,000 or may be sold for Rs. 35,000 resulting in a capital loss of Rs. 5,000.

Provisions

A provision represents amount set aside as reasonably necessary for the purpose of providing for any liability or loss which is either likely to be incurred or certain to be incurred but uncertain as to the amount or as to the date on which it will arise. Such reserves are a charge against profit and they are deducted from the respective assets. e.g., reserve for doubtful debts.

General Reserve

A General Reserve represents sum set aside out of profits to provide against unknown future contingencies or to increase the working capital or merely to strengthen the financial position of the concern. A General Reserve presupposes a profit and is appropriation of profit.

Specific Reserve

A Specific reserve represents amount set aside out of profit for some specific purpose, e.g., redemption of debentures, dividend equalisation fund etc.

Reserve Fund

A Reserve fund is the same as a General Reserve except that the surplus of assets representing the reserve is invested outside the business in gilt edged securities.

Capital Reserve

Capital Reserve is nothing but the accumulation of capital profit. Capital profit arises in special Circumstances not pertaining to trade as

1. Profit on acquisition of business.
2. Profit on Sale of fixed assets.
3. Premium on issue of debentures.
4. Profit on redemption of debentures etc.

Miscellaneous Expenses

Under miscellaneous expenditure the following items are usually shown to the extent not written off or adjusted.

(*a*) Preliminary expenses incurred in connection with formation of the company.
(*b*) Expenses including commission, brokerage, or brokerage on underwriting or subscription of shares or debentures.
(*c*) Discount allowed on the issue of shares or debentures.
(*d*) Interest paid out of capital during construction.
(*e*) Development expenditure not adjusted.

Proforma of Balance Sheet of a Company

Liabilities	*Assets*
(1) Share Capital	**(1) Fixed Assets**
– Authorised	(*a*) Good will
– Issued	(*b*) Land
– Subscribed	(*c*) Buildings
– Called up	(*d*) Leasehold
(Excluding calls in arrears)	(*e*) Plant & Machinery
Add Forfeited shares	(*f*) Furniture & Fittings
– paid up	(*g*) Patent & Trade Mark
	(*h*) Vehicles
(2) Reserves & Surplus	**(2) Investments**
(*a*) Capital Reserve	(*a*) Investment in Government Securities
(*b*) Share Redemption Reserve	(*b*) Investment in Shares, and Debentures
(*c*) Share premium a/c	
(*d*) Surplus in P & L a/c	**3) Current Assets**
(*e*) Proposed addition	**(A) Current Assets :**
(*f*) Sinking Fund	(*a*) Interest accured on Investment
(3) Secured Loans	(*b*) Stores & Spare Parts
(*a*) Debentures	(*c*) Loose Tools
(*b*) Loans & Advances from Banks	(*d*) Stock in Trade
(*c*) Loans & Advances from Subsidiaries	(*e*) Work in Progress
(*d*) Other loans and advances	(*f*) Sundry Debtors less Provisions
(4) Unsecured Loans	(*g*) Cash in hand
(*a*) Fixed Deposits	(*h*) Cash at Bank
(*b*) Loans & Advances from subsidiaries	**(B) Loans and Advances :**
(*c*) Share term loans	(*a*) Advances and loans to Subsidiaries
– from banks	(*b*) Bills of Exchange
– from others	(*c*) Prepaid Expense
(*d*) Other loans and advances	**(4) Miscellaneous Expenditure**
(*b*) Current Liabilities and Provisions	(*a*) Preliminary Expenses
(A) Current Liabilities	(*b*) Commission for underwriting
(*a*) Acceptance	(*c*) Discount on issue of shares or debentures
(*b*) Sundry Creditors	(*d*) Interest paid out of capital during construction.
(*c*) Advances from Subsidiaries	
(*d*) Advance payment and unexpired discounts	
(*e*) Unclaimed dividends	

(*f*) Other liabilities if any
(*g*) Interest occured but not due on Loan.

(B) Provisions

(*a*) Provision for taxation
(*b*) Provision for dividends
(*c*) Provision for contingencies
(*d*) Other provisions.

Problem 1. From the following Trial balance and other particulars of a limited company as on 31-12-2000 you are required to prepare the Trading Account, Profit & Loss account, P & L Appropriation account and Balance Sheet in Statutory form

	Dr.	Cr.
Authorised Capital		
5000 Equity Shares of Rs. 10 each		
Issued Capital		
4000 Equity Shares of Rs. 10 each		
Subscribed Capital		
3000 Shares of Rs. 10 each		30,000
Calls in Arrears	500	
Stock	2720	
Purchases & Sales	29,120	36,310
Salaries	4,100	
Other Expenses	1,820	
Investment	9,000	
General Reserve		10,000
Plant & Machinery	8,000	
Debtors and Creditors	14,200	2,030
Cash at Bank	21,730	
Amount due from Consignee		135
Provision for Taxation		10,000
Dividend on Investment		620
Income tax	3,100	
P & L Account (Balance)	–	6,050
	95,145	95,145

Adjustments :

(*i*) Closing stock Rs. 10,090.
(*ii*) Provision for RBD at 20%.
(*iii*) Proposed Dividend 10%.
(*iv*) Depreciate Plant & Machinery by 10%.
(*v*) Transfer Rs. 5,000 to General Reserve.

Solution :

Trading and Profit & Loss Account for the year ending 31-12-2000

To Opening Stock	2,720	By Sales	36,310
To Purchases	29,120	By Closing Stock	10,090
To Gross profit c/d	14,560		
	46,400		46,400

To Salaries	4,100	By Gross profit b/d	14,560
To Other expenses	1,820	By Dividend on Investment	620
To Provision for Debt	2,840	By Profit on Consignment	135
To Depreciation on plant	800		
To Net profit c/d	5,755		
	15,315		15,315

P & L Appropriation Account

To proposed Dividend 10% on 29,500	2,950	By Balance b/d (Previous year's)	6,050
To General Reserve	5,000	By Net profit (Current year's)	5,755
To Balance transferred to Balance Sheet	3,855		
	11,805		11,805

Balance Sheet as on 31-12-2000

I.	Share Capital			I	Fixed Assets		
	Authorised				Plant	8,000	
	5000 Equity Shares				less Dep.	800	7,200
	of Rs. 10 each		50,000	II	Investments		9,000
	4000 equity shares			III	Current Assets :-		
	of Rs. 10 each		40,000				
	Subscribed and called up :						
	3000 Shares of Rs. 10 each				Stock in Trade		10,090
	fully paid	30,000			Sunday Debtors		12,215
	less : arrears	500	29,000		Cash at Bank		21,730
II.	Reserve and Surplus :			IV	Miscellaneous expenses		NIL
	General Reserve	10,000					
	Add transfer						
	from P & L A/c	5,000					
			15,000				
	P & L Appropriation A/c		3,855				
III.	Secured Loans						
IV.	Unsecured Loans						
V.	Current Liabilities :						
	and Provisions :						
	(A) Current Liabilities :						
	Sundry Creditors		2,030				
	(B) Provisions :						
	For Taxation	10,000					
	Less : Prepaid	3,100					
			6,900				
	Proposed Dividend		2,950				
			60,235				60,235

Problem 2. From the following Trial balance of a limited company as at 31st Dec. 2001, prepare Trading and Profit & Loss Account and the Balance Sheet as at that date :

Trial Balance of the company as at 31-12-2001

	Dr.	Cr.
Stock on 1-1-2001	60,000	
Purchases and Sales	3,20,000	7,70,000
Wages	90,000	
Power	15,000	
Manufacturing Expense	35,000	
Carriage Outwards	20,000	
Carriage Inwards	10,000	
Salaries	60,000	
Insurance	10,000	
Sundry Debtors and Creditors	90,000	45,000
Bank Balance	6,000	
Sinking Fund Investment - 4%		
Govt. Securities	90,000	
Debenture Interest	6,000	
Land & Building	3,00,000	
Plant & Machinery	4,50,000	
Director's Fees	10,000	
Income tax paid	41,000	
Audit fees	6,000	
Provision for income tax		45,000
P & L Account		38,000
General Reserve Fund		1,00,000
Dividend Paid :		
(a) Preference Shares	6,000	
(b) Interim Dividend on ordinary Shares	30,000	
Preliminary expenses	20,000	
Goodwill	1,40,000	
Share Capital fully paid up		3,00,000
6% Redeemable pref. Shares		2,00,000
6% Mortgage Debentures		2,00,000
Salaries & Wages unpaid		25,000
Interest on Sinking fund Investment		2,000
Sinking fund		90,000
	18,15,000	18,15,000

The adjustments to be made are :

(1) Make provision for income-tax for current year Rs. 50,000.
(2) Transfer Rs. 25,000 to General Reserve Fund.
(3) Directors recommend final dividend of 20% on ordinary Shares.

(4) Add Rs. 10,000 to sinking fund.
(5) Write off Rs. 5,000 from preliminary expenses.
(6) Provide depreciation on land and Building at 2% and 10% on Plant & Machinery.
(7) The closing stock on 31st December 2001 was Rs. 58,000.

Solution :

Trading Account for the year ending 31-12-2001

To Opening Stock		60,000	By Sales		7,70,000
To Purchases		3,20,000	By Closing Stock		58,000
To Wages		90,000			
To Power		15,000			
To Manufacturing expenses		35,000			
To Carriage Inwards		10,000			
To Gross profit c/d		2,98,000			
		8,28,000			8,28,000
To Salaries		60,000	By Gross profit b/d		2,98,000
To Carriage outwards		20,000	By Interest on Sinking		
To Insurance		10,000	fund investment	2,000	
Debenture Interest	6,000		Add		
Add O/s	6,000	12,000	Accrued Interest	1,600	3,600
To Director's Fees		10,000			
To Audit Fees		6,000			
To Preliminary expenses					
written off		5,000			
To Provision for Income tax		46,000			
To Depreciation on					
Building	6,000				
Plant	45,000	51,000			
To Net Profit transferred					
to P & L Appeal		81,600			
		3,01,600			3,01,600

Profit & Loss Appropriation Account

To Interim Dividend		By Balance b/d	38,000
on ordinary shares	30,000	By P & L Account	81,600
To Proposed Dividend on			
ordinary Shares	30,000		
To Pref. shares dividend	6,000		
To General Reserve fund			
– Transfer	25,000		
To Sinking Fund	10,000		
– Transfer			
To Balance Transferred to B/s	18,600		
	1,19,600		1,19,600

Balance Sheet as on 31-12-2001

Share Capital			**Fixed Assets**		
Ordinary Shares			Goodwill		1,40,000
Fully paid up		3,00,000	Land & Buildings	3,00,000	
6% Redeemable pref. Shares		2,00,000	Less : Dep.	6,000	
Reserves & Surplus					2,94,000
General Reserve Fund	1,00,000		Plant & Machinery	4,50,000	
Add Current years	25,000		Less Dep.	45,000	
		1,25,000			4,05,000
			Investments		
Sinking fund	90,000		Sinking Fund Investment		90,000
Add Current years	10,000		**Current Assets :-**		
		1,00,000	Closing Stock		58,000
P & L App. Account		18,600	Sundry Debtors		90,000
Secured Loans			Accured Interest		1,600
6% Mortgage Debentures		2,00,000	Bank		6,000
Unsecured Loans		–	**Miscellaneous Expenses**		
Current Liabilities & Provisions			Preliminary expenses	20,000	
(*a*) Current Liabilities			Less written off	5,000	
Sundry Creditors		45,000			15,000
Salaries and Wages Unpaid		25,000			
O/s Debentures Interest		6,000			
(*b*) Provisions					
Proposed dividend		30,000			
Provision for income tax		50,000			
		10,99,600			10,99,600

Problem 3. Following is the trial balance of Nalanda Co. Ltd., as at 31-12-2000.

	Dr.	Cr.
Authorised Share Capital		
1,00,000 Shares of Rs. 10 each		
Issued capital Rs. 10 per share 7,500 Shares		75,000
Debtors and Creditors	12,000	8,800
Purchases and Sales	18,000	30,000
Land & Buildings	15,000	
Bad Debt Reserve 1-1-2000		500
Stock on 1-1-2000	10,000	
Plant & Machinery	22,000	
Wages	4,000	
Investments	5,000	
P & L Account 1-1-2000		3,000
Interest on Investment		500
Cash at Bank	9,200	
Salaries	3,000	
Bad debts	300	
Gas and Water	500	

Rates & Insurance	200	
Goodwill	15,000	
Manufacturing Expenses	3,000	
Returns	200	200
Unclaimed dividend		1,000
Trade expenses	300	
Preliminary Expenses	1,300	
	1,19,000	1,19,000

Adjustments :

(1) Stock on 31-12-2000. Rs. 12,000.
(2) Provide for depreciation on Plant & Machinery at 5%.
(3) Write off half the preliminary expenses.
(4) Transfer Rs. 1,000 to General Reserve.
(5) Provide for doubtful debts at 5%.

Prepare final accounts and the Balance Sheet in the prescribed form.

Solution :

The Nalanda Co. Ltd.
Trading and Profit & Loss Account for the year ending 31-12-2000

To Opening Stock		10,000	By Sales	30,000	
To Purchases	18,000		Less Returns	200	
Less Returns	200				29,800
		17,800	By Closing Stock		12,000
To Wages		4,000			
To Gas and Water		500			
To Manufacturing Expenses		3,000			
To Gross Profit		6,500			
		41,800			41,800
To Salaries		3,000	By Gross Profit b/d		6,500
To Reserve on Debts	300		By Interest on Investment		500
Add new Reserve	600				
	900				
Less Old Reserve	500	400			
To Rates & Insurance		200			
To Trade expenses		300			
To Preliminary expenses written off		650			
To Depreciation on plant		1,100			
To Net profit transferred to Profit & Loss App. a/c		1,350			
		7,000			7,000

Profit & Loss App. Account

To General Reserve	1,000	By Balance b/d	3,000
To Balance Transferred to B/s	3,350	By Profit & Loss Account	1,350
	4,350		4,350

Balance Sheet as on 31-12-2000

Share Capital		**Fixed Assets**		
Authorised Capital		Buildings		15,000
10000 Shares of Rs. 10 each	1,00,000	Plant	22,000	
		Less Dep.	1,100	20,900
Issued and Subscribed		Good will		15,000
7500 Shares of Rs. 10 each	75,000	Investments		5,000
Called up & paid up Capital :		**Current Assets**		
7500 Shares of Rs. 10 each	75,000	Closing Stock		12,000
Reserves & Surplus		Debtors	12,000	
Profit & Loss App. Account	3,350	Less RDD	600	
Reserves	1,000			11,400
Secured loans	–	Cash at Bank		9,200
Unsecured loans	–	**Miscellaneous Expenditures :-**		
Current Liabilities :		Preliminary - expenses	1,300	
Creditors	8,800	Less Written Off	650	
Unclaimed dividend	1,000			650
	89,150			89,150

Problem 4. The Silver Ore Company Ltd. was formed with an authorised capital of Rs. 6,00,000 in shares of Rs. 10 each. Of these 52,000 Shares was issued to the public. From the Trial balance given below and adjustments mentioned prepare, trading and profit and loss account of the company and a balance sheet on 31-3-2001.

Adjustments :

1) Depreciate plant and Railway Tracks by 10%.
2) Depreciate Furniture and Building by 5%.
3) Write 1/3rd of promotion expenses.
4) Value of Silver on 31-3-2001 was Rs. 15,000.
5) On 20-12-2000 Directors forfeited 100 Shares on which only Rs. 7.50 was paid by the shareholders.

The Trial Balance of the Company as on 31-3-2001 was as follows :

	Dr.	Cr.
Cash at Bank	1,05,500	
Share Capital		5,19,750
Plant	40,000	
Sale of Silver		1,79,500
Mines	2,20,000	
Promotion Expenses	6,000	
Interest on Fixed Deposits upto 31-12-2000		3,900
Dividend on Investments		3,200
Royalties paid	10,000	

Railway Track and Wagons	17,000	
Wages to miners	74,220	
Advertisement	5,000	
Cartage on Plant	1,800	
Furniture & Buildings	20,900	
Administrative Expenses	28,000	
Investment	80,000	
Repairs to Plant	900	
Coal and Oil	6,500	
Cash	530	
Brokerage on Investment	1,000	
Fixed Deposit in Canara Bank at 6%	89,000	
	7,06,350	7,06,350

Solution :

The Silver Ore Company
Trading & Profit & Loss Account for the period ending 31-3-2001

To Wages to miners		74,220	By Sale of Silver			1,79,500
To Royalties		10,000	By Closing Stock of Silver			15,000
To Coal and Oil		6,500				
To Gross Profit c/d		1,03,780				
		1,94,500				1,94,500
To Adm. expenses		28,000	By Gross profit			1,03,780
To Advertising		5,000	By Dividend on Investment			3,200
To Repairs to Plant		900	By Interest on Fixed Deposit		3,900	
To Promotion expenses written off		2,000	Add :			
To Depreciation on :			Accrued interest for			
Plant	4,180		3 months on 89000		1,335	
Railway	1,700					5,235
Furniture & Building	1,045					
		6,925				
To Net Profit		69,390				
		1,12,215				1,12,215

Notes :

1) Depreciation on Plant

Plant	40,000
Add Cartage on plant	1,800
	41,800

Depreciation at 10% on 41,800 = 4,180

2) Interest on Fixed Deposit

$$89{,}000 \times \frac{3}{12} \times \frac{6}{100} = 1{,}335 + 3{,}900 = 5{,}235$$

Balance Sheet as on 31-3-2001

Share Capital			**Fixed Assets**		
Authorised			Mines		2,20,000
60000 Equity Shares of Rs. 10 Each		6,00,000	Railway Track	17,000	
Issued, subscribed &			Less Dep.	1,700	15,300
paid up Capital :			Plant	41,800	
51900 Shares of Rs. 10			less Dep.	4,180	37,620
each fully paid	5,19,000		Furniture & Buildings	20,900	
Add Forfeited Shares	750	5,19,750	Less Dep.	1,045	19,855
Reserves & Surplus			**Investments**		
Profit & Loss Account		69,390	(80,000 + 1,000)		81,000
			Current Assets :		
			Interest on Fixed Deposit Accrued		1,335
			Stock of Ore		15,000
			Cash in hand		530
			Bank		1,05,500
			Fixed Deposit		89,000
			Miscellaneous Expenses		
			Promotion Expenses	6,000	
			Less 1/3 Written off	2,000	4,000
		5,89,140			5,89,140

Problem 5. The following is the Trial Balance of Wonderful Company Ltd. as at 31-12-2001.

Trial Balance

	Dr.	Cr.
Authorised Capital		
(50000 Shares of Rs. 10 each)		
Subscribed Capital		1,00,000
(10000 Shares of Rs. 10 each)		
Calls in arrears	6,400	
Land	10,000	
Buildings	25,000	
Machinery	15,000	
Furniture	3,200	
Carriage	2,300	
Wages	21,400	
Salaries	4,600	
Bad debts Reserve		1,400
Sales		80,000
Sales Returns	1,700	
Bank Charges	100	
Coal, gas, and water	700	
Rent and Rates	800	
Purchases	50,000	
Purchase Returns		3,400
Bills Receivable	1,200	

General Expenses	1,900	
Debtors	42,800	
Creditors		13,200
Stock	25,000	
Insurance	400	
Cash at Bank	13,000	
Cash in hand	2,500	
Share Premium		6,000
General Reserve		24,000
	2,28,000	2,28,000

Adjustments :

(*a*) Charge depreciation on Buildings at 2% on Machinery at 10% on Furniture at 10% and make a reserve of 5% on debtors for bad debts.
(*b*) Carry forward following unexpired amount : Insurance Rs. 120.
(*c*) Provide the following outstanding liabilities.
(*d*) Wages Rs. 3,200 ; Salaries Rs. 500 ; Rent and Rates Rs. 200. The value of Stock as on 31st December 2001, Rs. 30,000.

Prepare Trading and profit and loss account and the Balance Sheet.

Solution :

Wonderful Company Ltd.
Trading, profit & Loss account for the year ended 31st December 2001.

To Opening Stock		25,000	By Sales	80,000	
To Purchases	50,000		Less Returns	1,700	78,300
less Returns	3,400	46,600	By Closing Stock		30,000
To Carriage		2,300			
To Coal, Gas, Water		700			
To Wages	21,400				
Add O/s	3,200	24,600			
To Gross Profit c/d		9,100			
		1,08,300			1,08,300
To General Expenses		1,900	By Gross profit b/d		9,100
To Salaries	4,600		By Net Loss Carried to B/S		2,340
Add O/s	500	5,100			
To Bank Charges		100			
To Rent & Rates	800				
Add O/s	200	1,000			
To Bad debts Reserve (2,140 – 1,400)		740			
To Depreciation on :					
Buildings	500				
Machinery	1,500				
Furniture	320				
		2,320			
To Insurance	400				
Less Prepaid	120				
		280			
		11,440			11,440

Balance Sheet as at 31-12-2001

Share Capital			**Fixed Assets**		
Authorised Capital			Land		10,000
50000 Shares of Rs. 10 each		5,00,000	Buildings	25,000	
Issued & Subscribed			Less Dep.	500	
10000 Shares of Rs. 10 each		1,00,000			24,500
called up 10000 shares of Rs.			Machinery	15,000	
10 Each	1,00,000		Less Dep.	1,500	13,500
Less : Cells in Arrears	6,400	93,600	**Investments**		NIL
Reserves & Surplus :			**Current Assets**		
General Reserve	24,000		Stock		30,000
Less net loss	2,340	21,660	S. Debtors	42,800	
Share Premium		6,000	Less Returns	2,140	40,660
Current Liabilities			Cash at Bank		13,000
Sundry Creditors		13,200	Cash in hand		2,500
O/s Expenses :			**Loans & Advances**		
Wages	3,200		Bills Receivable		1,200
Salaries	500		Insurance prepaid		120
Rent & Rates	200	3,900			
		1,38,360			1,38,360

Problem 6. Alpha Manufacturing Co. Ltd. Mangalore was registered with a nominal capital of Rs. 6,00,000 in equity shares of Rs. 10 each. The following is the list of balances extracted from its books on 31st March, 2001.

Furniture	7,200
Calls in Arrears	7,500
Plant & Machinery	3,30,000
Business Premises	3,00,000
Interim Dividend paid	37,500
Stock on 1-4-2000	75,000
Sundry Debtors	87,000
Goodwill	25,000
Cash in hand	750
Cash at Bank	30,900
Purchases	1,85,000
Preliminary Expenses	5,000
Wages	84,865
General Expenses	6,835
Advertising	10,000
Freight and Carriage	13,115
Salaries	14,500
Director's Fees	5,725
Bad Debts	2,110
Debentures interest paid	9,000
Paid up Capital	4,00,000
6% Debentures	3,00,000
Profit & Loss Account (Cr.)	14,500

Bills payable	38,000
Sundry Creditors	50,000
Sales	4,15,000
General Reserves	25,000
Bad debts Reserve (1-4-2000)	3,500

The following adjustments have to be made.

1) Depreciate plant and Machinery by 5%, Business Premises by 2% and write off Rs. 1,200 on furniture.
2) Write off Rs. 1000 from preliminary expenses.
3) Provide for half year's debentures interest.
4) The Reserve for Bad Debts on 31st March 2001 should be equal to 1% on sales.
5) Director's fees are outstanding to the extent of Rs. 275 and salaries Rs. 500.
6) Goods to the value of Rs. 1,500 were distributed as free samples during the year, but no entry in this respect has been made.
7) The stock on 31-3-2001 was valued at Rs. 95,000.

You are required to prepare the Trading and Profit & Loss account and Profit & Loss App. Account for the year ending 31-3-2001 and the Balance Sheet as on the Same date.

Solution :

Alpha Manufacturing Co. Ltd.
Trading and Profit & Loss Account for the year ending 31-3-2001

To Opening Stock		75,000	By Sales	4,15,000
To Purchases	1,85,000		By Closing Stock	95,000
Less Free Samples	1,500			
		1,83,500		
To Wages		84,865		
To Freight & Carriage		13,115		
To Gross Profit c/d		1,53,520		
		5,10,000		5,10,000
To Salaries	14,500		By Gross Profit b/d	1,53,520
Add O/s	500			
		15,000		
To General Expenses		6,835		
To Director's Fees	5,725			
Add O/s	275			
		6,000		
To Bad debts	2,110			
Add New Reserve	4,150			
	6,260			
Less O/d Reserve	3,500			
		2,760		
To Debenture Interest	9,000			
Add O/s	9,000			
		18,000		
To Preliminary Expenses		1,000		
To Advertising		10,000		
To Free Samples		1,500		

To Depreciation :					
Plant	16,500				
Premises	6,000				
Furniture	1,200				
		23,700			
To Net profit transferred to P & L App. A/c		68,725			
		1,53,520			1,53,520
To Interim Dividend		37,500	By Balance b/d		14,500
To Balance c/d		45,725	By Profit & Loss A/c		68,725
		83,225			83,225

Balance Sheet as on 31-3-2001

Paid up Capital			**Fixed Assets**		
40000 Shares of			Goodwill		25,000
Rs. 10 each	4,00,000		Business premises	3,00,000	
Less cells in arrears	7,500	3,92,500	Less Dep.	6,000	2,94,000
Reserve & Surplus					
Capital Reserve		25,000	Plant	3,30,000	
P & L App. account		45,725	Less Dep.	16,500	3,13,500
Secured Loans			Furniture	7,200	
6% Debentures		3,00,000	Less Dep.	1,200	6,000
Current Liabilities			Investments		NIL
Bills payable		38,000	**Current Assets**		
Sundry Creditors		50,000	Cash in hand		750
Directors fee due		275	Cash at Bank		39,900
Debenture Interest O/s		9,000	Stock		95,000
Salary O/s		500	S. Debtors	87,000	
			Less Reserve	4,150	82,850
			Miscellaneous Expenses		
			Preliminary expenses	5,000	
			Less Written Off.	1,000	4,000
		8,61,000			8,61,000

Problem 7. Following is the Trial Balance of Dhanalaxmi Ltd. Bangalore as on December 31, 2001.

Share capital	Dr.	Cr.
8000 Equity Shares of Rs. 10 each	—	80,000
Stock (1-1-2001)	51,000	—
Purchases & Sales	2,20,000	3,30,000
Returns	3,800	
Trade Expenses	1,800	
Wages	12,000	
Salaries	18,700	
Travelling Expenses	3,200	
Advertising	1,550	
Rent & Taxes	4,900	
Discount		2,200
Bank Interest	850	

Bad debts	2,500	
Freehold Premises	95,000	
Plant & Machinery	98,000	
Sundry Debtors	45,000	
Sundry Creditors	—	55,500
Secured Loans	—	75,000
Cash	1,400	
Reserve Fund	—	23,000
Preliminary Expenses	11,000	
P & L Account (1-1-2001)	—	5,000
	5,70,700	5,70,700

Adjustments :

(1) Provide Rs. 25,000 for taxation.
(2) Dividend at 15% on Equity Shares to be provided.
(3) Transfer Rs. 10,000 to Reserve Fund.
(4) Stock on 31st Dec. 2001 was valued at Rs. 32,000.

Prepare final accounts of the company in the Statutory form.

Solution :

Dhanalaxmi Ltd.
Trading and profit & loss account for the year ended 31st Dec. 2001

To Opening Stock	51,000	By Sales	3,30,000	
To Purchases	2,20,000	Less Returns	3,800	
To Wages	12,000			3,26,200
To Gross profit c/d	75,200	By Closing Stock		32,000
	3,58,200			3,58,200
To Salaries	18,700	By Gross profit b/d		75,200
To Trade expenses	1,800	By Discount Received		2,200
To Travelling expenses	3,200			
To Rent & Taxes	4,900			
To Advertising	1,550			
To Bank interest	850			
To Bad debts	2,500			
To Provision for Taxation	25,000			
To Net profit transferred to Profit & Loss App. Account	18,900			
	77,400			77,400

Profit & Loss App. Account

To Reserve Fund	10,000	By Balance b/d	5,000
To dividend	12,000	By Net Profit	18,900
To Balance carried to B/s	1,900		
	23,900		23,900

Balance Sheet as at 31-12-2001

Share Capital			**Fixed Assets**	
Authorised		80,000	Premises	95,000
Issued & Subscribed			Plant & Machinery	98,000
8000 Shares of Rs. 10 each		80,000	Investments	—
Called up & paid up			**Current Assets**	
8000 Shares of Rs. 10 each		80,000	Closing Stock	32,000
Reserve & Surplus			Debtors	45,000
Reserve fund	23,000		Cash	1,400
Add Transferred during			**Miscellaneous expenses**	
the year	10,000	33,000	Preliminary expenses	11,000
P & L App. Account		1,900		
Secured Loans		75,000		
Unsecured Loans		NIL		
Current Liabilities				
Creditors		55,500		
Provisions				
Provision for Taxation		25,000		
Proposed dividend		12,000		
		2,82,400		2,82,400

Problem 8. Following is the Trial balance of Kumar Trading Co. Ltd. Tumkur as on 31st December 2001, prepare Trading, profit & loss account and Balance Sheet as per the requirements of Companies Act.

Trial Balance

	Dr. Rs.	Cr. Rs.
Share Capital		60,000
(10000 Shares of Rs. 6 Each)		
Calls in Arrears	5,000	
Debtors and Creditors	12,000	11,000
Purchases and Sales	24,800	38,500
Returns	300	500
Bills	14,500	500
Land & Buildings	20,800	
Opening Stock	14,000	
Wages	2,100	
Investments	3,000	
Profit & Loss App. Account (1-1-2001)		1,800
Interest on Investment		50
Balance at Bank	1,000	
Cash in Hand	50	
Salaries	1,800	
Director's Allowance	600	
Bad Debts	400	
Water and Power	400	

Insurance	1,100	
Goodwill	5,000	
Manufacturing Expenses	1,600	
Director's Fees	800	
Interim Dividend	2,000	
Preliminary Expenses	1,000	
Trade Expenses	600	
Discount	200	
6% Debentures		10,000
Reserve Fund		2,000
Furniture	1,000	
Interest on Debentures (for 6 months)	300	
	1,24,350	1,24,350

Additional Information :

(*a*) Closing Stock was valued at Rs. 26,500.
(*b*) Debenture Interest was outstanding for 6 months.
(*c*) Wages Outstanding Rs. 300.
(*d*) Write off 50% of preliminary expenses.
(*e*) Depreciate machinery at 10% and furniture at 5%.
(*f*) Transfer Rs. 200 to Reserve fund.
(*g*) Directors Recommended dividend at 10% for the year.

Solution :

Kumar Trading Co. Ltd.
Trading and Profit & Loss Account for the year ended 31-12-2001

To Opening Stock		14,000	By Sales	38,500	
To Purchases	24,800		Less Returns	300	38,200
Less Returns	500	24,300	By Closing Stock		26,500
To Wages	2,100				
Add O/s	300	2,400			
To Water and Power		400			
To Manufacturing expenses		1,600			
To Gross profit c/d		22,000			
		64,700			6,700
To Salaries		1,800	By Gross profit b/d		22,000
To Director's allowance		600	By Interest on Investment		50
To Trade expenses		600			
To Discount		200			
To Insurance		1,100			
To Interest on Debentures	300				
Add O/s	300	600			
To Preliminary expenses (50% Written off)					
To Director's Fees		800			

To Bad debts	400	
To Depreciation :		
On Machinery	1,000	
On Furniture	50	
To Net Profit Transferred to Profit & Loss App. Account	14,400	
	22,050	22,050

Profit & Loss App. Account

To Interim Dividend	2,000	By Balance b/d	1,800
To Transfer to Reserve Fund	2,000	By Profit & Loss A/c	14,400
To Dividend (10% of Rs. 55,000) (Dividend is not payable on calls in arrears)	5,500		
To Balance Carried to Balance Sheet	6,700		
	16,200		16,200

Balance Sheet as on 31-12-2001

Share Capital			**Fixed Assets**	
Authorised			Land & Building	20,800
10000 Shares of Rs. 6 each		60,000	Furniture (1000 – 50)	950
Issued & Subscribed :			Machinery	9,000
10000 Shares of Rs. 6		60,000	(10000 – 1000)	
Called Up :			Goodwill	5,000
10000 Shares of Rs. 6	60,000		Investments	3,000
Less calls in Arrears	5,000	55,000	**Current Assets**	
Reserves & Surplus			Balance at Bank	1,000
Reserve Fund	2,000		Cash in Hand	50
Add : Transfer			Debtors	12,000
during the year	2,000	4,000	Closing Stock	26,500
P & L App. A/c		6,700	**Loans & Advances**	
Secured Loans :			Bills	14,500
6% Debentures		10,000	**Miscellaneous expenses**	
Unsecured Loans		NIL	Preliminary Expenses	500
Current Liabilities				
Creditors		11,000		
Bills payable		500		
O/s. Debentures interest		300		
O/s Wages		300		
O/s Dividend		5,500		
		93,300		93,300

QUESTIONS

Simple Questions.

1. Define a Company.
2. State the Characteristics of a Company.
3. What do you mean by Authorised Capital ?
4. What do you mean by Issued Capital ?
5. What do you mean by Subscribed Capital ?
6. What do you mean by called up Capital ?
7. What do you mean by paid-up Capital ?
8. What is a Reserve Capital ?
9. Define Shares.
10. What do you mean by preference Shares ?
11. What are the types of preference Shares ?
12. What do you mean by Equity Shares ?
13. What do you mean by issue of Shares at par ?
14. What do you mean by issue of Shares at Premium ?
15. What do you mean by issue of shares at discount ?
16. What do you mean by cells in advance ?
17. What do you mean by forfeiture of Shares ?
18. Define Debentures.
19. How do you treat undimmed dividend while preparing final accounts of the Company ?
20. What is meant by interim Dividend ?
21. What do you mean by contingent liability ?
22. How would you treat miscellaneous expenses while preparing final accounts of a company ?

EXERCISE 1

The following balances appear in the books of M/s Moonlight Co. Ltd., as on 31-12-2001.

Trial Balance as on 31-11-2001

	Dr.	Cr.
Share Capital		
Authorised 60000 Equity Shares of Rs. 10 each		6,00,000
General Reserve		2,50,000
Unclaimed Dividend		6,526
Sundry Creditors		36,858
Buildings	1,00,000	
Purchases and Sales	5,00,903	9,83,947
Wages	3,59,000	
Salaries	26,814	
General Charges	31,078	
Machinery	2,00,000	
Motor Vehicles	15,000	
Furniture	5,000	
Opening Stock	1,72,058	
Book Debts	2,23,380	

Investments	2,88,950	
Bad Debts Reserve		71,000
Cash	72,240	
Director's Fees	1,800	
Bad Debts	15,000	
Interest on Investment		8,544
Profit & Loss App. Account		16,848
Debentures		37,500
	20,11,223	20,11,223

From these balances and the following information prepare the company final accounts.

(*a*) Stock on 31-12-2001 was valued at Rs. 1,48,680.
(*b*) Provide Rs. 10,000 for depreciation on Buildings.
(*c*) Interest on Investment occurred Rs. 2,750.
(*d*) Provide for Taxation Rs. 8,000.
(*e*) Proposed Dividend at 4%.
(*f*) Rs. 60,000 is Considered as bad.

[**Answer :** Gross profit 1,00,666
Net Profit 30,268
Total of Balance Sheet Rs. 9,86,000]

EXERCISE 2

A limited company registered with an authorised capital of Rs. 30,00,000 in equity Shares of Rs. 10 each. The following is the list of balances extracted from its books on 31-12-2001.

Purchases	9,25,000
Wages	4,24,325
Manufacturing expenses	65,575
Salaries	70,000
Bad debts	10,550
Director's fees	31,125
Debenture Interest paid	31,125
Preliminary expenses	25,000
Calls in arrears	37,500
Plant & Machinery	15,00,000
Premises	16,50,000
Interim Dividend paid	1,87,500
Furniture & Fixtures	35,000
Sundry Debtors	4,36,000
General Expenses	84,175
Stock on 1-1-2001	3,75,000
Goodwill	1,00,000
Cash in hand	28,750
Cash at Bank	1,99,500
Fully paid Share Capital	20,00,000
Profit & Loss Account (Cr. Balance)	72,500
6% Debentures	15,00,000
Sundry Creditors	2,90,000

Bills payable	1,67,500
Sales	20,75,000
General Reserve	1,25,000

You are required to prepare Trading and profit and Loss Account for the year ended 31st Dec. 2001 and the Balance Sheet as on that date making the following adjustments.

Depreciate Plant & Machinery by 10%, provide half years interest on debentures, write off Rs. 2,500 from preliminary expenses and make provision for bad and doubtful debts at Rs. 4,250 on sundry debtors. Stock on 31-12-2001 was Rs. 4,55,000.

[**Answers :** Gross profit Rs. 7,40,100
Net profit Rs. 2,97,500
Total of Balance Sheet Rs. 42,72,500]

EXERCISE 3

The following is the Trial balance of the Patiala Manufacturing Co. Ltd., as on 30-6-2000.

	Dr.	Cr.
Stock on 30-6-1999	7,500	
Sales		35,000
Purchases	24,500	
Productive Wages	5,000	
Discounts	700	500
Salaries	750	
Rent	495	
General expenses (including Insurance)	1,705	
Profit & Loss Account 30-6-1999		1,503
Dividend paid August 1999	500	
Interim Dividend paid Feb 2000	400	
Capital : 10000 Shares of Rs. 1 Fully paid		10,000
Debtors and Creditors	3,750	1,750
Plant & Machinery	2,900	
Cash in hand & at Bank	1,620	
Reserves		1,550
Loan to Managing Director	325	
Bad debts	158	
	50,303	50,303

You are required to prepare Trading Account profit & loss account for the year ended 30th June 2000 and the Balance Sheet as on that date giving consideration to the following facts.

(*a*) Stock on 30th June 2000 Rs. 8,200.
(*b*) Depreciate Machinery at 10% p.a.
(*c*) Reserve 5% discount on Debtors.
(*d*) Allow 2½% discount on Creditors.
(*e*) Provide Managing directors commission at 15% of the net profit before deducting his commission.
(*f*) One months rent at Rs. 45 per month was due on 30th June.
(*g*) Six months insurance included in general expenses was unexpired at Rs. 75 per annum.

[**Answer :** Gross Profit Rs. 6,200
Net Profit Rs. 2,083
Total of Balance Sheet Rs. 16,355.]

9

CHAPTER

DEPRECIATION ACCOUNTING

MEANING OF DEPRECIATION

Depreciation is the gradual and permanent decrease in the value of an asset from any cause. It has been defined as the diminution in intrinsic value of an asset due to its use or lapse of time. Pickles has defined it as the permanent and continuing diminution in the quality, quantity or value of an asset.

The American Institute of certified public accountants has defined Depreciation accounting as "System of accounting which aims to distribute the cost or other value of tangible capital assets less salvage (if any) over the estimated useful life of the asset in a systematic and rational manner". It is a process of allocation and not of valuation.

DEPLETION

Depletion or exhaustion refers to the reduction in the workable quantity of a wasting asset. For example, a forest gets depleted when timber is constantly used. Similarly a mine gets exhausted when the mineral contents are extracted and a time comes when it becomes valueless. This kind of loss is called depletion or exhaustion. Unlike depreciation, which is gradual, depletion is in steps and is not uniform over different periods.

OBSOLESCENCE

Obsolescence represents loss in the value of an asset on account of its becoming obsolete or out of date. Due to technological improvements or market changes production within existing machine may become unprofitable. The loss arising due to these factors is known as "obsolescence". It differs from depreciation in that it is a sudden loss while depreciation is a gradual loss.

FLUCTUATION

Fluctuation is a temporary variation in the market price of an asset due to the operation of the forces of demand and supply. The main points of distinction between depreciation and fluctuation are as follows :

Depreciation	*Fluctuation*
1. Depreciation is the permanent fall in the book value of an asset. 2. Depreciation is concerned with the book value of an asset. 3. Depreciation always represents a fall in the value of an asset. 4. Depreciation is concerned with the fixed - assets. 5. Depreciation is due to wear and tear, efflux of time, obsolescence etc.	1. Fluctuation is the temporary variation or change in the market value of an asset. 2. Fluctuation is concerned with the market value of an asset. 3. Fluctuation may represent either a fall or rise in the value of an asset. 4. Fluctuation is concerned with the floating assets. 5. Fluctuation is due to the operation of the forces of demand and supply in the market.

CAUSES FOR DEPRECIATION

The following are the causes for depreciation :

(*a*) **Wear and Tear :** When an asset is used it gets worn out. Its parts get loose or broken. Its production capacity or usefulness get reduced. Eventually it may become scrap.

(*b*) **Effect of time :** Certain assets like lease, patents or copy rights lose their value owing to passage of time.

(*c*) **Depletion :** Valuable contents of an asset like mine or quarry get reduced as their resources are extracted year after year and in course of time the entire asset becomes valueless.

(*d*) **Obsolescence :** Due to technological advancement an improved model of an asset is invented making old one uneconomical. So it has to be discarded resulting in loss.

(*e*) **Accident :** When an accident occurs and an asset is damaged or destroyed its value gets reduced or lost.

(*f*) **Permanent fall in the market value :** If the market price of an asset falls on a permanent basis there results a corresponding decline in the value of the asset in use.

OBJECTS OF DEPRECIATION

Depreciation is provided for serving the following objectives :

1. **For proper determination of profits.** When business is carried on by using an asset such an asset gets depreciated. Naturally the loss owing to depreciation should be set off against the income in order to determine the true profits.
2. **For ascertainment of cost of Production.** Depreciation is as much an item of production expense as wages, rent etc. though not visible. Hence for the correct ascertainment of cost of production depreciation should be taken into account.
3. **For replacement of Assets.** Providing depreciation ensures that amount required for replacement of an asset at the end of its useful life is made available without causing any strain on the finance of the business.
4. **For meeting legal requirement.** In case of Joint stock companies providing for depreciation is a statutory requirement before declaring dividend.

Factors to be taken into account while calculating depreciation :

The following factors are to be taken into account while providing depreciation.

(*a*) original cost of the asset.
(*b*) The estimated scrap or residual value of the asset.
(*c*) The estimated life of the asset.
(*d*) The chance of the asset becoming obsolete.
(*e*) The statute governing the provision of depreciation *viz*, the companies Act and the Income tax Act.
(*f*) Sometimes the interest that could have been earned had the money spent in acquiring the asset been invested in interest bearing securities is also taken into account.

METHODS OF RECORDING DEPRECIATION

Depreciation can be recorded in the books of accounts by two different methods :

(*a*) **When a provision for depreciation account is maintained :** Under this method the amount of depreciation to be charged in a particular year is debited to profit & loss account and credited to provision for depreciation account. The asset account appears in the books at original cost.
(*b*) **When provision for depreciation account is not maintained :** Under this method the amount of depreciation is debited to the depreciation account and credited to the asset account. The asset account thus appears in the books at written down value.

METHOD OF PROVIDING DEPRECIATION

The various method of providing depreciation are as follows :

(A) **Uniform charge method :**
  (*i*) Fixed Instalment method. (*ii*) Depletion method.
  (*iii*) Machine hour rate method.
(B) **Declining charge method :**
  (*i*) Diminishing balance method. (*ii*) Sum of years digits method.
  (*iii*) Double declining method.
(C) **Other method :**
  (*i*) Group depreciation method. (*ii*) Inventory system of depreciation.
  (*iii*) Depreciation fund method. (*iv*) Insurance policy method.
  (*v*) Annuity method.

(A) Uniform Charge Method

(*i*) **Fixed Instalment method :**

Under this method, the assets are depreciated at a fixed amount through out its life span. The amount of depreciation is calculated by dividing the value of an asset by the number of years of the estimated life of the machine. At the end of its life, the value of the asset will become zero. This method of depreciation is followed where the services rendered by the asset is uniform as in the case of furniture. The following formula is used for calculating depreciation.

$$\text{Depreciation} = \frac{\text{Original cost} - \text{Estimated scrap value}}{\text{Life of the asset in number of years}}$$

Advantages :

(*a*) It is simple to understand and apply.
(*b*) It is possible to reduce the value of the asset to zero under this method.

(*c*) For assets whose life is definite and assets not requiring much of repairs and maintenance, this method of depreciation is ideal.

Disadvantages :

(*a*) This method is not suitable for assets which require considerable expenditure on repairs and maintenance.
(*b*) This method ignores the degree of usage, age and efficiency of the asset.
(*c*) This method ignores interest on the amount invested in the purchase of the asset.

Problem 1. A company purchased a second hand plant for Rs. 30,000. It immediately spent on it Rs. 5,000. The plant was put to use on 1-1-1990. After having used it for 6 years, it was sold for Rs. 15,000. You are required to prepare the plant account for all the six years providing depreciation at 10% p. a. on original cost. **(Madras University, B Com. April 2000)**

Solution :

Plant A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
	To Cash a/c		31-12-90	By Depreciation	3,500
	— Purchase	30,000		$35{,}000 \times \frac{10}{100}$	
	To Cash a/c	5,000		By Balance c/d	31,500
	— Installation				
		35,000			35,000
1-1-91	To Balance b/d	31,500	31-1-91	By Depreciation	3,500
				By Balance c/d	28,000
		31,500			31,500
1-1-92	To Balance b/d	28,000	31-11-92	By Depreciation	3,500
				By Balance c/d	24,500
		28,000			28,000
1-1-93	To Balance b/d	24,500	31-11-93	By Depreciation	3,500
				By Balance c/d	21,000
		24,500			24,500
1-1-94	To Balance b/d	21,000	31-12-94	By Depreciation	3,500
				By Balance c/d	17,500
		21,000			21,000
1-1-95	To Balance b/d	17,500	31-12-95	By Depreciation	3,500
	To P& L a/c	1,000		By Cash — Sales	15,000
	(Profit of sale)				
		18,500			18,500

Working Note :

Calculation of profit or loss on sale of plant :

Cost of Machine	35,000

Less : Depreciation upto 6 years = 3,500 × 6 years books value	21,000
	14,000
Less : Sale value	15,000
Profit on sale	1,000

Problem 2. A trader purchased a machine on 1st January, 1990 at a cost of Rs. 50,000. It was estimated Rs. 5,000 as its scrap value and the life of the machine for 5 years. On 1st January, 1992 the machine was sold at Rs. 30,000 and another machine of the same type was purchased at a cost of Rs. 25,000 on that day. The scrap value of the machine was estimated at Rs. 3,000 and the life of the machine was 10 years. The installation cost of 1st and 2nd machine were Rs. 5,000 and Rs. 1,000 respectively. Show the machine a/c and depreciation a/c for 1990, 1991 and 1992. **(Calcutta University B. com. (Pass) 1999)**

Solution :

Machine A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-90	To Bank a/c (cost)	50,000	31-12-90	By Depreciation a/c	10,000
	To Bank a/c (Installation)	5,000		By Balance c/d	45,000
		55,000			55,000
1-1-91	To Balance b/d	45,000	31-12-91	By Depreciation a/c	10,000
				By Balance c/d	35,000
		45,000			45,000
1-1-92	To Balance b/d	35,000	31-12-92	By Bank a/c (sold)	30,000
	To Bank a/c (cost)	25,000		By P & L a/c (loss on sale)	5,000
	To Bank a/c (Installation)	1,000		By Depreciation a/c	2,300
				By Balance c/d	23,700
		61,000			61,000

Depreciation A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
31-12-90	To Machine a/c	10,000		By P & L a/c	10,000
31-12-91	To Machine a/c	10,000		By P & L a/c	10,000
31-12-92	To Machine a/c	2,300		By P & L a/c	2,300

Working note :

1. **Depreciation of the first machine per year :**

$$= \frac{\text{Cost price + Installation charges − Scrap value}}{\text{No. of years}}$$

$$= \frac{50{,}000 + 5{,}000 - 5{,}000}{5} = 10{,}000$$

2. Depreciation of the second machine per year

$$= \frac{25{,}000 + 10{,}000 - 3{,}000}{10} = 3{,}200$$

3. Profit or loss on sale of the first machine

$$[55{,}000 - (10{,}000 \times 2)] = 30{,}000$$

$$= \text{Loss Rs. } 5{,}000$$

Problem 3. A company whose accounting year is the calender year, purchased on 1st April 1992 machinery costing Rs. 30,000.

It purchased further machinery on 1st October 1992, costing Rs. 20,000 and on 1st July 1993 costing Rs. 10,000. On 1st January 1994, one-third of the machinery installed on 1st April 1992 became obsolete and was sold for Rs. 3,000.

Show how machinery account would appear in the books of the company if that machinery was depreciated by fixed instalment method at 10 percent annum. **(Madras University B.Com, October 1999)**

Solution :

Machinery A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-4-92	To Cash — Purchases	30,000	31-12-92	By Depreciation (2,250 + 500)	2,750
1-10-92	To Cash — Purchases	20,000		By Balance c/d	47,250
		50,000			50,000
1-1-93	To Balance c/d	47,250	31-12-93	By Depreciation (3,000 + 2,000 + 500)	5,500
1-7-93	To Cash — Purchases	10,000		By Balance c/d	51,750
		57,250			57,250
1-1-94	To Balance b/d	51,750	1-1-94	By Cash — Sale of machine	3,000
				By Loss on sale	5,250
			31-12-94	By Depreciation (2,000 + 2,000 + 1,000)	5,000
				By Balance c/d	38,500
		51,750			51,750

Working Note : Calculation of Depreciation

Date	*Particulars*	*Machine I*	*Machine II*	*Machine III*
1-4-92	Purchase	30,000	—	—
1-10-92	Purchase	—	20,000	—
31-12-92	**Depreciation :**			
	Machine — I $= 30,000 \times \frac{10}{100} \times \frac{1}{12}$	2,250	—	—
	Machine — II $= 20,000 \times \frac{10}{100} \times \frac{3}{12}$	—	500	—
		27,750	19,500	—
1-7-93	Purchase	—	—	10,000
31-12-93	**Depreciation**			
	Machine I $= 30,000 \times \frac{10}{100} \times 1\text{Yr}$	3,000	—	—
	Machine II $= 20,000 \times \frac{10}{100} \times 1\text{Yr}$	—	2,000	—
	Machine III $= 10,000 \times \frac{10}{100} \times \frac{6}{12}$	—	—	500
		24,750	17,500	9,500
		↓		
		$\frac{1}{3} \times 24,750 = 8,250$	$\frac{2}{3} \times 24,750 = 16,500$	
1-1-94				
	Loss : Sale of $\frac{1}{3}$rd Machine	3,000		
	Loss on Sale	5,250		
31-12-94	Depreciation :			
	Remaining $= \frac{2}{3} \times 30,000 = 20,000$			
	Machine I $\left(\frac{2}{3}\right)$			
	$= 20,000 \times \frac{10}{100} \times 1$ Yr	—	2,000	—
	Machine II			
	$= 20,000 \times \frac{10}{100} \times 1$ Yr	—	—	2,000
	Machine III			
	$= 10,000 \times \frac{10}{100} \times 1$ Yr	—	—	—
		Nil	14,500	15,500

(*ii*) Depletion Method : This method is adopted in such cases where it is possible to estimate the probable quantity of output available. Examples of such organisation are mines quarries etc. The following factors are taken into account while calculating depreciation.

(*a*) The total amount paid.
(*b*) Estimated quantity of output available.
(*c*) Actual quantity taken out during the said period.

The depreciation is calculated per unit. The formula used is

$$\text{Rate of Depreciation per unit} = \frac{\text{Total cost of the Asset}}{\text{Deworkable Deposit}}$$

The chief advantage of this method is depreiciation is related with the use of the asset.

(*iii*) Machine Hour Rate Method : Under this method depreciation is calculated on the basis time during, which the asset as used. Examples of assets which are depreciated under this method are machinery, vehicles etc. The following formula is used to calculate depreciation.

$$\text{Depreciation} = \frac{\text{Original cost of Asset} - \text{Scrap value}}{\text{Life of Asset in Hours}}$$

The main advantage of this method is it is related to "actual working time of the asset".

The main disadvantage of this method is that depreciation can be calculated only when the life of asset is measured in terms of hour.

(B) DECLINING CHARGE DEPRECIATION METHODS

The various methods under this category involves reduction in the amount of depreciation charged in subsequent years. These methods are as follows :

1. DIMINISHING BALANCE METHOD OR WRITTEN DOWN VALUE METHOD OR REDUCING BALANCE METHOD.

Under this method the depreciation is calculated every year on the diminishing value of the asset. For example, suppose the original value of asset is say Rs. 10,000 and the rate of depreciation is say 10 per cent. Then according to this method the asset will be depreciated by Rs. 1,000 in the first year. The diminished value of the asset in the second year will become Rs. 9,000. Then the depreciation for the second year will be charged on 9,000 which works out to Rs. 900 and this practice is continued till the end.

Advantages :

(*a*) For assets like machinery which requires increasing expenditure by way of repairs and maintenance as the assets advance in age this method is the most suitable. This is because while the amount charged by way of depreciation gradually declines the amount charged by way of repairs gradually increase so that the combined charge on the profit by these items will be more or less the same. This makes comparision of profits between different period meaningful.
(*b*) This method is simple to understand and easy to follow :

Disadvantages :

(*a*) The amount of depreciation charged differ from year to year.
(*b*) It is not possible to reduce the value of the asset to zero.

Problem 4. On the 1st January 1992, a limited company purchased a machinery for Rs. 12,000 and on 30th June 1993 it acquired additional machinery at a cost of Rs. 2,000. On 31st March 1994, one of the original machines which had cost Rs. 500 was found to have become obsolete and was sold as scrap for Rs. 50. It was replaced on that date by a new machine costing Rs. 800.

Depreciation to be provided @15% p.a. on the written down value. Show ledger accounts for the first three years. **(Madras University B. Com, May 1999)**

Solution :

Machinery A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-92	To Cash	12,000	31-11-92	By Depreciation	1,800
				By Balance c/d	10,200
		12,000			12,000
1-1-93	To Balance b/d	10,200	31-12-93	By Depreciation	1,680
30-6-93	To Cash	2,000		By Balance c/d	10,520
		12,200			12,200
1-1-94	To Balance b/d	10,520	31-12-94	By Cash (Sale of scrap)	50
31-3-94	To Cash	800		By Depreciation on Scrap machine (upto March 94)	14
				By P & L a/c (Loss)	297
				By Depreciation on remaining machine	1,614
				By Balance c/d	9,345
		11,320			11,320

Working Note :

1. Calculation of Depreciation

On 31-12-92 $= 12,000 \times \frac{15}{100} \times 1\text{yr}$ = 1,800

On 31-12-93 $= 12,000 - 1,800 = 10,200$

$= 10,200 \times \frac{15}{100}$ = 1,530

On 30-6-93 Additional machine

$= 2,000 \times \frac{15}{100} \times \frac{6}{12}$ = 150

1,680

On 31-3-94 **Depreciation on Scrap machine**

Cost of Original Machine 500

Less : Depreciation for 1992

$= 500 \times \frac{15}{100}$ 75

425

Less Depreciation for 1993

$= 425 \times \frac{15}{100}$ 64

	Book value on 1-1-94	361
	Less : Depreciation for 1994 (upto March 94)	
	$= 361 \times \frac{15}{100} \times \frac{3}{12}$	14
	Book value on 31-3-94.	347
	Sale of scrap	50
	Loss	297
on 31-12-94	**Depreciation on Remaining Machine**	
	Cost of original machine on 1-1-94	
	= (10,200 – 1,530)	8,670
	Add : Additional machine on 1-1-94 (2,000-150)	1,850
		10,520
	Less : Book value of scrap machine (sold)	361
		10,159
	$= 10,159 \times \frac{15}{100}$	1,524
	New additional machine on 31-3-1994	
	$= 800 \times \frac{15}{100} \times \frac{9}{12}$	90
	Depreciation on 31-12-94	1,614

Problem 5. X & Co., purchased a machine for Rs. 60,000 on 1st January 1994. On 1st July, 1995, X & Co., sold the machine for Rs. 45,000 and purchased another machine for Rs. 80,000. X & Co., charged depreciation @ 15% under diminishing balance method. The accounts of the business were closed every year on 31st December.

Short the Journal entries for 1994, 1995 and 1996 in the books of X & Co.,

(Calcutta University B. com. (Pass) 1997)

Solution :

Working Note

1. Depreciation for 1994 = $60,000 \times \frac{15}{100}$ = 9,000
2. Depreciation for 1995 = $(60,000 - 9,000) \times \frac{15}{100} \times \frac{6}{12}$ = 3,825
3. Loss on sale of machine = (60,000 – 9,000 – 3,825 – 45,000) = 2,175
4. Depreciation for 1995 for new machine = $80,000 \times \frac{15}{100} \times \frac{6}{12}$ = 6,000
5. Total Depreciation for 1995 (old + new) = 3,825 + 6,000 = 9,855
6. Depreciation for 1,996 = $(80,000 - 6,000) \times \frac{15}{100} \times \frac{6}{12}$ = 11,100

Journal Entries
In the books of X & Co.

Date	*Particulars*		*Dr. Amount*	*Cr. Amount*
1-1-94	Machine a/c	Dr.	60,000	
	To Bank a/c			60,000
	(Being machine purchased for cash)			
31-12-94	Depreciation a/c	Dr.	9,000	
	To Machine a/c			9,000
	(Being depreciation charged on machinery @ 15% on diminishing balance method)			
31-12-94	Profit & loss a/c	Dr.	9,000	
	To Depreciation a/c			9,000
	(Being depreciation transferred to Profit & Loss a/c)			
1-7-95	Depreciation a/c	Dr.	3,825	
	To Machine a/c			3,825
	(Being depreciation charged @ 15% on machine for 6 months)			
1-7-95	Bank a/c	Dr.	45,000	
	To Machine a/c			45,000
	(Being the machine sold for cash)			
1-7-95	Profit & loss a/c	Dr.	2,175	
	To Machine a/c			2,175
	(Being the loss on sale of Machinery transferred)			
1-7-95	Machine a/c	Dr.	80,000	
	To Bank a/c			80,000
	(Being new machine purchased for cash)			
31-12-95	Depreciation a/c	Dr.	6,000	
	To Machine a/c			6,000
	(Being depreciation charged on new machine @ 15% for 6 months)			
31-12-95	P & L a/c	Dr.	9,825	
	To Depreciation a/c			9,825
	(Being the depreciation transferred to P & L a/c)			
31-12-96	Depreciation a/c	Dr.	11,100	
	To Machine a/c			11,100
	(Being depreciation charged @ 15% on machine)			
31-12-96	Profit & Loss a/c	Dr.	11,100	
	To Depreciation a/c			11,100
	(Being depreciation transferred to P & L a/c)			

(*i*) **Sum of years digits method :** Under this method also the depreciation goes on decreasing every year. The following formula is used.

$$\frac{\text{Remaining life of the asset(taking into account the current year)}}{\text{Sum of the digits of the life of the Assets in years}} \times \text{Cost of acquiring the asset}$$

(*c*) **Other methods :**

(*i*) **Group Depreciation method :** Under this method, all assets having same average life expectancy are grouped together Depreciation is charged for the group of assets as a whole but not on each machine.

(*ii*) **Inventory system of depreciation :-** This method is adopted in case of assets whose value is small as in the case of tools, cattle etc. The following procedure is followed in calculating depreciation.

	Value of asset at the beginning of the year	X X
Add:	Additions during the year	X X
		X X
Less :	Value of asset at the end year	X X
	Depreciation for the year	X X

(*iii*) **Depreciation fund method or sinking fund method :** Under this method to facilitate ready replacement of asset without facing a financial problem, the depreciation amount is set aside from the divisible profit every year and a fund known as depreciation fund is created. The fund is invested in good securities. At the time of replacing the asset the securities are sold out and the sale proceeds are utilised for the purchase of the new asset. The following journal entries are passed :

(A) **At the end of first year :**

1. For setting aside the amount of depreciation :
   Depreciation a/c Dr.
   To Depreciation fund a/c

2. For investing the amount of depreciation :
   Depreciation fund Investment a/c Dr.
   To Bank a/c

Note : The depreciation a/c is shown on the debit side of P & L a/c. The Depreciation fund a/c is shown on the liability side of Balance Sheet and Depreciation Fund Investment a/c is shown on the asset side of Balance sheet.

(B) **In the second and subsequent years :**

(*i*) For interest received on Investment
Bank a/c Dr.
To Interest on Depreciation fund Investment a/c

(*ii*) For transferring interest to depreciation fund account.
Interest on depreciation fund Investment a/c Dr.
To Depreciation fund a/c

Note : The above two entries may be combined as follows :

Bank a/c Dr.
To Depreciation fund a/c

(*iii*) For annual instalment of depreciation.
Depreciation a/c Dr.
To Depreciation Fund a/c

(*iv*) For investing the amount of depreciation and interest received on investment.
Depreciation fund investment a/c Dr.
To Bank a/c

(C) **At the end of the last year :** In the last year entries Nos (*i*), (*ii*) and (*iii*) are repeated. The following additional entries are passed.

(*i*) For sale of investment
Bank a/c Dr.
To Dep. fund Investment a/c

(*ii*) For transfer of profit or loss on sale of investment

(*a*) **In case of profit :**
Dep. fund Investment a/c Dr.
To Dep. fund a/c

(*b*) **In case of loss :**
Dep. fund a/c Dr.
To Dep. fund Investment a/c

(*iii*) For recording sale of old asset
Bank a/c Dr.
To Old asset a/c

(*iv*) For transferring depreciation fund a/c to old asset a/c
Depreciation fund a/c Dr.
To Old asset a/c

(*v*) The balance in the old asset a/c represents profit & loss. It will be transferred to P & L a/c.

(*vi*) For purchase of new asset
New asset a/c Dr.
To Bank

Problem 6. A company purchased a machinery for Rs. 25,000 on 1-1-1994. It was decided to make provision of depreciation by means of Depreciation fund. The final investments were expected to fetch interest at 3% p.a. According to depreciation table Rs. 8,088.25 to be invested annually. At the end of the third year the investments realised Rs. 16,400.

Pass Journal entries to record the above transactions and prepare depreciation fund a/c and depreciation fund Investment a/c.

Solution :

Journal Entries

Date	*Particulars*		*Dr. Amount*	*Cr. Amount*
1994				
Jan. 1	Machinery a/c	Dr.	25,000.00	
	To Bank a/c			25,000.00
	(Being machinery purchased)			
Dec. 31	Depreciation a/c	Dr.	8,088.25	
	To Depreciation fund a/c			8,088.25
	(Being the annual depreciation charged)			
Dec. 31	Depreciation fund Investment a/c	Dr.	8,088.25	
	To Bank			8,088.25
	(Being the amount of depreciation fund invested)			

Date	*Particulars*		*Dr. Amount*	*Cr. Amount*
1995	Bank a/c	Dr.	242.65	
Dec. 31	To Depreciation fund a/c			242.65
	(Being the interest received on Investment credited to fund a/c)			
	Depreciation a/c	Dr.	8,088.25	
	To Depreciation fund a/c			8,088.25
	(Being the annual depreciation amount set aside)			
	Depreciation fund Investment a/c	Dr.	8,330.90	
	To Bank a/c			8,330.90
	(Being amount invested including current years. Depreciation of 8088.25 and interest of Rs. 242.65)			
1996	Bank a/c	Dr.	492.57	
Dec. 31	To Depreciation fund a/c			492.57
	(Being interest received credited to fund a/c)			
	Depreciation a/c	Dr.	8,088.28	
	To Depreciation fund a/c			8,088.28
	(Being annual depreciation)			
	Bank a/c	Dr.	16,400.00	
	To Depreciation fund Investment a/c			16,400.00
	(Being investments realised)			
	Depreciation fund a/c	Dr.	19.15	
	To Depreciation fund Investment a/c			19.15
	(Being the loss on sale of investment transferred)			
	Depreciation fund a/c	Dr.	25,000.00	
	To Machinery a/c			25,000.00
	(Being machinery written off by transfer to fund a/c)			
	Profit & loss a/c	Dr.	19.15	
	To Depreciation fund a/c			19.15
	(Being balance in depreciation fund a/c transferred to P & L a/c)			

Machinery A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-94	To Bank	25,000	31-12-94	By Balance c/d	25,000
1-1-95	To Balance b/d	25,000	31-12-95	By Balance c/d	25,000
1-1-96	To Balance b/d	25,000	31-12-96	By Depreciation fund a/c (Transfer)	25,000
		25,000			25,000

Depreciation on A/c

Date	Particulars	Amount	Date	Particulars	Amount
31-12-94	To Dep. fund a/c	8,088.25	31-12-94	By P & L a/c	8,088.25
31-12-95	To Dep. fund a/c	8,088.25		By P & L a/c	8,088.25
31-12-96	To Dep. fund a/c	8,088.25		By P & L a/c	8,088.25

Depreciation Fund A/c

Date	Particulars	Amount	Date	Particulars	Amount
31-12-94	To Balance c/d	8,088.25	31-12-94	By Depreciation a/c	8,088.25
31-12-95	To Balance c/d	16,419.15	1-1-95	By balance b/d	8,088.25
				By Interest on dep. Fund Investment	
				$8,088.25 \times \frac{3}{100}$	242.65
				By Depreciation	8,088.25
		16,419.15			16,419.15
31-12-96	To Machinery a/c	25,000.00	1-1-96	By Balance b/d	16,419.15
	To Dep. fund Investment a/c	19.15		By Interest on Dep. fund Investment	492.57
	(loss transferred)			$16,419.15 \times \frac{3}{100}$	
				By Depreciation (See note -1)	8,088.28
				By P & L a/c (See note-2)	19.15
		25,019.15			25,019.15

Depreciation Fund Investment A/c

Date	Particulars	Amount	Date	Particulars	Amount
31-12-94	To Bank	8,088.25	31-12-94	By Balance c/d	8,088.25
1-1-95	To Balance b/d	8,088.25	31-12-95	By Balance c/d	16,419.15
31-12-95	To Bank (8,088.25 + 242.65)	8,330.90			
		16,419.15			16,419.15
1-1-96	To Balance b/d	16,419.15	31-12-96	By Bank	16,400.00
				By Dep. fund a/c (loss on realisation)	19.15
		16,419.15			16,419.15

Interest on Depreciation Fund Investment A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
31-12-94	To Dep. fund a/c	242.65	31-12-94	By Bank a/c	242.65
31-12-95	To Dep. fund a/c	492.57	31-12-95	By Bank a/c	492.57

Working notes :

1. In order to make the amount Rs. 25,000, the investment made is Rs. 8,088.28 instead of Rs. 8,088.25.
2. Balance in the Depreciation fund a/c is transferred to P & L a/c. This balance is arrived at as follows :

	Value of Investment realised	16,400.00
Add :	Investment for 1996	8,088.25
		24,980.85
Less :	Balance in fund a/c	25,000.00
	Balance in fund a/c	19.15

Problem 7. A concern maintains sinking fund for replacement of machinery. The balance in the relevant account on 1-1-98 are :

	Rs.
Sinking fund	2,50,000
10% sinking fund Investment (Nominal : Rs. 3,00,000)	2,50,000
Machinery at cost	3,00,000

Annual contribution to sinking fund is Rs. 20,000. The investment are sold on 1-1-99 at a net price of 80% of the nominal value. The old machinery is sold for Rs. 30,000 on 1-1-99 and new machinery is purchased for Rs. 3,40,000.

Show ledger accounts in the books of the concern **(Calcutta University B.com (Hons.) 2000)**

Solution :

Sinking Fund

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
31-12-98	To Balance c/d	2,95,000	1-1-98	By Balance b/d	2,50,000
			31-12-98	By Interest a/c	25,000
				By P & L a/c	20,000
		2,95,000			2,95,000
1-1-99	To Sinking fund Investment a/c (Balance transferred)	55,000	1-1-99	By Balance b/d	2,95,000
		2,95,000			2,95,000

10% Sinking Fund Investments A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-98	To Balance b/d	2,50,000	31-12-98	By Balance c/d	2,95,000
31-12-98	To Bank a/c (Annual contribut ion together with (interest)	45,000			
		2,95,000			2,95,000
1-1-99	To Balance b/d	2,95,000	1-1-99	By Bank a/c (asset old)	2,40,000
				By Sinking fund a/c (loss on sale)	55,000
		2,95,000			2,95,000

Machinery A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-98	To Balance b/d	3,00,000	31-12-98	By Balance c/d	3,00,000
1-1-99	To Balance b/d	3,00,000	1-1-99	By Bank a/c (sold)	30,000
	To Bank a/c (Purchase)	3,40,000		By Sinking fund a/c	2,40,000
				By P & L a/c (Loss on sale)	30,000
				By Balance c/d	3,40,000
		6,40,000			6,40,000

(*iv*) **Insurance Policy method :** Under this method in order to provide for replacement of the asset at the end of its useful life an amount equal to annual depreciation charged is used to pay premium on insurance policy. At the end of the period the insurance company agrees to pay policy value, which is used in purchasing a new asset. The following entries are involved :

(A) **First and subsequent years :** In the beginning of the year for paying insurance premium.

Depreciation Insurance policy a/c Dr.
To Bank a/c

At the end of the year

Profit & loss a/c Dr.
To depreciation reserve a/c

(B) **At the end of the last year :** When money is received from Insurance Co.

Bank a/c Dr.
To Depriciation Insurance Policy a/c :

For transfer of profit on insurance policy

Dep. Insurance policy a/c Dr.
To Depreciation reserve a/c

For transfer of accumulated depreciation to the asset a/c

Depreciation reserve a/c Dr.
To Asset a/c

When new asset is purchased

New asset a/c Dr.
To Bank a/c

Problem 8. A firm purchases a lease for 3 years for 30,000 on 1-1-1997. It decided to provide for its replacement by means of Insurance policy for Rs. 30,000. The annual premium is Rs. 9,500 on 1-1-2000. The lease is renewed for a further period of 3 years for Rs. 30,000. Pass the necessary Journal entries and prepare various ledger accounts to record the above transactions.

Solution :

Journal Entries

Date	*Particulars*		*Dr. Amount*	*Cr. Amount*
1-1-97	Depreciation Insurance policy a/c	Dr.	9,500	
	To Bank a/c			9,500
	(Being the insurance premium paid)			
31-12-97	P & L a/c	Dr.	9,500	
	To Depreciation reserve a/c			9,500
	(Being depreciation provided out of profit)			
1-1-98	Dep. Insurance policy a/c	Dr.	9,500	
	To Bank a/c			9,500
	(Being depreciation provided out of profit)			
31-12-98	P & L a/c	Dr.	9,500	
	To Dep. reserve a/c			9,500
	(Being depreciation provided out of profit)			
31-12-99	Bank a/c	Dr.	30,000	
	To Dep. Insurance policy a/c			30,000
	(Being the receipt of the policy amount on maturity)			
	Dep. Insurance policy a/c	Dr.	1,500	
	To Dep. reserve a/c			1,500
	(Being the transfer of profit on Insurance policy)			
	Depreciation Reserve a/c	Dr.	30,000	
	To Lease a/c			30,000
	(Being transfer of accumulated depreciation to lease a/c)			
1-1-2000	New Lease a/c	Dr.	30,000	
	To Bank a/c			30,000
	(Being lease renewed for further 3 years)			

Lease A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-97	To Bank	30,000	31-12-97	By Balance c/d	30,000
1-1-98	To Balance b/d	30,000	31-12-98	By Balance c/d	30,000
1-1-99	To Balance b/d	30,000	31-12-99	By Dep. reserve a/c	30,000

Depreciation Reserve A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
31-12-97	To Balance c/d	9,500	31-12-97	By P& L a/c	9,500
31-12-98	To Balance c/d	19,000	1-1-98	By Balance b/d	9,500
			31-12-98	By P & L a/c	9,500
		19,000			19,000
31-12-99	To Lease a/c	30,000	1-1-99	By Balance b/d	19,000
				By P & L a/c	9,500
				By Insurance policy a/c	1,500
		30,000			30,000

Dep. Insurance Policy A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-97	To Bank — Premium	9,500	31-12-97	By Balance c/d	9,500
1-1-98	To Balance b/d	9,500	31-12-98	By Balance c/d	19,000
	To Bank — Premium	9,500			
		19,000			19,000
1-1-99	To Balance b/d	19,000	31-12-99	By Bank — Policy realised	30,000
	To Bank — Premium	9,500			
31-12-99	To Dep. Reserve a/c	1,500			
		30,000			30,000

(*v*) **Annuity method :** This method is based on the presumption that when an asset is used in a business the total loss to the business during the life of the asset is not only the original cost of the asset but also the interest which could have been otherwise earned had the money spent in the acquisition of the asset was invested in interest bearing securities. So under this system not only the original cost of the asset but also the interest on the money invested on the asset is written off as depreciation over the life of the asset. The amount of depreciation is uniform and is determined on the basis of annuity table. The following Journal entries are passed.

1. When the asset is purchased
   Asset a/c Dr.
   To Bank
2. When interest is charged to the asset
   Asset a/c Dr.
   To Interest a/c
3. When depreciation is charged
   Depreciation a/c Dr.
   To Asset a/c
4. When interest a/c is transferred to P & L a/c
   Interest a/c Dr.
   To P & L a/c

5. When depreciation a/c is transferred to P & L a/c.
   P & L a/c Dr.
   To Depreciation a/c

Problem 9. Vikrant tyres took a property on lease for Rs. 60,000 for 5 years on 1-1-95. It was decided to charge depreciation on Annuity method. As per annuity table Re. 1 for 5 years at 5% p.a. would be Re. 0.230975.

Show the lease account and Interest a/c for 5 years.

Solution :

Working Note

Annual charge to depreciation is :

Re. 0.230975 × Rs. 60,000 = Rs. 13,858.50

Lease A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-1-95	To Bank a/c	60,000.00	31-12-95	By depreciation	13,858.50
31-12-95	To Interest a/c	3,000.00		By Balance c/d	49,141.50
	$= 60{,}000 \times \frac{5}{100}$				
		63,000.00			63,000.00
1-1-96	To Balance b/d	49,141.50	31-12-96	By depreciation	13,858.50
	To Interest	2,457.10		To Balance c/d	37,740.10
	$= 49{,}141.50 \times \frac{5}{100}$				
		51,598.60			51,598.60
1-1-97	To Balance b/d	37,740.10	31-12-97	By Depreciation	13,858.50
31-12-97	To Interest	1,887.00		By Balance c/d	25,768.60
	$= 37{,}740.10 \times \frac{5}{100}$				
		39,627.10			39,627.10
1-1-98	To Balance b/d	25,768.60	31-12-98	By Depreciation	13,858.50
31-12-98	To Interest	1,288.45		By Balance c/d	13,198.55
	$= 25{,}768.60 \times \frac{5}{100}$				
		27,057.05			27,057.05
1-1-99	To Balance b/d	13,198.55	31-12-99	By Depreciation	13,858.50
31-12-99	To Interest	659.50			
	$= 13{,}198.55 \times \frac{5}{100}$				
		13,858.50			13,858.50

Interest A/c

Date	Particulars	Amount	Date	Particulars	Amount
31-12-95	To P & L a/c	3,000.00	31-12-95	By Lease a/c	3,000.00
31-12-96	To P & L a/c	2,457.10	31-12-96	By Lease a/c	2,457.10
31-12-97	To P & L a/c	1,887.00	31-12-97	By Lease a/c	1,887.00
31-12-98	To P & L a/c	1,288.45	31-12-98	By Lease a/c	1,288.45
31-12-99	To P & L a/c	659.95	31-12-98	By Lease a/c	659.95

CHANGE OF METHOD

In order to get consistency in the profit and loss a/c it is necessary to follow the same method of depreciation through out the life of the business. Sometimes the method of depreciation is changed and such a change may be effected either from the year of change or with retrospective effect.

Problem 10. X company purchased a machine on 1st April 1995, for 1,60,000 on October 1 1996, another machine was purchased for Rs. 1,04,000. On October 1, 1997 the first machine was sold for Rs. 1,20,000. On the same date another machine was purchased for Rs. 1,00,000. On October 1 1998, the second machine was sold for Rs. 92,000.

Rate of depreciation was 10% on original cost annually on 31st March. In 1998, the method of charging depreciation was changed to diminishing balance method, the rate being 15%.

Prepare machine account for the years ending 31st March 1996, 1997, 1998 and 1999.

(Delhi University, B.Com (Hons.) 1999)

Solution :

Machinery A/c for 31-3-1996

Date	Particulars	Amount	Date	Particulars	Amount
1-4-95	To Vendor's a/c	1,60,000	31-3-96	By Depreciation a/c on machine — I (10% p.a. SLM)	16,000
			31-3-96	By Balance c/d Machine I	1,44,000
		1,60,000			1,60,000

Machinery A/c for 31-3-97

Date	Particulars	Amount	Date	Particulars	Amount
1-4-96	To Balance b/d Machine I	1,44,000	31-3-97	By Depreciation a/c Machine I	16,000
1-10-96	To Vendor a/c Machine II	1,04,000		(@ 10% p.a. SLM) Machine II (@ 10% p.a. S.L.M for 6 months)	5,200
			31-3-97	By Balance c/d Machine I	1,28,000
				Machine II	98,800
		2,48,000			2,48,000

Machinery A/c for 31-3-98

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-4-97	To Balance b/d		1-10-97	By Depreciation a/c	
	Machine I	1,28,000		Machine I	8,000
	Machine II	98,000		(@ 10% p.a. SLM for 6	
1-10-97	To Vendor's a/c			months)	
	Machine III	1,00,000	1-10-97	By Bank a/c	1,20,000
				By Depreciation a/c	
				Machine II	10,400
				(@ 10% p.a. SLM)	
				Machine III	5,000
				(@ 10% p.a. SLM	
				for 6 months)	
			31-3-98	By Balance c/d	
				Machine II	88,400
				Machine III	95,000
		3,26,800			3,26,800

Machinery A/c for 31-3-99

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-4-98	To Balance b/d		1-10-98	By Depreciation a/c	
	Machine I	Nil		Machine II	6,630
	Machine II	88,400		(@ 15% p.a. DBM	
	Machine III	9,50,00		for 6 months)	
1-10-98	To Profit on sale of		1-10-98	By Bank a/c	92,000
	Machine II a/c	10,230	31-3-99	By Depreciation a/c	
				Machine III	14,250
				(@ 15% p.a. DBM)	
			31-3-99	By Balance c/d	
				Machine III	80,750
		1,93,630			1,93,630

Note : It is mentioned in the problem that depreciation method is changed from 1st April 1998. So DBM @ 15% p.a. is applied on machine II as well which is sold on 1-10-98 making a profit on its sale of Rs. 10,230.

Problem 11. Deva Ltd. charges depreciation on its plant and machinery @ 10% per annum on the diminishing balance method. On 31st March 2,000 the company decides to adopt straight line method of charging depreciation with retrospective effect from 1st April 1996, the rate of depreciation being 15%. On 1st April the Plant and Machinery account stood in the books at Rs. 2,91,600. On 1st July 1999, a sum of Rs. 65,000 was realised by selling a machine, cost of which on 1st April 1996 was Rs. 90,000. On 1st January 2000 a new machine was acquired at a cost of Rs. 1,50.000.

Show the Plant and Machinery a/c in the books of the company for the year ended 31st 2000

(CS Foundation, June 2000)

Solution :

Plant and Machinery A/c

Date	*Particulars*	*Amount*	*Date*	*Particulars*	*Amount*
1-4-99	To Balance b/d	2,91,600	1-7-99	By Bank	65,000
1-7-99	To P & L a/c (Profit on sale)	1,030		By Depreciation a/c (On machinery sold)	1,640
1-1-2000	To Bank — Purchase of new machine	1,50,000	31-3-2000	By P & L a/c (additional depreciation)	55,490
				By Depreciation a/c (Old Machine)	46,500
				By Depreciation a/c (on new machine)	5,625
				By Balance c/d	2,68,375
		4,42,630			4,42,630

Working Notes :

1. If cost of machinery is 100 on 1st April 1996, written down value of Machinery on 1st April 1999 @ 10% depreciation on diminishing balance method will be = Rs. 100-10-9-8.1 = Rs. 72.9.
2. **Calculation of profit or loss on sale of machinery :**

	Cost of machinery on 1-4-1996	90,000
	Written down value on 1-4-1999	
	$= 90,000 \times \frac{72.9}{100}$	65,610
Less :	Depreciation from 1st April 1999 till 1st July 1999	
	$= 65,610 \times \frac{3}{12} \times \frac{10}{100}$	1,640
	Written down value on 1-7-99	63,970
	Sale proceeds	65,000

Profit on sale = Rs. 65,000 – 63,970 = Rs. 1,030

3. **Additional Depreciation :**

	Written down value of machinery on 1st April 1996	2,91,600
	Cost on 1st April 1996	
	$= 2,91,600 \times \frac{100}{72.9}$	4,00,000
Less :	Cost of machinery sold	90,000
	Cost of remaining machinery	3,10,000
	Written down value of remaining machinery on 1st April 1999	
	$= 3,10,000 \times \frac{72.9}{100}$	2,25,900
	Cost of remaining machines as on 1-4-96 =	3,10,000
Less :	Depreciation for three years @ 15% p.a. on straight the method	

$= 3,10,000 \times \frac{45}{100} =$	1,30,500
Written down value as per new method	1,70,500

Additional depreciation to be debited to profit and loss account.
= 2,25,990 – 1,70,500 = Rs. 55,490

4. Depreciation on Rs. 3,10,000 @ 15% for full year = Rs. 46,500
5. Depreciation on Rs. 1,50,000 @ 15% for three months.

$$= 1,50,000 \times \frac{15}{100} \times \frac{3}{12} = \text{Rs. } 5,625$$

Accounting Standard 6 (Revised) Depreciation Accounting

Accounting standard-6 applies to all depreciable assets except the following items to which special considerations apply :

1. Forest, plantation or similar regenerative natural resources.
2. Wasting assets including expenditure on the exploration for and extraction of mineral oil, natural gas and similar non- regenerative resources.
3. Expenditure on research and development.
4. Goodwill.
5. Livestock.

And also land unless it has. a limited useful life for the enterprise.

Definitions :

(*a*) **Depreciation :** Depreciation is a measure of the wearing out, consumption or other loss of value of a depreciable asset arising from use, effluxion of time or obsolescence through technology and market changes. Depreciation is allocated so as to charge a fair proportion of the depreciable amount in each accounting period during the expected useful life of the asset. Depreciation includes amortisation of assets whose useful life is predetermined.

Depreciable assets :

Depreciable assets are assets which

(*i*) are expected to be used during more than one accounting period.
(*ii*) have a limited useful life and
(*iii*) use held by an enterprise for use in the production or supply of goods and services, for rental to others or for administrative purposes and not for the purpose of sale in the ordinary course of business.

Useful Life :

Useful life is either (*i*) The period over which a depreciable asset is expected to be used by the enterprise or (*ii*) The number of production or similar units expected to be obtained from the use of the asset by the enterprise.

Depreciable amount :

Depreciable amount of a depreciable asset is its historical cost or other amount substituted for historical cost in the financial statements, less the estimated residual value.

Accounting standard :

1. The depreciable amount of a depreciable asset should be allocated on a systematic basis to each accounting period during the useful life of the asset.

2. The depreciation method selected should be applied consistently from period to period. A change from one method of providing depreciation to another should made only if the adoption of the new method is required by statute or for compliance with an accounting standard or if it is considered that the change would result in more appropriate preparation or presentation of the financial statements of the enterprise. When such a change in the method of depreciation is made. Depreciation should be recalculated in accordance with the new method form the date of the asset coming into use. The deficiency of surplus rasing from retrospective recomputation of depreciation in accordance with the new method should be adjusted in the accounts in the year in which the method of depreciation is charged. In case the change in the method results in deficiency in depreciation in respect of past years, the deficiency should be charged in the statement of profit and loss. In case the change in the method results in surplus, the surplus should be credited to the statement of profit and loss. Such a change should be treated as a change in accounting policy and its effect should be quantified and disclosed.
3. The useful life of a depreciable asset should be estimated after considering the following factors :
   (*i*) Expected physical wear and tear.
   (*ii*) Obsolescence.
   (*iii*) Legal or other limits on the use of the asset.
4. The useful lives of major depreciable assets or classes of depreciable assets may be revienied periodically. Where there is a revision of the estimated useful life of an asset, the unamortised depreciable amount should be charged over the revised remaining useful life.
5. Any addition or extension which becomes an integral part of the existing asset should be depreciated over the remaining useful life of that asset. The depreciation on such addition or extension may also be provided at the rate applied to existing asset. Where an addition or extension retains a separate identity and is capable of being used after the existing asset is disposed of depreciation should be provided independently on the basis of an estimate of its own useful life.
6. Where the historical cost of a depreciable asset has undergone a change due to increase or decrease in the long term liability on account of exchange fluctuations, price adjustments, changes in duties or similar factors the depreciation on the revised unamortised depreciable amount should be provided prospectively over the residual useful life of the asset.
7. Where the depreciable assets are revalued the provision for depreciation should be based on the revalued amount and on the estimate of the remaining useful lives of such assets. In the case the revaluation has a material effect on the amount of depreciation, the same should be disclosed separately in the year in which revaluation is carried out.
8. If any depreciable asset is disposed of, discarded, demolished or destroyed the net surplus or deficiency, if material, should be disclosed separately.
9. The following information should be disclosed in the financial statements.
   (*i*) The historical cost or other amount substituted for historical cost of each class of depreciable assets.
   (*ii*) Total depreciation for the period for each class of assets and
   (*iii*) The related accumulated depreciation.
10. The following information should also be disclosed in the financial statements along with the discloser of other accounting policies.
   (*i*) Depreciation method used.
   (*ii*) Depreciation rates.

QUESTIONS

1. What is depreciation ?
2. What is depletion ?

3. What is obsolescence ?
4. What is "straight line method" of charging depreciation ?
5. What do you mean by "diminishing balance method" ?
6. Give the meaning of "Revaluation method" of depreciation.
7. What is "Annuity method" of depreciation ?
8. What is "Sinking fund " method of depreciation ?
9. What is "Insurance policy method" of depreciation ?
10. Write a note on " Machine hour method" of depreciation ?

EXERCISE 1

(Straight Line Method)

Jain Bros. acquired a machine on 1st July 2000 at a cost of Rs. 14,000 and spent Rs. 1,000 on its installation. The firm writes off depreciation at 10% of the original cost every year. The books are closed on 31st December every year. On 31st March 2003 the machine is sold for Rs. 9,500. Show the machinery account and depreciation account. [**Answer :** Machinery a/c total for the year 2003 is Rs. 11,250].

EXERCISE 2

(Diminishing Balance Method)

The Machinery account of a factory showed a balance of Rs. 3,80,000 on 1st January 1997. The accounts are closed every year on 31st December. Depreciation is written off @ 10% on diminishing balance. On 1st June 1997 new machinery was acquired at a cost of Rs. 57,783 and on the same date a machine which had cost Rs. 12,000 on 1st January 1992 was sold for Rs. 1,500 and another machine which had cost Rs. 1,200 on 1st January 1993 was scraped without realising anything. Show the machinery a/c for the year 1997.

(University of Madras B. com, May 1998)

[**Answer.** Total of Machinery a/c for 1993 Rs. 4,37,783].

EXERCISE 3

(Annuity Method)

On 1st January 1999 a company purchased a lease for a term of 4 years costing Rs. 20,000. You find from the annuity tables that in order to write off the lease on annuity method at 5% interest per annum, the amount to be written off annually as depreciation amounts to Rs. 5,640.34. Show the lease a/c for 4 years.

[**Answer.** Total of lease a/c for the year 2003 is Rs. 5,640.24].

EXERCISE 4

(Sinking Fund Method)

Mysore tyres company Ltd. Purchased a machinery on 1-1-2000 for Rs. 50,000 and decided to make a provision or it replacement by means of depreciation fund. The investment yield 4% per annum. According to the sinking fund tables Rs. 11,774.50 are to be invested annually. At the end of the fourth year the investments realised Rs. 36,700.

Show the depreciation fund a/c, depreciation fund investment a/c and the machinery a/c.

[**Answer.** Total of depreciation fund a/c on 2002 is Rs. 36,755.30].

EXERCISE 5

(Insurance Policy Method)

A firm purchased an machine for Rs. 1,00,000 on 1-1-2000. It was dicided to replace the machine at the end of the 4th year. For this purpose an insurance policy was taken, the annual premium being Rs. 22,000.

Prepare (1) Insurance policy a/c (2) Depreciation fund a/c (3) Machinery account.

[**Answer.** Total of Insurance policy a/c on 2003, Rs. 1,00,000.
Total of Depreciation fund a/c on 2003 Rs. 1,00,000].

10

CHAPTER

INVENTORY VALUATION

Inventory means stock in trade. Some people treat it as only stock of finished good, but it also includes the stock of materials and stores used for production purpose. The Institute of Chartered Accounants of India defines the term inventories as tangible property held :

(*i*) for sale in the ordinary course of business
(*ii*) in the process of production for such sale, or
(*iii*) for consumption in the production of goods or services for sale including maintenance supplies and consumables other than machinery spares.

Thus, in addition to stock of finished goods and raw materials, consumable stores, work-in-progress are also included in inventories. Spare parts of machinery are also sometimes included but many people treat them separately.

Importance of Inventory Valuation

Inventory is a property of the firm. In order to present the financial position of the firm properly this asset must also be included along with other assets and obviously at a fair valuation. Inventories represent costs incurred in the current year against which sales will take place next year. Therefore, such costs are carried forward to the next year by way of closing stock this year which will become the opening stock next year and debited to the trading acount then. That the value has to be arrived at carefully is clear from the fact that the amount directly affects the profit or loss shown by the profit and loss account. Take any trading and profit and loss account, change the amount shown as closing stock and then the amount of net profit shown will change exactly by the amount of change in the closing stock. Thus, if the value put on the closing stock is not proper, both the profit and loss account and the balance sheet will cease to be accurate.

Basic Principle

The principle of conservation demands that no anticipated profit is taken into account but that losses, likely to arise from transactions already entered into should be considered while ascertaining profit or loss for the year concerned. In regard to inventories, this principle means that inventories should be valued at cost or market price whichever is less. Thus, if some goods are purchased at say, Rs. 20 per unit, the closing stock of the goods will be valued at Rs. 20 per unit even if the selling price is higher. But if the selling price is say, only Rs. 19, then the closing stock will be valued at only Rs. 19 per unit. To this there is an exception ; the closing stock of finished goods in the case of plantations (tea, coffee, or rubber) is always valued at the market price.

"Market price" really means net realisable value in the ordinary course of business. Thus, if some expenses are to be incurred by the seller, such as on packing, freight or commission, the amount of such

expenses should be deducted from the market price. Suppose an article is purchased at Rs. 20 per unit ; the selling price is Rs. 22 per unit but Rs. 3 must be spent on packing, forwarding etc., the net realisable value will be Rs. 19 and then the closing stock must be valued at Rs. 19 per unit and not at Rs. 20 per unit.

In the case of raw materials, market price means replacement cost, i.e., the price at which fresh stocks can be purchased. Till recently, the rule was that new material stocks should be valued at cost or replacement cost whichever is lower. For example, if the purchase cost of materials was Rs. 10 but now the same material is available @ Rs. 9.50 and hence the same material should be valued at Rs. 9.50 and not at Rs. 10. But there is now a change in thinking in this regard. Now normal stock of raw material should be valued at cost, even if the replacement cost is lower, provided the price of the finished product covers the cost . Suppose in the example given above, the price of the finished product is higher than the cost, taking material cost @ Rs. 10, the closing stock of raw material should be valued at Rs. 10 and not at Rs. 9.50. Stocks of raw materials, in excess of the normal level, should be valued at cost or replacement cost, whichever is lower. Consumable stores are valued at cost, regardless of replacement cost.

For ascertaining the net realisable value of work-in-progress, what is done is, to estimate the selling price of the finished product and then deduct therefrom the amount still to be spent for completing the work ; the resulting figure is the net realisable value. Suppose the cost of incomplete units is Rs. 10,600 ; it is expected that Rs. 4,300 will be spent before the units are ready for sale and then they will sell for Rs. 14,000. The net realisale value of the work in progress is Rs. 9,700 ; i.e., 14,000 – 4,300, this is lower than the cost Rs. 10,600 ; hence the work-in-progress will be valued at Rs. 9,700. If the ultimate selling price is Rs. 16,000, the net realisable value will be Rs. 11,700 ; then the work in progress will be valued at Rs. 10,600, the cost

Meaning of Cost

In the case of purchased items, cost means the total of the amount paid to the supplier (against his bill) and the expenses incurred till the goods reach the firm's premises but expenses thereafter will not be included. Freight, insurance in transit, cartage, octroi duty are all added to the supplier's bill to ascertain the cost. But items such as godown insurance, godown rent, godown keeper's wages etc., are not included. Trade discounts, or rebates received from the supplier should be deducted.

Problem 1 : During April, 2004 a firm purchased 1,00,000 units of materials @ Rs. 40 per unit and incurred the following costs :

	Rs.
Freight and cartage	1,60,000
Octroi	40,000
Godown insurance and expenses	1,00,000

The firm received a rebate @ 2% of the purchase price. At the end of March 2005, 15,000 units were in stock. What is the amount at which these should be valued ?

Solution :

	Rs.
Cost of 1,00,000 units @ Rs. 40	40,00,000
Less : Rebate @ 2%	80,000
	39,20,000
Add : Freight and cartage	1,60,000
Octroi	40,000
Cost of 1,00,000 units	41,20,000
	41,20,000
Cost of one unit	1,00,000

	=	41.20
Cost of 15,000 units @ Rs. 41.20	=	Rs. 6,18,000.

As regards finished goods and work in progress, cost means the total cost incurred for putting the goods in their present location and condition. Since the administration and selling expenses and interest are not concerned with production and thus "not incurred" for putting the goods in their present location and condition, these are not considered as part of cost for valuation of inventories of finished goods. Thus, cost for this purpose will mean cost of materials and stores, labour, direct charges and production overheads.

Problem 2: In a factory in April 2004, 2,50,000 units of finished goods were produced. The various cost incurred were the following :

		Rs.
Materials		15,00,000
Wages		10,00,000
Overheads	– Factory	5,00,000
	– Office	2,00,000
	– Selling	3,00,000
Interest		2,00,000

At the end of March 2005, 30,000 units were in stock. What is the cost that should be attributed to this stock for balance sheet purpose ?

Solution :

Cost of Production :

Materials		15,00,000
Wages		10,00,000
Factory overheads		5,00,000
Cost of 2,50,000 units		30,00,000
Cost of one unit		30,00,000 / 2,50,000
	=	12.00
Cost of 30,000 units	=	Rs. 3,60,000

Methods of Issue

"Cost" will also differ in meaning according to the method of issue. Although goods will be issued and materials used up in the order in which they are received, the consignment received first being used first, the firm concerned may notionally adopt another method. The chief methods are the following :

1. First-In-First-Out (FIFO)

In this case, the earliest lots are exhausted first ; the stock on hand is out of the latest consignments received and is valued accordingly.

Suppose the following lots were received :

16th	October	200	units @ Rs. 10.00
20th	November	300	units @ Rs. 11.00
15th	December	250	units @ Rs. 11.50

The closing stock consists of 300 units. The value will be

250	units @ Rs. 11.50	Rs.	2,875
50	units @ Rs. 11.00	Rs.	550
	Total	Rs.	3,425

2. Last-In-First-Out (LIFO)

Here it is imagined that the latest consignment are used up first and hence the closing stock is supposed to be out of the earliest lots on hand. In the above mentioned example, the stock will be valued at Rs. 3,100 as under :

200 units @ Rs. 10	–	Rs.	2,000
100 units @ Rs. 11	–	Rs.	1,100
		Rs.	3,100

3. Average Cost Method

In this case, all the lots are merged together and value of the closing stock is calculated accordingly. The average price may be simple or weighted. In the case of simple average, quantities are ignored. In the above case, the simple average price is $\frac{\text{Rs. } 10 + \text{Rs. } 11 + \text{Rs. } 11.50}{3}$ or Rs. 10.83. The value of closing stock is 300 × 10.83 = Rs. 3,249. Simple average is not a popular method as it ignores quantities. Weighted average is most suitable. The weighted average is Rs. 10.90 as calculated under :

Number of Units	*Price*	*Total Price*
200	Rs. 10	Rs. 2,000
300	Rs. 11	Rs. 3,300
250	Rs. 11.50	Rs. 2,875
750		Rs. 8,175

Weighted average cost $= \frac{8,175}{750} = \text{Rs. } 10.90$

The value of the stock of 300 units is Rs. 3270.

Problem 3: A company purchased raw materials during the month of March 2005 as stated below :

March	2,	1,600	units @ Rs.	60	per unit
	8,	2,400	units @ Rs.	55	per unit
	11,	5,000	units @ Rs.	57	per unit
	19,	6,000	units @ Rs.	54	per unit
	23,	3,000	units @ Rs.	58	per unit
	30,	2,000	units @ Rs.	63	per unit.

While preparing final accounts on 31st March 2005 the company had 2,600 units of raw materials in its godown.

You are required to calculate the values of closing stock of raw materials according to

(*a*) First-In-First-Out Method
(*b*) Last-In-First-Out Method
(*c*) Weighted Average Method

Solution :

Valuation of Closing Stock

(*i*) **FIFO Method :**

2,000 units @ Rs. 63 per unit		1,26,000
600 units @ Rs. 68 per unit		40,800
Value of closing stock		1,66,800

(*ii*) **LIFO Method :**

1,600 units @ Rs. 60 per unit	96,000

1,000 units @ Rs. 55 per unit	55,000
	1,51,000

(*iii*) **Weighted Average Method**

Date	*Price*	*Qty.*	*Amount*
March 2	60	1,600	96,000
8	55	2,400	1,32,000
11	57	5,000	2,85,000
19	54	6,000	3,24,000
23	58	3,000	1,74,000
30	63	2,000	1,26,000
		20,000	11,37,000

Weighted average price $= \frac{11,37,000}{20,000} = \text{Rs. } 56.85$

Value of closing stock $= 2,600 \text{ units} \times \text{Rs. } 56.85$

$= \text{Rs. } 1,47,810.$

4. Standard Cost Method

This method is often used to arrive at historical cost for the purpose of inventory valuation. The use of standard cost requires that the standards are realistic, are reviewed regularly and where necessary, revised in the light of current conditions and that there should exist a proper system of pro-rating significant variances between the cost of sales and the inventories.

Problem 4: M/s Rao Brothers give you the details of their purchases and sales :

Date	*Purchases*	*Rate*	*Sales*
1st January	2,000	10.25	—
5th January	500	10.65	—
10th January	—	—	1,000
15th January	—	—	500
20th January	600	11.10	—
25th January	1,000	11.25	—
30th January	—	—	1,000

M/s Rao Brothers follow standard cost of Rs. 10.55 per unit for determining historical cost of inventories and also the cost of unit sold. Show the inventory valuation on the basis of standard cost.

Solution :

Actual cost of units purchased		43,735
Less : Standard cost :		
Units sold	$2,500 \times 10.55 =$ 26,375	
Closing stock	$1,600 \times 10.55 =$ 16,880	
		43,255
	Variance	480

Since the actual cost is more than the standard cost, the variance should be apportioned between units sold and the closing inventories. Therefore, the standard cost of closing inventory will be :

Standard cost	$(1,600 \times 10.55)$	16,880
Add : Share of variance	$480 \times \frac{1,600}{4,100}$	187
		17,067

4. Adjusted Selling Price Method or Retail Inventory Method

This method is also called retail inventory method. It is used widely in retail business or in business where the inventory comprises of items, the individual costs of which are not readily ascertainable. The use of this method is appropriate for measuring inventories of large numbers of rapidly changing items that have similar margins and for which it is impracticable to use other costing methods. The cost of the inventory is determined by reducing from the sales value of the inventory the appropriate percentage of gross margin. The calculation of the estimated gross margin of profit may be made for individual items or groups of items or by departments, as may be appropriate to the circumstance.

Problem 5: M/s A, B and C are in retail business. Following information are obtained from their records for the year ended 31st March 2005.

Goods received from suppliers :

(Subject to trade discount and taxes)		15,75,500
Trade discount 3% and Sales tax 11%		
Packaging and transportation charges	Rs.	87,500
Sales during the year	Rs.	22,45,400
Sales price of closing inventories	Rs.	2,35,000

Find out the historical cost of inventories using adjusted selling price method.

Solution :

Calculation of Cost of Purchase

Goods received from suppliers	15,75,500
Less : Trade discount 3%	47,265
	15,28,235
Add : Sales tax 11%	1,68,106
	16,96,341
Add : Packaging and transportation charges	87,500
	17,83,841

Calculation of Estimated Gross Profit Margin

Sales during the year	22,45,500
Add : Closing inventory at the selling price	2,35,000
	24,80,500
Less : Purchases	17,83,841
Gross profit margin	6,96,659
Percentage of gross profit margin	28.09%

Inventory Valuation

Selling price of closing inventories	2,35,000
Less : Gross profit margin 28.09%	66,012
	1,68,988

Accounting Standard Related to Valuation of Inventories

The revised standard on valuation of inventories supersides the earlier Accounting Standard (AS) 2, valuation of inventories issued in June 1981. The revised standard comes into effect in respect of accounting period commencing on or after 1-4-1999 and is mandatory in nature.

This should be applied in accounting for inventories other than :

(*a*) Work in progress arising under construction contracts, including directly related service contracts.
(*b*) Work in progress arising in the ordinary course of busines of service providers.
(*c*) Shares, debentures and other financial instruments held as stock-in-trade, and
(*d*) Producers inventories of livestock, agricultural and forest products and mineral oils, ores and gases to the extent that they are measured at net realisable value in accordance with well estalished practices in those industries.

The principle for valuation is that inventories should be valued at the lower of cost and net realisable value.

Cost of Inventories

The cost of inventories should comprise all costs of purchase, cost of conversion and other costs incurred in bringing the inventories to their present location and condition.

(*i*) Cost of Purchase. The cost of purchase consist of the purchase price including duties and taxes, freight inwards and other expenditure directly attributable to the acquisition. Trade discounts, rebates, duty drawbacks and other similar items are deducted in determining the costs of purchase.

(*ii*) Cost of Conversion. The costs of conversion of inventories include costs directly related to the units of production, such as direct labour. They also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods. Fixed production overheads are those indirect costs of production that remain relatively constant regardless of the volume of production such as depreciation and maintenance of factory buildings and the cost of factory management and administration. Variable production overheads are those indirect costs of production that vary directly or nearly directly, with the volume of production such as indirect materials and indirect labour. The allocation of fixed production overheads for the purpose of their inclusion in the costs of conversion is based on the normal capacity of production facilities.

A production process may result in more than one product being produced simultaneously. This is the case, for example, on the relative sales value of each product either at the stage in the production process when the products become separately identifiable, or at the completion of production. Most by-products as well as scrap or waste materials, by their nature, are immaterial. When this is the case, they are often measured at net realisable value and this value is deducted from the cost of main product.

(*iii*) Other Costs. Other costs are included in the cost of inventories only to the extent that they are incurred in bringing the inventories to their present location and condition. For example, it may be appropriate to include overheads other than production overheads or the costs of designing products for specific customers in the cost of inventories. Interest and other borrowing costs are usually considered as not relating to bringing the inventories to their present location and condition and are, therefore, usually not included in the cost of inventories.

It is appropriate to exclude certain costs and recognise them as expenses in the period in which they are incurred. Examples of such costs are :

(*a*) abnormal amounts of wasted material, labour or other production cost.
(*b*) storage costs, unless those costs are necessary in the production process prior to a further production stage.
(*c*) administrative overheads that do not contribute to bringing the inventories to their present location and condition, and
(*d*) selling and distribution costs.

Cost Formula

The cost of inventories of items that are not ordinarily interchangeable and goods or services produced and segregated for specific projects should be assigned by specific identification of their individual costs.

The cost of inventories, other than those dealt with in above paragraph should be assigned by using the first-in-first-out (FIFO) or weighted average cost formula. The formula used should reflect the fairest posible approximation to the cost incurred in bringing the items of inventory to their present location and condition.

Techniques for the measurement of the cost of inventories, such as the standard cost method or the retail method, may be used for convenience if the results approximate the actual cost.

Net Realisable Value

Net realisale value is the estimated selling price in the ordinary course of business less the estimated cost of completion and the estimated costs necessary to make the sale. An assessment is made of net realisable value as at each balance sheet date. Inventories are usually written down to net realisable value on an item-by-item basis. In some circumstances, it may be appropriate to group similar or related items.

Materials and other supplies held for use in the production of inventories are not written down below cost if the finished products in which they will be incorporated are expected to be sold at or above cost. However, when there has been a decline in the price of materials and it is estimated that the cost of the finished product will exceed net realisable value, the materials are written down to net realisable value. In such circumstances, the replacement cost of the materials may be the best available measure of their net realisable value.

The financial statements should disclose :

(*a*) The accounting policies adopted in measuring inventories including the cost formula used.
(*b*) The total carrying amount of inventories and its classification appropriate to the enterprise.

QUESTIONS

1. Why is correct valuation of inventory essential ? What is the basic principle involved while valuing inventories ?
2. Briefly explain the following methods of inventory valuation :
(*a*) FIFO (*b*) LIFO (*c*) Average Price.
3. What are the principal methods of inventory valuation suggested in Accounting Standard-2 (Revised).
4. Briefly explain the meaning of "cost" in relation to inventory valuation.

EXERCISE 1

In a newly established company, 1,00,000 units were produced ; the cost incurred were the following :

	Rs.
Materials	2,50,000
Labour	3,00,000
Production overhead	2,00,000
Office and selling expenses	1,50,000
Interest	1,00,000

At the end of the period 15,000 units were in stock. What is the amount at which these should be valued for balance sheet purposes ? The selling price per unit is Rs. 9.50. [**Answer :** Rs. 1,12,500**]**

EXERCISE 2

A newly established trading concern made the following purchases

October	5,	20,000	units @ Rs. 40
November	15,	20,000	units @ Rs. 45
December	20,	10,000	units @ Rs. 50

The selling price is Rs. 70 per unit, the closing stock is 5,000 units. What is the gross profit under FIFO, LIFO and Weighted Average Methods ?

[**Answer :** Rs. 12,00,000
Rs. 11,50,000
Rs. 11,70,000]

1

CHAPTER

MEANING, IMPORTANCE AND OBJECTIVES OF FINANCIAL MANAGEMENT

The term 'Financial Management' refers to corporation finance. At the turn of the previous century corporation finance emerged as a distinct field of study. In the earlier days its evolution was broadly analysed into (*i*) traditional phase; (*ii*) transitional phase and (*iii*) modern phase. Traditional phase lasted for about four decades. As its features, it referred to certain episodic events in the life cycle of the firm, particularly about the formation of the company. It also focussed on the issue of capital, its broad expansion programme and highlighted on mergers, reorganisation and liquidation. The discussions turned out to be more historical descriptive and institutional. The second phase, i.e., transitional phase began around fourties and continued upto the fifties. This was more or less similar to the traditional phase but with the current problematic views of the managers of finance in the areas of funds analysis, planning and control. The third phase, i.e., the modern phase started in mid fifties, and has witnessed an accelerated pace of development. Economic theories have incorporated these finance ideas and attempted to develop quantitative techniques in explaining these ideas. Attempts are made to rationally match the funds in their uses in the light of appropriate decision criteria. The dominance of the financial decision maker in his decision making is brought about. Its outlook is insider's view point.

Definition of Finance Function

Finance function involves procurement of funds and their effective utilisation in the business. There are, thus, two aspects of finance function, viz., (*a*) procurement of funds and (*b*) an effective use of these funds in the business.

Funds can be procured from various sources, each having different characteristics in terms of risk, control and cost. From risk point of view equity share capital is considered as best as there is no obligation to return the funds during the course of existing of business. But from the point of view of cost it is considered to be most expensive. Thus is because dividend expectations of the shareholders are higher than interest rate. Debentures as a source of funds is cheaper as the interest rate is not very high. But debentures entail a high degree of risk as they have to be repaid as per the terms of agreement. Further interest payment has to be made whether or not the company earns profit. There are thus risk, cost and control consideration which a finance manager must consider while procuring funds.

The second aspect of finance function is effective utilisation of funds. The finance manager must look into the situation where funds lye idle or where a proper use of funds is not being made. If the funds are not

utilised so as to generate income higher than the cost of procuring them, there is no point in running the business. The finance manager must also ensure that finance decisions in respect of fixed assets are properly analysed. This requires knowledge about capital budgeting. He must also keep in view the needs of working capital and ensure that while the firm enjoy an optimum level of working capital, they do not keep too much funds blocked in inventories, book debts and cash.

Definition of Financial Management

In the words of phillppatos "Financial Management' is concerned with the management decisions that result in the acquisition and financing of long-term and short-term assets for the firm. As such, it deals with situations that require the selection of specific assets or combination of assets, the selection of specific liabilities or combination of liabilities, as well as with the problems of size, and growth of enterprise. The analysis of these decisions is based upon the expected inflows and outflows of funds and their effect upon stated managerial objectives".

SCOPE OF FINANCIAL MANAGEMENT

Financial Management is broadly concerned with the acquisition and use of funds by a business firm. Its scope may be defined in terms of the following questions :

- How large should the firm be and how fast it should grow ?
- What should be the composition of the firms assets ?
- What should be the mix of the firm's financing ?
- How should the firm analyse, plan and control its financial affairs ?

The important tasks of financial management may be outlines as follows :

(A) Financial Analysis, Planning and Control

- Analysis of financial condition and performance
- Profit planning
- Financial forecasting
- Financial control

(B) Investing

- Management of current assets (cash, marketable securities, receivables, and inventories
- Capital budgeting (identification, selection and implementation of capital projects)
- Management of mergers, reorganisations and disinvestments.

(C) Financing

- Identification of sources of finance and determination of financing mix
- Identifying sources of funds and raising funds
- Disposition of profits between dividends and retained carrings

Scope of financial management for purposes of exposition is divided into two broad categories : (*a*) traditional approach and (*b*) modern approach

(a) Traditional approach : This refers to its subject matter in the academic literature in the initial stages of its evolution as a separate branch of academic study. The term 'corporation finance' was used to describe what is now known in the academic world as 'financial management'. The field of study dealing with finance was treated as encompassing three inter-related aspects of raising and administering resources from outside : (*a*) the institutional arrangement in the form of financial institutions which comprise the organisation of capital market ; (*b*) financial instruments through which funds were raised from the capital markets and the related aspects of practices and the procedural aspects of the capital market and ; (*c*) the legal and accounting relationships between a firm and its sources of funds.

Limitation of traditional approach : This dominated the scene during 1920s and 1930s. This is now discarded due to the following weaknesses : (*i*) those relating to the basic conceptual and analytical framework of the definitions and (*ii*) those relating to the treatment of various topics and the emphasis attached to them. The traditional treatment was the outsider-looking-in approach. The second ground of criticism was that the focus was on financing problems of corporate enterprises whereas non-corporate organisations lay outside its scope. Further as a logical corollary, the day-to-day financial problems of a normal company did not receive any attention.

(b) Modern approach : This approach views the term financial management in a broad sense and provides a conceptual and analytical outlook. In fact, it provides an analytical framework for financial decision making. According to it, the finance function covers both acquisition of funds and allocation too.

Thus, apart from the issues involved in acquiring external funds, the main concern of financial management is the efficient and wise allocation of funds to various uses. The new approach is an analytical way of viewing the financial problems of the firm. Some interpretation considered in the modern context are :

(1) Finance means cash only : It must be noted that at this stage, the meaning of finance is described to mean cash only. This meant only liquidity and financing of the firm.

(2) Finance is raising of funds : Firstly, this approach amphasised the perspective of an outside lender. It covers instruments and institutions of credit and also practices which encouraged raising of funds. This stressed upon long term finance. However, one cannot ignore the importance of short-term finance, viz., working capital.

(3) Finance relates to the raising and utilisation of funds : This relates to modern approach. This approach is concerned not only with raising funds but also their proper utilisation too. This determines the total amount of funds required by the firm. It also allocates these funds efficiently to the various assets. It also obtains the best mix of financing viz., type and amount of corporate securities and finally the use of financial tools to ensure proper and efficient use of funds.

Business activities presuppose both the procurement and utilisation of funds. Thus business finance is the process of raising, providing, and managing of all the funds to be used in connection with the business activities. Thus business activities are more concerned with planning, raising, controlling and administering funds used in the business.

Scope of Finance Function

Finance function deals with procurement and effective use of funds. Therefore the decision which concern management of funds are the subject matter of finance function. It may be seen that all decisions involve management of funds and are therefore, a part of financial mangement. Some of these decisions are as follows:

(1) Investment Decision

This decision involves the proper selection of assets in which funds will be invested by the firm. Assets normally comprises of long-term assets which will yield return over a period of time in future. Secondly, there are short-term or current assets. These assets in the normal course convert the business into cash within a year. In the case of long term assets, it is capital budgeting. The aspect of financial decision making with reference to current assets or short-term assets is popularly known as working capital management.

(a) Capital budgeting : This is the long-term investment decision — most probably a very crucial final decision of the firm. It relates to the selection of an asset or investment proposal or course of action whose benefits are likely to be available in future over the life time of the project. The first aspect of the capital budgeting decision relates to the choice of the new asset out of the alternative available or the re-allocation of capital when existing assets fail to justify the funds committed. The second aspect of the capital budgeting

decision is the analysis of risk and uncertainty. Since the benefits from the investment proposals extend over the future, there accrual is uncertain. They have to be estimated under various assumptions of the physical volume of sale and the level of prices. Finally, the evaluation of the worth of a long-term project implies a certain norm or standard against which the benefits are to be judged. In brief, the main elements of the capital budgeting decisions are : (*i*) the total assets and their compositions ; (*ii*) the business risk complexion of the firm ; and (*iii*) concept and measurement of the cost of capital.

(b) Working capital management : This is concrened with the management of the current assets. As short-term survival is a pre-requisite to a long-term success, this forms an integral part of financial management. There is conflict between profitability and liquidity. If a firm does not have adequate working capital, i.e., it does not invest sufficient funds in current assets, it may become illiquid and consequently may not have the ability to meet its current obligations and thus invite the risk of bankruptcy. If the current assets are too large, the profitability is adversely affected. To summarise, the management of working capital has two basic ingredients, viz., (*a*) an overview of working capital management as a whole and ; (*b*) efficient management of the individual current assets such as cash, receivables and inventory.

(2) Finance Decision

This is an important function to be performed by the finance manager. Broadly, he must decide when, where and how to acquire funds to meet the firm's investment needs. The central issue before him is to determine the proportion of equity and debt. The mix of debt and equity is known as the firm's capital structure. The finance manager must strive to obtain the best financing mix or optimum capital structure for his firm. The firm's capital structure is optimum when the market value of shares is maximised. The use of debt affects the return on equity funds but it always increases risk. A proper balance will have to be struck between return and risk. When the shareholder's return is maximised with minimum risk, the market value per share will be maximised and the firm's capital structure would be optimum. Once the finance manager is able to determine the best combination of debt and equity, he must raise the appropriate amount through the best available sources.

(3) Dividend Decision

Dividend decision is the third major financial decision. The finance manager must decide whether the firm should distribute all profits or retain them or distribute a portion and retain, the balance. Like the debt policy, the dividend policy should be determined in terms of its impact on the shareholder's value. The optimum dividend policy is one which maximises the market value of the firm's share. Thus, if shareholders are not indifferent to the firm's dividend policy, the finance manager must determine the optimum dividend-payout ratio. The dividend pay-out ratio is equal to the percentage of dividends distributed to earnings available to shareholders. The finance manager should also consider the question of dividend stability, bonus shares and cash dividends.

Functions of Finance Manager

The principle functions of a finance manager relate to decisions regarding procurement, investment and dividends. However, the finance manager also undertakes the following subsidiary functions.

(*a*) Supply of funds to all parts of the organisation : The finance manager must ensure that all branches, departments and units of the organisation are supplied with adequate funds. Those sections which have an excess of funds have to contribute to the central pool for use in other sections which need funds. An adequate supply of cash at all points of time is absolutely essential for smooth flow of operation. Cash management should also ensure that there is no excessive cash.

(*b*) Evaluation of financial performance : Management control systems are often based upon financial analysis. Analysis of the financial performance helps the management in seeing how the funds have been utilised in various divisions and what can be done to improve it.

(*c*) Financial negotiations : A large part of the time of the finance manager is utilised in carrying out negotiations with the financial institutions, banks, underwrites and public depositors etc. He has to furnish a lot of information to these institutions and persons and has to see that raising of funds is within the various statutes like Companies Act etc. Negotiations for outside financing often require specialised skills.

(*d*) Keeping track of stock exchange quotations and behaviour of share prices : This involves analysis of major trends in the stock market and judging their impact on the prices of the shares of the company.

Importance of Financial Management

The importance of financial management cannot be over emphasised. Some people think that a financial manager is useful only in private enterprise. But it can be said that sound financial management is essential in all organisations—profit or non-profit—where funds are involved. Commercial history is replete with examples where firms have been liquidated not because their technology was obsolete or because their products had no demand or because their labour was not skilled but because there was a complete mismanagement of financial affairs.

Financial management essentially optimises the output from the given input of funds. It attempts to use the funds in the most productive manner. In a country like India, where resources are scarce and the demand on funds are many, the need for financial manager is enormous. If proper financial management techniques are used, most of our enterprises can reduce their capital employed and improve their return on investment.

Financial management is very important in the case of non-profit organisation also. In our country it is seen that most non-profit organisations do not pay any attention to financial management. Even a simple transaction like depositing the cheques the same day they are received, is not undertaken. Such organisations pay heavy interest charges on borrowed funds, yet they are tardy in realising their own debtors. All this arises because one has no realisation of the time value of money. It is not appreciated that each rupee has to be made use of and that it has a direct cost of utilisation. It has to be realised that keeping a rupee idle even for a day involves costs. A non-profit making organisation may not be keen to make profit, in the traditional sense of the term, but surely, it needs to cut down its cost and use the funds at its disposal to their optimum capacity. A sound sense of financial management has therefore to be cultivated among own bureaucrats, administrators, engineers and educationists. Unless this is done, the colossal wastage of the slender capital resources of own country cannot be stopped.

Objectives of Financial Management

It has traditionally been argued that the objective of a company is to earn profit. Hence the objective of financial management is also profit maximisation. This implies that the finance manager has to take his decisions in a manner that the profits are maximised. Each alternative, therefore is to be seen as to whether or not it gives maximum profit.

(1) Profit maximisation as an object of financial management : Profit cannot be the sole objective of a business. It is at best a limited objective. If profit is given undue importane, the following problems will arise :

(*a*) Profit maximisation has to be tempered with a realisation of risks involved. There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals ; if they give high priority to profit. In practice, risk is a very important consideration and has to be balanced with the profit objective.

(*b*) Profit maximisation as an objective does not take into account the time pattern of returns. For example, proposal 'A', may give a higher amount of profit as compared to proposal 'B'. Yet, if the returns begin to flow say 10 years later, proposal 'B' may be preferred which may have lower overall profits but the returns flow is more quick.

(*c*) Profit maximisation as an objective is too narrow. It fails to take into account the social responsibilities to various groups of people such as investers, employees and customers. It these group of people are ignored, a company cannot survive for long.

(2) Wealth maximisation as an object of financial management : According to some thinkers on financial management they consider wealth maximisation and value of shares as an important objective of financial management. The value of share of a company gives an indication to its shareholders the worth of such a company. The value of shares is determined by two factors, viz.

(*a*) The earning per share of the company
(*b*) The capitalisation rate.

The earning per share depends upon the assessment as to how profitably a company is going to operate in the future or what it is likely to earn against each of its ordinary shares. For example, if a company is likely to earn annually Rs. 5 on its share of Rs. 10, its share will have a higher market value than a company which earns Rs. 4 for its Rs. 10 share each year, presuming that other factors remain the some earning per share is an important factor considered by the shareholders in valuing a company.

The capitalisation rate reflects the liking of the investor for a company. If a company earns a high rate of earnings per share through risky operations or risky financing pattern, the investors, will not look upon its share with favour. To that extent, the market value of shares of such a company will be low. An easy way to determine the capitalisation rate is to start with fixed deposit interest rate of banks. An investor may get, say, 7% interest (it may vary from time to time) from bank on a one year fixed deposit. However, if he has to invest in shares, he may want a higher return in view of the risks involved. How much higher would be his expectation would depend upon the risk involved in the particular share which in turn depends upon company policies, past records, the type of business etc. Thus capitalisation rate is the cumulative result of the assessment of the various shareholders regarding the risk and other qualitative factors of a company. If a company invests its funds in risky ventures, the investors will put in their money only if they get higher return as compared to that from a low risk share.

The market value of a share is thus a function of the earnings per share and the capitalisation rate. Suppose the earnings per share are expected to be Rs. 6 for a share (The face value really does not matter in this regard). If the capitalisation rate expected by the shareholders is 20% the market value of the share is likely to be $\frac{100 \times 6}{20}$ = Rs. 30.

This is so because at this price the investors have an earning of 20% something which they expect from a company with this degree of risk.

The finance manager has to ensure that his decision are such that the market value of the share of the company is maximum in the long run. This implies that the financial policy has to be such that it optimises the earnings per share keeping in view the risk and other factors in mind. Wealth maximisation is therefore, a better objective for a commercial undertaking since it represents both return and risk.

QUESTIONS

Simple Questions

1. What do you mean by finance function ?
2. Define financial management.
3. List out the four financial decisions.
4. What do you mean by wealth maximisation goal of financial management ?
5. What do you mean by profit maximisation goal of financial management ?
6. What do you mean by investment decision ?
7. What is meant by financing decision ?
8. What do you mean by dividend policy decision ?

Short Answer Questions

1. "The importance of finance function as a management activity has increased in modern time". Explain.
2. "Financial management is more than were procurement of funds". Explain the other functions of finance manager.
3. Discuss the scope of financial management.

Long Answer Questions

1. Discuss the goals of financial management.
2. Explain the various finance decisions involved in an organisation.

12

CHAPTER

ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

INTRODUCTION

Financial statements prepared in an organisation conveys the financial information in absolute terms which may not be readily understood by everyone. Moreover these statements do not disclose all the relevant and required information. Further financial statements suffer from certain inherent limitations. In order to obtain relevant and material information for knowing the strength and weakness of an organisation analysis and interpretation of financial statements is felt necessary. Analysis and interpretation of financial statement refers to a systematic and constant effort to determine the significance and meaning of the financial statements to enable forecasting profitability, solvency, and prospects of future earning. It is designated to be the last of the four major steps of accounting which involves presentation of information that aids business managers and a large mumber of external parties such as investors, creditors, security analysts and government and so on.

MEANING, DEFINITION AND IMPORTANCE OF ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

Analysis of financial statement refers to the art of applying various tools to know the behaviour of the accounting information. It is defined by Metcalf as the "Process of evaluating the relationship between component parts of a financial statement to obtain a better understanding of a firm's position and performance." According to Kennedy and Muller, "Analysis and interpretation of financial statements are an attempt to determine the significance and meaning of the financial statements data so the the forcast may be made of the prospects for future earnings, ability to pay interest and debt maturities and profitability of a sound dividend policy." In the words of Myers, "Financial statement analysis is largely a study of relationshp among various financial factors in a business as disclosed by a single set of staements and a study of the trends of these factors as shown in a series of statements." Analysis of financial statements may be compared to x-raying the financial position to diagnose the financial strength and weakness of the business.

Interpretation of financial statements refers to evaluating the performance of the business. According to F. Wood, "To interpret means to put the meaning of a statement in simple terms for the benefit of a person." It may be defined as critical examination of financial statements for a given period.

Differences between Analysis and Interpretation of financial statements

Analysis and interpretation though used synonymously are not same. They differ in the following respects:

1. The term analysis is used in narrow sense. Whereas the term interpretation is used in a broad sense to include analysis.
2. Analysis is the first step whereas interpretation follows analysis.
3. Analysis implies classification of facts or data in a logical order. It involves splitting the complex data into various simple elements. Whereas interpretation implies explaining the meaning and significance of the facts or data so classified.

However, it can be concluded that analysis and interpretation are complementary to each other. Analysis without interpretation is useless and interpretation becomes difficult without analysis.

IMPORTANCE OF ANALYSIS AND INTERPRETATION

The importance of analysis and interpretation of financial statements may be outlined under the following points:

1. Any decision taken on the basis of intution may prove to be wrong. To avoid wrong decision making it is always desireable to analyse and interpret the quantitative data. Decisions based on analysis and interpretation which is done systematically will never prove to be wrong and misleading.
2. All people may not possess knowledge and experience of understanding the financial statements in its raw-form. It can be easily understood even by layman when they are analysed and interpreted.
3. Analysis and interpretation is necessary to verify the correctness and accuracy of the decision made which must have been taken on the basis of intution.

STEPS INVOLVED IN ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

Analysis and interpretation is one of the important functions of management accountant. It is not only interesting but a significant function of management accountant. In fact it may be regarded as an art as it requires good understanding and experience in this regard. The following steps are involved in the process of analysing and interpreting financial statements:

1. **Analysis:** Generally information presented in financial statements relate to individual accounts or group balances of many accounts. This leads to lack of homogenity and uniformity. In order to facilitate easy interpretation of information, the data is to be rearranged and reclassified. This process of methodical arrangement of presented data is known as analysis of financial statements. In this process it involves splitting of total items into various component parts. For example, if the short term solveney position of a business is to be known, it is necessary to know the current assets and current liabilities. The component of current assets can be known by analysing the asset side of the balance sheet and segregate current assets from various other components of balance sheet. Similarly, the current liabilities can be known by segregating it from other components of liability side of the balance sheet. In this way analysis includes regrouping or reclassifying of data into homogenous and comparable component parts.
2. **Comparision:** After division of facts into various components and sub-components, the second step involved is the comparision of figures. This step involves measuring the magnitude of the figures and knowing the extent of relationship between them. Only then it is possible to interpret the analysed data.
3. **Study of trend:** Having analysed and compared the magnitude of figures, the next step is to observe the data over a period of time. This study reveals the trend and the trend analysis helps in formulating a rational judgement about the performance of a business.

4. **Interpretation:** The proces of drawing conclusions about the financial condition of a business is known as interpretation of financial statements. On the basis of findings a rational judgement is made when submitted in the form of report.
5. **Criticism:** Closely associated with the step of interpretation is the criticism. It may take two forms.
   (*a*) Criticism as to the form: This goes to suggest whether the financial statements prepared is according to the law laid down by an Act. In India, the final accounts of Banking companies are to be prepared along with supportive schedules and according to the prescribed mode as required by Banking Companies Act.
   (*b*) Criticism as to reliability: This goes to suggest that the information furnished is reliable or not. To know the reliability of accounts it is to be ensured that (*i*) Whether adequate provision is made for depreciation (*ii*) Assets are valued on a sound basis (*iii*) Deferred expenditure is gradually written off and so on.

PROCEDURE OF ANALYSIS AND INTERPRETATION

The procedure involved in the process of analysis and interpretation may be outlined as under:

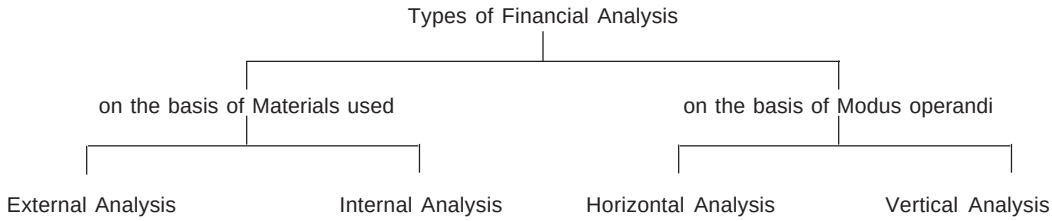
1. As the technique and tools of analysis depends upon the object of analysis and interpretation, at the outset the purpose and extent of analysis is to be determined.
2. To study all data presented in financial statement for a clear understanding.
3. Collect additional information if need be for proper interpretation.
4. Divide and sub-divide the components according to their resemblences.
5. Use proper tools for analysis such as comparative statements, trend analysis etc., depending upon the purpose of interpreatation.
6. Interpret the data and draw conclusions therefrom.
7. Prepare report incorporating the conclusions drawn.

Objectives of Analysis and Interpretation of Financial Statements

The objectives of financial statement analysis are as under :

1. To highlight the present and future earning capacity and the profitability of the concern.
2. To show the efficiency of the concern as a whole and department- wise.
3. To determine the solvency of the firm, both short term and long term.
4. To facilitate inter-firm and intra-firm comparisions.
5. To help in preparation of budgets.
6. To help in assessing the long term liquidity position of funds.

Types of Analysis and Interpretation of Financial Statements: Financial analysis is classified on the basis of materials used and modus operandi of the analysis. This is shown below:



1. **External analysis:** Such type of analysis is made by outsiders who have no access to the books of accounts. They constitute investors, creditors, credit agencies and government agencies. As they don't have access to the books of accounts they have to depend on the published accounts for the

purpose of analysis. However, government regulation requiring auditing of accounts has made published accounts more reliable and dependable. As compared to internal analysis, external analysis is not done in detail and hence it serves limited purpose.

2. **Internal analysis:** It is done by those parties in the business who have access to books of account. Such parties can be designated as accountant or financial analyst. Some times it can also be done by employees to know the performance of the business. Internal analysis is done in more detail when compared to external analysis.
3. **Horizontal analysis:** When financial analysis is done for number of years, it is known as horizontal analysis. Such analysis sets a trend wherein the figures of various years are compared with one standard year known as base year. Based on the trend prevailing it is possible to make decision and form a rational judgment about the progress of the business. This type of analysis is also known as dynamic analysis as it measures the change of position of the business over a number of years.
4. **Vertical analysis:** When analysis is made for data covering one year's period, it is known as vertical analysis. This type is also known as static analysis as it measures the state of affairs of the business as on given period of time. This type of analysis is useful in comparing the performance of several firms belonging to the same industry or various departments belonging to the same company.

Limitations of Financial Analysis

1. Because of the inflationary trend, the financial statements based on historical costs cannot be taken as an indicator for future forecasting and planning.
2. Analysis of financial statements is a tool which if used by an unskilled analyst may lead to faulty conclusions.
3. Financial statements are only interim reports and cannot be taken as final as the ultimate result of the business can be known only when the business is closed down. So analysis of these statements will not serve as conclusive evidence of the performance of the business.
4. The reliability of analysis depend upon the accuracy of the figures used in the financial statements. The analysis is distorted when the financial statements are manipulated by the accountant.
5. The results derived from analysis may be differently interpreted by different users.
6. The analysis of one year's statement will have limited use. Unless analysis is done for number of years it is not possible to compare so as to arrive at a meaningful conclusion.
7. When different firms belonging to same industry use different accounting procedures and policies the comparision will be difficult. This will not provide a reliable basis to know the performance of the industry as a whole.
8. A large number of tools are available for analysis and interpretation. Accordingly the results vary depending upon the type of tool used by the Accountant.

Tools or Technique or Methods of Financial Analysis

For analysing the financial data and interpreting them in a systematic manner and a number of techniques or tools are available. These are as follows:

1. Comparative financial statements.
2. Common-size statement analysis.
3. Trend analysis.
4. Average analysis.
5. Ratio analysis.
6. Fund flow analysis.
7. Cash flow analysis.

1. **Comparative Financial Statement:** These are statements indicating the direction of movement with respect to financial position and operating results. They are very useful to the analyst because they contain not only the data appearing in a single statement but also information necessary for the study of financial and operating trends over a period of years. Comparative statements may be made to show:
   (*a*) Absolute data (money values or rupee amounts).
   (*b*) Increases or decreases in absolute data in terms of money values.
   (*c*) Increases or decreases in absolute data in terms of percentages.
   (*d*) Comparisions expressed in ratios.
   (*e*) Percentage of totals.

The comparative financial statements as the name itself suggests enable comparision of financial information for two or more years placed side by side. From this it is possible to appraise, the performance, position and efficiency of business. The importance of comparative financial statement is recognised by the Indian Companies Act 1956. It makes obligatory for all companies to prepare the final accounts of companies by presenting current years as well as previous year figures.

The more common types of comparative statements are (*a*) Comparative Balance Sheet (*b*) Comparative income statement, (*c*) Comparative statement of working capital and (*d*) Comparative statement of Manufacturing costs.

A comparative balance sheet is prepared to know change of Assets, liabilities and capital of the business on two different dates. The changes may relate to an increase or decrease in any of the items. It contains columns for (*a*) Absolute data for the previous year (*b*) For absolute data for the current year (*c*) Changes in the items of Balance Sheet (*d*) Change in items of Balance Sheet expressed in percentages.

Similarly a comparative income statement is prepared to compare all items of profit and loss a/c and thus to know the increase or decrease in the items. By looking into the changes in expenditure and revenues it is possible to know the operating efficiency of the business.

Problem 1 : (Comparative Income Statement)

The following are the income statements of Swadeshi Cotton Mills for the year 2000 and 2001. Prepare comparative income statement and comment on the profitability of the company.

	2000	*2001*		*2000*	*2001*
To opening stock	85,000	2,00,000	By Sales less Returns	10,00,000	12,00,000
To purchases less returns	5,00,000	5,50,000	By closing stock	2,00,000	2,25,000
To Wages	60,000	80,000	By Income received from Investment	12,000	15,000
To Salaries	42,000	64,000	By Dividend received	5,000	7,500
To Rent, rates and insurance	35,000	40,000			
To Depreciation	40,000	60,000			
To Selling expenses	12,000	12,000			
To Discount allowed	5,000	7,000			
To Loss on sale of plant	–	8,000			
To Interest paid	12,000	14,000			
To Net profit	4,26,000	4,12,500			
	12,17,000	14,47,500		12,17,000	14,47,000

Solution:

Comparative Income Statement

		2000	*2001*	*Absolute change*	*Percentage Increase or Decrease*
Net	Sales	10,00,000	12,00,000	+ 2,00,000	+ 20%
Less:	Cost of goods sold (see working note)	4,45,000	6,05,000	+ 1,60,000	+ 35.9%
	Gross profit	5,55,000	5,95,000	+ 40,000	+ 5.41%
Less:	Operating expenses:				
	Salaries	42,000	64,000	+ 22,000	+ 52.38%
	Rent, rates, insurance	35,000	40,000	+ 5,000	+ 14.29%
	Depreciation	40,000	60,000	+ 20,000	+ 50%
	Selling expenses	12,000	12,000	–	–
	Discount allowed	5,000	7,000	+ 2,000	+ 40%
		1,34,000	1,83,000	49,000	+ 36.56%
	Operating profit	4,21,000	4,12,000	– 9,000	– 2.14%
Add:	Non-operating income:				
	Income from investment	12,000	15,000	+ 3,000	+ 25%
	Dividend received	5,000	7,500	+ 2,500	+ 50%
		17,000	22,500	+ 5,500	+ 32.35%
Less:	Non-operating expenses:				
	Loss on sale of plant	–	8,000	+ 8,000	+ 100%
	Interest paid	12,000	14,000	+ 2,000	+ 16.67%
		12,000	22,000	+ 10,000	+ 83.33%
Net	Profit	4,26,000	4,12,500	– 13,500	– 3.17%

Working Note:

Calculation of cost of goods sold:

		2000	*2001*
	Opening stock	85,000	2,00,000
Add:	Purchases	5,00,000	5,70,000
Add:	Wages	60,000	80,000
		6,45,000	8,30,000
Less:	Closing stock	2,00,000	2,25,000
	Cost of goods sold	4,45,000	6,05,000

Interpretation :

1. Gross profit has shown an increase in 2001 but it is not commensurate with the increase in sales. The reason is increased cost of goods sold in 2001.
2. Among operating expenses the salary and depreciation have increased substantially. This is responsible for reduction in operating profit.
3. The total non-operating expenses is less in 2001 when compared to non-operating income in both the years.
4. Net profit decreased in 2001 when compared to 2000.

Problem 2 : Following income statements of South India Metal Co. Ltd. are given for the years ending 2000 and 2001 prepare a multi-stage comparative income statement and interpret the changes.

Income statement

	2000	*2001*		*2000*	*2001*
To Cost of goods sold	9,00,000	9,50,000	By Sales	15,25,000	17,00,000
To Administration			By Dividends	7,500	6,200
expenses	93,250	95,980	By profit from		
To Selling expenses	1,90,000	2,09,000	sale of land	6,000	8,000
To Interest period	8,000	7,000			
To Loss on sale of					
machinery	2,500	800			
To Income tax	85,000	1,68,000			
To Net profit	2,59,750	2,83,420			
	15,38,500	17,14,200		15,38,500	17,14,200

Solution:

Comparative Income Statement

		2000	*2001*	*Increase or Decrease*	*Percentage change*
Sales		15,25,000	17,00,000	+ 1,75,000	+ 11.47%
Less :	Cost of sales	9,00,000	+9,50,000	50,000	+ 5.5%
	Gross profit	6,25,000	7,50,000	1,25,000	
Less :	Operating expenses :				
	Administration	93,250	95,980	+ 2,730	+ 2.93%
	Selling	1,90,000	2,09,000	+ 19,000	+ 10%
		2,83,250	3,04,980	+ 21,730	+ 7.67%
	Operating profit	3,41,750	4,45,020	1,03,270	
Add :	Non-operating Income :				
	Interest and Dividend	7,500	6,200	– 1,300	– 17.33%
	Profit from sale of land	6,000	8,000	+ 2,000	+ 33.33%
		13,500	14,200	+700	+ 5.18%
	Total Income	3,55,250	4,59,220	+ 1,03,970	
Less :	Non-operating expenses :				
	Loss on sale of Machinery	2,500	800	– 1,700	– 68%
	Income tax	85,000	1,68,000	+ 83,000	+ 92.9%
		87,500	1,68,800	81,300	+ 92.69%
	Net profit	2,67,750	2,90,420	+ 22,670	

Interpretation :

1. The increase in sales is to the extent of Rs. 1,75,000, while cost of sales increased by a sum of Rs. 50,000. The gross profit is increased by Rs. 1,25,000. This is a good indication of profitability.
2. Non-operating expenses is very high (Rs. 81,300), when compared to non-operating income (Rs. 700). This is responsible for decrease in profit.
3. Tax has gone up in 2001 by Rs. 83,000, which is also responsible for decrease in net profit.

Problem 3 : From the following income statements extracted from the books of Aravind Parimal Works for the year 2000 and 2001 prepare comparative income statement and interpret the results of the business.

Income Statement (Rs. 000)

	2000	*2001*		*2000*	*2001*
To Opening stock	40.0	92.3	By sales	510.0	725.0
To Purchases	210.0	280.0	By closing stock	98.5	105.0
To Wages	25.0	32.0	By Discount	5.0	–
To Salaries	20.5	22.0	By Interest on investment	5.5	8.0
To Rent, rates and taxes	17.8	18.1	By Interest on bank deposit	5.0	7.2
To Selling expenses	5.8	6.1			
To Distribution expenses	3.2	3.9			
To Loss on sale of investment	–	10.0			
To Interest paid	7.0	7.5			
To Depreciation	35.0	40.0			
To Net profit	250.7	326.82			
	615.0	838.72		615.00	838.72

Solution :

Comparative Income Statement

	2000	*2001*	*Absolute change (Increase or Decrease)*	*Percentage change*
Net Sales	5,10,000	7,25,000	+ 2,15,000	+ 42.16%
Less : Cost of goods sold (See working note)	1,76,500	2,99,300	+ 1,22,800	+ 69.58%
Gross profit	3,33,500	4,25,700	+ 92,200	+ 27.65%
Less : Operating expenses :				
Salaries	20,500	22,000	+ 1,500	+ 7.32%
Rent, Rates and Taxes	17,800	18,100	+ 300	+ 1.69%
Selling expenses	5,800	6,100	+ 300	+ 5.17%
Distribution expenses	3,200	3,900	+ 700	+ 21.88%
Depreciation	35,000	40,000	+ 5,000	+ 14. 29%
Total operating expenses	82,300	90,100	+ 7,800	+ 9.48%
	2,51,200	3,35,600	84,400	+ 18.17%

Add :	Operating Income :				
	Discount	500	–	– 500	– 100%
	Operating profit	2,51,700	3,35,600	+ 83,900	+ 33.33%
Less :	Non-operating expenses and losses :				
	Interest paid	7,000	7,500	+ 500	+ 7.14%
	Loss on sale of Investment	–	10,000	+ 10,000	
		7,000	17,500	+ 10,500	+ 150%
		2,44,700	3,18,100	+73,400	+ 30.0%
Add :	Non-operating Incomes :				
	Interest on Investment	5,500	8,000	+ 2,500	+ 45.45%
	Interest on Bank Deposits	500	720	+ 220	+ 44.00%
	Total Non-operating incomes	6,000	8,720	+ 2,720	+ 45.33%
	Profit before tax	2,50,700	3,26,820	+ 76,120	+ 30.36%
Less :	Tax @ 50%	1,25,350	1,63,410	+ 38,060	+ 30.36%
	Profit after tax	1,25,350	1,63,410	+ 38,060	+ 30.36%

Working Note :

Calculation of cost of goods sold

		2000	*2001*
	Opening stock	40,000	92,300
Add :	Purchases	2,10,000	2,80,000
		2,50,000	3,72,300
Add :	Direct Wages	25,000	32,000
		2,75,000	4,04,300
Less :	Closing stock	98,500	1,05,000
Cost of goods sold		1,76,500	2,99,300

Interpretation :

1. Though sales have increased by 42.16%, the gross profit increase is only by 27.65%. This is on account of rise in the cost of goods sold *i.e.*, 69.58%.
2. Operating expenses have increased only marginally, i.e., by 9.48% which is justified with the increase in sales.
3. There is a considerable increase in non-operating income by 45.33%. This is partly responsible for increased percentage of net profit.
4. Profitability has increased in 2001 as compared to 2000 *i.e.*, by 30.36%.

Problem 4 : Khaitan Fans Ltd. submitted the following particulars for the year ended 31.3.2001. Prepare a comparative income statement for the year ended 31st March 2001 for the first four quarters.

1. Sales for the first four quarters is estimated as Rs. 2,50,000, Rs. 2,10,000, Rs. 3,00,000 and Rs. 3,60,000.
2. Selling expenses are 2% and Distribution expenses are 25% of the selling expenses.
3. Cost of goods Sold-Fixed cost Rs. 40,000 fixed per quarter and variable expenses 12 1/2% of selling price.
4. Rent per quarter is Rs. 10,000 and in the last quarter an increase of 5%.
5. Administrative expenses for the first quarter is 37,250 and thereafter 5% increase of the preceding quarters expenses.

6. At the beginning of the second quarter the company borrowed a loan of Rs. 2,50,000 @ 9% and the interest is payable quarterly.
7. Rate of Tax is 25% for the first 2 quarters and 20% of the next two.

Solution :

Calculation of cost of goods sold

Working Note :

	I Qr	*II Qr*	*III Qr*	*IV Qr*
1. *Fixed cost*	40,000	40,000	40,000	40,000
Add : Variable cost				
$12\frac{1}{2}\%$ on sales	31,250	26,250	37,500	45,000
Cost of goods sold	71,250	66,250	77,500	85,000
2. *Rent*	10,000	10,000	10,000	10,000
Add: Increase of 5% in the last quarter	–	–	–	500
	10,000	10,000	10,000	10,500
3. *Administrative Cost :*				
1st quarter	37,500			
IInd quarter				
$37,500 + \left(37,500 \times \frac{10}{100}\right)$		41,250		
IIIrd quarter				
$41,250 + \left(41,250 \times \frac{10}{100}\right)$			45,375	
IVth quarter				
$45,375 + \left(45,375 \times \frac{10}{100}\right)$				49,912
4. *Selling Cost :*				
2% on sales				
Ist quarter	5,000			
$\left(\frac{2}{100} \times 2,50,000\right)$				
IInd quarter		4,200		
$\left(\frac{2}{100} \times 2,10,000\right)$				
IIIrd quarter			6,000	
$\left(\frac{2}{100} \times 3,00,000\right)$				
IVth quarter				7,200
$\left(\frac{2}{100} \times 3,60,000\right)$				

Contd.

	I Qr	*II Qr*	*III Qr*	*IV Qr*
5. *Distribution Cost :*				
25% of Selling cost				
Ist Quarter $\left(\frac{25}{100}\times 5{,}000\right)$	1,250			
IInd Quarter $\left(\frac{25}{100}\times 4{,}200\right)$		1,050		
IIIrd Quarter $\left(\frac{25}{100}\times 6{,}000\right)$			1,500	
IVth Quarter $\left(\frac{25}{100}\times 7{,}200\right)$				1,800
6. Interest on loan : IInd Quarter, IIIrd Quarter, IVth Quarter $2{,}50{,}000 \times \frac{9}{100}\times\frac{3}{12} = 5{,}625$				

Comparative Income Statement

		I Qr	*II Qr*	*III Qr*	*IV Qr*
Sales		2,50,000	2,10,000	3,00,000	3,60,000
Less :	Cost of goods sold	71,250	66,250	77,500	85,000
	Gross profit	1,78,750	1,43,750	2,22,500	2,75,000
Less :	Operating expenses :				
	Rent	10,000	10,000	10,000	10,500
	Administrative cost	37,500	41,250	45,375	49,912
	Selling cost	5,000	4,200	6,000	7,200
	Distribution cost	1,250	1,050	1,500	1,800
		53,750	56,500	62,875	69,412
	Operating profit	1,25,000	87,250	1,59,625	2,05,588
Less :	Non-operating expenses :				
	Interest paid	–	5,625	5,625	5,625
	Profit before Tax	1,25,000	81,625	1,54,000	1,99,963
Less :	Tax	31,250	20,406	30,800	39,993
	Profit after Tax	93,750	61,219	1,23,200	1,59,970

Problem 5 (Comparative Position Statement) : Following are the Balance Sheet of a company for the years 1997 and 1998. Prepare a comparative balance sheet and explain the financial position of the concern.

Balance Sheet as on

	1997	*1998*		*1997*	*1998*
Share capital	3,00,000	4,00,000	Land and Buildings	1,85,000	1,35,000
Reserves and surplus	1,65,000	1,11,000	Plant and Machinery	2,00,000	3,00,000
Debentures	1,00,000	1,50,000	Furniture and Fixtures	10,000	12,500
Long term loan	75,000	1,00,000	Other fixed assets	12,500	15,000
Bills payable	25,000	12,500	Cash at bank	10,000	40,000
Creditors	50,000	60,000	Bills receivable	75,000	46,000
Other current			Debtors	1,00,000	1,25,000
Liabilities	2,500	5,000	Stock	1,25,000	1,75,000
	7,17,500	8,48,500		7,17,500	8,48,500

(Osmania University, B. Com., October 1999)

Solution:

Comparative Balance Sheet for the years ending 31st Dec. 1997 and 1998

	1997	*1998*	*Increase/ Decrease(Rs.)*	*Increase/ Decrease (%)*
Assets :				
Fixed Assets :				
Land and Building	1,85,000	1,35,000	– 50,000	– 27.03%
Plant and Machinery	2,00,000	3,00,000	+ 1,00,000	+ 50%
Furniture and Fixture	10,000	12,500	+ 2,500	+ 25%
Other fixed assets	12,500	15,000	+ 2,500	+ 20%
Total fixed assets	4,07,500	4,62,500	+ 55,000	+ 13.49%
Current Assets :				
Cash of bank	10,000	40,000	+ 30,000	+ 300%
Bills receivable	75,000	46,000	– 29,000	– 39%
Debtors	1,00,000	1,25,000	+ 25,000	+ 25%
Stock	1,25,000	1,75,000	+ 50,000	+ 40%
Total current assets	3,10,000	3,86,000	+ 76,000	+ 24.52%
Total assets	7,17,500	8,48,500	+ 1,31,000	+ 18.26%
Liabilities :				
Equity share capital	3,00,000	4,00,000	+ 1,00 000	+ 33%
Reserves and Surplus	1,65,000	1,11,000	– 54,000	– 32.73%
Total	4,65,000	5,11,000	– 46,000	– 11.61%
Debentures	1,00,000	1,50,000	+ 50,000	+ 50%
Long term loans	75,000	1,00,000	+ 25,000	+ 33%
Bills payable	25,000	22,500	– 2,500	– 10%
Creditors	50,000	60,000	+ 10,000	+ 20%
Other current liabilities	2,500	5,000	+ 2,500	+ 100%
Total	2,52,500	3,37,500	+ 85,000	+ 33.60%
Total capital and liabilities	7,17,500	8,48,500	+ 1,31,000	+18.26

Interpretation :

1. There is an increase in Fixed assets in the year 1998 compared to 1997. This is as compared to long term liabilities and share capital which shows an increase of 75,000 (50,000 + 25,000) and Rs. 1,00,000 respectively. The company has bought fixed assets out of long term finds. The working capital is not affected.
2. Current assets show an increase of 24.52 %. Whereas current liabilities show an increase of Rs. 10,000 (i.e., 12.9%). The liquidity position is therefore considered to be good.
3. Reserves and surplus has decreased by 32.73%. The company might have utilised the reserve for the issue of bonus shares or for the payment of dividend.

Problem 6 : The following are the balance sheets for the year 1991 and 1992. Prepare comparative balance sheet and comment on the financal position.

Liabilities :	*1991*	*1992*
6% Preference shares	30,000	30,000
Equity share capital	40,000	40,000
Reserves	20,000	24,5000
Outstanding tax	10,000	15,000
Sundry creditors	15,000	20,000
Bills payable	5,000	7,500
Debentures	10,000	15,000
	1,30,000	1,52,000
Assets :		
Land	10,000	10,000
Buildings	30,000	27,000
Plant	30,000	27,000
Furniture	10,000	14,000
Stock	20,000	30,000
Debtors	20,000	30,000
Cash	10,000	14,000
	1,30,000	152,000

(*S. V. University, B. Com., April 1999*)

Solution:

Comparative Balance Sheet

	1991	*1992*	*Absolute change*	*Percentage change*
I. *Assets* :				
1. Current Assets :				
Stock	20,000	30,000	+ 10,000	+ 50%
Debtors	20,000	30,000	+ 10,000	+ 50%
Cash	10,000	14,000	+ 4,000	+ 40%
Total current assets	50,000	74,000	+ 24,000	+ 48%

2. Fixed Assets :				
Land	10,000	10,000	–	–
Buildings	30,000	27,000	– 3,000	– 10%
Plant	30,000	27,000	– 3,000	– 10%
Furniture	10,000	14,000	+ 4,000	+ 40%
Total fixed assets	80,000	78,000	– 2,000	– 2.50%
Total Assets (1 + 2)	1,30,000	1,52,000	+ 22,000	+ 16.92%
II. *Liabilities* :				
1. Current liabilities :				
Creditors	15,000	20,000	+ 5,000	+ 33.33%
Bills payable	5,000	7,500	+ 2,500	+ 50%
O/s Tax	10,000	15,000	+5,000	+ 50%
Total Current liabilities	30,000	42,500	+ 12,500	+ 41.66%
2. Long term loans :				
Debentures	10,000	15,000	+5,000	+50%
	10,000	15,000	+5,000	+50%
3. Shareholders Funds :				
Preference Share Capital	30,000	30,000	–	–
Equity Share Capital	40,000	40,000	–	–
Reserves	20,000	24,500	+ 4,500	+ 22.5%
Total Shareholders Funds	90,000	94,500	+ 4,500	+ 5%
Total of liabilities (1 + 2 + 3)	1,30,000	1,52,000	+ 22,000	+ 16.92%

Working Notes:

$$\text{Calculation of percentage change} = \frac{\text{Absolute change}}{\text{Amount of previous year}} \times 100$$

$$\text{For example : } \frac{\text{Change in Current Asset}}{\text{Total Current Asset in 1991}} \times 100 = \frac{24{,}000}{50{,}000} \times 100 = 48\%$$

Similarly other percentages are calculated.

Interpretation :

As there is slight rise in current assets over current liabilities (48% – 41.66% = 6.33%). the financial position can be stated as satisfactory. The company has not shown much change in other aspects. It is still to make effort to gain further in its financial position.

Problem 7 (Comparative Position Statement in Vertical Form) :

Following are the Balance Sheets as on 31 December 1997 and 1998 of M/s Gautami Ltd.

	1997	*1998*		*1997*	*1998*
Equity Share Capital	1,00,000	1,50,000	Land and Building	80,000	75,000
General Reserve	60,000	10,000	Plant and Machinery	42,000	85,000
P & L a/c	5,000	30,000	Furniture and Fittings	7,000	6,000
Bank O. D	–	65,000	Investments	6,000	12,000
Mortgage loan (Secured on plant)	–	40,000	Stock	27,500	94,500
Provision for tax	10,000	15,000	Sundry Debtors	46,500	77,250
Sundry creditors	30,000	20,000	Cash	2,000	7,250
Bills payable	10,000	30,000	Preliminary expenses	4,000	3,000
	2,15,000	3,60,000		2,15,000	3,60,000

You are required to prepare :

1. Comparative Financial statements in vertical form and to.
2. Offer your comments there on. **(University of Bombay, B.Com., October 1999)**

Solution :

Comparative Balance Sheet

	1997	*1998*	*Absolute change*	*Percentage change*
Source of Fund :				
1. Shareholders fund:				
Equity share capital	1,00,000	1,50,000	+ 50,000	+ 50%
2. Reserves and surplus:				
General reserve	60,000	10,000	– 50,000	– 83.33%
P & L a/c	5,000	30,000	+ 25,000	+ 5%
	65,000	40,000	– 25,000	+ 38.46%
Less : Preliminary expenses	4,000	3,000	1,000	– 25%
	61,000	37,000	– 24,000	– 39.34%
3. Long term loan:				
Mortgage loan	–	40,000	+ 40,000	–
Total funds employed (1 + 2 + 3)	1,61,000	2,27,000	66,000	41%
Application of funds:				
Fixed Assets :				
Land and Buildings	80,000	75,000	– 5,000	6.25%
Plant and Machinery	42,000	85,000	+ 43,000	+ 102.39%
Furniture and Fittings	7,000	6,000	– 1,000	14.29
(*A*)	1,29,000	1,66,000	37,000	28.68
Trade Investments (*B*)	6,000	12,000	6,000	100%

Current Assets :				
Stock	27,500	94,500	67,000	243.64%
Debtors	46,500	77,250	30,750	66.13%
Cash	2,000	7,250	5,250	262.5%
(*C*)	76,000	1,79,000	1,03,000	135.53%
Current liabilities and provisions:				
Bank overdraft	–	65,000	+ 65,000	–
Sundry creditors	30,000	20,000	– 10,000	– 33.33%
Bills payable	10,000	30,000	+ 20,000	+ 200%
Provision for tax	10,000	15,000	5,000	+ 50%
(*D*)	50,000	1,30,000	80,000	+16.0%
Working capital	26,000	49,000	23,000	88.46%
Total Funds employed	1,61,000	2,27,000	66,000	+41%

Interpretations :

1. During the year 1998 the bonus shares of Rs. 50,000 are issued by capitalising general reserves. Also new machines were purchased which was financed through mortgaged loan.
2. Increase in current assets is partly, through the plouging back of profits in business and partly by bank overdraft and bills payable.
3. Proprietors funds in proportion to total assets have been reduced as during the year mortgage loan was taken.

Problem 8 : From the following data prepare comparative balance sheets in vertical form as at 31st March 998 and 31st March 1999 of M/s APJ Ltd.

	1998	*1999*		*1998*	*1999*
Share capital	70,000	80,000	Building	55,000	80,000
P & L a/c	20,000	20,000	Machinery	43,000	50,000
Debentures	20,000	30,000	Stock	25,000	5,000
Other secured loans	10,000	20,000	Debtors	15,000	10,000
Creditors	10,000	3,000	Cash	2,000	15,000
Bank O.D.	8,000	4,000			
O/s Expenses	2,000	3,000			
	1,40,000	1,60,000		1,40,000	1,60,000

Also offer your comments. **(University of Bombay, B.Com., April 1999)**

Solution :

Comparative Balance Sheet as at 31st March 1998-99

	1998	*1999*	*Absolute change*	*Percentage change*
Sources of Funds:				
(*A*) Shareholders fund:				
Share capital	70,000	80,000	+ 10,000	+ 14.29%
P & L a/c	20,000	20,000	–	–
	90,000	1,00,000	+ 10,000	11.11%

(*B*) Loan Funds :				
Debentures	20,000	30,000	+ 10,000	+ 50%
Other secured loans	10,000	20,000	+ 10,000	+ 100%
	30,000	50,000	+ 20,000	+ 66.67%
Total Funds (*A* + *B*)	1,20,000	1,50,000	30,000	25%
Application of Funds:				
(*A*) Fixed Assets :				
Building	55,000	80,000	+ 25,000	+ 45.55%
Machinery	43,000	50,000	+ 7,000	+ 16.28%
	98,000	1,30,000	+ 32,000	+ 32.65%
(*B*) Current Assets :				
Stock	25,000	5,000	– 20,000	– 80%
Debtors	15,000	10,000	– 5,000	– 33 1/3%
Cash	2,000	15,000	+ 13, 000	+ 650%
	42,000	30,000	– 12,000	– 28.57%
(*C*) Current liabilities:				
Creditors	10,000	3,000	– 7,000	– 70%
Overdraft	8,000	4,000	– 4,000	– 50%
O/s expenses	2,000	3,000	+ 1,000	+ 50%
	20,000	10,000	– 10,000	– 50%
Working capital (*B* – *C* = *D*)	22,000	20,000	– 10,000	– 50%
Total funds (*A* + *D*)	1,20,000	1,50,000	30,000	+ 25%

Interpretation:

1. Long term funds and building both show increase but not machinery.
2. Current liabilities and current assets show significant decline implying less commercial activity.
3. The above factors collectively indicate that the company is in process of operation.

Problem 9 : The following are the balance sheets of Hindustan Ltd. for the years ending 31 st March 1993 and 1994.

	1993	*1994*
Equity share capital	4,00,000	6,60,000
Pref. share capital	2,00,000	3,00,000
Reserves	40,000	60,000
P & L a/c	30,000	40,000
Bank O.D.	1,00,000	1,00,000
Creditors	80,000	1,00,000
Provision for taxation	40,000	50,000
Proposed dividend	30,000	50,000
	9,20,000	13,60,000
Fixed assets less depreciation	4,80,000	7,00,000
Stock	80,000	1,00,000
Debtors	2,00,000	2,50,000
Bills Receivable	40,000	1,20,000
Prepaid expenses	20,000	24,000
Cash in hand	80,000	1,06,000
Cash at Bank	20,000	60,000
	9,20,000	13,60,000

Prepare the comparative Balance sheet and study its financial position.

(S. V. University, B.Com., April 1998)

Solution:

Comparative Balance Sheet as on 1993 and 1994

	1993	*1994*	*Absolute change*	*Percentage change*
Assets :				
1. Fixed assets less depreciation	4,80,000	7,00,000	+ 2,20,000	+ 45.83%
2. Current assets :				
Stock	80,000	1,00,000	+ 20,000	+ 25%
Debtors	2,00,000	2,50,000	+ 50,000	+ 25%
Bills Receivable	40,000	1,20,000	+ 80,000	+ 200%
Prepaid expenses	20,000	24,000	+ 4,000	+ 20%
Cash in hand	80,000	1,06,000	+ 26,000	+ 32.5%
Cash at Bank	20,000	60,000	+ 40,000	+ 200%
	4,40,000	6,60,000	+ 2,20,000	+ 50%
Total Assets (1 + 2)	9,20,000	13,60,000	+ 4,40,000	+ 47.83%
Liabilities :				
1. Shareholders funds :				
Equity share capital	4,00,000	6,60,000	+ 2,60,000	+ 65%
Pref. share capital	2,00,000	3,00,000	+ 1,00,000	+ 33 1/3%
Reserves and Surplus				
Reserve	40,000	60,000	+ 20,000	+ 50%
P & L a/c	30,000	40,000	+ 10,000	+ 33 1/3%
	6,70,000	10,60,000	+ 3,90,000	+ 58.2%
2. Current liabilities:				
Bank O.D.	1,00,000	1,00,000	–	–
Creditors	80,000	1,00,000	+ 20,000	+25%
	1,80,000	2,00,000	+ 20,000	+ 11.1%
3. Provisions :				
Provision for taxation	40,000	50,000	+ 10,000	+ 25%
Proposed Dividend	30,000	50,000	+ 20,000	+ 66.67%
	70,000	1,00,000	+ 30,000	+ 42.86%
Total liabilities (1 + 2 + 3)	9,20,000	13,60,000	+ 4,40,000	+ 47.83%

Interpretation :

1. Workng capital has increased by Rs. (2,20,000 – 20,000) = 2,00,000.
2. The raise of shareholders fund 58.2% (Rs. 3,90,000) was utilised to raise the fixed Assets 45.83% (Rs. 2,20,000) and utilised for working capital also.
3. The dividend payable to shareholders also has increased which will increase public confidence.

Problem 10 : (Comparative Income Statement and Position Statement)

From the following financial statements of Vaibhav Ltd. prepare comparative financial statements in vertical form.

Revenue Statement

	31.12.95	**31.12.96**		**31.12.95**	**31.12.96**
Cost of goods sold	6,00,000	7,50,000	Sales	8,00,000	10,00,000
Administrative expenses	30,000	40,000			
Selling expenses	20,000	20,000			
Net profit	1,50,000	1,90,000			
	8,00,000	10,00,000		8,00,000	10,00,000

Balance Sheet

	31.12.95	**31.12.96**		**31.12.95**	**31.12.96**
Equity share capital	4,00,000	4,00,000	Land	2,00,000	2,40,000
9% Pref. share capital	3,00,000	3,00,000	Building	6,00,000	5,40,000
General Reserve	2,00,000	2,45,000	Stock	2,00,000	3,00,000
Tax payable	1,00,000	1,50,000	Debtors	2,00,000	3,00,000
Creditors	2,00,000	2,75,000	Cash	1,00,000	1,40,000
17% Debentures	1,00,000	1,50,000			
	13,00,000	15,20,000		13,00,000	15,20,000

Briefly comment on the difference between the stated net profit of 1996 and the increment in general reserves on 31-12-96 assuming that no amount is paid towards tax in 1996.

Also ascertain the quantum of cash gross profit of 1996, assuming that no depreciation is provided on Land. **(University of Bombay, B.Com., October 1997)**

Solution:

Comparative Income Statement

		31-12-95	*31-12-96*	*Absolute change*	*Percentage change*
	Sales	8,00,000	10,00,000	+ 2,00,000	25%
Less:	Cost of Sales	6,00,000	7,50,000	+ 1,50,000	26%
	Gross profit	2,00,000	2,50,000	+ 50,000	+ 25%
Less:	Operating expenses:				
	Administration expenses	30,000	40,000	+ 10,000	+ 33 1/3%
	Selling expenses	20,000	20,000	–	–
		50,000	60,000	+ 10,000	+ 20%
	Net operating profit	1,50,000	1,90,000	+ 40,000	26.67%

Comparative Balance Sheet

	31-12-95	*31-12-96*	*absolute change*	*Percentage change*
Sources of Funds:				
(*A*) Shareholders funds:				
Equity share capital	4,00,000	4,00,000	–	–
9% pref. share capital	3,00,000	3,00,000	–	–
	7,00,000	7,00,000		
(*B*) Reserves and surplus:				
General reserve	2,00,000	2,45,000	+ 45,000	+ 22.5%
	9,00,000	9,45,000	+ 45,000	+5%
(*C*) Long term liabilities:				
17% Debentures	1,00,000	1,50,000	+ 50,000	+ 50%
Total funds employed	10,00,000	10,95,000	+ 95,000	+ 9.5%
Applications of Funds:				
(*A*) Fixed Assets:				
Land	2,00,000	2,40,000	+ 40,000	+ 20%
Building	6,00,000	5,40,000	– 60,000	– 10%
	8,00,000	7,80,000	– 20,000	– 2.5%
(*B*) Currents Assets :				
Stock	2,00,000	3,00,000	+ 1,00,000	50%
Debtors	2,00,000	3,00,000	+ 1,00,000	50%
Cash	1,00,000	1,40,000	+ 40,000	40%
	5,00,000	7,40,000	+ 2,40,000	+ 48%
(*C*) Current liabilities:				
Tax payable	1,00,000	1,50,000	+ 50,000	50%
Creditors	2,00,000	2,75,000	+ 75,000	+ 37.50%
	3,00,000	4,25,000	1,25,000	41.67%
Working Capital ($B - C = D$)	2,00,000	3,15,000	1,15,000	41.67%
Total funds employed ($A + D$)	10,00,000	10,95,000	+ 95,000	+ 9.5%

Interpretation:

1. Net profit for the year 1996 has increased by 45,000.
2. There is no change in the capital structure of the company.
3. Value of building has decreased by Rs. 60,000 indicating the loss in the value of building. Alternatively it may taken to mean depreciation on building.

Problem 11 : Circle and Square are carrying on partnership business. Their position as on 31 st March 1995 and 1994 is as follows:

I. The Summarised Balance Sheet

	1995	*1994*		*1995*	*1994*
Capital a/cs,	71,750	59,500	Fixed Assets	52,500	43,750
Bank loan	14,000	10,500	Investments	3,500	1,750
Sundry creditors	38,500	35,000	Stock	21,000	17,500
			Sundry debtors	31,500	26,250
			Loans and advances	14,000	14,000
			Cash and bank balance	1,750	1,750
	1,24,250	1,05,000		1,24,250	1,05,000

II. Summarised Income Statement

	1995	*1994*
Net Sales	42,000	38,500
Less: Cost of Sales	31,500	29,750
Gross Margin	10,500	8,750
Less: Operating expenses	8,750	7,000
Net profit before Tax	1,750	1,750

(University of Bombay, B.Com., April 1995)

Soluton:

Comparative Income Statement

	1994	*1995*	*Absolute change*	*Percentage change*
Sales	38,500	42,000	+ 3,500	+ 9.09%
Less: Cost of sales	29,750	31,500	– 1,750	+ 5.88%
Gross margin	%8,750	10,500	1,750	+ 20%
Less: Operating expenses	7,000	8,750	1,750	+ 25%
Net profit	1,750	1,750	–	–

Comparative Balance Sheet

	1994	*1995*	*Absolute change*	*Percentage change*
Sources of Funds:				
Capital a/cs .	59,500	71,750	+ 12,250	+ 20.59%
Loan funds	10,500	14,000	+ 3,500	+ 33.33%
Total funds employed	70,000	85,750	+ 15,750	+ 22.50%
Application of funds:				
Fixed Assets (A)	43,750	52,500	+ 8,750	+ 20%
Investments (B)	1,750	3,500	+ 1,750	+ 100%

Current Assets :				
Stock	17,500	21,000	+ 3,500	+ 20%
Debtors	26,250	31,500	+ 5,250	+ 20%
Loans and advances	14,000	14,000	–	–
Cash and bank	1,750	1,750	–	–
	59,500	68,250	+ 8,750	+ 14.71 %
Current Liabilities:				
Creditors	35,000	38,500	+ 3,500	+ 10%
Working Caital (C)	24,500	29,750	+ 5,250	+ 21.43%
Total funds employed (A + B + C)	70,000	85,750	+ 15,7 50	+ 22.50%

Interpretation:

1. There is an increase in partners capital as well as loans in the firm. This is utilised in financing fixed assets.
2. There is no change in profit in 1995 as compared to 1994 which means that additional capital is used in financing working capital requirements of the business.
3. Cost of sales equals operating expenses. Again both cost of sales and operating expenses equals (1,750 + 1,750 = 3,500) sales. Thus there is no absolute increase in the profit.

2. Common-Size Financial Statement Analysis: They are comparative statements that give only the percentages for financial data without giving the rupee value. They are also known as 100 percent statements because each statement is reduced to the total of 100 and each individual item is stated as a percentage of the total of 100. Each percentage shows the relation of the individual items to its respective total. The common size financial statements are most valuable in making comparisons between the firms in the same industry. The two common-size financial statements usually prepared are : (*a*) Common-size income statement and (*b*) Common-size balance sheet.

Computation of Common-size statements

1. In case of common-size income-statement, total net sales are stated as 100 percent. In case of position statement either total assets or total of liabilities and capital is taken as 100.
2. The quotient of each item is found out by dividing individual money amount by the total amount in the statement. This is expressed in the form of percentage.

Illustration: If the selling expense in any particular year of a business is Rs. 60,000 and its net sales is Rs. 6,00,000 for that year, the above two steps may be illustrated as follows:

$$\frac{\text{Selling expenses}}{\text{Net sales}} \times 100$$

$$= \frac{60{,}000}{6{,}00{,}000} \times 100 = 10\%$$

This denotes that selling expenses for that particular year is 10% of net sales or they amount to Rs. 10 for every Rs. 100 worth of sales.

Other items can also be incorporated in the statements in the same manner and similar conclusions can be drawn.

Problem 12 : (Common-size Income Statement) Prepare common-size income statement in vertical form from the following income statement and briefly comment thereon.

P & L a/c for the year ended 31-3-99

To	Cost of Sales	4,91,400	By Gross Sales	8,26,200
To	Administrative expenses	81,000	Less Returns	16,200
				8,10,000
To	Selling and distribution expenses	1,62,000	By Non-operating income	8,100
To	Non-operating expenses	10,800		
To	Tax provision	36,450		
To	Proposed Dividend	7,000		
To	Retained Earnings	29,450		
		8,18,100		8,18,100

(University of Bombay, B.Com., October 1999)

Solution:

Common-Size Income Statement

			Amount	*Percentage*
Sales			8,26,200	102%
Less :	Sales Returns		16,200	2%
	Net sales		8,10,000	100%
Less :	Cost of sales		4,91,400	60.67%
	Gross profit		3,18,600	39.33%
Less :	Operating expenses:			
	Office & Adm. expenses	81,000		10%
	Selling and Distribution exenses	1,62,000		20%
			2,43,000	
	Net operating profit		75,600	9.33%
Add :	Non-operating income		8,100	1%
			83,700	10.33%
Less :	Non-operating expenses		10,800	0.133%
	Net profit before Tax		72,900	9%
Less :	Tax provision		36,450	4.50%
	Net profit after Tax		36,450	4.50%
Less :	Proposed Dividend		7,000	0.86%
	Balance transferred to B/S		29,450	3.64%

Interpretation:

1. Operating expenses are high for a given cost of sales. This must be under check.
2. Non-operating expenses are high compared to non-operating income.
3. Rate of Dividend declared is very less (0.86%).

Problem 13 : The following figures relate to the activities of R. R. Ltd, Mumbai for the year ending 31 st March 1995.

Sales	7,50,000
Purchases	3,75,000
Opening stock	70,000
Closing stock	80,000
Administration Expenses:	
Salaries	37,000
Rent	12,000
Postage and Stationary	5,000
Provision for taxation	50,000
Selling and Distribution expenses:	
Salaries	18,000
Advertising	6,000
Commission on sales	7,500
Discount	2,000
Non-operating expenses:	
Interest	5,000
Loss on sale of assets	11,500
Non-operating income:	
Profit on sale of investments	9,500

You should study the income statement of the concern with the help of common-size statement.

(S. V. University, B.Com., October 1998)

Solution:

Common-size Income-Statement of R.R. Ltd. for the year ended 31-3-1995

			Amount	Percentage
Sales			7,50,000	100%
Less :	Cost of goods sold:			
	Opening stock	70,000		
Add :	Purchases	3,75,000		
		4,45,000		
Less :	Closing stock	80,000		
			3,65,000	48.67%
			3,85,000	51.33%
	Gross profit			
Less :	Operating expenses :			
Administration expenses :				
	Salaries	37,000		
	Rent	12,000		
	Postage and stationary	5,000		
			54,000	7.20%
			3,31,000	44.13%

Selling and Distribution expenses :				
	Salaries	18,000		
	Advertising	6,000		
	Commission on sales	7,500		
	Discount	2,000		
			33,500	4.47%
	Operating profit		2,97,500	39.66%
Less :	Non-operating expenses :			
	Interest	5,000		0.67%
	Loss on sale of investment	11,500	16,500	1.53%
			2,81,000	37.46%
Add :	Non-operating Income:			
	Profit on sale of investment		9,500	1.27%
	Profit before Tax		2,90,500	38.73%
Less :	Provision for Tax		50,000	6.67%
	Profit after Tax		2,40,500	32.06%

Interpretation:

1. Total operating expenses is 1/4th of cost of goods sold (i.e., 87,500: 3,65,000). This is a satisfactory position.
2. Total Non-operating income is less than total non-operating expenses. This is not a satisfactory position.
3. Profitable percentage of 32.06% is considered to be good percentage.

Problem 14 : (Common-Size Balance Sheet) Following are the Balance sheets of Vinay Ltd. for the year ended December 1996 and 1997.

Liabilities	*1996*	*1997*	*Assets*	*1996*	*1997*
Equity capital	1,00,000	1,65,000	Fixed Assets (Net)	1,20,000	1,75,000
Pref. capital	50,000	75,000			
Reserves	10,000	15,000	Stock	20,000	25,000
P & L a/c	7,500	10,000	Debtors	50,000	62,500
Bank O.D.	25,000	25,000	Bills receivable	10,000	30,000
Creditors	20,000	25,000	Prepaid expense	5,000	6,000
Provision for Taxation	10,000	12,500	Cash at Bank	20,000	26,500
Proposed dividend	7,500	12,500	Cash in hand	5,000	15,000
	2,30,000	3,40,000		2,30,000	3,40,000

Prepare a common -size balance sheet and interpret the same.

(Osmania University, B.Com., March 1999)

Solution:

Common-size Balance Sheet of Vinay Ltd. for the year 1996 and 1997.

	1996		*1997*	
	Rs.	*%*	*Rs.*	*%*
Assets				
Fixed Assets (Net) (*A*)	1,20,000	52.17	1,75,000	51.47%
Current Assets :				
Stock	20,000	8.70	25,000	7.35%
Debtors	50,000	21.74	62,500	18.38%
Bills Receivable	10,000	4.34	30,000	8.82%
Prepaid expenses	5,000	2.17	6,000	1.78%
Cash at Bank	20,000	8.70	26,500	7.79%
Cash in hand	5,000	2.18	15,000	4.41%
Total (B)	1,10,000	47.83	1,65,000	48.53%
Total Assets (A + B)	2,30,000	100,00	3,40,000	100%
Liabilities:				
Capital and Reserves: (*A*)				
Equity capital	1,00,000	43.58	1,65,000	48.53%
Preference capital	50,000	21.74	75,000	22.05%
Reserves	10,000	4.34	15,000	4.41%
P & L a/c	7,500	3.26	10,000	2.95%
Total (A)	1,67,500	72.82	2,65,000	77.94%
Current liabilities : (*B*)				
Bank overdraft	25,000	10.87	25,000	7.35%
Creditors	20,000	8.70	25,000	7.35%
Provision for taxation	10,000	4.35	12,500	3.68%
Proposed dividend	7,500	3.26	12,500	3.68%
Total (B)	62,500	27.18	75,000	22.06%
Total liabilities (*A* + *B*)	2,30,000	100	3,40,000	100%

Interpretation:

1. Current assets increased from 47.83% to 48.53%. Whereas current liabilities decreased from 27.18% to 22.06%. The liquidity position is reasonably good.
2. Fixed assets increased from Rs. 1,20,000 to Rs. 1,75,000. They were purchased from the additional share capital issued.

Problem 15 : Following are the Balance sheets of `S' Ltd. for the year ending December 31, 1992 and 1993.

Liabilities	*1992*	*1993*
Equity share capital	40,000	60,000
Reserves and surplus	31,200	35,400
Debentures	5,000	10,000
Mortgage	15,000	25,500
Sundry creditor	25,500	11,700
Other current liabilities	700	1,000
	1,17,400	1,43,600

Assets:		
Land and Building	27,000	17,000
Plant and Machinery	31,000	78,600
Furniture and Fixtures	900	1,800
Other fixed assets	2,000	3,000
Long term loans	4,600	5,900
Cash in hand	11,800	1,000
Sundry Debtors	20,900	19,000
Inventory	16,000	13,000
Prepaid Expenses	300	300
Other current assets	2,500	4,000
	1,17,400	1,43,600

Analyse the financial position of the company with the help of common-size balance sheet.

(*S. V. University, B. Com., October 1999*)

Solution:

Comparative Common-size Balance Sheets of 'S' Ltd., as on 31-12-92 and 31-12-93

	1992		*1993*	
	Amount	*%*	*Amount*	*%*
Assets:				
1. Fixed Assets :				
Land and Buildings	27,000	23%	17,000	11.84%
Plant and Machinery	31,000	26.40%	78,600	54.74%
Furniture and Fixtures	900	0.77%	1,800	1.25%
Other Fixed Assets	2,000	1.70%	3,000	2.08%
Total Fixed Assets	60,900	51.87%	1,00,400	69.91%
2. Investments:				
Long term loans	4,600	3.92%	5,900	4.11%
3. Current Assets:				
Cash in hand	11,800	10.05%	1,000	0.70%
Sundry Debtors	20,900	17.80%	19,000	13.23%
Inventory	16,000	13.63%	13,000	9.05%
Prepaid expenses	300	0.26%	300	0.21%
Other current assets	2,900	2.47%	4,000	2.79%
	51,900	44.21%	37,300	25.98%
Total Assets (1 + 2 + 3)	1,17,400	100%	1,43,600	100%
Liabilities:				
1. Shareholders funds :				
Equity share capital	40,000	34.07%	60,000	41.78%
Reserves and Surplus	31,200	26.58%	35,400	24.65%
	71,200	60.65%	95,400	66.43%
2. Long term Debts :				
Debentures	5,000	4.25%	10,000	6.96%
Mortgages	15,000	12.78%	25,500	17.76%
	20,.000	17.03%	35,500	24.72%

3. Current liabilities:				
Sundry creditors	25,500	21.72%	11,700	8.15%
Other current liabilities	700	0.60%	1,000	0.70%
	26,200	22.32%	12,700	8.85%

Interpretation:

1. There is drastic fall in the working capital. In the year 1992 it was 21.89 (44.21 – 22.32) and in the year 1993 it was 17.13% (25.98 – 8.85).
2. The liquid assets also have come down which has adversely affected the business.
3. Fixed assets have increased in 1993, the increase being 18.04% (69.91 – 51.87). This rise in fixed assets is financed partly by raising shareholder's funds and long term loans and partly by diversion from working capital, i.e., 4.57%. The latter is not acceptable.
4. Rserves and Surplus have diminished in 1993, i.e., from 26.58% to 24.65%. This is not a welcome sign.

Problem 16 : (Common-size Balance sheet-Vertical Method) Prepare a common-size balance sheet of M/s Ram Ltd. in vertical form from the following information and comment on it.

Balances as on 31.3.1999

	Rs.
Land and Building	6,00,000
Plant and Machinery	5,00,000
Equity capital	5,00,000
Preference capital	2,00,000
Stock	2,40,000
Debtors	2,00,000
Cash and Bank	55,000
Miscellaneous current assets	5,000
Profit and loss a/c (cr. balance)	2,00,000
General reserve	1,00,000
Sundry creditors	80,000
Bills payable	60,000
Miscellaneous current liabilities	60,000
Debentures	4,00,000

(University of Bombay, B.Com., October 1999)

Solution:

Common-size Balance Sheet as on 31st December 1999

		Amount	*Percentage*
Sources of Funds :			
I. Shareholders funds :			
(*A*) Share capital–Equity		5,00,000	35.71%
– Preference		2,00,000	14.29%
	(*A*)	7,00,000	50%
(*B*) Reserves and Surplus :			
P & L a/c		2,00,000	14.29%
General Reserve		1,00,000	7.14%
	(*B*)	3,00,000	21.43.%

II. Long term loan :		
Debentures	4,00,000	28.57
Total funds employed (*A* + *B* + *C*)	14,00,000	100%
Application of funds :		
(*A*) Fixed Assets :		
Land and Building	6,00,000	42.86%
Plant and Machinery	5,00,000	35.71%
(A)	11,00,000	78.57%
(*B*) Current Assets :		
Stock	2,40,000	17.14%
Debtors	2,00,000	14.29%
Cash and Bank	55,000	3.93%
Miscellaneous current assets	5,000	0.36%
(*B*)	5,00,000	35.71%
(*C*) Current liabilities:		
Sundry creditors	80,000	5.71%
Bills payable	60,000	4.29%
Miscellaneous current liabilities	60,000	4.28%
(*C*)	2,00,000	14.28%
Working capital (*B* – *C*) = *D*	3,00,000	21.43%
Total funds employed *A* + *D*	14,00,000	100%

Interpretation:

1. Proprietors funds constitute 71.43 % (50 + 21. 43%) of total fund employed.
2. Fixed assets which constitute 78.57% are financed by proprietor's funds indicate sound financial position.
3. Currents assets are higher than current liabilities.

Problem 17 : (Common-size Income and position statement) Shiv Leela Ltd. furnishes you with the following financial statement.

Balance sheet as on 31st March 1999

Share capital:				
Equity	1,00,000	Building	2,00,000	
12% preference	50,000	Less Depreciation	15,000	
				1,85,000
Reserves and Surplus	35,000	Short term Investments		40,000
10% Debentures (Secured by Mortgage)	50,000			
Bills payable	15,000	Stock		35,000
Creditors for goods	20,000	Debtors		30,000
Outstanding expenses	10,000	Bank		10,000
Provision for taxation	10,000			
Proposed Dividend	10,000			
	3,00,000			3,00,000

Profit and Loss a/c for the year ended 31-3-1999

To Opening stock	30,000	By sales	3,00,000
To Purchases	1,80,000	By closing stock	35,000
To Expenses :			
Administration	25,000		
Selling	30,000		
Financing	5,000		
To Depreciation	150,000		
To Provision for Taxation	10,000		
To Proposed Dividend	10,000		
To Balance c/d	30,000		
	3,35,000		3,35,000

You are required to:

1. Convert the above into common-size statements in vertical form.
2. Comment on above briefly. **(University of Bombay, B.Com., April 1999)**

Solution:

Common-size Income Statement for the year ended 31st March 1999

			Amount	Percentage
Sales			3,00,000	100%
Less :	Cost of goods sold			
	Opening stock	30,000		
Add :	Purchases	1,80,000		
		2,10,000		
Less :	Closing stock	35,000		
			1,75,000	58.33%
			1,25,000	41.67%
	Gross profit			
Less :	Overheads:			
	Administrative (25,000 + 15,000)	40,000		
	Selling	30,000		
	Financing	5,000		
			75,000	25.60%
	Net profit before tax		50,000	16.67%
Less :	Income tax		10,000	3.33%
	Net profit after tax		40,000	13.34%
Less :	Dividend		10,000	3.34%
	Retained Earnings		30,000	10.00%

Interpretation:

1. Gross profit is quite high as compared to overheads. This shows efficiency of business.
2. When compared to sales, cost of goods sold is 58.33% which indicates high profitability.

Common-size Balance sheet for the year ended 31st March 1999

		Amount	*Percentage*
Sources of Funds :			
1. Shareholders funds :			
Equity share capital		1,00,000	42.55%
12% preference share capital		50,000	21.28%
Reserves and Surplus		35,000	14.89%
		1,85,000	78.72%
2. Loan funds :			
10% Debentures		50,000	21.28%
Total funds		2,35,000	100%
Application of funds :			
1. Fixed Assets :			
Buildings	2,00,000		
Less Depreciation	15,000		
		1,85,000	78.72%
2. Current Assets :			
Short term investments		40,000	17.02%
Stock		35,000	14.89%
Debtors		30,000	12.77%
Bank		10,000	4.26%
		1,15,000	48.94%
3. Current liabilities :			
Creditors		20,000	8.51%
Bills payable		15,000	6.38%
Outstanding expenses		10,000	4.26%
Taxation		10,000	4.26%
Dividend		10,000	4.25%
		65,000	27.66%
Working capital (2 – 3 = 4)		50,000	21.28%
Total funds (1 + 4)		2,35,000	100%

Interpretation:

1. Investment of proprietors funds is very high.
2. Fixed Assets are very high compared to current assets.
3. Current Ratio is high and it shows sound financial position.

TREND ANALYSIS OR TREND RATIOS

Trend ratios can be defined as the index numbers of the movements of the various financial items on the financial statement for a number of periods. It is a statistical device applied in the analysis of financial statements to reveal the trend of the items with the passage of time. They provide a horizontal analysis of comparative statements and reflect the behaviour of various items with passage of time. The trend ratios are the useful analytical device for management since by substitution of percentages for large amounts, the brevity and readability is achieved. It can be graphically presented for a better understanding by the management. They are very useful in predicting the behaviour of the various financial factors in future. Sometimes trends are significantly affected by external causes over which the organisation has no control. Such factors are Government policies, economic conditions, change in income and its distribution etc.

Points to be considered in calculation of trend ratios:

(*i*) The accounting principles and practices followed should be constant throughout the period for which analysis is made.
(*ii*) Trend ratios should be calculated only for items having logical relationship with one another.
(*iii*) There should be financial statement for a number of years.
(*iv*) Take one of the statements as the base with reference to which all other statements are to be studied but the selected base statements should belong to a normal year.
(*v*) Every item in the base statement should be stated as 100.
(*vi*) Trend Ratios of each item in other statement is calculated with reference to same item in the base statement by using the following formula.

$$\frac{\textbf{Absolute value of item in the statement under study}}{\textbf{Absolute value of the same item in base statement}} \times \mathbf{100}$$

Problem 18 : From the following data, calculate trend percentage (taking 1995 as base).

	1995 *Rs.*	*1996* *Rs.*	*1997* *Rs.*
Sales	50,000	75,000	1,00,000
Purchase	40,000	60,000	72,000
Expenses	5,000	8,000	15,000
Profit	5,000	7,000	13,000

(Osmania University, B.Com., March 1999)

Solution:

Statement Showing Trend Percentages

Particulars	*1995* *Rs.*	*1996* *Rs.*	*1997* *Rs.*	*Trend percentages (Base 1995)*		
				1995	*1996*	*1997*
Purchases	40,000	60,000	72,000	100	150	180
Expenses	5,000	8,000	15,000	100	160	300
Profit	5,000	7,000	13,000	100	140	260
Sales	50,000	75,000	1,00,000	100	150	200

Problem 19 : From the following data, calculate trend percentages (1995 as the base).

	1995 *Rs.*	*1996* *Rs.*	*1997* *Rs.*
Cash	200	240	160
Debtors	400	500	650
Stock	600	800	700
Other current asset	450	600	750
Land	800	1,000	1,000
Buildings	1,600	2,000	2,400
Plant	2,000	2,000	2,400

(Osmania University, B.Com., October 1998)

Solution:

Statement Showing Trend Percentages (Base year 1995)

Assets	*1995 Rs.*	*1996 Rs.*	*1997 Rs.*	*Trend percentages*		
				1995	*1996*	*1997*
Fixed Assets:						
Land	800	1,000	1,000	100	125	125
Building	1,600	2,000	2,400	100	125	150
Plant	2,000	2,000	2,400	100	100	120
Total	4,400	5,000	5,800	100	114	132
Current Assets:						
Cash	200	240	160	100	120	80
Debtors	400	500	650	100	125	163
Stock	600	800	700	100	133	117
Other current assets	450	600	750	100	133	167
Total current assets	1,650	2,140	2,260	100	130	137

QUESTIONS

Simple Questions

1. What is meant by financial analysis?
2. Distinguish between 'analysis' and 'interpretation' of financial statements.
3. What is meant by external analysis of financial statements?
4. What is meant by internal analysis of financial statements?
5. What is meant by horizontal analysis of financial statments?
6. What is meant by vertical analysis of financial statement?
7. List out the various methods of financial analysis.
8. What is meant by comparative statements?
9. What is a common-size statements?
10. What is trend analysis?

Short Answer Questions

1. "Decisions taken on the basis of financial statements may not be regarded as final and accurate"–Comment.
2. Write an analytical note on comparative income statement and state the procedure of computing them.
3. "The significanse of financial statements lies not in their preparation but in their analysis and interpretation"–Comment.
4. Write an analytical note on common-size statements and state the procedure of computing it.
5. Briefly analyse the importance of "Trend percentages" as a tool of financial analysis and state the procedure of computing it.
6. Explain the procedure of financial statement analysis.
7. State the limitations of financial analysis.

EXERCISE 1

(Comparative Financial Statement) :

Balance sheet of RT Ltd. as on 31st December 1994 and 1995 is given below:

	1995	*1996*		*1995*	*1996*
Preference share capital	–	4,00,000	Fixed Assets	7,00,000	10,00,000
Equity share capital	5,00,000	5,00,000	Investments (at cost)	1,00,000	1,20,000
Reserves and surplus	1,35,000	1,71,500	Stock	1,50,000	1,80,000
12% Debentures	2,00,000	–	Debtors	2,36,000	2,44,000
Bank O.D	50,000	80,000	Cash	24,000	2,500
Sundry creditors	1,50,000	1,25,000			
Provision for taxation	75,000	1,20,000			
Proposed dividend	1,00,000	1,50,000			
	12,10,000	15,46,000		12,10,000	15,46,000

Prepare a comparative financial statement. **(University of Bombay, B.Com., October 1996)**

EXERCISE 2

The Balance sheets of Santhosh Ltd. is as follows:

	1993 (Rs.)	*1994* (Rs.)
Liabilities:		
Equity share capital	2,00,000	2,50,000
10% pref. share capital	2,00,000	1,50,000
Reserve fund	80,000	1,00,000
P & L a/c	1,00,000	1,50,000
12% Debentures	2,00,000	3,00,000
Creditors	1,00,000	1,20,000
Bank O.D.	50,000	20,000
	9,30,000	10,90,000
Assets:		
Buildings	3,00,000	3,20,000
Machinery	1,50,000	1,80,000
Furniture	40,000	35,000
Investments	1,00,000	1,50,000
Stock	1,50,000	2,00,000
Debtors	1,00,000	1,20,000
Cash at Bank	90,000	85,000
	9,30,000	10,90,000

You are required to comment on the financial position of business with the help of comparative Balance sheet Technique. **(Bangalore University, B.Com., April 1996)**

EXERCISE 3

From the following profit and loss account and balance sheet of Radha Industries, prepare a comparative income statement and a comparative balance sheet.

Profit & loss A/c (Rs. in lacs)

	1992 Rs.	*1993* Rs.		*1992* Rs.	*1993* Rs.
To Cost of goods sold	500	640	By sales	700	900
To Operating expenses:					
Administrative expenses	20	20			
Selling expenses	30	40			
To Net profit	150	200			
	700	900		700	900

Balance sheet as on 31st December (Rs. in lacks)

	1992	*1993*		*1992*	*1993*
Bills payable	50	75	Cash	50	70
Tax payable	100	150	Debtors	300	450
Sundry creditors	150	200	Stock	100	200
Debentures	100	150	Land	100	120
Pref. share capital	300	300	Buildings	200	180
Equity share capital	200	200	Machinery	250	225
Reserves	200	250	Furniture	100	80
	1,100	1,325		1,100	1,325

(University of Madras, B.Com., September 1994)

EXERCISE 4

(Common-size Financial Statements):

From the following particulars prepare a common-size income statement and interpret changes in 1996 as compared to 1995.

(*Amount in Lakhs of Rs.*)

	1995	*1996*
Net Sales	600	800
Cost of goods sold	400	500
Gross profit	200	300
Operating expenses	40	50
Operating profit	160	250
Non-operating income	20	25
Non-operating expenses	30	40
Net profit	150	235

(Bangalore University, B.Com., April 2001)

EXERCISE 5

The profit and loss account of a company is given below:

P & L a/c

	1997	*1998*		*1997*	*1998*
To Cost of goods sold	600	750	By Net sales	800	1,000
			By Non-operating Income	50	100
To *Operating expenses*:					
Administration expenses	30	40			
Selling expenses	40	50			
To Non-operating expenses	30	40			
To Net profit	150	220			
	850	1,100		850	1,100

You are required to prepare a common-size income statement and interpret the changes.

(Bangalore University, B.Com., April 2000)

EXERCISE 6

Following are the two Balance Sheets on two different dates rearrange them in vertical form and prepare common-size statements :

	1993	*1994*		*1993*	*1994*
Equity share capital	2,25,000	2,62,500	Good will	45,000	35,250
General Reserve	15,000	22,500	Machinery	67,500	1,43,250
Capital Reserve	–	18,750	Building	75,000	56,250
P & L a/c	13,500	20,250	Long term Investment	7,500	26,250
Creditors	33,000	48,750	Stock	63,750	58,500
Provision for Tax	21,000	24,000	Debtors	45,000	67,500
Proposed Dividend	20,250	24,750	Bank	12,750	21,000
			Bills Receivable	11,250	13,500
	3,27,750	4,21,500		3,27,750	4,21,500

(University of Bombay, B.Com., October 1998)

EXERCISE 7

Following are the Balance sheets of Shanti & Co. and Sheela & Co. as on 31.12.1999 :

Liabilities:	*Shanti & Co.*	*Sheela & Co.*
	Rs.	*Rs.*
Equity share capital	3,00,000	1,50,000
Preference share capital	1,75,000	1,30,000
Reserves and Surplus	1,20,000	1,20,000
Debentures	4,55,000	2,50,000
Creditors	25,000	9,000
Bills payable	30,000	15,000
	11,05,000	6,74,000

Assets:		
Land	3,00,000	2,00,000
Building	3,00,000	1,20,000
Machinery	2,00,000	1,50,000
Investments	80,000	44,000
Debtors	1,70,000	1,40,000
Cash	55,000	20,000
	11,05,000	6,74,000

Compare the financial position of the two companies with the help of common-size Balance sheets are comment. **(Bangalore University, B.Com., April 2000)**

EXERCISE 8

The summarised Balance sheet of two companies are as follows:

Balance sheet as on 31.3.1998

	Top Ltd.	*Ten Ltd.*		*Top Ltd.*	*Ten Ltd.*
Equity share capital	1,20,000	3,50,000	Fixed Assets	2,45,000	4,10,000
10% Pref. shares capital	1,00,000	50,000	Current Assets	2,90,500	3,32,800
Reserves	1,40,000	56,000	Preliminary expenses	10,000	6,000
15% Debentures	50,000	50,000			
Current liabilities	1,35,500	2,42,800			
	5,45,500	7,48,800		5,45,500	7,48,800

Revenue Statement for the year 31.3.1998

	Top Ltd. (Rs.)	*Ten Ltd. (Rs.)*
Sales	10,00,000	12,00,000
Less: Cost of sales	6,00,000	8,00,000
	4,00,000	4,00,000
Less: Operating expenses (including interest)	1,40,000	2,05,000
Less: Non-cash operating expenses (Depreciation)	10,000	20,000
	2,50,000	1,75,000
Less: Taxes	1,00,000	70,000
Less: Dividend	70,000	75,000
Retained earnings	80,000	30,000

Prepare:

(*a*) Common-size balance sheet (in vertical form).
(*b*) Common-size income statement (in vertical form).
(*c*) Comment in brief. **(University of Bombay, B.Com., April 1998)**

EXERCISE 9

From the following financial statements of Loyal limited prepare common-size financial statements and give your comments on them.

P & L a/c for the year ended 31-3-1996

To Opening stock	4,00,000	By Sales	20,00,000
To Purchases	12,00,000	By closing stock	6,00,000
To Wages	2,50,000		
To Factory overheads	2,50,000		
To G.P.cld.	5,00,000		
	26,00,000		26,00,000
To Administrative expenses	75,000	By G. P. bld.	5,00,000
To Selling and Distribution expenses	50,000	By Dividend	30,000
To Depreciation	65,000		
To Interest on Debentures	20,000		
To Net profit cld.	3,20,000		
	5,30,000		5,30,000
To Preference dividend	15,000	By Balance bld.	2,00,000
To Provision for tax (1996)	1,05,000	By Net profit bld.	3,20,000
To Surplus to Balance sheet	4,00,000		
	5,20,000		5,20,000

Balance sheet as on 31-3-1996

Equity share capital	10,00,000	Good will	5,00,000
Pref. share capital	5,00,000	Plant and Machinery	5,00,000
General Reserve	1,00,000	Land and Building	8,00,000
P & L a/c Balance	4,00,000	Furniture	1,00,000
Provision for Tax	1,05,000	Stock	5,00,000
Bills payable	1,95,000	Bills Receivable	80,000
Bank overdraft	1,00,000	Debtors	2,00,000
Creditors	5,00,000	Bank	2,20,000
	29,00,000		29,00,000

(University of Bombay, B.Com., October 1997)

EXERCISE 10

(Trend Analysis):

From the following information interpret the results of operations of a manufacturing concern using Trend ratios-use 1995 as base.

Particulars	*1995*	*1996*	*1997*	*1998*
Net sales	100	95	120	130
Cost of goods sold	60	58.90	69.60	72.80
Gross profit	40	36.10	50.40	57.20
Operating expenses	10	9.70	11.00	12
Net operating profit	30	26.40	39.40	45.20

(Bangalore University, B.Com., April 2001)

EXERCISE 11

Calculate Trend percentages.

Particulars	*1994* *Rs.*	*1995* *Rs.*	*1996* *Rs.*
Sales	50,000	75,000	1,00,000
Purchases	40,000	60,000	72,000
Expenses	5,000	8,000	15,000
Profit	5,000	7,000	13,000

(Osmania University B.Com., March 1998)

13

CHAPTER

RATIO ANALYSIS

INTRODUCTION

Ratio analysis is the process of determining and interpreting numerical relationship based on financial statements. It is the technique of iterpretation of financial statements with the help of accounting ratios derived from the balance sheet and profit and loss account. It involves the comparision of existing ratios against standards established. The standards may be set by management as goals expressed in the budgets *(i.e.*, budgetary standard) or may be historical figures showing performance of the same concern in the past (*i.e.*, historical standard) or may be figures reflecting the performance of other companies (*i.e.*, industrial or market standard).

Meaning of Accounting Ratios

A ratio is simply one number expressed in terms of another, it is an expression of relationship spelt out by dividing one figure by another. It is the quotient of two arithmetical numbers obtained from financial statements. Wixon, Kell and Bedford in their book 'Accountant's Handbook' define ratio, as "an expression of the quantitative relationship between two numbers". According to J. Batty the term accounting ratio is used to describe the significant relationship which exists between figures shown in a balance sheet and profit and loss account in a budgetary control system or any other part of accounting organistion.

Nature of Accounting Ratios

Ratios are indicators, sometimes they serve as pointers but not in themselves powerful tools of management. The ratios help to summarise the large quantities of financial data and to make qualitative judgement about the firm's financial performance.

Though ratios are indicators, too much reliance should not be put on the figures arrived at by the ratios. They can not be taken as the final result regarding good or bad financial position of the business. They are at best symptoms and there is always a need to investigate the facts revealed by them further. Hence ratios alone are not adequate for taking a financial decision. Infact, it must be used for what they are financial tools. Quite often ratios are looked upon as ends in themselves rather than as means to on end. The value of a ratio should not be regarded as good or bad among themselves. It may be an indication that a firm is weak or strong in a particular area but it must never be taken as a powerful tool of management.

Ratios as a matter of fact tools of quantitative analysis and it is quite possible that quantitative factors may override numerical aspects with the consequence that the conclusions from the ratio analysis may get distorted. In a way ratios are an attempt to delve in past as financial statements, (from which ratios are derived), are historical documents. But in a modern business, it is more importent to have an idea of the probable happening in future rather than, those in the past. These factors emphasise that ratios themselves are not powerful tools of management.

Mode of Expressing Accounting Ratios

Accounting ratios can be expressed in various ways, such as:

(*a*) Pure ratio, say ratio of current assets to current liabilities is 2 : 1, or
(*b*) A rate, say current results are 2 times current liabilities
(*c*) A percentage, say, current assets are 200% of current liabitites.

Each method of expression has a distinct advantage over the other. The analyst will select that method which best suits has convenience and purpose. There are certain accounting ratios which can be best expressed if stated as a pure ratio, *e.g*., debt-equity ratio, current ratio etc. Some other ratios can be best expressed as a rate only, *e.g*. stock turnover ratio, debtors, turnover ratio etc. While some others can most advantageously be expressed as a percentage only *e.g*. gross profit ratio, operating ratio etc. Ratios are expressed in such a way that the first appears as the numerator and the second as the denominator.

Interpretation of Ratios

The significance of ratio analysis lies in proper interpretation of the related items calculation by ratios as a step of ratio analysis is a simple task and it is a clerical work. Interpretation of ratios which is the ultimate step is difficult process and requires knowledge, intelligence and skill. The following are the various ways of interpreting accounting ratios.

1. **Single absolute ratio:** A ratio taken in isolation may not convey much meaning. If it is expressed in relation to another aspect it may prove to be more useful. For example, if current ratio is less than one, it may reveal the insolvency position of the business, *i.e*., current assets are not sufficient to pay current liabilitites sometimes a single ratio may fail to show the exact financial position of business.
2. **Group ratios:** When group of ratios are calculated and interpreted they convey better idea about the bussines operation and efficiency for example, in addition to calculating current ratio, *i.e*., current asset to current liabilities if liquid ratio, *i.e*., liquid asset to liquid liabilities, is also used, it throws better light on the business.
3. **Historical comparision:** Under this method of interpretation, the ratios of current period is compared with ratios of past year or years. Comparision of ratios over a period of time gives better indication and sets a trend which again reflects the performance and position of the business. However, care must be taken to ensure that there is no change in accounting policy and procedure during the period of comparision.
4. **Inter-firm comparision:** Under this method, the ratios of one firm is compared with ratios of other firm belonging to the same industry. But this method may prove to be ineffective when different firms use different accounting policies and procedure.
5. **Projected ratios:** Sometimes ratios can be calculated based on estimated financial statements. In which case they constitute standard ratios. The actual ratios are compared with standard ratios. The variance in ratios indicate the success or failure of the business.

Uses or Utility of Ratio

Ratio analysis is one of most important tools or analysing and interpreting the financial statements. It helps in understanding the financial health and trend of a business. Its past performance enables to forecast the future state of affairs of the business. It reveals the symptoms of a business as in the case of a patients temperative. Blood pressure or pulse beat which indicates the symptoms of disease in a patient. The utility of ratio analysis can be explained under the following headings:

1. **Utility to management:** Management of a business uses ratio analysis in: (*a*) formulating the policies, (*b*) in making decisions, (*c*) evaluating the performance, (*d*) in knowing the trends of the business, (*e*) in planning and forecasting the future, (*f*) communicating, (*g*) controlling.

2. **Utility to shareholders and investors:** An investor would assess the financial position of a business before he invests his money in it. All investors are interested in the safety, security and profitability of their investiments. Ratios enable the prospective investors to select best companies to invest their finds. The shareholders of a company uses ratios to evaluate the performance and future prospects of the company. But reviewing the operational effeciency, they are able to make out the price of their shares in the stock market.
3. **Utility to creditors:** Creditors and suppliers who supply goods on credit basis are interested in the solvency and liquidity position of the company. This can be known by looking into current ratio and acid-test ratio.
4. **Utility to employees:** Employees are interested in the performance of business as their fringe benefits are related to the profits earned by the company. Profitability ratios such as gross profit ratio, net profit ratio etc. can be used by them in order to claim increased wages and other benefits.
5. **Utility to Government:** The Government uses ratio analysis with a view to study the cost structure and thereby implement price control measures to protect the interest of the customers.

Limitations:

1. Usefulness of ratios depends upon the abilities and intentions of the persons who handle them. It will be affected considerably by the prejudice of such persons.
2. Ratios are worked out on the basis of money value only. They do not take into account the real values of various items involved.
3. Historical values are considered in working out the ratios. However, the effects of changes in the price levels of various items are ingored and to that extant the comparison and evaluation of proposals through ratios become unrealistic.
4. One particular ratio in isolation is not sufficient to analyse investment proposals or liquidity analysis. A group of ratios are to be considered simultaneously to arrive at the conclusion.
5. Ratio analysis is only a technique for making judgement and not a substitute for judgement.
6. Ratios are only symptoms, they may indicate what is to be investigated, only a careful investigation will bring out the correct position.
7. Liquidity ratios can mislead since current assets and liabilities can change quickly. Their utility becomes more doubtful for firms with seasonable business.
8. If there is window dressing in financial statements, ratios derived therefrom will not serve the purpose. Outsiders cannot make out the window dressing of a business.
9. Financial statements buffer from inherent limitations which make ratios inaccurate. Ratios calculated on the basis of past statements need not necessarily constitute true indicator of future.

Types of Ratios—A Traditional Basis of Classification of Ratios

Accounting ratios may be classified according to the following bases:

1. **Classification on the basis of statements:** The include the following:
   (*a*) *Balance sheet or position ratios :* They deal with relationship between two items or group of items which are taken from the balance sheet such as current ratio, debt-equity ratio, etc.
   (*b*) *Profit and loss account or revenue ratios:* These are the ratios which are calculated out of the figures appearing in the profit and loss account. They are also known as operating ratios. Some ratios derived from profit and loss account, are gross profit ratio, expense ratio, operating profit ratio etc.
   (*c*) *Position-cum-revenue ratios:* These ratios are also known as consolidated or combined or complex ratios or inter-statement ratios. They portrary the relationship between items one of which is a part of the balance sheet and the other of the revenue statement. Examples of such ratios are, return on total resources, return on capital empolyed, turnover of debtors etc.

2. **Classification on the basis of time:** On the basis of time ratios are classified into:
   (*a*) Structural ratios, *i.e.*, ratios computed from data referring to the same point of time; *e.g.*, ratios of a particular month or year.
   (*b*) Trend ratios, *i.e.*, ratios compared between the items referred to different period of time.
3. **Classification on the basis of nature:** On the basis of nature of ratios, it is classified into:
   (*a*) *Primary ratios :* It measures the size of profit in relation to capital employed, *e.g.*, operating profit to capital employed.
   (*b*) *Secondary ratios :* Also referred to as supporting ratios, brings to light strategic facts in the profit earning structure, *e.g.*, stock velocity, debtors velocity, expense ratios etc.
4. **Classification according to functions:** Ratios are grouped in accordance with certain tests which they are intended to subserve from the view point of various parties having a financial interest in on enterprise. There tests are:
   (*a*) *Financial ratios:* Financial ratios include liquidity and solvency ratios. Ratios indicating the liquidity position of the firm are current ratio, quick-ratio, absolute liquidity ratio, solvency ratios include proprietory ratio, debt-equity ratio, captal gearing ratio.
   (*b*) *Profitability ratios :* Profitability ratios would cover gross profit ratio, net profit ratio, return on capital employed.
   (*c*) *Market test ratio :* Market test ratios comprise of divident yield, fixed dividend cover, price earning ratio, etc.

For the sake of clear understanding we classify ratio into the following types :

Classification of Ratios

Analysis of short term financial position or tests of liquidity	Analysis of long term financial position or tests of solvency	Activity ratios	Profitability ratio
1. Current ratio	1. Debt-equity ratio	1. Stock turnover ratio	1. Gross profit ratio
2. Quick ratio	2. Proprietary ratio	2. Debtors turnover ratio	2. Net profit ratio
3. Absolute liquid ratio	3. Solvency ratio	3. Creditors turnover ratio	3. Operating ratio
	4. Fixed assets to net worth ratio	4. Working capital turnover ratio	4. Expenses ratio
	5. Current assets to net worth ratio	5. Fixed assets turnover ratio	5. Operating profit ratio
	6. Current liabilities to net worth ratio	6. Current assets turnover ratio	6. Return on total resource ratio
	7. Capital gearing ratio	7. Total assets turnover ratio	7. Return on capital employed ratio
	8. Fixed assets ratio	8. Sales to networth ratio	8. Return on equity share
	9. Fixed charges cover ratio		9. Return on equity capital ratio
	10. Dividend cover ratio		10. Earning per share
			11. Dividend pay out ratio
			12. Price earning ratio
			13. Dividend yield ratio
			14. Book value for share
			15. Preference dividend cover

(I) ANALYSIS OF SHORT-TERM FINANCIAL POSITION OR TESTS OF LIQUIDITY

The liquidity ratios are used to test the short term solvency position or liquidity position of the business. It enables to know whether short-term liabilities can be paid out of short-term assets. This ratio also indicates whether a firm has adequate working capital to carry out routine business activity. Though commercial Banks and other short-term creditors are primarily concerned with the analysis of short-term financial position or test of liquidity, it is a valuable aid to management in checking the efficiency with which working capital is being employed in the business. It is also of importance to shareholders and long-term creditors in determining to some extent the prospects of dividend and interest payment. The questions involved in connection with the ratio analysis of short-term financial position are:

(*a*) Will the company be able to pay its current debts promptly?
(*b*) Is the management utilising capital effectively?
(*c*) Is the current financial position improving?

The important ratios which fall under this category are as follows:

1. **Current ratio:** Current ratio, also called as working capital ratio, is the most widely used of all analytical devices based on the balance sheet. It establishes the relationship between total current assets and current liabilities. It is the barometer of general measure of liquidity and state of trading. The following formula is used to calculate current ratio:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Component of Current Assets

Current assets inculude the following :

(*a*) Cash in level
(*b*) Cash at bank
(*c*) Bills receivable
(*d*) Sundry debtors
(*e*) Stock of raw materials, work-in-process and finished goods
(*f*) Short-term investment, *i.e.*, readily realisable investments
(*g*) Prepaid expense
(*h*) Accrued income

Loose tools are not treated as current asset. Instead it is treated as fixed assets.

Components of Current Liabilities

(*a*) Sundry creditors
(*b*) Bills payable
(*c*) Bank overdraft
(*d*) Outstanding expenses
(*e*) Income received in advance
(*f*) Provision for taxation
(*g*) Short-term borrowing
(*h*) Unclaimed dividend
(*i*) Proposed dividend

Current assets are those assets which are expected to be converted into cash within a year. Current liabilities are those liabilities which are payable within one year.

Significance of Current Ratio

1. It indicates liquidity position of the business
2. It denotes the adequacy of working capital
3. It discloses, over or under capitalisation
4. Margin of safity for short-term creditor

Standard Current Ratio

A current ratio of 2 : 1 is considered ideal as a rule of thumb. It means the current assets must not only be equal to current liabilities but should leave a comfortable margin of working capital after paying off the current debts. But in actual practice 1 : 1 ratio is found acceptable than 2 :1. A high ratio, *i.e.*, more than 2 : 1, say, 3 : 1 indicates under trading and the same also indicates one of the signs of over capitalisation. Conversely, a low ratio indicates over trading or under capitalisation of business.

Limitations of Current Ratio

(*a*) Current ratios differ among various industries and also between manufacturers and retailers in the same line of business.

(*b*) All current assets are treated alike but they are not equally or readily realisable in cash to meet the demand of the total current liabilities.

(*c*) The credit given to the debtors and available from the creditors in a particular business can affect the position of this ratio. If these periods are different the desirable ratio would also differ.

2. **Quick ratio or acid test ratio or liquid ratio:** It is a refinement of the current ratio and a second testing device for the working capital position. It is concerned with the relationship between liquid assets and liquid liabilities. The following formula is used:

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Quick Liabilities}}$$

Components of quick assets: The assets which are converted into cash without loss within a short period of time say, 1 year is known as quick assets. Quick assets include all current assets except stock and prepaid expenses.

Components of quick liabilities: The liabilities which become payable within a short period of time, say 1 year is known as quick liabilities. It includes all current liabilities expcept bank overdraft and cash credit as they more or less constitute permanent arrangement and renewed periodically.

Interpretation of quick ratio: A quick ratio of 1 : 1 is usually considered to be ideal. The ratio is a more rigorous test of liquidity than the current ratio and when used in conjuction with it, gives a better picture of the firm's ability to meet its short-term debts out of short-term assets. However, care must be exercised in placing too much reliance on 100% acid test ratio without further investigation. This is so because the interpretation of the acid test ratio, depends on circumstances, For example, a seasonal business which seeks to stabilise production will tend to have a weak acid-test ratio during its period of slack sales, and probably a powerful one during the period of heavy selling.

3. **Absolute liquidity ratio or cash position ratio:** This ratio establishes a relation between absolute liquid assets to quick liabilities. The following formula is used:

$$\text{Absolute Liquidity Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Quick Liabilities}}$$

Components of absolute liquid assets: Absolute liquid assets include (*a*) cash in hand, (*b*) cash at bank, (*c*) Marketeable securities, (*d*) temporary investments. The following assets are not included in absolute liquid asset — (*a*) closing stock, (*b*) prepaid expenses, (*c*) outstanding income, (*d*) sundry debtors, (*e*) bills receivable.

Interpretation:

The ideal absolute liquid ratio is 1 : 2. It means if the ratio is 1 : 2 or more than this the concern can be taken as liquid. If the ratio is less than the standard of 1 : 2, it means the concern is not liquid.

Problem 1. The following is the Balance Sheet of Super Star Company Ltd. on 31st Dec., 1995. Calculate the liquidity group ratios and comment upon the same.

Equity share capital	10,00,000	Land and Building	7,00,000
Profit and loss a/c	1,50,000	Plant and Machinery	17,50,000
General reserve	3,00,000	Stock	10,00,000
Bank over draft	20,00,000	Sundry debtors	5,00,000
Sundry creditors	5,00,000	Bills receivable	50,000
Bills payable	2,50,000	Cash at Bank	2,00,000
	42,00,000		42,00,000

(Osmania University, B.Com., March 1996)

Solution:

(*i*) $$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\frac{17,50,000}{27,50,000} = 0.636$$

Current Assets:

Stock	10,00,000
Sundry debtors	5,00,000
Bills received	50,000
Cash at bank	2,00,000
	17,50,000

Current liabilities:

Bank overdraft	20,00,000
Sundry creditors	5,00,000
Bills payable	2,50,000
	27,50,000

Interpretation:

The current ratio is 0.636 : 1. Which is much below the standard ratio if 2 : 1

2. Quick ratio $$= \frac{\text{Quick Assets}}{\text{Quick Liabilities}}$$

$$= \frac{7,50,000}{7,50,000} = 1$$

Quick assets:

Sundry debtors	5,00,000
Bills receivable	50,000
Cash at Bank	2,00,000
	7,50,000

Quick liabilities:

Sundry creditors	5,00,000
Bills payable	2,50,000
	7,50,000

Interpretation:

The quick ratio is 1 : 1 and the standard ratio is also 1 : 1. So, it can meet its current obligation (except bank overdraft)

3. Absolute liquid ratio $= \frac{\text{Absolute Liquid Assets}}{\text{Liquid Liabilities}}$

$= \frac{2,00,000}{7,50,000} = 0.26$

Interpretation:

The absolute liquid ratio is 0.26 : 1 and the standard ratio is 1 : 2. It means the liquidity position of the company is not satisfactory.

Problem 2. The following particulars are extracted from the books of Bright Star so as on 31.12.2001. Calculate absolute liquid ratio.

	(Amt. 000)
Goodwill	50
Plant and machinery	400
Investment	200
Marketable securities	150
Bills receivable	40
Cash in hand	45
Cash at Bank	30
Stock	75
Bank OD	70
Sundry creditors	60
Bills payable	90
O/s expenses	30

Solution:

$$\text{Absolute Liquid Ratio} = \frac{\text{Absolute Liquid Assets}}{\text{Liquid Liabilities}}$$

$$= \frac{2,25,000}{1,80,000} = 1.25$$

Absolute liquid assets:

Marketable securities	1,50,000
Cash in hand	45,000
Cash at Bank	30,000
	2,25,000

Liquid liabilities:

Sundry creditors	60,000
Bills payable	90,000
O/s expenses	30,000
	1,80,000

Interpretation:

The ratio of 1.25 is higher than the standard ratio of 1.2. Hence the liquidity position is satisfactory.

(II) ANALYSIS OF LONG-TERM FINANCIAL POSITION OR TESTS OF SOLVENCY

When an organisation's assets are more than its liabilities is known as solvent organisation. Solvency indicates that position of an enterprise where it is capable of meeting long obligation. The long-term debt is contributed by debenture holders, financial institutions, other suppliers selling goods on instalment basis. All such creditors are interested in the security of loan as well as the interest due thereon. As such long term solvency ratios denote the ability of the organisation to repay the loan and interest thereon. The following ratios are used to indicate solvency position of a concern.

1. Debt-equity ratio or external-internal equity ratio: Debt- equity ratio expresses the relationship between debt and equity. Debt here is taken to mean long-term and short-term debt and equity means owners or shareholders funds. In other words, this ratio indicates the relaioship between external equities, *i.e.*, outsiders funds and internal equities *i.e.*, shareholders finds. The following formula is used:

$$\text{Debt-equity ratio} = \frac{\text{Debt}}{\text{Equity}}$$

OR

$$\frac{\text{External Equities}}{\text{Internal Equities}}$$

Components of Debt: It comprises of long term as well as term debt.

Components of Equity: It consists of shareholders funds, reserves and accumulated profit, However, if there is any accumulated losses or fictitors assets, they are deducted from shareholders funds.

Often a question would arise as to treatment of preference share capital as a part of shareholders funds. While some accountants are of the opinion that it must be treated as internal equity; others are of the view that it is an external equity as a fixed rate of dividend is paid on them. Further redeemable preference share may have to be paid during the life time of the company. If preference share are redeemable it can be treated as external equity and irredeemable preference share is treated as internal equity. Similarly, there is a difference of opinion as to treatment of current liabilities. Some accountants are of the opinion that current liabilities are payable within a short-period of time and hence they do not constitute a long-term debt. As such no interest becomes payable on such current liabilities. But some other accountants feel that current liability is an outside debt and therefore it is a part of external equity. It is suggested that current liability is to be included in the long-term liabilities.

Interpretation :

The standard debt-equity ratio is 2 : 1. It means for every 2 shares there is 1 debt. If the debt is less than 2 times the equity, it means that creditors are relatively less and the financial structure of the business is sound. If the debt as more than 2 times the equity. The state of long- term creditors are move and indicates week financial structure.

Problem 3. The comparative figures of X Ltd. and Y Ltd. are given below :

	X Ltd.	*Y Ltd.*
Total assets	2,00,000	3,00,000
Total liabilities	40,000	1,00,000
Owner's equity	1,60,000	2,00,000

Calculate debt-equity ratio for each company and comment.

(Bangalore University, B.Com., Nov. 1995)

Solution:

$$\text{Debt-equity Ratio} = \frac{\text{Debt}}{\text{Equity}}$$

$$X \text{ Ltd.} = \frac{40,000}{1,60,000} = 0.25$$

$$Y \text{ Ltd.} = \frac{1,00,000}{2,00,000} = 0.50$$

Interpretation:

In the case of *X* Ltd. it is less dependent on debt (as its borrowed capital is 25%) and dependent more on equity. In the case of *Y* Ltd. borrowed capital as 50% and equity fund is 50%. *Y* Ltd. is considered to be more satisfactory in terms of capital structure.

2. Proprietory ratio or net worth ratio: This ratio establishes the relationship between the proprietors fund, (equity + preference + capital reserves + free reserves + undistributed profits) and total assets. It is also called as net worth to total assets ratio. The following formula is used:

$$\text{Proprietory Ratio} = \frac{\text{Proprietor's Fund}}{\text{Total Assets}}$$

OR

$$= \frac{\text{Capital Employed}}{\text{Total Liabilities}}$$

Interpretation :

Higher the proprietory ratio, stronger the financial position and vice-verse. A ratio of 0.5 : 1 is considered ideal.

Problem 4:

Given : Total assets Rs. 8,00,000
Proprietor's equity Rs. 4,00,000

Calculate proprietory ratio **(Bangalore University, B.Com., November, 1992)**

Solution:

$$\text{Proprietory Ratio} = \frac{\text{Shareholders Funds}}{\text{Total Assets}}$$

$$= \frac{4,00,000}{8,00,000} = 0.5$$

3. Solvency ratio: If expresses the relatioship between total assets and total liabilities of a business. It is expressed as a proportion and the following formula as used :

$$\text{Solvency Ratio} = \frac{\text{Total Assets}}{\text{Total Liabilities}}$$

Interpretation:

No standard ratio is fixed in this regard. It may be compared with similar, such organisations to evaluate the solvency position. Higher the solvency ratIo, the stronger is its financial position and vice-versa.

4. Fixed assets to net worth ratio : It is obtained by dividing the depreciated book value of fixed assets by the amount of proprietors funds. It is calculated by applying the following formula:

$$\text{Fixed Assets to Net Worth Ratio} = \frac{\text{Net Fixed Assets}}{\text{Net Worth or Proprietor's Funds}}$$

This ratio shows the extent to which ownership funds are sunk into assets with relatively low turnover. When the amount of proprietor's funds exceed the value of fixed assets, a part of the net working capital is provided by the shareholders, provided there are no other non-current assets, and when proprietor's funds are less than the fixed assets, creditors obligation have been used to finance a part of fixed assets. The yardstick for this measure is 65% for industrial undertakings.

It is a sound principle that proprietors should subscribe sufficient capital to cover fixed aseets, intangible investments in other companies and a resonable figure for working capital. Some analyst deduct intangible assets from the proprietors funds, but this would depend upon the realisable value of intagibles and the purpose of analysis. Losses should also be deducted and funds payable to others should not be added.

Interpretation:

A ratio of 0.75 : 1 (or 75%) is deemed to be a desirable one. A higher ratio, say, 100 percent means that there are no outside liabilities and all the funds employed are those of shareholders. In such a case the return to shareholders would be a lower rate of dividend and this is also a sign of 'over-capitalisation'.

5. Current assets to net worth ratio: This is obtained by dividing the value of current assets by the amount of proprietor's funds. The following formula is used:

$$\text{Current assets to net worth ratio} = \frac{\text{Current Assets}}{\text{Proprietor's Fund}}$$

The purpose of this ratio is to show the percentage of proprietor's fund investment in current assets. A higher proportion of current assets to proprietor's fund, as compared with the proportion of fixed assets to proprietor's funds is advocated, as it is an indicator of the financial strength of the business. However, different industries have different standards and history of particular concern must be studied before too great a reliance is placed on this ratio. This ratio must be read alongwith the results given by the fixed assets to proprietorship funds ratio.

6. Current liabilities to net worth ratio: This ratio is expressed as a proportion and is obtained by dividing current liabilities by proprietor's fund. The following formula is used:

$$\text{Current liabilities to net worth ratio} = \frac{\text{Current Liabilities}}{\text{Net Worth}}$$

Interpretation:

This ratio indicates the relative contribution of short-term creditors and owners to the capital of an enterprise. The standard ratio fixed is 1/3. It the ratio is high, it means it is difficult to obtain long-term funds by the business.

7. Capital gearing ratio : It expresses the relationship between equity capital and fixed interest bearing securities and fixed dividend bearing shares. The following formula is used:

$$\text{Capital Gearing Ratio} = \frac{\text{Fixed interest bearing securities + Fixed dividend bearing shares}}{\text{Equity shareholders funds}}$$

Components of fixed interest bearing securities :

1. Debentures
2. Long-term loans
3. Long-term fixed deposits

Components of equity shareholders funds:

1. Equity share capital
2. Accumulated reserves and profits
3. Deduction of losses and fictitious assets from the total of (1) and (2)

Interpretation:

When fixed interest-bearing securities and fixed dividend-bearing shares are higher than equity shareholders funds, the company is send to be 'highly geared'. Where the fixed interest-bearing securities and fixed dividend bearing shares are equal to equity share capital at is said to be 'evenly geared'. Where the fixed interest-bearing securities and fixed dividend bearing shares are lower than equity share capital it is said to be 'low geared'. If capital gearing is high, further reising of long-term loans may be difficult and issue of equity shares may be attractive and *vice-versa*.

8. Fixed assets ratio: It establishes the relation between fixed assets and capital employed. The following formula is used :

$$\text{Fixed Assets Ratio} = \frac{\text{Fixed Assets}}{\text{Capital Employed}}$$

Components of capital employed:

1. Owners funds
2. Long-term loans
3. Long-term deposits
4. Debentures

Interpretation:

This ratio enables to know how fixed assets are financed, *i.e.*, by use of long-term funds or by short-term funds. The ideal ratio is 0.67. This ratio should not be more than 1.

9. Fixed charges cover ratio or debt service ratio : This ratio is determined by dividing net profit by fixed interest charges. The following formula is used:

$$\text{Fixed charges cover ratio} = \frac{\text{Net profit before deduction of interest and income tax}}{\text{Fixed interest charges}}$$

Net profit for the purpose of this ratio means net profit before deduction of interest and Income-tax. Fixed charges include interest on long-term loans, deposits and debentures. This ratio indicates the financial ability of the enterprise to meet interest payment out of current earning.

Interpretation:

The ideal Debt-Service cover is 6 or 7 times. If the ratio is high it means there is higher margin of safety for the long term lenders and as such it is not difficult for the business to obtain further long term funds and *vice-versa*.

10. Dividend cover ratio: It is the ratio between disposable profit and dividend. Disposable profit refers to profit left over after paying interest on long-term borrowing and income tax. This ratio is expressed as a rate and is calculated using the following formula.

$$\text{Dividend Cover Ratio} = \frac{\text{Net Profit after interest and tax}}{\text{Dividend declared}}$$

Interpretation:

This ratio indicates the ability of the business to maintain the dividend on shares in future. If this ratio is higher is indicates that there is sufficient amount of retained profit. Even if there is slight decrease in profit in the future it will not affect payment of dividend in future.

(III) ACTIVITY RATIOS OR PERFORMANCE RATIOS

Activity ratios indicate the performance of an organisation. This indicate the effective utilisation of the various assets of the organisation. Most of the ratios falling under this category is based on turnover and hence these ratios are called as turnover ratio. The various activity ratios are as follows:

1. Stock turnover ratio: This ratio establishes the relationship between the cost of goods sold during a given period and the average stock holding during that period. It tells us as to how many times stock has turned (sold) over the period. This rato indicates the operational and marketing efficiency of the business. It not only helps in determining the liquidity of the firm but also assets in evaluating inventory policy so as to protect the firm from any danger of over-stocking.

Normally, inventory turnover ratio is best expressed through the relationship between cost of goods sold and average inventory at cost, but rato of sales to inventory may also be used as a substitute for the rate of cost of goods sold to average inventory, in case, cost of goods sold is not available. Besides these methods, some firms like departmental stores, customarily valuing there inventories at selling prices, compute inventory turnover ratio as the ratio between net sales and average inventory at selling prices.

The average inventory for a year is the sum of inventory at the beginning of the year and inventory at the end of the year and the total is divided by 2. The following formula is used to calculate the inventory turnover ratios:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

Interpretation:

The ideal stock turnover ratio is 8 times a year. A low inventory turnover may reflect dull business, over investment in inventory, accumulation of stock at the end of the period in anticipation of higher prices or of greater sales volume, incorrect inventory resulting from the inclusion of obsolete and unsaleable items and excessive quantitites of certain inventory items in relation to immediate requirements.

A high turnover may not be accompanied by a relatively high net income as, profits may be sacrificed in obtaining a large sale volume with the result that a higher rate of turnover is likely to prove less profitable than a lower turnover unless accompanied by a larger total gross profit. Similarly, a relatively high turnover ratio may not really be an indicator of favourable results as it may indicate serious under-investment in inventories and this may in turn result in loss of customer patronage on account of failure to make prompt deliveries. But, generally, a high stock turnover ratio means that the concern is efficient and hence it sells its goods quickly.

Problem 5: Rate of Gross profit is 25% on cost. Total sales Rs. 5,00,000. Average stock Rs. 80,000. Compute stock turnover ratio. **(Bangalore University, B.Com., November 1994)**

Solution:

Gross profit ratio on cost = 25%

or Gross profit ratio on sales = 20%

$$\text{Gross profit} = \frac{20}{100} \times 5,00,000 = 1,00,000$$

Cost of sales = Sales – Gross profit

= 5,00,000 – 1,00,000

= 4,00,000

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of sales}}{\text{Average stock}}$$

$$= \frac{4,00,000}{80,000} = 5 \text{ times}$$

Problem 6:

Calculate the stock turnover ratio

	(Rs.)
Opening stock	45,000
Closing stock	55,000
Sales	2,50,000
Gross profit	25% on sales

(Osmania University, B.Com., October 1997)

Solution:

Calculation of Gross Profit

$$\frac{20}{100} \times 2,50,000 = 50,000$$

Calculation of Average Stock

$$\text{Average stock} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

$$= \frac{45,000 + 55,000}{2} = 50,000$$

Cost of sales or cost of goods sold = Sales – Gross profit

= 2,50,000 – 50,000 = 2,00,000

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}} = \frac{2,00,000}{50,000} = 4 \text{ times}$$

2. Debtors turnover ratio or debtors velocity ratio: This ratio explains the relationship of net (credit) sales of a firm to its book debts indicating the rate at which cash is generated by turnover of receivables or debtors. The following formula is used :

$$\text{Debtors Turnover Ratio} = \frac{\text{Net annual credit sales}}{\text{Average debtors}}$$

The term debtors for the purpose of this ratio is used in a comprehensive sense and also includes the amount of bills receivable along with book debts at the end of the accounting period. Moreover debtors which do not arise from regular sales should be excluded, *e.g.*, a bill receivable from the buyer of fixed assets. Sometimes, the ratio is computed from the average of debtors at the beginning and at the end of the year. Another important point in connection with the ratio is that reserve for bad and doubtful debts is not deducted form the total amount of trade debtors.

In the absence of the break-up of sales into cash and credit, the analyst has to use total sales for computation of the ratio with the result that, to the extent cash sales are included, the ratio tends to be overstated. So far as the calculation of daily sales are concerned, the denominator is to be the number of working days of the business during the year and while it is customary to use 360 days basis rather than 365 days exact, some writers on of the opinion that the denominator should only be 300 days owing to the remainder days being holidays, when too business is transacted.

The purpose of this ratio is to measure the liquidity of the receivable or to find out the period over which receivables remain uncollected, *i.e.*, ageing of receivables. Since debtors constitute a major element of current assets, the credit and collection policies of the business must be under continuous watch. The amount of trade debtors at the end of the accounting period should not exceed a reasonable proportion of net sales. The larger the amount of trade debtors in relation to net sales, the greater would be the expense in connection with uncontrollable accounts. An over-investment in receivables may be the result of over extension of credit, liberalisation of credit terms, ineffective credit investigation, lack of effective collection policies or the inabitity of the collection department to make collection in periods of depression.

Problem 6: Gross profit ratio 20% on sales. Total gross profit Rs. 1,00,000. Cash sales Rs. 1,20,000. Average debtors Rs. 95,000. Calculate debtors turnover ratio. **(Bangalore University, B.Com., November 1994)**

Solution:

$$\text{Gross profit on sales} = 20\%$$

$$\text{Gross profit} = \text{Rs. } 1{,}00{,}000$$

$$\text{Total sales} = 1{,}00{,}000 \times \frac{100}{20} = 5{,}00{,}000$$

$$\text{Credit sales} = \text{Total sales} - \text{Cash sales}$$

$$= 5{,}00{,}000 - 1{,}20{,}000 = 3{,}80{,}000$$

$$\text{Debtors turnover ratio} = \frac{\text{Credit Sales}}{\text{Average Debtors}}$$

$$= \frac{3{,}80{,}000}{95{,}000} = 4 \text{ times}$$

3. Debt collection period ratio : This ratio is helpful in knowing the speed at which debts are collected. It refers to the time involved in collecting the debts by a business enterprise. The following formula is used to calculate debt collection period ratio:

$$\text{Debt collection period ratio} = \frac{\text{No. of days in a year}}{\text{Debtors turnover}}$$

OR

$$= \frac{\text{Debtors}}{\text{Net annual credit sales}} \times \text{No. of days in a year}$$

OR

$$= \frac{\text{Net annual credit sales}}{\text{No. of days in a year}}$$

Problem 7: Find out debtors turnover and average collection period from the following information:

	1994	*1995*
	Rs.	*Rs.*
Annual credit sales	5,00,000	6,00,000
Debtors in the beginning	80,000	90,000
Debtors at the end	1,00,000	1,10,000
No. of days for the year	360 days	360 days

(University of Madras, B.Com., March 1997)

Solution:

$$\text{Debtors Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Debtors}}$$

$$1994 = \frac{5,00,000}{90,000} = 5.56 \text{ times}$$

$$1995 = \frac{6,00,000}{1,00,000} = 6 \text{ times}$$

Note : Calculation of Average Debtors

$$\text{Average Debtors} = \text{Opening debtors} + \text{Closing Debtors}$$

$$1994 = \frac{80,000 + 1,00,000}{2} = 90,000$$

$$1995 = \frac{90,000 + 1,10,000}{2} = 1,00,000$$

$$\text{Average Collection Period} = \frac{\text{No. of Days}}{\text{Debtors Turnover Ratio}}$$

$$1994 = \frac{360}{5.56} = 65 \text{ days}$$

$$1995 = \frac{360}{6} = 60 \text{ days}$$

4. Crditor's turnover ratio or creditors velocity : This ratio indicates the number of times the creditors are paid in a year. The following formula is used :

$$\text{Creditors Turnover Ratio} = \frac{\text{Net annual credit purchases}}{\text{Average creditors}}$$

Components :

Credit purchases refers to credit purchase minus purchase returns. Creditors include bills payable. Average creditors is obtained by dividing opening sundry creditors and opening bill payable plus closing sundry creditors and closing bill payable divided by 2. When particulars about opening creditors and opening bills payable are not available, then closing creditors and closing bills payable is taken as denominator.

Problem 8: A company purchases goods both on cash as well as on credit terms. The following particulars are obtained from the books.

	Rs.
Total purchases	3,00,000
Cash purchases	30,000
Purchases returns	51,000
Creditors at the end	1,05,000
Bills payable at the end	60,000
Reserve for discount on creditors	8,000

Calculate average payment period

(University of Madras, B.Com, March 1994)

Solution:

Total purchase	3,00,000
Less cash purchases	30,000
	2,70,000
Less purchase returns	51,000
Net credit purchases	2,19,000

Accounts payable = Creditors + Bills payable

or

$$\text{Total creditors} = 1{,}05{,}000 + 60{,}000$$
$$= 1{,}65{,}000$$

$$\text{Creditors Turnover Ratio} = \frac{\text{Credit purchases}}{\text{Average creditors}}$$
$$= \frac{2{,}19{,}000}{1{,}65{,}000} = 1.33$$

$$\text{Average Payment Period} = \frac{\text{No. of days}}{\text{Creditors turnover ratio}}$$
$$= \frac{365}{1.33} = 274.44 \text{ day}$$

4. Working capital turnover ratio: The term working capital refers to excess of current assets over current liabilities. This ratio establishes a relationship between working capital and sales. The following formula is used:

$$\text{Working Capital Turnover Ratio} = \frac{\text{Net Sales}}{\text{Working Capital}}$$

This ratio enables to know efficient utilisation of working capital of an organisation.

5. Fixed assets turnover ratio : This ratio establishes a relationship between fixed assets and sales. The following formula is used :

$$\text{Fixed assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Fixed Assets}}$$

Interpretation:

The standard fixed turnover ratio is 5 times. A high ratio indicates better utilisation of fixed assets. A low ratio indicates under-utilisation of fixed assets.

6. Current assets turnovers ratio: It establishes a relationship between current assets and sales. The following formula is used:

$$\text{Current Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Current Assets}}$$

Just as fixed assets turnover ratio, this ratio indicates the contribution of current assets to sales.

7. Total assets turnover ratio: This ratio establishes a relationship between total assets and sales. This ratio enables to know the efficient utilisation of total assets of a business. The following formula is used:

$$\text{Total Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

Interpretation:

A total asset turnover ratio of 2 times or more indicates that assets are utilised efficiently and a ratio below 2 indicates that the assets are under-utilised.

8. Sales to net worth: It establishes a relationship between sales and owner's funds. This ratio enables to know the utilisation of owner's funds.

(IV) PROFITABILITY RATIOS

Profitability ratios indicate the profit earning capacity of a business. For the sake of clear understanding profitability ratios are classified into two categories, *viz.*, general profitability ratios and overall profitability ratios.

General Profitability Ratios

They include the following ratios:

1. Gross profit ratio
2. Operating ratio
3. Operating profit ratio
4. Expense ratio
5. Net profit ratio

These ratios are explained below :

1. Gross Profit Ratio: It expresses the relatioship of gross profit to net sales and is expressed in terms of percentage. Sales for this purpose menas net sales, *i.e.*, sales after deducting the value of goods returned by the coustomers. Gross profit results from the difference between net sales and cost of goods sold without taking into account expenses generally charged to profit and loss a/c. Cost of goods sold in the case of a trading concern is the purchase of goods and all expenses directly connected with the purchases of goods, while in the case of manufacturing concern, it consists of the purchase price of raw materials and all manufaturing expenses. The following formula is used to calculate this ratio :

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$$

This ratio is a measure of general profitability of the business and a tool that indicates the degree to which selling price of goods per unit may decline without resulting in losses on operations for the firm. The gross

profit should be adaquate to cover the operating expenses and to provide for fixed charges, dividends and buidling up of reserves.

Interpretation:

A low gross profit may indicate unfavourable purchasing, the instability of management to develop sales volume thereby making it impossible to by goods in large volume, excessive competition etc.

On the other hand, an increase in the gross profit ratio may reflect an increase in the sale price of goods sole without any corresponding increase in costs; a decrease in cost without its impact on the sale price of goods, opening stock valued at a figure lower than it should have been, over valuation of closing stock of the end of accounting period etc. There is no rigid standard to this ratio. Normally 25% to 30% margin is anticipated.

2. Operating ratio : This ratio establishes a relationship between cost of goods sold plus other operating expenses and net sales. Operating expenses consists of administrative expenses, financial expenses selling and distribution expenses. The following formula is used:

$$\text{Operating Ratio} = \frac{\text{Cost of goods sold + Operating expenses}}{\text{Net sales}}$$

Interpretation:

This ratio is calculated mainly to ascertain the operational efficiency of the management in their business operations, as it shows the percentage of net sales that is absorbed by the cost of goods sold. Higher the operating ratio, the less favourable it is because it would leave a smaller margin to meet interest, dividend and other corporate needs. In general, for manufacturing concerns, operating ratio is expected to touch a percentage of 75% to 35%. This ratio can also be used as a partial index of over-all profitability but cannot be used as a test of financial condition.

3. Operating profit ratio : This ratio establishes the relatioship between operating profit and net sales and is calculated as follows :

$$\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Net Sales}} \times 100$$

For calculating this ratio, non-operating expenses and non-operating incomes are ignored. This ratio indicates the portion remaining out of every rupee worth of sales after all operating costs and expenses have been met.

4. Expense ratio : These ratios supplement the information given by the operating ratio. They are calculated by dividing each individual operating expenses (*i.e.*, administrative, selling and general expenses) by the net sales revenue.

i.e., (*a*) $\text{Material Consumed Ratio} = \frac{\text{Materials consumed}}{\text{Net Sales}} \times 100$

(*b*) $\text{Office and Administration Expenses Ratio} = \frac{\text{Office and Adm. expenses}}{\text{Net Sales}} \times 100$

(*c*) $\text{Selling and Distribution Expenses Ratio} = \frac{\text{Selling and Distribution Expenses}}{\text{Net Sales}} \times 100$

(*d*) $\text{Financial Expenses Ratio} = \frac{\text{Financial Expenses}}{\text{Net Sales}} \times 100$

(*e*) Non-operating Expenditure Ratio = $\frac{\text{Non-operating Expenditure Ratio}}{\text{Net Sales}} \times 100$

These ratios which represent a summation of changes in net sales and in the expense items are valuable in comparing similar business or operating data from year to year for the same business.

5. Net profit ratio: It expresses the relationship between net profit after taxes to sales. The following formula is used:

$$\text{Net Profit Ratio} = \frac{\text{Net Profit after Tax}}{\text{Net Sales}} \times 100$$

This ratio is widely used as a measure of over-all profitability and is very useful to proprietors, as it gives an idea of the efficiency as well as profitability of the business to a limited extent. It different from the operating ratio in the sense it is calculated after adding non-operating income like interest or dividend on investments etc., to generating profit and deducting non-operating expenses such as loss on sale of old assets, provision for legal damages, etc., from such profit.

Tests of Overall Profitability

The ratios which test the overall profitability are concerned with measuring the overall efficiency of the business relating profit to the investment made in the business. These ratios are as follows:

1. Return on shareholders investment or net worth ratio
2. Return on equity capital
3. Return on capital employed
4. Return on total resourses
5. Dividend yield ratio
6. Preference dividend cover ratio
7. Equity dividend cover ratio
8. Price covering ratio
9. Dividend pay-out ratio
10. Earning per share

The above ratios are explained below:

1. Return on shareholders investment or net worth ratio: Sharehoders investment also called return on proprietor's finds is the ratio of net profit (after tax and interest) to proprietor's funds. It is invariably calculated by the prospective investor in the business to find out whether the investment would be worth-making in terms of return as compared to the risk involved in the business. The following formula is used:

$$\text{Return on Shareholders Investment} = \frac{\text{Net profit (After tax and interest)}}{\text{Proprietor's fund}}$$

Shareholders investment includes all categories of share capital, capital reserves, contingency reserves, all revenue reserves, undistributed profits. Normally the average of the figures relating to shareholder's investments in the opening and closing balance sheets are considered while computing this ratio. Net profit for the purpose represents the net profit after tax and interest on long-term liabilties.

Returns on capital is one of the effective measures of the profitableness of an enterprise. The realisation of a satisfactory net income is the major objective of a business and this ratio shows the extent to which this objective has been achieved. This ratio is also used in making inter-firm comparison.

2. Return on equity capital : This ratio establishses the relationship between net profit available to equity shareholders and the amount of capital invested by them. The following formula is used :

$$\text{Return on Equity Capital} = \frac{\text{Net profit} - \text{Dividend due to preference shareholders}}{\text{Equity share capital (paid-up)}}$$

For the purpose of calculating this return net profits are arrived at after deducting the dividend due to preference shareholders. If participating preference shares are issued, they have a right to participate further in the profits after a certain rate of dividend has been paid to equity shareholders. Such participating dividend would also have to be subtracted in order to arrive at profits due to equity shareholders.

This rate of return is designed to show that percentage the earned profit of the period bears to the amount of capital invested by equity shareholders. It is used to compare the performance of company's equity capital with those of other companies, and thus help the investor in choosing a company with higher return on equity capital.

3. Return on capital employed : This ratio is the most appropriate indicator of the earning power of the capital employed in the business. It also acts as a pointer to the management, showing the progress or deterioration in the earning capacity and efficiency of the business. The following formula is used:

$$\text{Return on Capital Employed} = \frac{\text{Net profit before taxes and interest on long-term loans, and debentures}}{\text{Capital employed}}$$

The term capital employed refers to the total long-term funds used in a business. It is calculated is shown below:

Net fixed assets	xx
Add : Trade investiments, *i.e*., investments made in associated concern to promote trade	xx
Add : Net working capital, *i.e*., excess of current assets over current liabilitites capital employed	xx
	xx

Interpretation:

The standard return on capital employed is about 15%. If the actual ratio is equal to or above 15% it indicates higher productivity of the capital employed and *vice-versa*.

4. Return on total resources : This ratio acts as an yardstick to assess the efficiency of the operations of the business as it indicates the extent to which assets employed in the business are utilised to result in net profit. The following formula is used:

$$\text{Return on Total Resources} = \frac{\text{Net Profit}}{\text{Total Assets}} \times 100$$

5. Dividend yield ratio : It refers to the percentage or ratio of dividend paid per share to the market price per share. This ratio throws light on the effective rate of return on investment, which potential may hope to earm. The following formula is used:

$$\text{Dividend Yield Ratio} = \frac{\text{Dividend paid per equity share}}{\text{Market price per equity share}}$$

6. Preference dividend cover: It indicates how many times the preference dividend is covered by profits after tax. This ratio measures the margin of safety for preference shareholders. Such investors normall expect their dividend to be coverd about 3 times by profits available for dividend purpose. The following formula is used:

$$\text{Preference Dividend Cover} = \frac{\text{Profit after tax}}{\text{Annual programme dividend}}$$

7. Equity dividend cover: This ratio indicates the number of times the dividend is covered by the amount of profit availabe for equity shareholders, *i.e*., net profit after tax less preference dividend. The following formula is used :

$$\text{Equity Dividend Cover} = \frac{\text{Net profit (after Tax)} - \text{Preference dividend}}{\text{Dividend paid on equity capital}}$$

or

$$= \frac{\text{Earnings per equity share}}{\text{Dividend per equity share}}$$

Interpretation:

An ideal equity dividend cover is 2, *i.e*., out of every Rs. 100 profits available for dividend, Rs. 50 is distributed and Rs. 50 is retained and ploughed back in the business. Higher the dividend cover, the higher is the extent of retained earnings and higher is the degree of certainty that dividend will be repeated in future year also.

8. Pric-earning ratio: It shows how many times the annual earnings the present sharehoders are willing to pay to get a share. This ratio helps investors to know the effect of earnings per share on the market price of the share. This ratio when calculated for several years can be used as trend analysis for predicting future price earning retios and therefore, future stock prices. The following formula is used:

$$\text{Price Earning Ratio} = \frac{\text{Average market price per share}}{\text{Earning per share}}$$

9. Dividend pay-out ratio: This ratio indicates the proprotion of earnings available which equity share-holders actually recieve in the form of dividend. An investor primarily interested should invest in equity shares of a company with high pay-out ratio. A company having low-pay-out ratio need not necessarily be a bad company. A company having income may like to finance expansion out of the income earned and thus have low-pay-out ratio. An investor interest in stock-price appreciation may well invest in such a company even though the pay-out ratio is low. The following formual is used:

$$\text{Pay-out Ratio} = \frac{\text{Dividend paid per share}}{\text{Earning of equity share}}$$

10. Earning per share: This ratio indicates the earnings per equity share. It establishes the relationship between net profit available for equity shareholders and the number of equity shares. The following formula is used:

$$\text{Earning Per Share} = \frac{\text{Net profit available for equity shareholders}}{\text{Number of equity shares}}$$

Leverage Ratios

Leverage ratios are calculated to test long-term financial position of a firm. Leverage ratios are classified into three types, *viz.*

(*a*) Financial leverage or trading on equity: Financial leverage refers to use of long-term interest bearing debt and preference share capital along with equity share capital. The following formula is used:

$$\text{Financial Leverage} = \frac{\text{Earnings before interest and tax}}{\text{Earnings before interest and tax} - \text{Interest and preference dividend}}$$

(*b*) Operating leverage: It is obtained by dividing 'contribution' by earnings before interest and tax. Contribution represents the difference between the sales and variable cost. The following formula is used:

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Earning before interest and tax}}$$

(*c*) Combenid leverage: This is a product of above two leverages. The following formula is used:

Combined Leverage = Financial Leverage × Operating Leverage

Problem 9: Rao Insulating Company submitted the following particulars. Calculate (*a*) financial leverage, (*b*) operating leverage under both the situations :

Sales 50,000 units @	Rs.	15	
Variable cost per unit	Rs.	9	
Fixed cost	Rs.	20,000	
Debenture interest paid	Rs.	40,000	
Tax 50%			
Increase in production		10,000	units

Solution:

Statement Showing Profit after Tax

	50,000 *Units*	60,000 *Units*
Sales		
50,000 × 15		
60,000 × 15	7,50,000	9,00,000
Less variable cost		
50,000 × 9		
60,000 × 9	4,50,000	5,40,000
Contribution	3,00,000	3,60,000
Less fixed expenses	2,000	20,000
	2,80,000	3,40,000
Less interest	40,000	40,000
Profit before taxes	2,40,000	3,00,000
Less taxes	1,20,000	1,50,000
Profit after tax	1,20,000	1,50,000

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

$$\text{For 50,000 units level} = \frac{2,80,000}{2,80,000 - 40,000} = \frac{2,80,000}{2,40,000} = 1.167$$

$$\text{For 60,000 units level} = \frac{3,40,000}{3,40,000 - 40,000} = \frac{3,40,000}{3,00,000} = 1.13$$

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

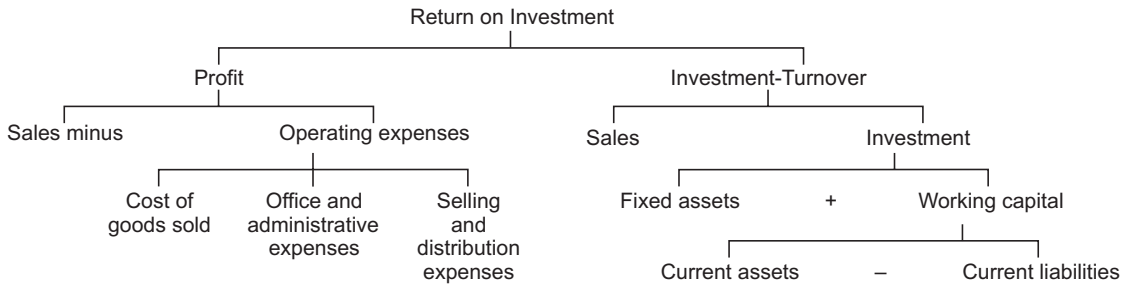
$$\text{For 50,000 units level} = \frac{3,00,000}{2,80,000} = 1.07$$

$$\text{For 60,000 units level} = \frac{3,60,000}{3,40,000} = 1.05$$

DU-PONT CONTROL CHART

It is a chart designed by an DU-pont company of America. The chart helps management to exercise control by using ratios and their inter-relationship. The actual ratios are compared with standard ratios to judge the performance of the business. The chart is as follows:

DU-PONT CHART



The chart is based on two aspects, *viz*. profit and investment. Profit is the difference between sales and operating expenses. When operating expenses are controlled profit margin will be increased. Earnings is the difference between sales and cost of sales. Cost of sale is the aggregate of cost of goods sold, office and administration expenses and selling and distribution expenses. Investments is the aggregate of fixed assets and working capital. Working capital is the excess of current assets over current liabilities.

The efficiency of a business depends upon the functioning of the business. The return on investment is taken as a basis to measure efficiency. The efficiency is reflected by the profit earned by the business. The efficiency can be increased by minimising costs or effective use of capital or by increasing sales. In case of inefficiency, the management can identify the areas and take remedial steps. Inter-firm comparision is used as a technique to evaluate the performance. The important ratios used in this connection are return on investment, assets turnover ration and profitability ratios.

Problem 10. From the following final accounts of XYZ Co. Ltd. for the year ended 31st March, 1999, you are required to calculate the following:

1. Acid test ratio
2. Stock turnover ratio
3. Operating ratio
4. Debt collection period and
5. Net profit to capital employed ratio

Balance sheet as on 31st March 1999

Share capital (in shares		Land and Buildings	5,00,000
of Rs. 10 each)	5,00,000	Plant and Machinery	2,00,000
General Reserve	4,00,000	Stock	1,50,000
Profit and loss a/c	1,50,000	Sundry debtors	2,50,000
Sundry creditors	2,00,000	Cash and bank balance	1,50,000
	12,50,000		12,50,000

Profit and loss A/c for the year ended 31st March 1999

Opening stock	2,50,000	Sales	18,00,000
Purchases	10,50,000	Closing stock	1,50,000
Gross profit b/d	6,50,000		
	19,50,000		19,50,000

Administrative expenses	2,30,000	Gross profit b/d	6,50,000
Selling and distribution expenses	1,00,000	Other income	50,000
Expenses of financing	20,000		
Net profit	3,50,000		
	7,00,000		7,00,000

(CS, Inter, December, 1999)

Solution:

1. Acid-test Ratio = $\frac{\text{Liquid assets}}{\text{Liquid liabilities}}$

$$= \frac{4,00,000}{2,00,000} = 2:1$$

Liquid Assets

Sundry debtors	= 2,50,000
Cash and bank balance	= 1,50,000
	4,00,000

2. Stock Turnover Ratio = $\frac{\text{Cost of goods sold}}{\text{Average stock}}$

$$= \frac{11,50,000}{2,00,000} = 5.75 \text{ times}$$

Cost of goods sold

Opening stock	=	2,50,000
Add: Purchases	=	10,50,000
		13,00,000
Less : Closing stock		1,50,000
		11,50,000

$$\text{Average stock} = \frac{\text{Opening stock + Closing stock}}{2} = \frac{2,50,000 + 1,50,000}{2} = 2,00,000$$

3. Operating ratio = $\frac{\text{Cost of goods sold + Operating expenses}}{\text{Net Sales}} \times 100$

$$= \frac{11,50,000 + 3,30,000}{18,00,000} \times 100 = 82.2\%$$

Operating expenses

Administrative expenses + Selling and Distribution expenses

$$= 2,30,000 + 1,00,000 = 3,30,000$$

4. Debt Collection Period = $\frac{\text{Total debtors}}{\text{Sales per day}} = \frac{2,50,000}{\frac{18,00,000}{365}}$

$$= \frac{2,50,000 \times 365}{18,00,00} = 50.7 \text{ or } 51 \text{ days}$$

5. Net profit to capital employed $= \frac{\text{Net profit}}{\text{Capital employed}} \times 100$

$$= \frac{3,50,000}{10,50,000} \times 100 = 33.33\%$$

Capital employed	
Share capital	5,00,000
General reserve	4,00,000
Profit & loss A/c	1,50,000
Sharehorders funds	10,50,000

Problem 11: The Balance Sheet of Punjab Auto Ltd. as on 31.12.1991 was as follows:

Liabilities		*Assets*	
Equity share capital	40,000	Plant and machinery	20,000
Capital reserve	8,000	Land and building	40,000
8% loan on mortagage	32,000	Furniture and fixture	16,000
Creditors	16,000		
Bank overdraft	4,000	Stock	12,000
Taxation :		Debtors	12,000
— current	4,000	Investment	4,000
— future	4,000	(short term)	
P & C A/c	12,000	Cash in hand	12,000
	1,20,000		1,20,000

From the above compute : (*a*) The Current Ratio, (*b*) Quick Ratio, (*c*) Debt-equity Ratio, (*d*) Proprietory Ratio. **(Bangalore University, B.B.M. April 2000)**

Solution:

(*a*) Current ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{40,000}{28,000} = 1.42$

Current assets	
Stock	12,000
Debtors	12,000
Investment	4,000
(Short-term)	
Cash in hand	12,000
	40,000
Current liabilities	
Creditors	16,000
Bank overdraft	4,000
Taxation	8,000
	28,000

(*b*) Qick Ratio $= \frac{\text{Liquid assets}}{\text{Liquid liabilities}}$

$= \frac{28,000}{24,000} = 1.16$

Liquid assets	
Debtors	12,000
Investment (Short-term)	4,000
Cash in hand	12,000
	28,000
Liquid liabilities	
Creditors	16,000
Taxation	8,000
	24,000

(*c*) Debt-equity Ratio $= \frac{\text{External equities}}{\text{Internal equities}} = \frac{52,000}{60,000} = 0.86$

External equities	
8% loan on mortgage	32,000
Creditors	16,000
Bank overdraft	4,000
	52,000
Internal equities	
Equity share capital	40,000
Capital reserve	8,000
P & L A/c	12,000
	60,000

(*d*) Proprietory Ratio $= \frac{\text{Shareholders funds}}{\text{Total tangible assets}} = \frac{60,000}{1,20,000} = 0.50$

Problem 12: Following is the balance sheet of Non-Such Co. Ltd. for the year ending 31st March, 1997. Calculate ratios for (*i*) testing liquidity and (*ii*) testing solvency:

Liabilitites		*Assets*	
Equity share capital	5,00,000	Goodwill	2,50,000
12% preference share capital	2,50,000	Plant and machinery	3,00,000
General reserve	50,000	Land and building	3,50,000
Profit and loss A/c	2,00,000	Furniture	50,000
Provision for tax	88,000	Stock	3,00,000
Bills payable	62,000	Bills receivable	15,000
Bank overdraft	10,000	Sundry debtors	75,000
Sundry creditors	40,000	Bank	1,00,000
12% debentures	2,50,000	Marketable securities	10,000
	14,50,000		14,50,000

(Sri Vankateshwara University, B.Com., April 1999)

Solution:

Tests of Liquidity

(*a*) Currenct Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{5,00,000}{2,00,000} = 2.5$

Current assets	
Stock	3,00,000
Bills receivable	15,000
Sundry debtors	75,000
Bank	1,00,000
Marketable securities	10,000
	5,00,000
Current liabilities	
Provision for tax	88,000
Bills payable	62,000
Bank OD	10,000
Sundry creditors	40,000
	2,00,000

(*b*) Quick or Liquid Ratio = $\frac{\text{Liquid Assets}}{\text{Liquid Liabilities}} = \frac{2,00,000}{1,90,000} = 1.05$

Liquid assets	
Bills receivable	15,000
Sundry debtors	75,000
Bank	1,00,000
Marketable securities	10,000
	2,00,000

Liquid liabilities = Current liabilities – Bank OD

= 2,00,000 – 10,000

= 1,90,000

(*c*) Absolute Liquid Ratio = $\frac{\text{Absolute liquid assets}}{\text{Liquid liabilities}} = \frac{1,10,000}{1,90,000} = 0.57$

Absolute liquid assets	
Bank	1,00,000
Marketable securities	10,000
	1,10,000

2. *Solvency ratios*

(*a*) Debt-equity Ratio = $\frac{\text{Long term liabilities}}{\text{Shareholders funds}} = \frac{2,50,000}{10,00,000} = 0.25$

Long-term liabilities

12% Debentures = 2,50,000

Shareholders funds

Preference share capital = 5,00,000

Equity share capital	=	2,50,000
General reserve	=	50,000
P & C A/c	=	2,00,000
		10,00,000

Note : Preference share capital is included in the shareholders funds as it is not redeemable.

(*b*) Proprietory Ratio $= \frac{\text{Proprietors funds}}{\text{Total assets}}$

$= \frac{10,\ 00,000}{14,50,000} = 0.69$

(*c*) Capital Gearing Ratio $= \frac{\text{Fixed interest bearing securities + Fixed dividend bearing securities}}{\text{Equity shareholder's funds}}$

$= \frac{2,50,000 + 2,50,000}{7,50,000} = \frac{5,00,000}{7,50,000} = 0.66$

Fixed interest bearing securities

12% Debentures	=	2,50,000

Fixed dividend bearing securities

12% Preference share capital	=	2,50,000

Equity shareholders funds

Equity share capital	=	5,00,000
General reserve	=	50,000
P & L A/c	=	2,00,000
		7,50,000

(*d*) Fixed assets ratio $= \frac{\text{Net fixed assets}}{\text{Proprietor's funds}}$

$= \frac{9,50,000}{10,00,000} = 0.95$

Net fixed assets

Goodwill	=	2,50,000
Plant and machinery	=	3,00,000
Land and building	=	3,50,000
Furniture	=	50,000
		9,50,000

Proprietors funds

Equity share capital	=	5,00,000
General reserve	=	50,000

P & C A/c	=	2,00,000
12% pref. share capital	=	2,50,000
		10,00,000

Problem 13: From the following information calculate current ratio liquid ratio, creditors turnover and average credit sales of Surya Ltd. and Chandra Ltd.

Credit to debtors	*Surya Ltd. 3 months* Rs.	*Chandra Ltd. 3 months* Rs.
Stock	8,00,000	1,00,000
Debtors	1,70,000	1,40,000
Cash	30,000	60,000
Trade creditors	2,80,000	1,50,000
Bills payable	20,000	10,000
Bank overdraft	4,000	30,000
Creditor for expenses	60,000	10,000
Total purchases	9,30,000	6,60,000
Cash purchases	30,000	20,000

(University of Bombay, B.Com., October 1999)

Solution:

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Surya Ltd.} = \frac{10,00,000}{4,00,000} = 2.5 \text{ times}$$

Current assets

Stock		8,00,000
Debtors		1,70,000
Cash		30,000
		10,00,000

Current liabilities

Trade creditors	=	2,80,000
Bills payable	=	20,000
Bank OD	=	40,000
Creditors for expenses	=	60,000
		4,00,000

$$\text{Chandra Ltd.} = \frac{3,00,000}{2,00,000} = 1.5 \text{ times}$$

Current assets

Stock	=	1,00,000
Debtors	=	1,40,000
Cash	=	60,000
		3,00,000

Current liabilities

Trade creditors	=	1,50,000
Bills payable	=	10,000
Bank overdraft	=	30,000
Creditors for expenses	=	10,000
		2,00,000

3. Liquid ratio $= \frac{\text{Liquid assets}}{\text{Liquid liabilities}}$

or $= \frac{\text{Current assets – stock}}{\text{Current liabilities – Bank O.D.}}$

Surya Ltd. $= \frac{2,00,000}{3,60,000} = 0.56$

Chandra Ltd. $= \frac{2,00,000}{1,70,000}$ 1.18

3. Creditors turnover ratio $= \frac{\text{Credit purchases}}{\text{Creditors + Bills payable}}$

Surya Ltd. $= \frac{9,00,000}{2,80,000 + 20,000}$

$= \frac{9,00,000}{3,00,0000} = 3$ times

Chandra Ltd. $= \frac{6,40,000}{1,50,000 + 10,000}$

$= \frac{6,40,000}{1,60,000} = 4$ times

4. *Average Credit Sales*

Surya Ltd. :

for 3 months: Debtors are Rs. = 1,70,000

for 12 months: — ?

$\frac{1,70,000 \times 12}{3}$ = Rs. 6,80,000

Chandra Ltd:

for 3 months: Debtors are = 1,40,000

for 12 months: — ?

$\frac{1,40,000 \times 12}{3}$ = Rs. 5,60,000

Problem 14: Form the following balance sheet of Tara Ltd. calculate : (*a*) long-term debt-equity, (*b*) proprietory ratio, (*c*) capital gearing ratio, (*d*) stock-working capital ratios.

Equity share capital	2,00,000	Land and building	1,40,000
8% pref. share capital	60,000	Plant and machinery	80,000
Reserve	30,000	Furniture and fixtures	20,000
P & C A/c	20,000	Debtors	80,000
9% Debentures	40,000	Stock	70,000
Creditors	60,000	Cash in hand	30,000
O/s expenses	5,000	Prepaid expenses	10,000
Provision for taxation	20,000	Preliminary expenses	20,000
Proposed dividend	15,000		
	4,50,000		4,50,000

(University of Bombay, B.Com., October 1999)

Solution:

1. Long-term debt equity ratio $= \frac{\text{Long Term Debt}}{\text{Shareholders funds}} = \frac{40,000}{2,90,000} = 0.138$

Long-term Debt		
9% Debentures	=	40,000
Shareholders funds		
Equity share capital	=	2,00,000
Preference share capital	=	60,000
Reserves and surplus	=	30,000
P & C A/c	=	20,000
		3,10,000
Less fictitious assets		20,000
		2,90,000

2. Proprietory ratio $= \frac{\text{Proprietor's funds}}{\text{Total assets}} = \frac{2,90,000}{4,30,000} = 0.67$

Total assets		
Total of all assets	=	4,50,000
Less : Prepaid expenses	=	10,000
Less : Preliminary expenses	=	20,000
		30,000
		4,20,000

3. Capital bearing ratio $= \frac{\text{Fixed interest bearing securities + Fixed dividend bearing securities}}{\text{Equity shareholders funds}}$

$$= \frac{40,000 + 6,00,000}{2,30,000} = 0.43$$

Fixed Interest Bearing Securities		
9% Debentures	=	40,000
Fixed dividend bearing securities		
8% pref. shares	=	60,000
Equity shareholders funds		
Equity share capital	=	2,00,000
Reserves	=	30,000
P & L A/c	=	20,000
		2,50,000
Less : Preliminary expenses		20,000
		2,30,000

4. Stock-working capital ratio $= \frac{\text{Stock}}{\text{Working Capital}} = \frac{70,000}{90,000} = 0.77$

Working capital

Current assets:			
Debtors			80,000
Stock			70,000
Cash in hand			30,000
Prepaid expenses			10,000
			1 ,90,000
Less : Current liabilities			
Creditors	60,000		
O/s expenses	5,000		
Provision for tax	20,000		
Proposed dividend	15,000		
	1,00,000		1,00,000
		Working capital	90,000

Problem 15:

The following are the trading and profit & loss for the year ended 31st December, 1998 and the balance sheet as on that date of K Ltd.

Trading and P & L A/c

To opening stock	9,950	By sales	85,000
To purchases	54,525	By closing stock	14,900
To wages	1,425		
To gross profit	34,000		
	99,900		99,900
To administrative expenses	15,000	By gross profit	34,000
To selling expenses	3,000	By interest	300

To financial expenses	15,000	By profit on sale of shares	600
To loss on sale of assets	400		
To net profit	15,000		
	34,900		34,900

Balance Sheet

Share capital	20,000	Land and buildings	15,000
Reserves	9,000	Plant and machinery	8,000
Current liabilities	13,000	Stock	14,900
P & L A/c	6,000	Debtors	7,100
		Cash at bank	3,000
	48,000		48,000

You are required to calculate:

(*a*) Current Ratio
(*b*) Operating Ratio
(*c*) Stock Turnover Ratio
(*d*) Net Profit Ratio
(*e*) Fixed Assets Turnover Ratio **(Osmania University, B.Com., October 1999)**

Solution:

(*a*) Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{25,000}{13,000} = 1.92$

Current Assets

Stock	14,900
Debtors	7,100
Cash at bank	3,000
	25,000

(*b*) Operating Ratio $= \frac{\text{Cost of goods sold + Operating expenses}}{\text{Net sales}}$

$= \frac{51,000 + 19,500}{85,000} = \frac{70,500}{85,000} = 0.829$

Cost of goods sold

Opening stock	=	9,950
Purchases	=	54,525
Wages	=	1,425
		65,900
Less : Closing stock		14,900
		51,000

(*c*) Stock Turnover Ratio $= \frac{\text{Cost of goods sold}}{\text{Average stock}} = \frac{51,000}{12,425} = 4.10$ times

Average stock

$$= \frac{\text{Opening stock} + \text{Closing stock}}{2} = \frac{9,950 + 14,900}{2} = 12,425$$

(*d*) Net Profit Ratio $= \frac{\text{Net profit}}{\text{Net sales}} \times 100 = \frac{15,000}{85,000} \times 100 = 17.64\%$

(*e*) Fixed Assets Turnover Ratio $= \frac{\text{Net sales}}{\text{Fixed assets}} = \frac{85,000}{23,000} = 3.7$ times

Problem 16: The profit and loss A/c and balance sheet of XYZ Ltd. are as under :

Profit and loss A/c for the year ended 31st December, 1997

Net sales			3,00,000
Less :	Cost of production		2,58,000
			42,000
Less :	Operating expenses		
	Selling	2,200	
	Geneal administration	4,000	
	Rent of office	2,800	
			9,000
	Gross operating profit		33,000
Less :	Depreciation		10,000
	Net operating profit		23,000
	Other income and interest on Govt. securities		1,500
	Gross income (before tax)		24,500
Less :	Other expenses :		
	Interest on bank overdraft	300	
	Interest on debentures	42,000	
			4,500
	Net income (before tax)		20,000
	Tax 50% on net income		10,000
	Net income (after tax)		10,000

Balance sheet as at 31st Dec., 1997

Equity share capital	50,000	Fixed assets	1,80,000	
7% pref. share capital	10,000	*Less* : Depreciation	50,000	
Reserves and surplus	40,000			1,30,000
6% Mortgage debentures	70,000	Investment on Govt. securities		15,000
Creditors	6,000	Debtors		20,000
Bills payable	10,000	Stock		30,000
O/s expenses	1,000	Cash		5,000
Provision fot taxation	13,000			
	2,00,000			2,00,000

You are required to calculate the following ratios:

1. Return on investment
2. Net profit ratio
3. Current ratio
4. Net worth to capital employed
5. Cost of production to capital employed

(CS Intermediate, June, 1999)

Solution:

1. Return on Investment $= \frac{\text{Net profit (After tax and interest)}}{\text{Proprietors funds}} = \frac{10,000}{1,00,000} = 0.10$

Proprietors Funds

Equity share capital	=	50,000
7% pref. share capital	=	10,000
Reserves and surplus	=	40,000
		1,00,000

2. Net profit ratio $= \frac{\text{Net profit}}{\text{Net sales}} \times 100 = \frac{10,000}{3,00,000} \times 100 = 3.33\%$

3. Current ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{55,000}{30,000} = 1.88$

Current assets

Debtors	20,000
Stock	30,000
Cash	5,000
	55,000

Current liabilities

Creditors	6,000
Bills payable	10,000
O/s expenses	1,000
Provision for taxation	13,000
	30,000

4. Net worth to capital employed $= \frac{\text{Net worth}}{\text{Capital employed}} = \frac{1,00,000}{1,55,000} = 0.64$

Capital employed

Net fixed assets		1,30,000
Add : Current assets :		
Debtors	20,000	
Stock	30,000	
Cash	5,000	
		55,000
		1,85,000
Less : Current liabilities		30,000
		1,55,000

Net worth

Equity share capital	=	50,000

7% pref. share capital	=	10,000
Reserves and surplus	=	40,000
		1,00,000

5. Cost of production to capital employed $= \frac{\text{Cost production}}{\text{Capital employed}} \times 100$

$= \frac{2,58,000}{1,55,000} \times 100 = 166.45\%$

Problem 17: The actual ratios of a company compared to the industry standard are given below. Comment on each ratio and indicate in one or two sentences the nature of action to be taken by the company:

Ratio	*Industry standard*	*Actual for the company*
(*i*) Current ratio	2.2	2.7
(*ii*) Debtors turnover ratio	6	8
(*iii*) Stock turnover ratio	10	3
(*iv*) Net profit ratio	5%	2.4%
(*v*) Total debt to total assets	7.5%	40%

(ICWA, Intermediate, December, 1999)

Solution:

1. **Current Ratio:** Normal value is 2. Here the company's position is above the normal value and the industry standard. This may also be due to excessive stock (Also refer to point 3 below).
2. **Debtor's Turnover Ratio:** The industry standard indicates an average collection period of two months, while for the company it is only 1½ months. The companys position is better.
3. **Stock Turnover Ratio:** The stock is moving very slowly obviously there is excessive stock in the company. Perhaps this has boosted up the current ratio. The sales volume has to be considerably increased and stock level brought down.
4. **Net Profit Ratio:** Here the company's performance is very unsatisfactory compared to the overall position in the industry. This calls for steps to get better sales realisation and reduction of the cost of production.
5. **Total Debts to Total Assets :** The percentage is disproportionately high in the company indicating a larger proportion of debt in the capital structure. Too high a debt component means too high a risk for equity sahreholders.

Problem 18: The Balance Sheets of Katha Ltd., as on 31st December 1996 and 1997 were as follows:

(Rs. in Thousand)

Liabilities	*1996*	*1997*	*Assets*	*1996*	*1997*
Equity share capital (Rs. 10 each)	3,000	3,000	Fixed assets	3,600	4,240
12% preference share	1,000	1,000	Sundry debtors	1,100	1,300
Reserves	1,160	1,770	Bills receivable	860	1,050
10% Debentures	600	900	Stock	760	920
Creditors	480	640	Prepaird expenses	80	50
Bills payable	100	140	Bank balance	120	120
Bank overdraft	200	240	Preliminary expenses	20	10
	6,540	7,690		6,540	7,690

During the year 1997, total sales were Rs. 1,80,00,000 and cash sales were 10% of total sales. Stock turnover ratio was 20 times. Net profit before payment of taxes at 40% was Rs. 22,50,000. There were no non-operating expenses and profit on sale of fixed assets Rs. 50,000. Calculate the following ratio for the year 1997.

1. Gross profit ratio
2. Operating ratio
3. Current ratio
4. Debtors turnover ratio and collection period
5. Rerun on capital employed
6. Earning per share **(University of Bombay, B.Com., October, 1998)**

Solution:

(*Fig. in Thousand*)

1. Gross Profit Ratio $= \frac{\text{Gross profit}}{\text{Net Sales}} \times 100 = \frac{1,200}{18,000} \times 100 = 6.67\ \%$

Calculate of gross profit

Sales – Cost of goods sold = Gross profit

18,000 – 16,800 = 1,200

Calculation of Cost of Goods Sold

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of goods sold}}{\text{Average stock}}$$

$$20 = \frac{x}{840}$$

on cross multiplying $x = 20 \times 840 = 16,800$

Calculation of Average Stock

$$= \frac{\text{Opening stock + Closing stock}}{2} = \frac{760 + 920}{2} = 840$$

2. Operating Ratio $= \frac{\text{Operating cost + Operating expenses}}{\text{Net sales}} = \frac{16,800 + 0}{18,000} = 0.93$

3. Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{3,440}{1,020} = 3.37$

Current assets	
S. Debtors	1,300
Bills receivable	1,050
Stock	920
Prepaid expenses	50
Bank balance	120
	3,440
Current liabilities	
Creditors	640
Bills payable	140
Bank OD	240
	1,020

4. Debtors Turnover Ratio $= \dfrac{\text{Net credit sales}}{\text{Average accounts recoverable}}$

$$= \frac{16,200}{2,155} = 7.52 \text{ times}$$

Net credit sales

Total sales	18,000
Less : Cash sales	1,800
$\frac{10}{100} \times 18,000$	16,200

Average accounts receivable

$$= \frac{(\text{Opening bills receivable} + \text{Opening debtors}) + (\text{Closing B.R.} + \text{Closing debtors})}{2}$$

$$= \frac{(860 + 1,100) + (1,050 + 1,300)}{2} = \frac{4,310}{2} = 2,155$$

$$= \frac{365}{\text{Debtors Turnover Ratio}} = \frac{365}{7.52} = 48.53 \text{ or } 49 \text{ Days}$$

5. Return on Capital Employed $= \dfrac{\text{Net profit before tax + interest}}{\text{Capital employed}}$

$$= \frac{2,250 + 90}{6,660} \text{ (Debentures Interest)} = 0.35$$

Capital employed			
Net Fixed Assets			4,240
Add : Working capital :			
Current assets :			
Debtors		1,300	
B.R.		1,050	
Stock		920	
Prepaid expense		50	
Bank balance		120	
		3,440	
Less: Current liabilities			
Creditors	640		
B.P.	140		
Bank OD	240	1,020	
			2,420
		Capital Employed	6,660

6. Earning Per Share $= \dfrac{\text{NPAT} - \text{Preference dividend}}{\text{No. of equity shares}}$

$$= \frac{1350 - 120}{300} = \text{Rs. } 4.10$$

N.P.A.T.	
Net Profit Before Tax	2,250
Less : Tax @ 40%	900
B.P.	140
	1,350

Problem 19: The summarised Balance Sheet of Good Value Traders Ltd. for the year ended 31.3.1998 is given below:

(Rs. in Lakhs)

Equity share capital	140	Fixed assets	210	
Reserve & surplus	45	*Less* : Depreication	25	
Profit and loss A/c	20	*Current assets :*		185
Provision for taxation	10	Stock	25	
Sundry creditors	40	Debtors	30	
		Cash	15	70
	225			225

The following further particulars are also given for the year

(in Lakh of repees)

Sales	120
Earning before Interest Tax (EBIT)	30
Net Profit after Tax (PAT)	20

Calculate the following for the company and explain the significance of each in one or two sentences :

1. Current ratio
2. Liquidity ratio
3. Profitability ratio
4. Profitability on funds employed
5. Debtors turnover
6. Stock turnover
7. Average collection period
8. Return on equity

(*ICWA, Inter, June 1998*)

Solution:

(*Figures in Lakh of Rupees*)

1. Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{70}{40} = 1.75$

This ratio measures the liquidity of the firm and indicates its ability to meet the liabilities. Normal or ideal ratio is 2 : 1.

2. Liquidity Ratio $= \frac{\text{Liquid Assets}}{\text{Liquid liabilities}} = \frac{45}{40} = 1.125$

Liquid Assets	
Debtors	30
Cash	15
	45

This is more stringent than current ratio and measures the short term liquidity of the firm. Normal value of 1 : 1.

3. Profitability $= \frac{\text{EBIT}}{\text{Sales}} \times 100 = \frac{30}{120} \times 100 = 25\%$

This ratio indicates profit earned on sales

4. Profitability on funds employed $= \frac{\text{EBIT}}{\text{Share capital and long} - \text{term loans}} = \frac{30}{205}$

Share Capital and Long-term Loans

Equity share capital	140
Reserves and surplus	45
Profit and loss A/c	20
	205

This ratio measures profitability on funds employed

5. Debtors Turnover Ratio $= \frac{\text{Sales}}{\text{Average debtors}} = \frac{120}{30} = 4$

This ratio indicates how fast debtors are converted into cash.

6. Stock Turnover Ratio $= \frac{\text{Cost of goods sold}}{\text{Average stock}} = \frac{90}{25} = 3.6$ times

Cost of Goods Sold

Sales – EBIT

12 – 30 = 90

This ratio indicates the number of times stock is sold during the period.

7. Average Collection Period $= \frac{\text{Debtors}}{\text{Credit Sales}} \times \text{No. of months in a year}$

$$= \frac{30}{120} \times 12 = 3 \text{ months}$$

This ratio indicates the normal credit allowed to customers.

8. Return on Equity $= \frac{\text{PAT}}{\text{Shareholders funds}} = \frac{20}{205} = 9.76$

This ratio indicates the return earned on shareholders funds.

Problem 20: Form the following Balance Sheet and the sub-joined information of a company, you are required to calculate:

(*a*) Current ratio
(*b*) Quick ratio
(*c*) Inventory turnover
(*d*) Average collection period presuming 360 days in a year
(*e*) Owned finds to liabiltites ratio

Balance Sheet

Share capital	2,00,000	Goodwill	1,20,000
Reserves and surplus	58,000	Plant and machinery	1,50,000
Debentures	1,00,000	Stock	80,000
Creditors	40,000	Debtors	45,000
Bills payable	20,000	Cash	17,000
Other current liabilities	2,000	Miscellaneus current assets	8,000
	4,20,000		4,20,000
Sales (credit) for the year		Rs. 4,00,000	
Gross profit		Rs. 1,60,000	

(CS, Inter, December, 1998)

Solution:

1. Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{1,50,000}{62,000} = 2.4$

Current assets	
Stock	80,000
Debtors	45,000
Cash	17,000
Miscellaneous current assets	8,000
	1,50,000
Current liabilities	
Creditors	40,000
Bills payable	20,000
Other current liabilities	2,000
	62,000

2. Quick Ratio $= \frac{\text{Liquid assets}}{\text{Liquid liabilities}} = \frac{70,000}{62,000} = 1.1$

3. Inventory Turnover Ratio $= \frac{\text{Cost of sales}}{\text{Average stock}} = \frac{4,00,000 - 1,60,000}{80,000}$

$= 3$ times

Note : In the absence of information, closing stock has been taken as the average stock.

4. Average Collection Period $= \frac{\text{Debtors}}{\text{Net credit sales per day}} = \frac{45,000}{1,111} = 41$ days

Credit Sales Per Day $= \frac{4,00,000}{360} = 1.11$

5. Proprietor's Funds to Liabilities Ratio $= \frac{\text{Owners equity}}{\text{Total liabilities}} = \frac{2,58,000}{1,62,000} = 1.6$

Problem 21: The following one the P & L A/c and the Balance Sheet of a company in summarised form P & C A/c:

To opening stock	76,250	By sales	5,00,000
To purchases	3,22,250	By closing stock	98,500
To gross profit c/d	2,00,000		
	5,98,500		5,98,500
To selling and distribution expenses	22,000	By gross profit	2,00,000
To administrative expenses	98,000	By dividend	9,000
To loss on sale of assets	2,000	By profit on sale of share	3,000
To net profit	90,000		
	2,12,000		2,12,000

Balance Sheet

Share capital	2,60,000	Land and buildings	1,50,000
(2600 equity)		Plant and machinery	80,000
Shares of Rs. 100 each		Stock	98,500
Reserves	70,000	Debtors	61,500
P & L a/c	20,000	Bills receivable	60,000
Current liabilities	1,30,000	Bank	30,000
	4,80,000		4,80,000

Calculate

1. Gross profit ratio
2. Net profit ratio
3. Operating ratio
4. Operating profit ratio
5. Stock turnover ratio
6. Turnover of fixed assets.

(Bangalore University, B.B.M., November, 1998)

Solution:

1. Gross Profit Ratio $= \frac{\text{Gross profit}}{\text{Net sales}} \times 100 = \frac{2,00,000}{5,00,000} \times 100 = 40\%$

2. Net Profit Ratio $= \frac{\text{Net profit}}{\text{Sales}} \times 100 = \frac{90,000}{5,00,000} \times 100 = 18\%$

3. Operating Ratio $= \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100 = \frac{1,01,500 + 1,20,000}{5,00,000} \times 100$

$$= \frac{22,15,000}{5,00,000} \times 100 = 44.3\%$$

4. Operating Profit Ratio = 100 – Operating ratio
$= 100 - 44.3\% = 55.7\%$

5. Stock Turnover Ratio $= \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{5,98,500 - 2,00,000}{87,375} = 4.56$ times

Average stock

$$= \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

$$= \frac{76,250 + 98,500}{2} = \frac{1,74,750}{2} = 87,375$$

6. Turnover of Fixed Assets

$$= \frac{\text{Net sales}}{\text{Fixed assets}} = \frac{5,00,000}{2,30,000} = 2.17$$

Problem 22: Following are the Trading Account, profit and loss a/c of Sarmer Ltd. for the year ending 31st December, 1996 and Balance Sheet on that date:

P & L A/c

To opening stock	1,45,000	By sales	7,50,000
To purchases	6,10,000	By closing stock	1,55,000
To gross profit c/d	1,50,000		
	9,05,000		9,05,000
To Sundary expenses	80,000	By gross profit b/d	1,50,000
To Net profit	70,000		
	1,50,000		1,50,000

Balance Sheet

Share capital		7,00,000	Net block	5,50,000
Reserves and surplus	5,000		Stock	2,55,000
Add: Profit for the year	70,000		Debtors	1,80,000
		1,20,000	Cash	20,000
Bank overdraft		35,000		
Criditors		1,50,000		
		10,50,000		10,50,000

You are required to calculate the following ratios:

1. Current ratio,
2. Quick ratio,
3. Gross profit to sales ratio,
4. Stock turnover ratio,
5. Debtors turnover ratio,
6. Net profit to paid-up capital.

(University of Bombay, B.Com., April, 1998)

Solution:

1. Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{4,55,000}{1,85,000} = 2.46$

Current assets	
Stock	2,55,000
Debtors	1,80,000
Cash	20,000
	4,55,000
Current liabilities	
Bank OD	35,000
Creditors	1,50,000
	1,85,000

2. Quick Ratio $= \frac{\text{Quick assets}}{\text{Quick liabilities}} = \frac{2,00,000}{1,50,000} = 1.33$

Quick assets	
Debtors	1,80,000
Cash	20,000
	2,00,000

Quick liabilities here includes only creditors

3. Gross Profit Ratio $= \frac{\text{Gross profit}}{\text{Net sales}} \times 100 = \frac{1,50,000}{7,50,000} = 20\%$

4. Stock Turnover Ratio $= \frac{\text{Cost of goods sold}}{\text{Average stock}} = \frac{6,00,000}{1,50,000} = 4 \text{ times}$

Cost of Goods Sold	
Opening stock	1,45,000
Add : Purchase	6,10,000
	7,55,000
Less : Closing stock	1,55,000
	6,00,000

Average Stock

$$= \frac{\text{Opening stock} + \text{Closing stock}}{2} = \frac{1,45,000 + 1,55,000}{2} = 1,50,000$$

Alternatively, average stock may be taken as Rs. 2,00,000 $\left(i.e., \frac{1,45,000 + 2,55,000}{2} \right)$ and the stock turnover ratio will be 3 times *i.e.*, $\frac{6,00,000}{2,00,000}$

5. Debtors Turnover Ratio $= \frac{\text{Debtors} + \text{Bill receivable}}{\text{Net credit sales}}$

$$= \frac{1,80,000}{7,50,000} \times 365 = 88 \text{ Days App.}$$

6. Net Profit to Paid up Share Capital $= \frac{\text{Net profit after tax}}{\text{Paidup share capital}} \times 100 = \frac{70,000}{7,00,000} \times 100 = 10\%$

Problem 23: Following figures have been extracted from the books of Voodoso Ltd.

	Rs.
Land and building	6,00,000
Plant and machinery	5,00,000
Equity capital	5,00,000
Preference capital	2,00,000
Stock	2,40,000
Debtors	2,00,000
Cash at bank	55,000
Miscellaneous reserve	5,000
P & L A/c	2,00,000
General reserve	1,00,000
Sundry creditors	80,000
Bills payable	60,000
Miscellaneous current liabilities	60,000
Debentures	4,00,000

You are required to:

(*a*) Rearrange above figures in the vartical form and

(*b*) Calculate

(*i*) Debt equity ratio,

(*ii*) Proprietory ratio,

(*iii*) Capital gearing ratio. **(University of Bombay, B.Com., April 1998)**

Solution:

Voodoso Ltd.
Balance Sheet as on

Sources of Fund		
Share capital :		
Preference share capital	2,00,000	
Equity share capital	5,00,000	
		7,00,000
Reserves and surplus :		
Profit and loss A/c	2,00,000	
General reserve	1,00,000	
		3,00,000
Loan fund:		
Debentures		4,00,000
		14,00,000
Application of funds		
Fixed Assets:		
Land and building	6,00,000	
Plant and machinery	5,00,000	
		11,00,000
Working capital		
Current Assets:		
Stock	2,40,000	
Debtors	2,00,000	

Cash at bank		55,000	
Miscellaneous current assets		5,000	
		5,00,000	
Less : Current liabilities:			
Creditors	80,000		
Bills payable	60,000		
Miscellaneous current liability	60,000		
		2,00,000	
			3,00,000
Total applications			14,00,000

1. Debt Equity Ratio $= \frac{\text{Long term debts}}{\text{Shareholders funds}} = \frac{4,00,000}{10,00,000} = 0.4$

2. Proprietory Ratio $= \frac{\text{Proprietors fund}}{\text{Total assets}} = \frac{10,00,000}{16,00,000} = 0.62$

3. Capital Gearing Ratio $= \frac{\text{Fixed Interest bearing securities + Fixed dividend bearing securities}}{\text{Equity shareholders fund}}$

$$= \frac{2,00,000 + 4,00,000}{8,00,000} = 0.75$$

Equity sahreholders funds		
Equity share capital	5,00,000	
Reserve and P & L A/c	3,00,000	
	8,00,000	

Problem 24: From the following calculate:

(*a*) Gross profit ratio
(*b*) Net profit ratio
(*c*) Operating ratio
(*d*) Current ratio
(*e*) Acid test ratio
(*f*) Stock turnover ratio
(*g*) Debtors turnover ratio
(*h*) Return on investment

Trading and Profit & Loss A/c for the year ended 31st Dec., 1996

To opening stock	25,000	By sales	1,80,000
To puchases	1,05,000	By closing stock	15,000
To gross profit	65,000		
	1,95,000		1,95,000
To administrative expenses	23,000	By gross profit	65,000
To selling and distribution expenses	10,000	By profit on sale of fixed assets	5,000
To financial expenses	2,000		
To net profit	35,000		
	70,000		70,000

Balance Sheet as at 31st Dec., 1996

Share capital	50,000	Land and buildings	50,000
General reserve	40,000	Plant and machinery	20,000
P & L A/c	15,000	Stock	15,000
Creditors	12,000	Debtors	2,000
Bills payable	8,000	Bills receivable	5,000
		Cash at bank	15,000
	1,25,000		1,25,000

(Osmania University, B.Com., March 1999)

Solution:

(*a*) Gross Profit Ratio $= \frac{\text{Gross profit}}{\text{Net sales}} \times 100 = \frac{65{,}000}{1{,}80{,}000} \times 100 = 36.11\%$

(*b*) Net Profit Ratio $= \frac{\text{Net profit}}{\text{Net sales}} \times 100 = \frac{35{,}000}{1{,}80{,}000} \times 100 = 19.44\%$

(*c*) Operating Ratio $= \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$

$= \frac{1{,}15{,}000 + 35{,}000}{1{,}80{,}000} \times 100 = \frac{1{,}50{,}000}{1{,}80{,}000} \times 100 = 83.33\%$

Cost of goods sold	
Opening stock	25,000
Add: Purchase	1,05,000
	1,30,000
Less : Closing stock	15,000
	1,15,000
Operating expenses	
Administration expenses	23,000
Selling and distribution expenses	10,000
Financial expenses	2,000
	35,000

(*d*) Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{55{,}000}{20{,}000} = 2.75$

Current assets	
Stock	15,000
Debtors	20,000
B.R.	5,000
Cash at bank	15,000
	55,000
Current liabilities	
Creditors	12,000
B.P.	8,000
	20,000

(*e*) Acid Test Ratio $= \dfrac{\text{Liquid assets}}{\text{Liquid liabilities}} = \dfrac{40{,}000}{20{,}000} = 2$

Liquid Assets = Current assets – Stock

= 55,000 – 15,000 = 40,000

(*f*) Stock Turnover Ratio $= \dfrac{\text{Cost of goods sold}}{\text{Average stock}} = \dfrac{1{,}15{,}000}{20{,}000} = 5.75$ times

Average stock $= \dfrac{\text{Opening stock + Closing stock}}{2} = \dfrac{25{,}000 + 15{,}000}{2} = 20{,}000$

(*g*) Debtors Turnover Ratio $= \dfrac{\text{Net sales}}{\text{Debtors + Bills receivable}}$

$= \dfrac{1{,}80{,}000}{20{,}000 + 5{,}000} = \dfrac{1{,}80{,}000}{25{,}000} = 7.2$ times

(*h*) Return on Investment $= \dfrac{\text{Net profit}}{\text{Capital employed}} \times 100 = \dfrac{35{,}000}{1{,}05{,}000} \times 100 = 33.33\%$

Capital employed

= Fixed assets + Current assets – Current liabilities

= 70,000 + 55,000 – 20,000 = 1,05,000

Problem 25: The comparative statements of income and financial position are given below:

	1990	*1991*
	Rs.	*Rs.*
Net sales	1,00,000	1,50,000
Less: Cost of sales	70,000	1,10,000
Gross profit	30,000	40,000
Less: Operating expesnes	20,000	25,000
Net profit	10,000	15,000
Assets		
Cash in hand	5,000	8,000
Cash at bank	4,000	2,000
Debtors	40,000	25,000
Stock at cost	15,000	10,000
Fixed assets (Net)	56,000	65,000
	1,20,000	1,10,000
Liabilities		
Creditors	36,000	12,000
Bills payable	2,000	1,000
Mortgage loan	10,000	20,000
Equity share capital	60,000	70,000
Reserves and surplus	12,000	7,000
	1,20,000	1,10,000

You are required to calculate the following ratios for both the years:

1. Current ratio
2. Acid test ratio
3. Debtors turnover ratio
4. Average collection period
5. Stock turnover ratio

(Assume 360 days in a year) **(Sri Venkateshwara University, B.Com., April 1998)**

Solution:

1. Current Ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$

Year 1990	*Year 1991*
$= \frac{64,000}{38,000}$	$= \frac{45,000}{13,000}$
= 1.68	= 3.46

Current assets

	1990	*1991*
Cash in hand	5,000	8,000
Cash in bank	4,000	2,000
Debtors	40,000	25,000
Stock	15,000	10,000
	64,000	45,000
Current liabilities		
Creditors	36,000	12,000
Bills payable	2,000	1,000
	38,000	13,000

2. Acid Test Ratio = $\frac{\text{Liquid assets}}{\text{Current liabilities}}$

$= \frac{49,000}{38,000}$	$= \frac{35,000}{13,000}$
= 1.29	= 2.69

Liquid assets	*1990*	*1991*
Cash in hand	5,000	8,000
Cash at bank	4,000	2,000
Debtors	40,000	25,000
	49,000	35,000

3. Debtors Turnover Ratio = $\frac{\text{Net credit sales}}{\text{Average trade debtors}}$

Year 1990	*Year 1991*
$= \frac{1,00,000}{40,000}$	$= \frac{1,50,000}{32,500}$
= 2.5	= 4.6

Average Trade Debtors	*1990*	*1991*
Rs.	40,000	$\frac{40,000 + 25,000}{2}$
		= 32,500

4. Average Collection Period $= \frac{\text{Average trede debtors}}{\text{Net credit sales}} \times \text{No. of working days}$

$$1990 = \frac{40,000}{1,00,000} \times 360 = 144 \text{ days}$$

$$1991 = \frac{32,500}{1,50,000} \times 360 = 78 \text{ days}$$

5. Stock Turnover Ratio $= \frac{\text{Cost of sales}}{\text{Average stock}}$

$$1990 = \frac{70,000}{15,000} = 4.67 \text{ times}$$

$$1991 = \frac{1,10,000}{12,500} = 8.8 \text{ times}$$

Average Stock:

$$1990 = \text{Rs. } 15,000$$

$$1991 = \frac{15,000 + 10,000}{2} = 12,500$$

Problem 26: From the following Balance Sheet, calculate current ratio, acid test ratio, stock turnover ratio, debtors turnover ratio and average collection period:

Share capital	4,00,000	Goodwill	2,50,000
General reserve	2,88,000	Buildings	4,00,000
8% Debentures	3,00,00	Machinery	3,50,000
Mortgage loan	2,50,000	Closing stock	2,00,000
Creditors	90,000	Debtors	80,000
Bills payable	35,000	Bills receivable	90,000
Bank overdraft	60,000	Cash	65,000
O/s expenses	15,000	Prepaid expenses	3,000
	14,38,000		14,38,000

Additional information opening stocks Rs. 1,50,000: Opening debtors Rs. 1,50,000 and net credit sales Rs. 6,00,000. **(University of Madras, B.Com., May 1997)**

Solution:

1. Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{4,38,000}{2,00,000} = 2.19$

Current assets	
Stock	2,00,000
Debtors	80,000

Bills receivable	90,000
Cash	65,000
Prepaid expenses	3,000
	4,38,000
Current liabilities	
Creditors	90,000
Bills payable	35,000
Bank OD	60,000
O/s expenses	15,000
	2,00,000

2. Acid Test Ratio $= \frac{\text{Quick assets}}{\text{Quick liabilities}} = \frac{2,35,000}{1,40,000} = 1.68$

Quick assets

= Current assets – Stock – Prepaid expenses

= 4,38,000 – 2,00,000 – 30,000 = 2,35,000

Quick liabilities

= Current liabilities – Bank OD

= 2,00,000 – 60,000 = 1,40,000 (Credit Sales)

3. Stock Turnover Ratio $= \frac{\text{Cost of sales or sales}}{\text{Average stock}} = \frac{6,00,000}{1,75,000} = 3.43$ times

Average Stock $= \frac{\text{Opening stock} + \text{Closing stock}}{2}$

$= \frac{1,50,000 + 2,00,000}{2} = \frac{3,50,000}{2} = 1,75,000$

4. Debtors Turnover Ratio $= \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}} = \frac{6,00,000}{2,05,000} = 2.93$ times

Average Accounts Receivable $= \frac{\text{Opening Debtor} + \text{Closing Debtor}}{2} + \text{B.R.}$

$= \frac{1,05,000 + 80,000}{2} + 90,000$

$= 1,15,000 + 90,000 = 2,05,000$

5. Average Collections Period $= \frac{12}{\text{D.T.R.}}$ or $= \frac{365}{\text{D.T.R.}}$

$= \frac{12}{2.93}$ $= \frac{365}{2.43}$

= 4.09 months = 124.57 days

Problem 27: *(Calculate of Missing Information)*

Calculate:

(*a*) Current assets
(*b*) Inventory, form the following particulars :

Current ratio = 2.6:1

Current liability = Rs. 40.000 **(Bangalore University. B.Com., April 2000)**

Solution :

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$2.6 = \frac{\text{CA.}}{40{,}000}$$

or $\text{C.A.} = 2.6 \times 40{,}000$

$\text{C.A.} = 1{,}04{,}000$

Inventory is the same as current asset in the absence of liquid assets which is not given in the problem.

Problem 28: Average stock of a firm is Rs. 40,000. Its opening stock is Rs. 5,000 less than the closing stock. Find out opening stock. **(Bangalore University, B.Com., April 2000)**

Solution:

Average Stock = 40,000

Total Stock = Average stock × 2

= 40,000 × 2 = 80,000

Add: Opening stock less by 5,000 = 5,000

= 85,000

Hence, opening stock $\frac{85{,}000}{2}$ = 42,500

Problem 29: Gross profit ratio is 20% on sales. Total gross profit Rs. 1,00,000. Cash sales Rs. 1,20,000. Average debtors Rs. 95,000. Calculate debtor's turnover ratio. **(Bangalore University, B.Com., April 2000)**

Solution:

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Sales}} \times 100$$

$$\frac{20}{100} = \frac{1{,}00{,}000}{\text{Sales}}$$

or $$\text{Sales} = \frac{1{,}00{,}000 \times 100}{20} \text{ (on cross multiplication)}$$

$= 5{,}00{,}000$

Total sales = 5,00,000

Credit sales = Total sales – Cash sales

= 5,00,000 – 1,20,000

= 3,80,000

$$\text{Debtors Turnover Ratio} = \frac{\text{Credit sales}}{\text{Average debtors}}$$

$$= \frac{3,80,000}{95,000} = 4$$

Problem 30: Cost of sales of a firm is Rs. 2,50,000 and stock turnover ratio is 5 times. Find out the value of stock:

Solution:

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of sales}}{\text{Average stock}}$$

Less : Average stock $= x$

$$5 = \frac{2,50,000}{x}$$

or $5x = 2,50,000$

$$x = \frac{2,50,000}{5} = 50,000$$

Problem 31: Gross profit ratio of a firm is 20%. Gross profit is Rs. 30,000. Calculate the sale figure.

Solution:

$$\text{Gross Profit Ratio} = \frac{\text{Cost profit}}{\text{Sales}} \times 100$$

$$\frac{20}{100} = \frac{30,000}{\text{Sales}}$$

$$20 \text{ sales} = 30,000 \times 100$$

$$\text{Sales} = \frac{30,000 \times 100}{200} = 1,50,000$$

Problem 32: Given:

Gross profit is Rs. 3,00,000

Gross profit ratio at 25% on sales

Compute the cost of sales

Solution:

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Sales}}$$

$$\frac{25}{100} = \frac{3,00,000}{\text{Sales}}$$

or $25 \text{ sales} = 3{,}00{,}000 \times 100$

$$\text{Sales} = \frac{3{,}00{,}000 \times 100}{25} = 12{,}00{,}000$$

Cost of sales = Sales – Gross profit

= 12,00,000 – 3,00,000 = 9,00,000

Problem 33: Turnover to fixed assets ratio is 1 : 1.2 value of goods sold is Rs. 9,00,000. Compute the value of fixed assets.

Solution:

$$\text{Fixed Assets to Turnover Ratio} = \frac{\text{Turnover}}{\text{Fixed assets}}$$

$$1.2 = \frac{9{,}00{,}000}{1}$$

or $$= \frac{9{,}00{,}000}{1.2} \text{ (on cross multiplication)}$$

$$= 7{,}50{,}000$$

Therfore fixed assets = Rs. 7,50,000.

Problem 34: Given long term debt to equity ratio is 2 : 3. Equity amount is Rs. 50,000. Compute the value of long-term debt.

Solution:

$$\text{Long-term to Equity Ratio} = \frac{\text{Long term debt}}{\text{Equity}}$$

$$\frac{2}{3} = \frac{x}{50{,}000}$$

or, $3x = 2 \times 50{,}000$ (on cross multiplication)

$$x = \frac{2 \times 50{,}000}{3} = 33{,}333$$

Problem 35: Gross profit of a firm is 20% of sales. Cost of goods sold Rs. 1,60,000. Find out the sales.

Solution:

Gross profit on sales = 20% of sales

Therfore cost of goods sold must be 80 *i.e.*, (100 – 20)

For cost of goods sold of 80 = 1,60,000

$$\text{For } 100 \rightarrow = \frac{1{,}60{,}000 \times 100}{80} = 2{,}00{,}000$$

Sales = 2,00,000

Problem 36: Average stock of a firm is Rs. 40,000. Its opening stock is Rs. 5,000 less than the closing stock. Find out the opening stock.

Solution:

Average stock = 40,000

Total stock = $40,000 \times 2 = 80,000$

Opening stock is Rs. 5,000 less than the closing stock

$= 80,000 - 5,000 = 75,000$

$= \frac{75,000}{2} = 37,500$

Opening stock = 37,500

Closing stock = 37,500 + 5,000 = 42,500

Problem 37: Gross profit ratio is 20% on sales, stock velocity 5, average stock Rs. 1,10,000. Ascertain the sales.

Solution:

Stock Turnover Ratio $= \frac{\text{Cost of goods sold}}{\text{Average stock}}$

$5 = \frac{\text{Cost of goods sold}}{1,10,000}$

or Cost of goods sold $= 1,10,000 \times 5 = 5,50,000$

Sales = Cost of goods sold + Profit

100 = 80 + 20

For 80; cost of goods sold is = 5,50,000

For 100 $\rightarrow$ $= \frac{100 \times 5,50,000}{80} = 6,87,500$

Problem 38: Closing stock of X Ltd. is Rs. 2,00,000. Total liquid assets are Rs. 10,00,000. Liquid ratio is 2 : 1. Find out working capital.

Solution:

Closing stock = 2,00,000

Liquid assets = 10,00,000

Liquidity ratio $= \frac{\text{Liquid assets}}{\text{Liquid liabilities}} = \frac{2}{1}$

Current assets = Liquid assets + Stock

= 10,00,000 + 2,00,000

= 12,00,000

Working capital = Current assets + Current liabilities

For liquid assets 2 : The amount is 10,00,000

For liquid asset 1 : $\rightarrow$ X $\rightarrow$

$= \frac{10,00,000}{2} = 5,00,000$

Working capital = Current assets – Current liabilities
= 12,00,000 – 5,00,000 = 7,00,000

Problem 39: Total current liabilities are Rs. 80,000 current ratio is 2.5 :1. Acid test ratio 1.5 : 1. Total current assets include stock, debtors and cash only. Cash is 2/3 of debtors. Calculate debtors.

Solution:

Current ratio $= \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2.5}{1}$

Current liabilities $= 1 \times 80,000 = 80,000$

Therfore current assets $= 80,000 \times 2.5$

$= 2,00,000$

Acid test ratio $= \frac{\text{Liquid assets}}{\text{Liquid liabilities}} = \frac{1.5}{1}$

$1 = 80,000$

Therfore liquid assets $= 1.5 \times 80,000 = 1,20,000$

Stock = Current assets – Liquid assets

$= 2,00,000 - 1,20,000 = 80,000$

Liquid assets = Cash + Debtors

$1,20,000 = x \times \frac{2}{3} + x$ (Debtors assumed as x)

$x + \frac{2}{3}x = 1,20,000$

or $3x + 2x = 3 \times 1,20,000$

$5x = 3,60,000$

$x = 72,000$

Therefore debtors = Rs. 72,000

Cash $= \frac{2}{3} \times 7,20,000 = 48,000$

Verification = Debtors + Cash

= 72,000 + 48,000 = 1,20,000

Problem 40: Current ratio 2.5, acid test ratio 1.75, stock Rs. 1,50,000. Calculate net working capital.

Solution:

Current ratio $= \frac{2.5}{1}$

Liquidity ratio $= \frac{1.75}{1}$

Current asset = 2.50

Liquid asset = 1.75

Current asset – Liquid asset = Stock

$$2.50 - 1.75 = 0.75$$

Stock $= 0.75$ or $\frac{3}{4} = 1,50,000$

or $= \frac{4 \times 1,50,000}{3} = 2,00,000$

Current liability $= 1 = 2,00,000$

Current asset $= 2,00,000 \times 2.5 = 5,00,000$

Net working capital = Current assets – Current liabilities

$= 5,00,000 - 2,00,000 = 3,00,000$

Problem 41: Current liabilities of a company are Rs. 3,00,000. Its current ratio is 3 : 1 and quick ratio is 1 : 1. Calculate the value of stock in trade.

Solution:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\frac{3}{1} = \frac{x}{3,00,000}$$

$$x = 3 \times 3,00,000 = 9,00,000$$

$$\text{Quick ratio} = \frac{\text{Quick assets}}{\text{Quick liabilities}}$$

$$\frac{1}{1} = \frac{x}{3,00,000}$$

$$x = 1 \times 3,00,000 = 3,00,000$$

Current assets – Stock = Quick assets

$$9,00,000 - x = 3,00,000$$

$$x = 6,00,000$$

Hence, stock in trade = Rs. 6,00,000

Problem 42: Given current ratio is 2.5, working capital is 60,000. Calculate the amount of current assets and current liabilities.

Solution:

Current assets – Current liabilities = Working capital

$$2.5 - 1 = 1.5$$

If working capital is Rs. 1.5, then current asset is 2.5

If working capital is 1, then current asset is $\frac{2.5}{1.5}$

$$\frac{2.5}{1.5} \times 60,000 = 1,00,000$$

Current asset = 1,00,000

1,00,000 – Current liabilities = 60,000

Current liabilities = 40,000

Problem 43: Following information are available from the books of Smart Projects Ltd.

Debtors velocity	3 months
Stock velocity	6 months
Creditors velocity	2 months
Gross profit ratio	20%

Gross profit for the year ended 31st March, 1999 was Rs. 50,00,000, stock on 31st March, 1999 was more than what it was at the beginning of the year. Bills receivable and bills payable were Rs. 60,000 and Rs. 36,667 respectively.

You are required to calculate the value of (1) Sales, (2) Sundry debtors, (3) Sundry creditors and (4) Closing stock and also prepare a note for the finance director on the overall impact of the results.

(CS, Inter, June, 2000)

Solution:

1. Calculation of Sales

$$\text{Gross Profit Ratio} = \frac{\text{Gross profit}}{\text{Sales}}$$

$$\frac{20}{100} = \frac{5,00,000}{\text{Sales}}$$

$$20 \text{ sales} = 5,00,000 \times 100$$

$$\text{Sales} = \frac{5,00,000 \times 100}{20} = \text{Rs. } 25,00,000$$

2. Calculation of Sundry Debtors

Sales = 25,00,000

Debtor's velocity = 3 months

Year end sales outstanding

$$25,00,000 \times \frac{3}{12} = 6,25,000$$

Less: Bills receivable = 60,000

Sundry debtors = 5,65,000

3. Calculation of Creditors

Purchases = Sales – Gross profit + Increase in stock

= 25,00,000 – 5,00,000 + 20,000

Purchases = 20,20,000

Creditor's velocity = 2 months

Year end purchases outstanding

$$20,20,000 \times \frac{2}{12} = 3,36,667$$

Less : Bills payable	= 36,667
Sundry creditors	= 3,00,000

4. Calculation of Closing Stock

Cost of goods sold	= Sales – Profit
	= 25,00,000 – 5,00,000
Cost of goods sold	= 20,00,000
Stock velocity	= 6 months
Average stock	$= 20,00,000 \times \frac{6}{12} = 10,00,000$
Let opening stock be	= x
Closing stock	= x + 20,000
Twice average stock	= 2x + 20,000
20,00,000	= 2x + 20,000
2x	= 19,80,000
x	= 9,90,000
Thus opening stock	= 9,90,000
Hence closing stock	= 9,90,000 + 20,000 = 10,10,000

Overall Impact of the Results

The debtors velocity and the amount of debtors are more than what the creditors velocity and the amount of creditors. This means that the company is paying liberal credit than what it receives from the creditors. The company is having a low inventory turnover ratio which result in blocking of funds in inventory. The gross profit is merely 20% of the sales which seems to be insufficient to cover up the overheads and maintain a reasonable net profit.

Problem 44: The current ratio of a company is 2 : 1 which of the following transactions would:

(*i*) Improve the ratio
(*ii*) Reduce the ratio
(*iii*) Not alter the ratio (give your reasons)

1. Pay a current liability
2. Sell machinery for cash
3. Borrow money us interest repayable at the end of 5 years
4. Purchase stock of goods for cash
5. Accept a bill of exchange drawn by a supplier
6. Issue of bouns shares. **(University of Bombay, B.Com., October,1998)**

Solution:

1. **Pay a Current Liability:** Paying a current will decrease both in current liability and current asset by the same amount. Therfore current ratio shall improve.
2. **Sell Machinery for Cash:** Selling machinery for cash will decrease the fixed assets and increases the current assets therfore current ratio shall be improved.

3. **Borrow Money at Interest Payable at the End of 5 Years:** This will result in increase in current asset and increase in long-term loans. Therefore current ratio shall be improved.
4. **Purchased Stock of Goods for Cash:** This will result in increase in stock and decrease in cash balabce. Total current assets and current liabilities remain the same and hence current ratio will not be affected.
5. **Accept a Bill of Exchange Drawn by Supplier:** This will increase bills payable and reduce creditors. Total current assets and current liabilities remain the same the hence current ratio will not be affeted.
6. **Issue of Bouns Shares:** This will increase equity share capital and will reduce the surplus. Both effects are on non-current items, not affecting on current assets and current liabilities. Total current assets and current liabilities remain the same and hence current ratio will not be affected.

Problem 45: From the following information as certain:

(*i*) Long-term loans
(*ii*) Reserves and surplus
(*iii*) Capital employed

Capital gearing ratio	0.57
Debt equity ratio	0.40
(Long-term debts to shareholders funds)	
Equity share capital	Rs. 3,00,000
Preference share capital	Rs. 1,00,000

(University of Bombay, B.Com., October 1998)

Solution:

Let long-term loans $= x$

Reserves and surpluses $= y$

$$\text{Capital Gearing Ratio} = \frac{\text{Preference share capital + Long term debts}}{\text{Equity share capital + Reserves and surpluses}}$$

$$0.75 = \frac{1{,}00{,}000 + x}{3{,}00{,}000 + y}$$

$$\therefore \quad 0.75\,(3{,}00{,}000 + y) = 1{,}00{,}000 + x$$

$$\therefore \quad 0.75y + 2{,}25{,}000 = 1{,}00{,}000 + x$$

$$x = 0.75y + 1{,}25{,}000 \quad \ldots (1)$$

$$\text{Debt Equity Ratio} = \frac{\text{Long term debts}}{\text{Shareholders funds}}$$

$$0.40 = \frac{x}{\text{Equity share capital + Reserves + Preference share capital}}$$

or
$$0.40 = \frac{x}{3{,}00{,}000 + 1{,}00{,}000 + y}$$

$$x = 0.4\,(4{,}00{,}000 + y)$$

$$x = 1{,}60{,}000 + 0.4y \quad \ldots (2)$$

or
$$0.75y + 1{,}25{,}000 = 1{,}60{,}000 + 0.4y$$

or
$$0.75y - 0.4y = 1{,}60{,}000 - 1{,}25{,}000$$

or $0.35y = 35{,}000$

or $y = \frac{35{,}000}{0.35} = 1{,}00{,}000$

Calculation of Long-term Debts, *i.e., X*

Debt Equity Ratio $= \frac{\text{Long – term debt}}{\text{Equity shares capital + Pref. share capital + Reserves}}$

$0.40 = \frac{x}{3{,}00{,}000 + 1{,}00{,}000 + 1{,}00{,}000}$

$0.40 = \frac{x}{5{,}00{,}000}$

$x = 5{,}00{,}000 \times 0.40 = 20{,}00{,}000$

Calculation of Capital Employed

Equity share capital	3,00,000
Preference share capital	1,00,000
Reserves and surplus	1,00,000
Long-term loans	2,00,000
Capital employed	7,00,000

Problem 46: From the following details find out (*a*) Current assets, (*b*) Current liabilities, (*c*) Quick asset, (*d*) Stock

Current Ratio = 2.5

Quick Ratio = 1.5

Working Capital = Rs. 60,000 **(Osmania University, B.Com., October., 1999)**

Solution:

Current Ratio $= \frac{\text{Current assets}}{\text{Current liabilities}}$

$2.5 = \frac{CA}{CL}$

or $CA = 2.5\,CL$

Let current liabilities be $= x$

$\therefore$ Current assets $= 2.5x$

Working capital = Current assets – Current liabilities

$= 2.5x - x$

$= 1.5x$

But working capital $= 60{,}000$

$1.5x = 60{,}000$

$$x = \frac{60,000}{1.5} = 40,000$$

Current liabilities = 40,000

∴ Current assets = 2.5 × 40,000 = 1,00,000

Liquidity ratio $= \frac{\text{Quick assets}}{\text{Liabilities}}$

$$1.5 = \frac{\text{Quick assets}}{\text{Liabilities}}$$

QA = 1.5 × QL = 1.5 × 40,000

= 60,000

Stock = Current assets × Quick assets

= 1,00,000 – 60,000 = 40,000

Problem 47: *(Preparation of Balance Sheet with Ratio):*

The gross profit of X Ltd. for the year 1998 is Rs. 80,000. This is one-fourth of the year's sales. Out of total sales, three-fourth is on credit. The stock turnover is 10 times and the average collection period is 15 days (assume 360 days). Total assets turnover is 4 times and the long-term debt to equity is 50%. Shareholder's equity is Rs. 40,000. The current ratio is 2 : 1.

Find out (1) creditors, (2) long-term debt, (3) cash in hand, (4) debtors, (5) closing stock, (6) fixed assets. And also prepare Balance Sheet of 'X' Ltd. for the year 1998.

(Bangalore University, B.Com., October 2000)

Solution:

1. Credit Sales

Gross profit = 80,000

Sales, 4 times the gross profit

i.e., 80,000 × 4 = 3,20,000

Credit sales $\frac{3}{4}$ of 3,20,000 = 2,40,000

2. Inventory or Stock

Stock turnover ratio $= \frac{\text{Cost of goods sold}}{\text{Average inventory}}$

$$10 = \frac{\text{Sales} - \text{Gross profit}}{\text{Inventory}}$$

$$10 = \frac{3,20,000 - 80,000}{\text{Inventory}}$$

Inventory $= \frac{2,40,000}{10}$ = Rs. 24,000

3. Debtors

Average collection period = 15 days

Debtors turnover ratio $= \frac{360}{15} = 24$

$$24 = \frac{\text{Credit sales}}{\text{Average debtors}}$$

$$24 = \frac{2,40,000}{\text{Average debtors}}$$

Debtors $= \frac{2,40,000}{24} = 10,000$

4. Total Assets

Assets turnover ratio $= \frac{\text{Sales}}{\text{Total assets}}$

$$4 = \frac{3,20,000}{\text{Total assets}}$$

or, 4 total assets = 3,20,000

or Total assets $= \frac{3,20,000}{4} = 80,000$

5. Long-term Debt

Long-term debt to equity $= \frac{\text{Long term debt}}{\text{Equity}}$

50% of 40,000 long-term debt $= \frac{50}{100} \times 40,000 = 20,000$

6. Cash

Current Ratio = 2 : 1

Current assets = Inventory + Debtors + Cash

40,000 = 24,000 + 10,000 + Cash

or Cash = 40,000 – 34,000 = 6,000

7. Fixed Assets

Total assets – Current Assets

= 80,000 – 40,000 = 40,000

8. Current Liabilities

Current Liabilities = Total assets – Shareholders equity – Long-term debt

= 80,000 – 40,000 – 20,000

= 20,000

Required Information

1. Creditors = Rs. 20,000
2. Long-term debts = Rs. 20,000
3. Cash in hand = 6,000

4. Debtors = 10,000
5. Closing stock = 24,000
6. Fixed assets = 40,000

Balance Sheet

Equity share capital	40,000	Fixed assets	40,000
Long-term liabilities	20,000	Inventory	24,000
Creditors	20,000	Debtors	10,000
		Cash	6,000
	80,000		80,000

QUESTIONS

Simple Questions

1. What do you mean by Accounting Ratio?
2. In what ways can ratios be expressed?
3. Define ratio analysis.
4. What are the key steps involved in ratio analysis?
5. Mantion the ratios which determine the solvency of a concern.
6. What are liquidity ratios?
7. What are solvency ratios?
8. What is meant by profitability ratios?
9. What are activity ratios?
10. What do you understand by leverage ratios?
11. Explain current ratio.
12. What is 'Window dressing' in current ratio?
13. How is 'Window dressing' done?
14. What is liquid ratio? How is it calculated?
15. What is 'absolute liquidity' ratio?
16. What is a proprietory ratio?
17. What do you mean by debt-equity ratio?
18. What is gross profit ratio?
19. What is net profit ratio?
20. What is operating ratio?
21. What is operating profit ratio?
22. What is an expense ratio?
23. What is mean by 'Return on capital employed'?
24. What is stock turnover ratio?
25. What is meant by 'Debtors Turnover Ratio'?
26. What is meant by 'Creditors Turnover Ratio'?
27. What do you understand by 'Fixed Assets Turnover Ratio'?
28. What is capital gearing?
29. What is meant by dividend coverage ratio?
30. What is interest coverage ratio?
31. How is 'Earnings per share' calculated?
32. What is price earning ratio?

33. What is dividend payout ratio?
34. What is Dupont control chart?
35. Mention any form Balance Sheet ratio?
36. What is activity raito?
37. State the significance of 'Current ratio'.
38. What is acid test ratio?
39. How do you calculate 'average collection period'?
40. What is average collection period ratio?
41. What is average payment period ratio?
42. What is price-earning ratio?
43. What is working capital turnover ratio?
44. What is return on equity capital?
45. What is capital turnover ratio?
46. What is dividend yield ratio?
47. The working capital of a firm is Rs. 80,000 and its current ratio is 5. Calculate the current assets and current liabilities. **(Osmania University, B.Com., March 1999)**
[**Answer :** Current liabilities = Rs. 20,000
Current assets = Rs. 1,00,000]
48. Calculate the stock turnover ratio

Opening stock	Rs. 90,000
Closing stock	Rs. 1,10,000
Sales	Rs. 5,00,000
Rate of gross profit	20%

(Osmania University, B.Com., March 1998)
[**Answer :** Stock turnover ratio 4 times]
49. Turnover to fixed assets ratio is 1 : 1.5. Value of goods sold is Rs. 5,00,000. Compute the value of fixed assets. **(Bangalore University, B.Com., October 2000)**
[**Answer :** Fixed assets Rs. 3,33,333]
50. Current ratio is 2.5 liquid ratio is 1.5. Working capital is Rs. 50,000. Ascertain current assets and inventory. **(Bangalore University, B.Com., October 2000)**
[**Answer :** Current assets = 83,333
Inventory =33,333]
51. Current ratio 2.5
Working capital Rs. 60,000
Calculate the amount of current assets and current liabilities
(Sri Venkateswara University, B.Com., October 1999)
[**Answer :** Current assets = 1,00,000
Current liabilities = 40,000]
52. Opening stock Rs. 29,000, Closing stock Rs. 31,000, Sales Rs. 3,20,000, Gross profit ratio 25% on sales. Calculate stock turnover ratio. (Sri Venkateshwara University, B.Com., October 1999)
[**Answer :** Stock turnover ratio 8 times]

Short Answer Questions

1. Explain the nature of accounting ratios.
2. Explain different ways of interpreting accounting ratios.
3. Explain the uses of accounting ratios.

4. State the limitations of accounting ratios.
5. Explain the various types of Balance Sheet ratios.
6. Explain the various types of profit and loss account ratios.
7. From the following data, compute ratio, acid-test ratio, inventory turnover ratio:
   (*a*) Assets
   Stock – Rs. 10,000, Debtors – Rs. 30,000, prepaid expenses–Rs. 2,000,
   cash in hand – Rs. 20,000
   (*b*) Liabilities
   Sundry creditors – Rs. 25,000, Bank overdraft – Rs. 5,000, Bills payable – Rs. 10,000.
   (*c*) During the year sales amounted to Rs. 3,50,000.

   (University of Madras, B.Com., September 1997)

   [**Answer :** Current Ratio = 1.55; Acid test ratio = 1.43;
   Inventory turnover ratio = 35 times]

8. The ratios relating to a company are given below:

Gross profit ratio	15%
Stock velocity	6 months
Debtors velocity	3 months
Creditors velocity	3 months

   Gross profit for the year ending 31st December, 1995 amounts to Rs. 60,000. Closing stock is equal to opening stock.
   Find out (*a*) sales, (*b*) closing stock, (*c*) sundry debtors, (*d*) sundry creditors.

   (University of Madras, B.Com., September 1996)

   [**Answer :** Sales = 4,00,000; Closing Stock = 1,70,00;
   Sundry debtors = 1,00,000; Sundry creditors = 85,000]

9. Triveni Ltd. has the following earnings last year:

Particulars	*Rs.*
Profit before tax	26,50,000
Tax rate	40%
Proposed equity dividend	25%
Capital employed	
10% preference share capital	15,00,000
80,000 equity shares of Rs. 50 each	40,00,000
Current market price per equity	Rs. 125

   Calculate (*i*) Earning per share, (*ii*) Price earning ratio, (*iii*) Dividend payout ratio.

   (*University of Bombay, B.Com., April 1997*)

   [**Answer :** Earning per share = Rs. 18; Price earning ratio = 6.94; Dividend payout ratio = 0.69]

Long Answer Questions

1. Explain the various types of ratios.
2. Following are the profit and loss a/c and Balance Sheet of a company. Calculate the following ratio:
   (*a*) Gross profit ratio
   (*b*) Operating ratio
   (*c*) Current ratio
   (*d*) Liquid ratio
   (*e*) Stock turnover ratio
   (*f*) Debt equity ratio

Profit and Loss A/c

To opening stock	1,50,000	By sales	10,00,000
To purchase	3,00,000	By closing stock	2,50,000
To wages	2,00,000		
To manufacturing expenses	1,00,000		
To gross profit	5,00,000		
	12,50,000		12,50,000
To administration expenses	50,000	By gross profit	5,00,000
To selling and distribution expenses	50,000	By profit on sale of shares	50,000
To loss on sale of furniture	25,000		
To interest on debentures	10,000		
To net profit	4,15,000		
	5,50,000		5,50,000

Balance Sheet

Share capital	2,00,000	Fixed assets	2,50,000
Reserves	1,00,000	Stock	2,50,000
Debentures	2,00,000	Sundry debtors	1,00,000
Sundry debtors	1,00,000	Bank	50,000
Bills payable	50,000		
	6,50,000		6,50,000

(Osmania University, B.Com., October 1997)

[**Answer :** Gross profit = 50%; Operating ratio = 61%; Current ratio = 2.66; Liquid ratio = 1; Stock turnover ratio = 2.5; Debt equity ratio = 0.53]

3. The balance of Contractors Ltd. as on 31st December 1996 and 1997 were as follows:

	1996	*1997*		*1996*	*1997*
Equity share capital	1,500	1,700	Fixed assets	1,800	2,100
12% preference shares	500	400	Sundry debtors	550	650
Reserve	570	770	B.R.	430	525
10% Debentures	300	450	Stock	380	460
Creditors	240	320	Prepaid expenses	20	30
Bills payable	50	70	Bank	80	65
Bank OD	100	120			
	3,260	3,830		3,260	3,830

During the year 1997, total sales were Rs. 1,20,00,000 and cash sales were 20% of total sales. Stock turnover ratio was 20 times net profit before payment of taxes at 50% was Rs. 18,00,000.

There was no, non-operating expenses and non-operating incomes. Calculate the following ratios for the year 1997 :

1. Gross profit ratio
2. Operating ratio
3. Current ratio
4. Debtor turnover ratio
5. Debt collection period
6. Return on capital employed.

(University of Bombay, B.Com., April 1997)

[**Answer :** Gross profit ratio = 30%; Operating ratio = 85%; Current ratio = 3.39; Debtors turnover ratio = 8.91 ; Debt collection period = 40.4 days; Return on capital employed = 55.57%.]

4. The following figures related to the trading activities of Z Ltd. for the year ended 31st March, 1996.

	Rs.
Sales	10,57,000
Closing stock	4,60,000
Purchase	8,35,000
Loss on sale of assets	45,000
Advertising	32,750
Rent	18,750
Profit on sale of shares	25,000
Provision for taxation	1,00,000
Salaries	35,750
Salesmen's salaries	14,250
Depreciation	36,000
Sales return	57,000
Depreciation on delivery van	8,000
Printing and stationery	17,500
Audit fees	12,000
Opening stock	2,25,000
Dividend received on shares	15,000

You are required to rearrange above income statement in vertical form and compute the following ratios:

(*a*) Gross profit ratio (*b*) Operating ratio
(*c*) Net operating profit ratio (*d*) Selling and distribution expenses to sales ratio.

(University of Bombay, B.Com., October 1996)

[**Answer :** Gross profit ratio = 40%; Operating ratio = 77.50%; Net operating profit ratio = 22.50%; Selling and distribution expenses to sales ratio = 5.50%.]

5. Rearrange the following Balance Sheet and profit & loss a/c of Edens Ltd. in a form suitable for analysis and calculate the following ratios :

1. Current ratio
2. Stock turnover ratio
3. Liquidity ratio
4. Debt equity ratio
5. Gross profit ratio
6. Net profit ratio

Balance Sheet as at 31st March 1996

Bills payable	25,000	Fixed assets	1,25,000
Sundry creditors	50,000	Sundry debtors	50,000
Debentures	1,00,000	Bank	25,000
Reserves	50,000	Inventory	1,25,000
Equity share capital	50,000		
Preference share capital	50,000		
	3,25,000		3,25,000

P & C A/c for the year ended 31st March 1996

To opening inventories	75,000	By sales	5,00,000
To purchases	1,50,000	By closing inventories	1,25,000
To manufacturing expenses	50,000	By profit on sale of shares	25,000
To direct wages	1,00,000		
To administration expenses	25,000		
To selling expenses	25,000		

To loss on sale of assets	27,000		
To interest on debentures	5,000		
To net profit	1,92,500		
	6,50,000		6,50,000

(University of Bombay, B.Com., April 1996)

[**Answer :** Current ratio = 2.67; Stock turnover ratio = 2.5 times; Liquidity ratio = 1; Debt equity ratio = 0.4; Gross profit ratio = 50%; Net profit ratio = 39%]

6. Comment on the position of Commentary Ltd. from the following :
Profit and loss accounts and Balance Sheets after calculating stated ratios:

Balance Sheet

	31.3.95	*31.3.94*		*31.3.95*	*31.3.94*
Capital of Rs. 10 each	70,000	70,000	Fixed assets	90,000	92,000
Reserves	80,000	68,000	Current assets	1,10,000	1,12,000
Secured loans	22,000	24,000	Loans and advances	52,000	40,000
Current liabilities	26,000	30,000			
Provision	54,000	52,000			
	2,52,000	2,44,000		2,52,000	2,44,000

P & C A/c for the Yeae Ended

	31.3.95	*31.3.94*		*31.3.95*	*31.3.94*
To opening stock	44,000	40,000	By sales	2,10,000	2,00,000
To purchases	84,000	72,000	By closing stock	46,000	44,000
To wages	40,000	36,000			
To factory expenses	32,000	28,000			
To adm. expenses	8,000	6,000			
To selling expenses	6,000	10,000			
To managerial remuneration	2,000	2,000			
To transfer to reserve	2,000	2,000			
To income-tax	22,000	24,000			
To proposed dividend	6,000	8,000			
To balance c/d	10,000	16,000			
	2,56,000	2,44,000		2,56,000	2,44,000

1. Current ratio, 2. Proprietory ratio, 3. Debt equity ratio, 4. Earning per share, 5. Stock working capital ratio, 6. Liquid ratio, 7. Cost of sales to sales ratio, 8. Administrative expenses to sales ratio, 9. Selling expenses to sales ratio. **(University of Bombay, B.Com., October 1995)**

Answer:

	31.3.95	*31.3.96*
Current ratio	2.025	1.854
Proprietory ratio	0.6	0.57
Debt equity ratio	0.15	0.17
Earning per share	2.571	3.714
Stock working capital ratio	0.56	0.62
Liquid ratio	0.80	0.82

Cost of sales to sales	73.33%	66%
Adm. expenses ratio	4.76%	4.00%
Selling expenses to sales	2.86%	5%

7. The following is the balance sheet of XYX Co. Ltd. as on 31.12.1995:

Equity share capital	20,00,000	Plant and equipment	12,50,000
(Shares of Rs. 100 each)		Land and building	5,00,000
		Sundry debtors	4,50,000
Returned earnings	5,00,000	Stock	7,00,000
Sundry creditors	4,00,000	B.R.	1,50,000
Bills payable	1,50,000	Prepared insurance cash	10,000
Other current liabilitites	50,000	Cash	40,000
	31,00,000		31,00,000

Statement of Profit for the year eneded 31-12-95

		Rs.
Sales		50,00,000
Less : Cost of goods sold		38,50,000
Gross profit		11,50,000
Less : Operating expenses		7,50,000
Net profit		4,00,000
Less : Tax at 40%		1,60,000
Net profit after tax		2,40,000

Sundry debtors and stock at the begining of the year were Rs. 4,00,000 and Rs. 6,00,000 respectively.

Calculate:

1. Current ratio
2. Acid test ratio
3. Stock turnover ratio
4. Debtors turnover ratio
5. Gross profit ratio
6. Net profit ratio
7. Earning per share
8. Return on equity.

(Bangalore University, B.B.M, April 1997)

Answer:

Current ratio	= 2.25
Acid test ratio	= 1.06
Stock turnover ratio	= 5.92 times
Debtors turnover ratio	= 11.76
Gross profit ratio	= 23%
Net profit ratio	= 8%
Earning per share	= 12
Return on equity	= 12%

8. From the following information make out a balance sheet with as many details as possible :

(*a*)	Gross profit turnover ratio	= 25%
(*b*)	Debtors velocity	= 3 months
(*c*)	Creditors velocity	= 2 months
(*d*)	Stock velocity	= 8 times
(*e*)	Capital turnover ratio	= 2.5 times

(*f*) Fixed assets-turnover ratio = 8 times

Gross profit for the year ended 31st December, 1992 was Rs. 80,000. There was no long-term loan or overdraft, reserves and surplus amounted to Rs. 28,000, liquid assets were Rs. 97,333.

Closing stock of the year was Rs. 2,000 more than opening stock. Bills receivable and bills payable were Rs. 5,000 and Rs. 2,000 respectively. **(University of Madras, B.Com., March 1996)**

[**Answer :** Total of Balance Sheet = 1,68,333]

9. From the following information, prepare a Balance Sheet, show the workings:
   (*a*) Working capital = 75,000
   (*b*) Reserves and surplus = 1,00,000
   (*c*) Bank overdraft = 60,000
   (*d*) Current ratio = 1.75
   (*e*) Liquid ratio = 1.15
   (*f*) Fixed assets to proprietors funds = 0.75
   (*g*) Long-term liabilities = Nil

(University of Madras, B.Com., Correspondence Course, May 1996)

[**Answer :** Balance Sheet Total Rs. 4,00,000]

10. From the following particulars, you are required to prepare the Balance Sheet of a Zinc Company.

Fixed assets (after writing off 30%)	10,50,000
Fixed assets turnover ratio (on cost of sales)	2
Finished goods turnover ratio (on cost of sales)	6
GP rate on sales	25%
Net profit (before interest) to sales	8%
Fixed charges cover (debenture interest 7%)	8
Debt collection period	1.5 months
Materials cosumend to sales	30%
Stock of raw-materials (in terms of months consumption)	3
Current ratio	2.4
Quick ratio	1.0
Reserve to capital ratio	0.4

(CS, Inter, June 1997)

[**Answer :** Balance Sheet Total 20,10,000]

11. From the following details, prepare a Balance Sheet:
    Current rati is 1.75
    Liquid ratio is 1.25
    Stock turnover ratio (closing stock) is 9 times
    Gross profit ratio is 25%
    Debt collection period is 1.5 months
    Reserves to capital is 0.2
    Turnover of fixed assets is 1.2
    Capital gearing ratio is 0.6
    Fixed assets to net worth is 1.25
    Sales for the year Rs. 12,00,000 **(CS, Inter, December 1997)**

[**Answer :** *Balance Sheet Total 11,00,000*]

14

CHAPTER

FUND FLOW ANALYSIS

INTRODUCTION

A fund flow statement is a technical device designed to analyse, the changes in the financial condition of a business enterprise between two dates. It is also called a 'statement of sources and application of funds' as it portrays, the sources and application of working capital and highlights the basic changes in the resources and financial structure of a concern. This statement is intended to supplement and not to supplant, the balance sheet and profit and loss account in whole or in part. The fund flow statement is becoming popular with the management, because it not only helps them in analysing financial operations, providing basis for comparison with budgets, and in serving as a tool of communication, but also explains the financial consequences of such operations such as, the reason why the company is experiencing difficulty in making payments to creditors or why the bank balance is getting thinner.

CONCEPT OF 'FUND' AND 'FLOW OF FUND'

Fund

In its broadest sense, it refers to all financial resources or purchasing power or economic value possessed by a firm at a point of time. According to this concept all assets — both fixed and current would constitute fund. In a popular sense it is used to refer to working capital, *i.e.*, excess of current assets over current liabilities. In a narrow sense it is used to refer to cash and bank balance.

Concept of Flow of Fund

The flow of fund refers to the changes in the existing financial position of a business caused by in-flow and out-flow of resources owing to receipts and payments. It is generally taken to mean a change in working capital of a business. If a transaction results in an increase in fund it is known as source of fund. Where a transaction results in a decrease in the fund, it is known as application of fund. When there is no change in the fund, there is no flow of fund.

Meaning of Fund Flow Statement

It refers to a statement which incorporates working capital that brings about changes in assets, liabilities and capital of owners between two consecutive balance sheets. According to Roy A. Foulke it is a statement of sources and application of fund designed to analyse the change in the financial conditions of a business enterprise between two dates.

Objective of Fund Flow Statement

Fund flow statement is a useful tool in the financial manager's analytical kit. The important objectives of this statement are :

1. to indicate the result of current financial management;
2. to lay emphasis on the most singnificant changes that have taken place, during a specific period;
3. to show how general expansion in a business has been financed or to describe the sources from which additional funds were derived;
4. to establish the relationship between profits from operations, distribution of dividend and raising of new capital or contracting of loans;
5. to give recognition to the fact that a business exists on flow of funds and is not a static organisation.

IMPORTANCE OF FUND FLOW STATEMENT

Fund Flow analysis helps in judging the efficiency of capital functions and administration of a business by providing a summary of the sources from which funds have been procured and uses to which such funds have been put to. Such on analysis is particularly useful in long range planning where projections of available liquid resources are vital and are necessarily to be made. Management can come to know about long-term debts or arrange funds for daily needs. Fund flow statement is a parameter for testing the effective use of working capital by the management should take for effective use of working capital.

A projected fund flow statement will help the analyst in finding out as to how the management is going to allocate the scarce financial resources for meeting the productive requirements of the business. The use of funds should be phased in such an order that the available resources are put to the best use of the enterprise. Further, fund flow analysis helps in the proper postmortem of the financial policy of the business, thereby providing useful guidance to the management in the matter of debt retirement, expansion or replacement or to the payment of dividends etc. Thus the significance of funds flow statement can be summarised as follows :

(*a*) it suggests the ways of improving working capital position;
(*b*) it helps in planning for retirement of long-term debts;
(*c*) it helps in the formulation of a realistic dividend policy;
(*d*) it helps in deciding about the mode of financing expansion or replacement of facilities;
(*e*) It evaluates the urgency of operational uses;
(*f*) it helps to explain the phenomena of high profitability with low liquidity.

Difference between Statement of Receipt and Payments and Fund Flow Statement

1. The statement of receipts and payments contains a summary of inward and outward movement of cash which is only a part of the working capital, whereas the fund flow statement contains a summary of the inward and outward movement of all items affecting the working capital of a business.
2. The statement of receipts and payments is prepared from cash book, whereas, the fund flow statement is prepared from two balance sheets and other concerned particulars.

Differences between Cash Budget and Fund Flow Statement

1. Cash budget is generally futuristic in approach whereas, fund flow statement is usually based on past data.
2. Cash budget is planning for cash before hand but fund flow is only the postmortem analysis.
3. Cash budget is prepared for a specific period and requires previous data only for the purpose of judicious forecasting whereas fund flow statement is prepared from the accounting data at two specified dates.

4. Cash budget is a tool for management for controlling cash whereas fund flow statement represents the working of the company for previous year and it is for the benefit of external parties too.

Difference between Income Statement and Fund Flow Statement

Fund Flow statement	*Profit and Loss A/c*
1. It shows sources and application of funds.	1. It shows profit or loss of the business.
2. Depreciation is included in the fund from operation. So fund from operation is greater in volume compared to net profit.	2. Net profit excludes depreciation. So net profit is smaller in volume compared to fund from operation.
3. Fund flow statement explains the way the funds are generated and how it is used in making various payments such as tax, dividend, purchase of fixed assets.	3. The profit and loss account explains how profit or loss has resulted by comparing revenue with expenditure.
4. Fund flow statement does not consider outstanding and prepared expense. It does not consider the problem associated with time.	4. Profit and loss a/c takes into account out standing and prepaid expense. It takes into account problem associated with time.
5. It is meant for management for taking decisions and making policies.	5. It is meant for various parties interested in business.

Superiority of fund flow statement over-income statement : Though a fund flow statement and income statement have different functions to perform a fund flow statement is a better substitute for an income statement due to the following reasons :

(*a*) The income statement discloses the operating results while a fund flow statement deals with the financial resources required for running the business. A fund flow statement translates the economic consequences of operations into their financial information as a basis for action.

(*b*) Income statement is prepared at the end of the accounting period, whereas fund flow statement is prepared as and when management wants it.

(*c*) An income statement is static in as much as it gives information on what has happened during the period covered by it. For managerial purposes funds flow statement may be prepared much before business operations and as an instrument of planning and control. It is dynamic and presents financial information in the form of a flow.

(*d*) An income statement is not very reliable as items shown in income statement can be easily manipulated by the management while a funds flow statement is more reliable.

Differences between balance sheet and a fund flow statement

Balance Sheet	*Fund Flow Statement*
1. It reveals the financial position as on a particular data.	1. It reveals the changes in the financial position between two balance sheet period.
2. It portrays all assets and liabilities.	2. It portrays a change in working capital.
3. It is an end product of an accounting system.	3. It is a by-product of balance sheet. It is under taken after the preparation of a balance sheet.
4. It is meant for external parties.	4. It is meant for the use of management.
5. Its preparation is compulsory in higher form of business organisation.	5. It is voluntarily prepared to benefit the management.

Uses and limitations of Fund Flow Analysis

Uses

1. One gets an insight into financial operations of the firm. This will help to analyse the past trends and plan future operation.
2. It is possible to know whether the firm's growth was financed from internal source or from external sources. It will also be clear whether growth was at a rapid pace and financing was strained.
3. It reveals disproportionate growth of inventories and disproportionate increase in creditors in relation to current assets affecting the credit worthiness of the firm.
4. It is possible to detect the imbalance in the use of funds. For example, one can evaluate the ratio of dividends to earnings against the background of the firm's need for funds.
5. In the case of multi-division companies, fund flow statement helps to evaluate the performance of division in the use of funds allotted to them.

Limitations

1. The fund flow statement reveals the overall change in the working capital but not the variation in individual items.
2. Fund flow statement is prepared based on historical information.
3. It is not a substitute to financial statements. Instead it is only supplementary to financial statements.
4. The management may manipulate the working capital by adopting different method of inventory valuation.
5. The concept 'fund' consists of various types of items such as cash, debtors, stock, prepaid expenses etc. Thus fund flow statement lacks homogeneity.

Steps Involved in the Preparation of Fund Flow Statement

1. Preparation of a schedule showing change in working capital : The schedule analysing changes in working capital is prepared with the help of current assets and current liabilities of the two (period) balance sheets one being the previous year, *i.e.*, opening balance sheet and the other being current year, *i.e.*, closing balance sheet. An increase in the amount of any current asset in the current year in comparison to that in the previous year results in an increase in working capital. A decrease in the amount of any current asset in the current year in comparision to that in the previous year results in a decrease in working capital. Similarly current liabilities are also compared, *i.e.*, an increase in any current liability in the current year in comparison to the previous year results in a decrease in the working capital and *vice-versa*. Finally the total increase and total decrease is compared and the difference shows the decrease or increase on the working capital. An increase of working capital is the application of funds and decrease of working capital is the source of funds.

While preparing a schedule of change in working capital, the following points must be borne in mind.

(*a*) *Provision for taxation :* Provision for tax may be treated either as a current or non-current liability. When it is treated as a current liability (*i.e.*, as a charge on profit), provision for taxation is considered while preparing statement of working capital and not used for adjusting the profit made during the year the calculating the funds from operation and also tax paid during the year is not treated as an application of fund.

As a non-current liability, the provision for tax is treated as internal appropriation of profit and it is used for adjusting the profit made during the year. In this case it will not appear in the schedule of working capital. A separate account known as 'Provision for taxation' is prepared. It is credited with the opening balance and credited with tax paid and closing balance. The tax paid during the year is treated as an application of fund in the flow how statement. The balancing figure represents the provision made during the year and is transferred to profit and loss account.

(*b*) *Proposed Dividend:* When proposed dividend is treated as a current liability it will be shown in the schedule of working capital as an item decreasing the working capital. Any dividend paid during the current year or an earlier year is not shown as an application of funds because such payment will not change net working capital or fund, *i.e*., it will affect two current accounts, *viz*., cash a/c and proposed dividend.

When proposed dividend is treated as a non-current liability, it is taken as an appropriation of profit. So this item will not appear in the schedule of working capital. A separate account is opened entitled 'proposed dividend a/c" to find out proposed dividend made during the year. The adjusted profit and loss a/c is debited with this amount of proposed dividend. The payment of dividend made during the current year in response to the proposed dividend for previous year is shown as an application in the fund flow statement.

(*c*) Trade investments should be treated as long-term investments and they should not be included in statement of changes in working capital. However, if investments represent surplus fund temporarily invested in marketable securities, they are to be treated as current assets, and as such are to be considered in determining working capital.

A proforma of a schedule of changes in working capital is shown below:

Schedule of changes in working capital

	Previous year	*Current year*	*Increase*	*Decrease*
Current Assets				
Cash in hand	xx	xx		
Cash at Bank	xx	xx		
Debtors	xx	xx		
Marketable Securities	xx	xx		
Bills receivables	xx	xx		
Stock	xx	xx		
Prepaid expenses	xx	xx		
Total (A)				
Current Liabilities				
Creditors	xx	xx		
Bills payable	xx	xx		
O/s expenses	xx	xx		
Total (B)				
Working capital (A–B)	xx	xx		
Net increase/Decrease in working capital				

(*d*) Preparation of Adjusted Profit and Loss a/c to calculate fund from operation: The current operations of the business is the most important single source of funds and in the long run they constitute the largest source of funds. The repayment of loans, purchase of plant, payment of dividend etc., must ultimately depend upon this source. Funds from operations which are internal in character are arrived after making adjustments in the net profit. These adjustments are necessary because the net profit has been determined after deducting non-cash expenses such as depreciation, depletion charges, amortisation of fictitious and intangible assets like amount written off by way of preliminary expenses, goodwill, patents, discount on shares or debentures, premium on redemption of preference shares or debentures, deferred charges etc. and loss on sale of fixed assets charged to profit and loss account, which do not result in flow of funds. These

transactions, in fact are book adjustments and do not involve use of resources. So the actual fund generated from operations are larger by the amount of such non-cash expenses. Similarly the non-trading or non-operating incomes like dividends and interest received from out side or profit on sale of fixed assets, appreciation in the value of fixed assets will have to be deducted from net profit only if they have been considered already while preparing the profit and loss account. In short, funds from operations may be arrived at by deducting all non-cash credits (incomes) and adding back non-cash debits (expenses) to the net profit. It there has been a net loss as per profit and loss account, non-cash expenses have to be deducted therefrom and non-cash income added thereto.

A proforma of adjusted profit and loss account is given below :

Adjusted Profit & Loss A/c

	Rs.		*Rs.*
To Depreciation and depletion of fictitious and intangible assets such as goodwill, patent, trade marks etc.	xx	By Opening balance of P & L a/c	xx
		By Transfer from excess provision	xx
To Appropriation of Retained earnings such as transfer to general reserve, sinking fund etc.	xx	By Appreciation in the value of fixed assets	xx
		By Dividend received	xx
		By Profit on sale fixed assets	xx
To Loss on sale of any current or fixed asset	xx	By Funds from operation	xx
To Dividend (including) interim dividend)	xx	(Balancing figure in case debt side exceeds credit side).	
To Proposed dividend (If not taken as a current liability)	xx		
To Provision for taxation (If not taken as a current liability)	xx		
To Closing balance of profit & loss a/c	xx		
To Fund lost on operation (Balancing figure in case credit side exceeds debit side)	xx		
	xx		xx

3. Reconstruction of all non-fund accounts: The various non-fund accounts which have changed between the two balance sheets period and in respect of which additional information is given is to be reconstructed. Such reconstruction is done by recording opening and closing balances along with additional information given. Any difference in the reconstructed account will represent either a sources or application of fund. For example, a debit balance in a fixed asset account represents purchase and it relates to use of funds. If there is a credit balance, it represents sale of asset and it constitutes a sources of fund. In case of non-fund liability account, if the balancing figure is on the debit side, is represents repayment and is a use of fund, while it is on the credit side, it will be a source of funds.

4. Preparation of a statement of sources and application of funds: The final stage will involve the preparation of the statement of sources and uses of funds which portrays the avenues through which funds have been obtained and the uses to which they have been put. This statement contains the balancing figures in various non-fund accounts and the figure of fund from operation. Increase or decrease of working capital is also added as application or sources, as the case may be. The principle sources and application of funds are listed below:

Sources of Funds

1. Funds from operation
2. Issue of share capital
3. Borrowing long-term loans such as debentures, mortgage, long-term deposits, etc.
4. Sale of fixed assets such as land, building, plant, long-term investment, etc.
5. Non-trading receipts such as dividend and interest earnings, damages recovered in legal action etc.
6. Decrease in working capital (as per schedule)

Uses of Funds

1. Funds lost in operation (trading loss)
2. Redemption of preference shares
3. Repayment of long-term loans
4. Purchase of fixed assets
5. Non-trading payments, *e.g.*, loss arising from legal action, loss of cash by embezzlement etc., and payment of taxes and dividends.
6. Increase in working capital (as per schedule)

When we prepare a fund flow statement *i.e.*, sources and application sides, would tally with each other. A specimen form of fund flow statement is shown below:

Specimen of Fund Statement

Sources of Funds		
Fund from operation		xx
Issue of share capital		xx
Raising of long-term loans		xx
Receipts from partly paid shares called up		xx
Sale of fixed assets		xx
Non-trading receipts such as dividend received		xx
Sale of long-term Investments		xx
Decrease in working capital		xx
	Total	xx
Application of Funds		
Fund lost in operation		xx
Redemption of preference share capital		xx
Redemption of debentures		xx
Repayment of long-term loans		xx
Purchase of fixed assets		xx
Purchase of long-term Investments		xx
Non-trading payments		xx
Payment of tax		xx
Increase in working capital		xx
	Total	xx

Problem 1 : *(Preparation of schedule of working capital) :*

From the following Trial balance of 'A' Ltd. You are required to prepare a schedule of changes in working capital.

Trial Balance

	1998		*1999*	
	DR	***CR***	***DR***	***CR***
Capital	–	80,000	–	85,000
Mortage	–	–	–	5,000
Land and Buildings	50,000	–	50,000	–
Plant and Machinery	24,000	–	34,000	–
Stock	9,000	–	7,000	–
Debtors	16,500	–	19,500	–
Cash at Bank	4,000	–	9,000	–
Profit & loss a/c	–	14,500	–	24,500
Creditors	–	9,000	–	5,000
	1,03,500	1,03,500	1,19,500	1,19,500

(Bangalore University, B.Com., April 2000)

Solution:

Schedule showing statement of working capital

	1998	*1999*	*Increase*	*Decrease*
Current Assets				
Stock	9,000	7,000	–	2,000
Debtors	16,500	19,500	3,000	–
Cash at Bank	4,000	9,000	5,000	–
Total (A)	29,500	35,500		
Current Liabilities				
Creditors	9,000	5,000	4,000	–
Total (B)	9,000	5,000		
Working Capital (A–B)	20,500	30,500	–	–
Net increase in working capital	10,000	–	–	10,000
	30,500	30,500	12,000	12,000

Problem 2 : Prepare a statement showing changes in working capital:

	1990(Rs.)	*1991(Rs.)*
Assets:		
Cash	60,000	94,000
Debtors	2,40,000	2,30,000
Stock	1,60,000	1,80,000
Land	1,00,000	1,32,000
	5,60,000	6,36,000
Liabilities:		
Share capital	4,00,000	5,00,000
Creditors	1,40,000	90,000
Retained earnings	20,000	46,000
	5,60,000	6,36,000

(Osmania University, B.Com., March 1997)

Solution :

Schedule showing change in working capital

	1990	*1991*	*Increase*	*Decrease*
Current Assets				
Cash	60,000	94,000	34,000	–
Debtors	2,40,000	2,30,000	–	10,000
Stock	1,60,000	1,80,000	20,000	–
Total (A)	4,60,000	5,04,000		
Current Liabilities:				
Creditors	1,40,000	90,000	50,000	–
Total (B)	1,40,000	90,000		
Working capital (A–B)	3,20,000	4,14,000		
Net increase in working capital	94,000			94,000
	4,14,000	4,14,000	10,4,000	1,04,000

Problem 3 : *(Problem on calculation of Fund from operation) :*

Calculate funds from operation from the following profit and loss A/c:

P & L A/c

To	Rent, salaries paid	75,000	By Gross profit	1,12,500
To	Depreciation	17,500	By Grain on sale of land	15,000
To	Loss on sale of machinery	1,000		
To	Discount on issue of debentures	50		
To	Goodwill written off	5,000		
To	Net profit	28,950		
		1,27,500		1,27,500

(Osmania University, B.Com., October 1999)

Solution :

Adjusted Profit & Loss A/c

To	Depreciation	17,500	By Gain on sale of land	15,000
To	Loss on sale of machine	1,000	By Fund from operation	37,500
To	Discount	50		
To	Goodwill written off	5,000		
To	Balance c/d	28,950		
		52,500		52,500

Problem 3 : *(Effect of Transactions on Working Capital) :*

State with reasons whether the following transactions result in increase or decrease of working capital or do not effect the working capital.

(*a*) preliminary expenses written off Rs. 3,600.
(*b*) Bills receivable Rs. 4,000 was discounted for Rs. 3,850.
(*c*) Advance income tax paid Rs. 5,000.
(*d*) Rs. 50,000, 12% debentures were redeemed by purchase from open market at Rs. 95 for a debenture of Rs. 100.

Solution:

1. This is a non-current item as the amount is treated as deferred revenue expenditure. Hence this may be treated as an outflow of cash and affects the working capital.
2. This is a current liability being paid out and there is an outflow of cash and it decreases working capital.
3. There is an increase in current asset and current liability. This will not affect the working capital.
4. This is a non-current item and hence will not affect working capital.

Problem 4 : State with reasons whether the following transactions result in increase or decrease in working capital or do not affect the working capital.

1. Bills accepted and issued to creditors Rs. 8,000.
2. One machine costing Rs. 30,000 (with an accumulated depreciation of Rs. 17,000) was sold for Rs. 15,000.
3. Amount paid for insurance Rs. 2,800 includes Rs. 600 prepaid insurance.
4. Dividend on investment received Rs. 800.

Solution :

1. This represents only an application of funds and it is a current liability. It decreases working capital.
2. There is a decrease in non-current assets and increase in cash. It will increase working capital.
3. There is an increase in current asset and decrease in current asset, *i.e*., cash. It decreases working capital.
4. It is a non-current asset and does not affect working capital.

Problem 5 : The balance sheets of Prasad Ltd. showed a net profit of Rs. 40,000 and Rs. 50,000 for the years 2000 and 2001 respectively. During the year 2001, proposed dividend was Rs. 30,000 and Rs. 20,000 was transferred to general Reserve Depreciation on fixed assets was Rs. 30,000. There was loss on sale of furniture to the extent of Rs. 5,000 and on plant was Rs. 10,000. Investments were sold for Rs. 40,000 and a profit of Rs. 20,000 was made. Preliminary expenses charged to the profit and loss account was Rs. 5,000. Calculate the fund from operation.

Solution :

Adjusted Profit & Loss A/c

To Proposed dividend	30,000	By Balance b/d	40,000
To Transfer to general reserve	20,000	By Profit on sale of investments	20,000
To Depreciation on fixed assets	30,000	By Fund from operation	90,000
To Loss on sale of furniture	5,000		
To Loss on sale of plant	10,000		
To Preliminary expenses	5,000		
To Balance c/d	50,000		
	1,50,000		1,50,000

Problem 6 : Tauras Ltd. had the following balance sheet on 31-12-2001

Share capital	1,00,000	Buildings	40,000
Creditors	40,000	Stock	20,000
		Cash	80,000
	1,40,000		1,40,000

Following is the summary of transactions for the year

	Rs.
Purchases:	
Cash	15,000
Credit	35,000
Cash paid to creditors	5,000
Sales:	
Cash	20,000
Credit	80,000
Operating expenses (Cash paid)	20,000
Closing stock	50,000

Show the Net Change in Working Capital

Solution :

Cash A/c

To Balance b/d	80,000	By Cash purchases	15,000
To Cash sales	20,000	By Cash paid to creditors	5,000
		By Operating expenses	20,000
		By Balance c/d (Balancing figure)	60,000
	1,00,000		1,00,000

Creditors A/c

To Cash paid to creditors	5,000	By Balance b/d	40,000
To Balance c/d (Balancing fugure)	70,000	By Credit purchases	35,000
	75,000		75,000

Schedule showing change working capital

	2000	*2002*	*Increase*	*Decrease*
Current Assets				
Cash	80,000	60,000	–	20,000
Stock	20,000	50,000	30,000	–
Total (A)	1,00,000	1,10,000		
Current Liabilities				
Creditors	40,000	70,000	–	30,000
Total (B)	40,000	70,000		
Working capital (A–B)	60,000	40,000		
Decrease in working	–	20,000	20,000	–
Capital	60,000	60,000	50,000	50,000

Problem 7 : From the following particulars prepare a statement of sources and application of funds for the year ended 31.12.2000 of 'X' Co. Ltd.

(*a*) 'X' Co. Ltd. issued 1,000 shares of Rs. 100 each at a premium of Rs. 20 per share and all the shares are subscribed and fully paid up

(*b*) The company has redeemed preference shares for Rs. 1,00,000 at 10% premium

(*c*) Investments are sold for Rs. 50,000 (resulting in a profit of Rs. 20,000)
(*d*) Sale of machinery during the year Rs. 30,000 (resulting in a loss of Rs. 5,000)
(*e*) Purchase of fixed assets Rs. 1,20,000
(*f*) Dividend paid Rs. 40,000 and income tax paid Rs. 35,000
(*g*) Working capital of the company was Rs. 1,20,000 on 1-1-2000 and Rs. 1,80,000 on 31-12-2000
(*h*) Closing balance in P & L a/c was Rs. 45,000 more than opening balance as per Balance Sheets
(*i*) Depreciation provided for the year was Rs. 50,000 and preliminary expenses written off was Rs. 10,000

Solution :

Adjusted Profit & Loss A/c

To Loss on sale of machinery	5,000	By Profit on sale of investment		20,000
To Dividends	40,000	By Funds from operation		1,65,000
To Income tax	35,000			
To Depreciation	50,000			
To Preliminary expenses written off	10,000			
To Net profit	45,000			
	1,85,000			1,85,000

Fund Flow Statement

Sources		*Applications*	
Sale of machinery	30,000	Purchase of fixed assets	1,20,000
Sale of Investment	50,000	Dividend paid	40,000
Fund from operation	1,65,000	Income tax paid	35,000
Issue of shares	1,20,000	Redeumption of preference shares	1,10,000
		Increase in working capital	60,000
	3,65,000		3,65,000

Problem 8 : From the following particulars prepare (1) provision for depreciation A/c and (2) machinery A/c

	1.1.2001	*31.12.2001*
	Rs.	*Rs.*
Machinery a/c	1,80,000	2,50,000
Provision for depreciation a/c	50,000	60,000

The following information is also obtained :

(*a*) Machinery purchased in 2001 for Rs. 30,000 by issue of debentures
(*b*) One machine costing Rs. 40,000 on 1.1.2001 (with an accumulated depreciation of Rs. 20,000) was sold for Rs. 25,000

Solution:

Machinery A/c

To Balance b/d	1,80,000	By Sales		25,000
To Purchase of machinery		By Depreciation		20,000
by issue of debenture	30,000	By Balance c/d		2,50,000
To Adj. P & L a/c-profit on sale of machinery	5,000			
To Purchases of machinery for cash (Balancing figure)	80,000			
	2,95,000			2,95,000

Provision for depreciation

To Machinery a/c	20,000	By	Balance b/d	50,000
To Balance c/d	60,000	By	Adj. P & L a/c (Balancing figure)	30,000
	80,000			80,000

Working Note:

Calculation of profit on sale

Book value of machinery	40,000
Less: Depreciation	20,000
Depreciated value	20,000
Sales value of machinery	25,000
Profit on sale	5,000

Problem 9

(Preparation of Fund Flow Statement):

Following are the summarised balance sheets of Sahana Ltd. as on 31st December, 1998 and 1999

	1998	*1999*		*1998*	*1999*
Share capital	4,50,000	4,50,000	Fixed assets	4,00,000	3,20,000
General reserve	3,00,000	3,10,000	Investments	50,000	60,000
P & L a/c	56,000	68,000	(non-current)		
Creditors	1,68,000	1,34,000	Stock	2,40,000	2,10,000
Provision for			Debtors	2,10,000	4,55,000
taxation	75,000	10,000	Bank	1,49,000	1,97,000
Mortgage loan	–	2,70,000			
	10,49,000	12,42,000		10,49,000	12,42,000

Additional Information

(*a*) Investment costing Rs. 8,000 were sold during the year 1999 for Rs. 8,500
(*b*) Provision for taxation made during the year was Rs. 90,000
(*c*) During the year part of the fixed assets costing Rs. 10,000 was sold for Rs. 12,000. The profit was included in the profit and loss account.
(*d*) Dividend paid during the year amounted to Rs. 40,000
Prepare a statement showing the sources and applications of funds for the year ended 31st December 1999. **(Bangalore University, B.Com., April 2000)**

Schedule showing changes in working capital

	1998	*1990*	*Increase*	*Decrease*
Current Assets:				
Stock	2,40,000	2,10,000	–	30,000
Debtors	2,10,000	4,55,000	2,45,000	–
Bank	1,49,000	1,97,000	48,000	–
Total (A)	5,99,000	8,62,000		

Current Liabilities				
Creditors	1,68,000	1,34,000	34,000	–
Total (B)	1,68,000	1,34,000		
Working capital (A–B)	4,31,000	7,28,000		
Increase in working capital	2,97,000	–	–	2,97,000
	7,28,000	7,28,000	3,27,000	3,27,000

Fixed Assets A/c

To Balance b/d	4,00,000	By Cash-sales	12,000
To P & L a/c (Profit on sale)	2,000	By Depreciation (Balancing figure)	70,000
		Balance c/d	3,20,000
	4,02,000		4,02,000

Investments

To Balance b/d	50,000	By Cash-sales	8,500
To P & L a/c-profit	500	By Balance c/d	60,000
To Cash-purchases (Balancing figure)	18,000		
	68,500		68,500

Provision for Taxation A/c

To Cash a/c (Balancing figure)	74,000	By Balance b/d	75,000
		By P & L a/c	9,000
To Balance c/d	10,000		
	84,000		84,000

Adjusted Profit & Loss A/c

To General reserve	10,000	By Balance b/d	56,000
To Dividends	40,000	By Profit on sale of investments	5,000
To Provision for taxation	9,000	By Profit on sale of fixed assets	2,000
To Depreciation on fixed assets	70,000	By Fund from operation	1,38,500
To Balance c/d	68,000		
	1,97,000		1,97,000

Statement of sources and application of funds

Sources		*Applications*	
Fund from operation	1,38,500	Dividend paid	40,000
Sale of fixed assets	12,000	Tax paid	74,000
Sale of Investments	8,500	Purchase of Investments	18,000
Mortgage loan	2,70,000	Increase in working capital	2,97,000
	4,29,000		4,29,000

Problem 10 : From the following balance sheets of Joy Ltd. as on 31st December 1998 and 31st December 1999, you are required to prepare a fund flow statement for the year 1999.

Liabilities	*1998*	*1999*	*Assets*	*1998*	*1999*
Share capital	50,000	60,000	Plant and Machinery	30,000	25,000
General reserve	8,000	12,000	Land and Building	20,000	40,000
P & L a/c	6,000	10,000			
Bank loan (Long-term)	10,000	2,000	Stock	26,000	20,000
Sundry creditors	12,000	16,000	Debtors	13,000	20,000
Provision for taxation	4,000	6,000	Cash	5,000	6,000
O/s expenses	4,000	5,000			
	94,000	1,11,000		94,000	1,11,000

Additional Information

1. Interest paid on bank loan amounted to Rs. 1,000
2. Income tax paid for the year 1999 Rs. 4,400
3. Assets of another company were purchased for a consideration of Rs. 10,000 and paid in shares. Assets consisted of land and buildings Rs. 4,000 and stock Rs. 6,000.
4. A machinery costing Rs. 5,000 (W D V Rs. 3,000) was sold Rs. 1,000, the loss being written off against general reserve.
5. Closing stock of 1999 was over-valued by Rs. 5,000.
6. O/s expenses paid during the year were Rs. 4,500. **(Bangalore University, B.Com., October, 2000)**

Solution :

Schedule showing change in working capital

	1998	*1999*	*Increase*	*Decrease*
Current Assets				
Stock	26,000	20,000	–	6,000
Sundry debtors	13,000	20,000	7,000	–
Cash	5,000	6,000	1,000	–
Total (A)	44,000	46,000		
Current Liabilities:				
Sundry creditors	12,000	16,000	–	4,000
Total (B)	12,000	16,000		
Working capital (A–B)	32,000	30,000		
Net decrease in working capital	–	2,000	2,000	
	32,000	32,000	10,000	10,000

Outstanding expenses A/c

To Bank - O/s expenses paid	4,500	By Balance b/d	4,000
		By Adj. P & L a/c	5,500
To Balance c/d	5,000		
	9,500		9,500

General reserve A/c

To Loss on sale of Machinery (3,000–1,000)	2,000	By Balance b/d	8,000
		By Adj. P & L a/c	6,000
To Balance c/d	12,000	(Balancing figure)	
	14,000		14,000

Provision for taxation

To Bank a/c – Income tax paid	4,400	By Balance b/d	4,000
		By Adj. P & L a/c – provision for tax	6,400
To Balance c/d	6,000	(Balance figure)	
	10,400		10,400

Machinery A/c

To Balance b/d	30,000	By Depreciation (5,000 – 3,000)	2,000
		By Loss on sale of machinery	2,000
		By Bank a/c – Sale of machinery	1,000
		By Balance c/d	25,000
	30,000		30,000

Land and buildings A/c

To Balance b/d	20,000	By Balance c/d	40,000
To Shares a/c – purchases	4,000		
To Bank a/c cash purchases (Balance figure)	16,000		
	40,000		40,000

Adjusted Profit and Loss A/c

To Transfer to reserve	6,000	By Balance b/d	6,000
To Provision for tax	6,400	By Over-valuation of stock	5,000
To Interest on bank loan	1,000	By Fund from operation	19,900
To Outstanding expenses	5,500		
To Depreciation on machinery	2,000		
To Balance c/d	10,000		
	30,900		30,900

Fund flow statement

Sources		*Applications*	
Funds from operation	19,900	Loan paid	8,000
Sale of machinery	1,000	Income tax paid	4400
Issue of shares	10,000	Outstanding expenses paid	4500
Decrease in working-capital	2,000	Purchase of land & building	16,000
	32,900		32,900

QUESTIONS

Simple Questions

1. What is a fund?
2. What is meant by flow of funds?
3. Define a funds flow statement.
4. State the need for fund flow statement.
5. State two uses of funds flow statement to management.
6. Mention any two limitations of fund flow statement analysis.
7. What are the major sources of funds for a business?
8. State two points of differences between funds flow statement and an income statement.
9. State two points of differences between funds flow statement and position statement.
10. State the common 'inflows' to working capital.
11. State the common 'outflows' from working capital.
12. What is 'positive' and 'negative' changes in working capital?
13. Mention the important steps involved in the preparation of funds flow statement.
14. Give the meaning of working capital.
15. How do you treat provision for taxation while preparing a funds flow statement.
16. State the rules to ascertain which transaction give rise to a source or use of working capital.
17. What is 'Fund from operation'?
18. State the significance of preparing a funds flow statement.
19. How do you 'proposed dividend'? While preparing a funds flow statement?

Short Answer Questions

1. Analyse the managerial uses of funds flow analysis.
2. A fund flow statement is a better substitute for an income statement comment.
3. State the reasons whether the following transactions result in increase or decrease of working capital or do not effect the working capital.
   (*a*) A company issued 10,000 shares of Rs. 10 each at per fully paid up.
   (*b*) Debentures for Rs. 1,00,000 are commented into equity shares.
   (*c*) Investments were sold for Rs. 50,000.
   (*d*) Building was purchased for Rs. 1,50,000.
   (*e*) Bills payable accepted and issued to creditors Rs. 40,000.
   (*f*) Bills receivable Rs. 10,000 discounted for 9,500.
   (*g*) Fixed assets purchased by issue of shares for Rs. 1,00,000.
   (*h*) Cash paid to creditors Rs. 30,000.
   (*i*) Preliminary expenses written off Rs. 5,000.
   (*j*) Advance income tax paid Rs. 50,000. **(Bangalore University, B.Com., April 1994)**

EXERCISE 1

From the following information, calculate fund from operation:

Profit & Loss A/c

To	Expenses:		By	Gross profit	2,00,000
	Operation	1,00,000	By	Gain on sale	20,000

Depreciation	40,000	of building	
To Loss on sale of machinery	10,000	By Other incomes	2,000
To Advertisement suspense a/c	5,000		
To Discount on debtors	500		
To Discount on issue of shares	500		
To Goodwill	12,000		
To Preliminary expenses	2,000		
To Net profit	52,000		
	2,22,000		2,22,000

(University of Madras, B.Com., May 1997)

[**Answer:** Rs. 1,01,500]

EXERCISE 2

Calculate fund from operation from the following profit & loss a/c.

Profit & Loss A/c

To Rent	10,000	By Gross profit	9,86,000
To Salary	25,000		
To Depreciation on furniture	3,000		
To Discount on issue of shares	10,000		
To Goodwill written off	5,000		
To Preliminary expenses	6,000		
To New profit	9,27,000		
	9,86,000		9,86,000

(University of Madras, B.Com., March 1996)

[**Answer:** Rs. 9,51,000]

EXERCISE 3

Prepare an adjusted profit & loss account to determine the funds from operations from the following information extracted from Crown Ltd. for the year 2000:

Profit & loss a/c balance on 1.1.2000	Rs. 2,00,000
Profit & loss a/c balance on 31.12.2000	Rs. 6,40,000
Profit earned during the year was	Rs. 6,40,000
After the following adjustments were made:	
Depreciation on assets	2,80,000
Preliminary expenses written off	20,000
Patents written off	30,000
Provision for tax	3,20,000
Proposed dividend	1,20,000
Provision for doubtful debts	40,000
Profit on sale of fixed assets	10,000
Loss on sale of investments	5,000

In addition the profit was overstated by Rs. 20,000 due to change in the method of revaluation of closing stock. There was also a transfer of Rs. 2,00,000 to reserves (out of Rs. 6,40,000).

Prepare a profit & loss (adjusted) account for arriving at your answer. [**Answer:** Rs 12,85,000]

EXERCISE 4

Following information is extracted from the books of Omega Ltd. for the year 2000:

Opening balance of P & L a/c	25,000
Closing balance of P & L a/c	60,000
Salaries paid	5,000
Rent paid	3,000
Refund of tax paid	3,000
Profit on sale of building	5,000
Depreciation on plant	5,000
Provision for tax	4,000
Loss on sale of plant	2,000
Discount on issue of debentures	2,000
Provision for bad debts	1,000
Transfer to general reserve	1,000
Preliminry expenses written off	3,000
Goodwill written off	2,000
Proposed dividend	6,000
Dividend received	5,000

Prepare a statement showing funds from operations through an adjusted profit & loss account.

[**Answer:** Rs. 48,000]

EXERCISE 5

Prepare a statement showing changes in working capital from the following balance sheets of excel for the years 1999–2000.

	1990	*2000*		*1999*	*2000*
Equity share capital	15,00,000	6,00,000	Fixed assets	10,00,000	11,20,000
			Less: Dep.	3,70,000	4,60,000
Reserves	1,50,000	1,80,000		6,30,000	6,60,000
P & L a/c	40,000	65,000	Stock	2,40,000	3,70,000
7% Debentures	3,00,000	2,50,000	A/c Receivable	2,50,000	2,30,000
A/c payable	1,70,000	1,60,000	Cash at bank	80,000	60,000
Provision for income tax	60,000	80,000	Preliminary expenses	20,000	15,000
	12,20,000	13,35,5000		12,20,000	13,35,000

[**Answer:** Increase in working capital Rs. 10,00,000]

EXERCISE 6

From the following information preprare a funds flow statement including a schedule of changes in working capital for the year ended 31.12.96:

Balance Sheet

	31.12.95	*31.12.96*		*31.12.95*	*31.12.96*
Share capital	1,40,000	1,48,000	Cash	18,000	15,600
Debentures	24,000	12,000	Debtors	29,800	35,400
Reserve for doubtful debts	14,000	1,600	Stock	98,400	85,400
Creditors	20,720	23,680	Land	40,000	60,000
P & L a/c	20,080	21,120	Goodwill	20,000	10,000
	2,06,200	2,06,400		2,06,200	2,06,400

Additional Information

(*a*) Dividends paid Rs. 7,000
(*b*) During the year 1996 land purchased for Rs. 20,000.

(Osmania University, B.Com., March 1998)

[**Answer :** Total of fund flow statement Rs. 39,000]

EXERCISE 7

From the following Balance sheets of Nav Bharat Ltd. as on 31 December, 1995 and 1996 you are required to prepare a fund flow statement.

	1995	*1996*		*1995*	*1996*
Share capital	2,00,000	2,50,000	Land & building	2,00,000	1,90,000
General reserve	50,000	60,000	Plant	1,50,000	1,69,000
P & L a/c	30,500	30,600	Stock	90,000	74,000
Bank loan (short-term)	70,000	–	Debtors	80,000	64,200
Creditors	1,50,000	1,35,200	Cash	2,500	8,600
Provision for tax	30,000	35,000	Goodwill	8,000	5,000
	5,30,500	5,10,800		5,30,500	5,10,800

Additional Information

1. Dividends paid during the year 1996 Rs. 23,000.
2. Depreciation written off on plant Rs. 14,000 and on building Rs. 10,000.
3. Income tax provision made during the year Rs. 33,000.

(Osmania University, B.Com., October 1997)

[**Answer:** Total by Fund Flow Statement Rs. 1,43,100]

EXERCISE 8

The comparative balance-sheets of Star Ltd. are given below:

Liabilities	*1995*	*1996*
12% pref share capital	2,00,000	1,00,000
Equity share capital	6,00,000	8,00,000
Share premium	10,000	30,000
Reserves	52,000	70,000
P & L a/c	1,75,000	1,50,000
6% Debentures	1,25,000	1,00,000
Sundry creditors	1,02,000	1,33,000
Interim dividend payable	–	2,000
Provision for taxation	38,000	48,000
	13,02,000	14,33,000
Assets		
Goodwill	85,000	80,000
Land & Building	2,02,000	2,16,000
Investments	1,00,000	75,000
Patents	30,000	24,000
Plant	4,20,000	5,10,000

Stock	2,85,000	3,37,000
Sundry debtors	1,30,800	1,46,400
Prepaid expenses	3,200	4,600
Advance income tax	40,000	35,000
Discount on issue of debentures	6,000	5,000'
	13,02,000	14,33,000

Additional Infomation

1. Preference share redemption was carried on 31 December, 1996.
2. Dividend 12% p.a was paid on preference share and interim dividend on equity shares Rs. 43,000 was paid in the year 1996.
3. Depreciation of Rs. 26,000 and Rs. 79,000 has been provided on land and building and plant respectively in the year 1996.
4. Plant costing Rs. 60,000 purchased on 1st January 1994, depreciated by 20% (on WDV) was sold on 1st January 1996 for Rs. 30,000.
5. Investements having book value Rs. 57,000 sold for Rs. 49,000.
6. Income tax assessment for the year ended 31st December 1995 was completed on 1st April 1996 for a gross demand of Rs. 45,000. The balance amount of demand often adjusting advance-tax (1995) was paid on 10th April, 1996.

You are required to prepare

1. Statement of funds flow during the year 1996.
2. Schedule of changes in working capital showing separate item wise figures therein.
3. Provision for taxation a/c and advance-tax a/c. **(University of Bombay, B.Com., October 1997)**

[**Answer:** Fund from operation Rs. 2,50,400; Total of fund flow statement Rs. 5,49,400]

EXERCISE 9

From the following balance sheets of Ananth Co. Ltd., prepare a statement of changes in the working capital and the fund flow statement for the year ended 31st March 1996.

	1995	*1996*		*1995*	*1996*
Share capital	3,00,000	3,50,000	Goodwill	1,00,000	80,000
Debentures	1,50,000	2,50,000	Machinery	4,10,000	5,40,000
P & L a/c	60,000	70,000	Investments	30,000	80,000
General reserve	1,00,000	1,50,000	Discount on		
Provision for Depreciation	90,000	1,30,000	issue of debtentures	5,000	–
on Machinery			Cash at Bank	1,20,000	1,30,000
Sundry creditors	75,000	1,10,000	Sundry debtors	80,000	1,90,000
Bills payable	10,000	15,000	Stock in trade	40,000	55,000
	7,85,000	10,75,000		7,85,000	10,75,000

During the year investments costing Rs. 30,000 were sold for Rs. 28,000. A new machine was purchased for Rs. 45,000 and payment was made in fully paid shares.

(Bangalore University, B.B.M., November 1997)

[**Answer:** Total of FFS Rs. 3,50,000]

EXERCISE 10

From the following balance sheets of XYZ Co. Ltd., prepare funds flow statement:

	(Rs. 000)			*(Rs. 000)*	
	1995	*1996*		*1995*	*1996*
Equity share capital	600	800	Goodwill	230	180
Preference share capital	300	200	Land & buildings	400	340
General reserve	80	140	Plant & machinery	160	400
P & L a/c	60	96	Debtors	320	400
Proposed dividend	84	100	Stock	154	218
Creditors	110	166	Bills receivable	40	60
Bills payable	40	32	Cash	30	20
Tax provision	80	100	Bank	20	16
	1,354	1,634		1,354	1,634

Additional Information

1. Proposed dividend made during 1995 has been paid during 1996.
2. Depreciation: (*a*) Rs. 20,000 on plant & machinery
   (*b*) Rs. 4,000 on land & buildings.
3. Interim dividend has been paid Rs. 40,000 in 1996.
4. Income-tax Rs. 70,000 has been paid during 1996. **(CS, Inter, December 1997)**

[**Answer:** Fund from operation Rs. 4,36,000; Total of fund flow statement Rs. 6,56,000]

15

CHAPTER

CAPITAL STRUCTURE

PLANNING THE CAPITAL STRUCTURE

The term capital structure refers to the proportions of different types of financing used by the firm. By capital structure, we mean the kinds of securities and their proportionate amounts that make up the capitalisation. In simple words capital structure is the composition or the make up of the capital. While capitalisation relates to the decisions about the amount of securities to be issued, capital structure relates to the decisions as to the kinds of securities to be issued.

Some Authors on financial management believe that 'capital structure' is tantamount to 'financial structure' and hence it represents both long-term and short-term sources of funds under capital structure. Broadly speaking, capital structure is composed of owned funds and borrowed funds. While owned funds include share capital and free reserves and surplus, borrowed funds represent debenture loan and long-term loans provided by term financing institutions.

Pattern of Capital Structure

Broadly speaking, there may be three fundamental patterns of capital structure in a new concern.

1. A company may issue only equity shares when regular earning or income is not quite certain.
2. When the average earnings are rather good, even through annual earnings may not be quite certain, preference shares may be issued.
3. A company which expects to have a stable and reasonably good income to pay the fixed interest, may issue debentures.

The general principles do not in practice become operative because these principles are militant to each other. A company usually resorts to the issue of all the three types of securities. It is the gearing that is really of importance in capital structure and hence, we will do well to consider the principles present in the decision of the capital structure.

Principles that determine the Capital Structure

There are at least five important principles that determine proper capital structure of any company. They are: (*i*) cost principle; (*ii*) risk principle; (*iii*) control principle; (*iv*) flexibility principle; (*v*) timing principle.

Capital structure or composition of capital pattern of securities or the security mix is the second important aspect of financial planning. Once the financial manager has determined the firm's financial requirements, his next task is to see that these funds are on hand. This capital comes in many forms-long-term and short-term

debts, secured and unsecured debts, preference shares, equity shares, retained earnings and other sources of finance. To decide upon the rates of these securities in the total capitalisation is to decide the capital structure. So in simple words capital structure is the form of capital. According to Weston and Brigham, "Capital structure is the permanent financing of the firm, represented by long-term debts, preferred stock and net worth". "Net worth is the equity shareholder's equity capital and includes reserves and surpluses, retained earnings and net worth reserves.

Other interpretations of capital structure involve the investment decisions of the firm; the optimal use of leverage, the timing of the pricing of issues as well as determining the acceptable level of risk and liquidity.

The basic patterns of capital structure may take any of these forms:

1. Equity shares only
2. Equity shares and preference shares
3. Equity shares and debentures
4. Equity shares, preference shares and debentures

There are no hard and fast rules to indicate what patterns would be ideal under what circumstances and what percentage of capitalisation should be represented by equity shares, preference shares or debentures. It may differ from industry to industry, from trade to trade, from company to company and so on. But whatever decision is taken in envolving the capital structure of a company, two basic principles must be observed. First of all, the ratio of funded debts of equity should always be geared to the degrees of stability of earnings. Secondly, the capital structure must be balanced with adequate 'equity cushion' to absorb the shocks of the business cycles and to afford flexibility.

Factors that determine the Capital Structure

To design a suitable pattern of capital structure for the company, a satisfactory compromise among various conflicting factors of cost, risk, control, flexibility and timing should be arrived at. Having studied the principles of capital structure it is important to analyse the factors which determine the ideal financial leverage of a company. The following factors generally determine the capital gearing of the composition of the financial plan of the company.

1. **Trading on equity:** Trading on equity is also known as financial leverage. It refers to an arrangement where the borrowing programme is so arranged as to secure a fairly high return on the equity shares. Trading on equity is the financial process of resorting borrowing to generate gain for the residual owner. The practice is known as 'Trading on equity' because it is the equity shareholders who have an interest or equity in the business income. The term owes its name also to the fact that the creditors are willing to advance funds on the strength of the equity supplied by the owners. It is based on the theory that there is a difference among the rates of returns on the different types of securities issued by a company. By issuing debentures and preference shares with a fixed rates of returns, the rate of dividend on equity share is raised. If, on the other hand, the entire capital is raised by issue of equity shares, the rate of dividend will get reduced. Trading on equity acts as a lever to magnify the influence of fluctuations in earnings. Any fluctuations in earnings before interest and taxes (EBIT) is magnified on the earnings per share (EPS) by operation of equity. The larger the magnitude of debt in capital structure, the higher is the variation in EPS given any variation in EBIT.

The concept has got serious implications and limitations.

Firstly, a concern should have stable earnings, as for example, profit with little variations. With a large amount of indebtedness it is under constant pressure to earn a return sufficient to cover the interest cost of such funds. Its products should not have high elasticity of demand, otherwise the earning capacity is likely to be adversely affected.

Secondly it should have large investments in fixed assets because they constitute an important adjunct for borrowing money, since they give the lender a feeling of security, the stable earnings and a huge investment in fixed assets.

Thirdly, the field of operations for such an enterprise should be an established and a non-speculative one.

High gearing of capital exists when the proportion of equity capital to the total capital is small; and in case of low gearing the reverse is true. The higher the gear is, the more speculative the ordinary shares will be. With the increase in the gearing of capital, the value of both the priority rights and equity shares decreae and so does the credit of the company.

2. **Characteristics of the company:** Peculiar characteristics of the company affect the factors influencing the choice of different sources of funds. Accordingly weights are assigned to different principles of manoeuvrability, cost, risk, control and timing in the light of the peculiar features of the company.
   - ***(a) Size of the business:*** Smaller companies confront tremendous problems in assembling funds because of their poor credit worthiness. Investors feel bad investing their money in securities of these firms. Lenders prescribe highly restrictive terms in lending. Hence special attention should be paid to flexibility principle for obtaining funds in future. Again control aspect should also be given special consideration, otherwise large concerns may buy a controlling interest. Larger concerns have to employ different types of securities to procure desired amount of funds at reasonable cost because they find it very difficult to raise huge capital at reasonable cost if demand for funds is restricted to a single source. They should be given greater consideration so as to minimise the cost of capital.
   - ***(b) Form of business organisation:*** Control principle carries higher weightage in private limited companies where ownership is 'closely held ' by a few shareholders when compared with public limited companies. In partnership or sole proprietorship form, manoeuvrability factor is not helpful owing to limited access to the capital market. Control is undoubtedly an important consideration in such organisations.
   - ***(c) Stability of earnings:*** A company can insist on leverage principle if it has greater stability in sales and earnings and as such the fixed obligation debt with loss risk may be undertaken. A company with irregular earnings should pay greater attention to the risk principle, depending upon the sale of stock to raise capital. It should reduce debt capital because of fixed burden on interest.
   - ***(d) Asset structure:*** A company having major investment in fixed assets and greater stability in sales can pay greater attention to leverage principle to take advantage of cheaper source. Otherwise, risk principle should be given greater weightage than leverage.
   - ***(e) Age of the company:*** Established companies with good earnings should adopt leverage principle since they are in comfortable position to raise capital from whatever sources they like. New companies should give more weightage to flexibility factor so as to have as many alternatives opened as possible in future to meet their growth requirements.
   - ***(f) Credit standing:*** A company with high credit standing should pay attention to flexibility factor since it can adjust sources of funds upwards or downwads in response to major changes in need for funds than one with poor credit standing.
   - ***(g) Attitude of management:*** Where management has strong desire for assured and exclusive control, preference will have to be given to borrowing for raising capital in order to be assured of continued control. If the management's chief aim is to stay in office they would insist on risk principle or else they would prefer to insist on the leverage principles.
3. **Policy of term financing institution:** If the financial institution adopt harsh policy of lending and precribe highly restrictive terms management must give more significance to teh flexibility principle and abstain from borrowing from those institutions to preserve the company’s flexibility in capital

funds. However, if funds are obtained in desired quantity and on early terms from the financial institutions, the management may assign more weightage to the cost principle and obtain funds from them.

Factors which Influence Planning of Capital Structure in Practice

The various factors which influence planning of capital structure in practice are as follows:

1. **Internal Factors:** Some of the internal factors which are to be considered in planning the capital structure are as follows:
   (*a*) ***Cost of capital:*** The current and future cost of each potential source of capital should be estimated and compared.
   (*b*) ***Risk:*** Ordinarily, debt securities increase the risk. While equity securities reduce it, Risk can be measured to some extent by the use of ratios measuring gearing and time-interest earned.
   (*c*) ***Dilution of value:*** A company should not issue any shares which will have the effect of removing or diluting the value of the shares by the existing shareholders.
   (*d*) ***Acceptability:*** A company can borrow only if investors are willing to lend. Few companies can afford the luxury of the capital structure which is unacceptable to financial institutions.
   (*e*) ***Transferability:*** Many companies put their securities for quotation on the stock exchange quotations and improve the transferability of the shares.
   (*f*) ***Matching fluctuating needs against short-term source:*** Where needs are fluctuating, a firm may prefer to borrow short-term loans from commercial banks.
   (*g*) ***Increasing owner's profits:*** Profits of the owners can be increased by relying more and more on debt financing.
2. **External Factors:**
   (*a*) ***General level of business activity :*** Where the overall level of business activity is rising, a firm would want to expand its operations.
   (*b*) ***Level of interest rates :*** If interest rates become excessive, firms will delay debt financing.
   (*c*) ***Availability of funds in the money market:*** The availability of funds in the money market affects a firm's ability to offer debt and equity securities.
   (*d*) ***Tax policy on interest and dividends :*** Although each management makes its own decisions on its capital sources, there are certain general factors which seem to influence the overall capital structure.
3. **General Factors:** This include the following:
   (*a*) ***Size of the business and character of capital requirements:*** New and big firms are conservatively financed. But they are likely to issue new securities to the public. If an enterprise is especially successful, it grows rapidly and may issue bonds and preferred stock without diluting equity stock interests. For companies which expand rapidly, even though their current earnings are low; the sale of equity stock is not desirable. However if assets are plentiful borrowing is possible. The practice of issuing mortgage bonds encourage borrowing by those firms that have a heavy investment in fixed assets. In some industries, very large quantities of current assets account for a bigger proportion of the total assets.
   (*b*) ***Operational characteristics:*** Businesses differ in their operational characteristics and their need for funds. Merchandising firms operate on a small margin of gross profit, mainly with current assets. Public utilities, on the other hand, have small gross income relative to their capital and require extensive capital.
   (*c*) ***Continuity of earnings:*** A firm must have stable earnings in order to handle recurring fixed charges. Non-durable consumer goods enjoy stability of demand and rigidity in prices is compared to durable consumer goods. The capital structure of all firms in the industries should be more conservative than that of industries which are stable.

(*d*) ***Marketability:*** The financial management of a corporation watches changes in market psychology and considers them carefully in planning new security offerings. General economic conditions develop new attitudes in the market.

(*e*) ***Government influence:*** Taxes exercise a major influence on the capital structure of the business. Corporate income-tax has reduced the net earnings of companies. Debt financing is encouraged because of income-tax leverage.

(*f*) ***Financial leverage:*** Unfavourable financial leverage indicates a low level of profitability and makes borrowings more costly than the returns on investment. It is very difficult for a firm to issue additions stock when profit are low.

CAPITAL STRUCTURE THEORIES

The following are the various capital structure theories:

1. Traditional Approach

The crux of the traditional view relating to leverage and valuation is through judicious use of debt-equity proportions, a firm can increase its total value and thereby reduce the overall cost of capital. The rationale behind this view is that debt is relatively cheaper source of funds as compared to equity shares with a change in the leverage, *i.e*., using more debt in the place of equity, a relatively cheaper source of funds replace a source of funds which involves a relatively higher cost. This obviously causes a decline in the overall cost of capital. If the debt-equity ratio is raised further, the firm would become financially more risky to the investors who would penalise, the firm by demanding a higher equity capitalisation (Kc) But the increase in Kc may not be so high as to neutralise the benefit of using cheaper debt. In other words the advantages arising out of the use of debt is so large that, even after allowing for higher Kc the benefits of the use of the cheaper source of funds are still available. If, however, the amount of debt is increased further, two things are likely to happen; (*i*) owing to increased financial risk, Kc will record a substantial rise; (*ii*) the firm would become very risky to the creditors who would like to be compensated by a higher return such that Kc will rise. The use of debt beyond a certain point will, therefore, have the effect of raising the weighted average cost of capital and conversely the total value of the firm. Thus, upto a point or degree of leverage, the use of debt will adversely affect it. At that level of debt-equity ratio, the capital structure is an optimal capital structure. At the optimum capital structure the marginal real cost of debt, defined to include both implicit and explicits, will be equal to the real cost of equity. For a debt-equity ratio before that level, the marginal real cost of debt would be less than that of equity capital, while beyond that level of leverage, the marginal real cost of debt would exceed that of equity. Thus, there would be an optimal structure according to the traditional view. Of course, there are variations to the traditional approach. According to one of these, the equity capitalisation rate (Kc) rises only after a certain level of leverage and not before, so that the use of debt does not necessary increase the Kc. This happens only after a certain degree of leverage. The implication is that firm can reduce its cost of capital significantly with the initial use of leverage.

Criticism of the traditional view: The validity of the traditional position has been questioned on the ground that the market value of the firm depends on its net operating income and risk attached to it. The form of financing can neither change the net operating income nor the risk attached to it. It can simply change the way in which net operating income and risk attached to it are distributed between equity and debt holders. Therefore, firms with identical net operating income and risk, but differing in their modes of financing should have same total value. The traditional view is criticised because it implies that totality of risk incurred by all security holders of a firm can be altered by changing the way in which this totality of risk is distributed among the various classes of securities. However, the argument of the traditional theorists that an optimum capital structure exists can be supported on two counts; the tax deductibility of interest charges and market imperfections. Modigliani and Miller also do not agree with the traditional view. They criticise the assumption that

the cost of equity remains unaffected by leverage upto some reasonable limit. They assert that sufficient justification does not exist for such an assumption. They do not also accept thee contention that moderate amounts of debt in 'sound' firms do not really add very much to the 'riskness' of the shares.

2. Net Income Approach

This is suggested by Mr. D. Durand. According to him, the capital structure decision is relevant to the valuation of the firm. In other words, a change in the capital structure financial leverage will lead to a corresponding change in the overall cost of capital as well as the total value of the firm. Therefore, if the degree of financial leverage as measured by the ratio of debt to equity is increased, the weighted average cost of capital will decline both in the value of the firm as well as the market price of equity shares. The net income approach to valuation is based on three assumptions; first, there are no taxes; second, that the cost of debt is less than equity capitalisation rate or the cost of equity; third, that the use of debt does not change the risk-perception of the investors. That the financial risk-perception of the investors does not change with the introduction of debt or change in leverage implies that due to change in leverage, there is no change in either the cost of debt or the cost of equity. The implication of the three assumptions underlying the net income approach is that as the degree of leverage increases, the proportion of an inexpensive source of funds *i.e.*, debt in the capital structure increases. As a result of the above, the weighted average cost of capital tends to decline; leading to an increase in the total value of the firm. Thus, with the cost of debt and the cost of equity, being constant, the increased use of debt (increase in leverage), will magnify the shareholder's earnings and thereby, the market value of the equity shares. The financial leverage is an important variable in the capital structure decision of a firm. With a judicious mixture of debt and equity, a firm can evolve an optimum capital structure which will be the one at which value of the firm is the highest and the overall cost of capital lowest. At that structure the market price per share would be the maximum. If the firm uses no debt or if the financial leverage is zero, the overall cost of capital will be equal to the equity-capitalistion rate. The weighted average cost of capital will decline and will approach the cost of debt as the degree of leverage reaches one.

3. Net Operating Income (NOI) Approach

Another theory of capital structure, suggested by Durand, is the net operating income (NOI) approach. This is diametrically opposite to the net income approach. The essence of this approach is that the leverage/ capital structure decision of the firm is irrelevant. Any change in leverage will not lead to any change in the total value of the firm, and the market price of the shares, on the overall cost of capital is independent of the degree of leverage.

Overall Cost of Capital/Capitalisation Rate (Ko) is Constant

The NOI approach to valuation argues that the overall capitalization rate of the firm remains constant for all classes of leverages. The valuation of the firm, given the level of EBIT (Earnings before Interest and Tax) is determined as follows:

$$V = \frac{EBIT}{Ko}$$

In other words, the market evaluates the firm as a whole. The split of the capitalisation between debt and equity is therefore, not significant.

Residual Value of Equity

Value is residual in the case if equity which is determined by deducting the total value of debt (B) from the total value of the firm (V). Symbollically:

Total market value of equity capital (S) = V– B

Changes in Cost of Equity Capital

The equity-capitalistion rate/cost of equity capital (Ko) increases with the degree of leverage. The increase in the proposition of debt in the capital structure relatively to equity shares would lead to an increase in the financial risk to the ordinary shareholders. To compensate for the increased risk, the shareholder would expect a higher rate of return on their investments. The increase in the equity-capitalisation rate (or the lowering of the price-earning ratio, *i.e.*, P/E ratio) would match the increase in the debt equity ratio. The Ko would be:

$$= Ko + (Ko - Kc)\left(\frac{B}{S}\right)$$

Cost of Debt

The cost of debt (Ki) has two parts: (*a*) Explicit cost represented by the rate of interest. Irrespective of the degree of leverage, the firm is assumed to be able to borrowci at a given rate of interest. This implies that the increasing proportion of debt in the financial structure does not affect the financial risk of the lenders, and they do not penalise the firm by charging higher interest. (*b*) Implicit or 'hidden cost', as shown in the assumption relating to the changes in Ko, increase in the degree of leverage of the proportion of debt to equity causes an increase in the cost of equity capital. This increase in Kc being attributable to the increase in debt, in the implicit of Ki.

Thus the advantage associated with the use of debt, supposed to be a 'cheaper' source of funds in terms of the explicit cost is exactly neutralised by the implicit cost represented by the increase in Kc. As a result, the real cost of debt and the real cost of equity, according to the NOI approach are the some and equal.

Optimum Capital Structure

The total value of the firm is unaffected by its capital structure. No matter what the degree of leverage is the total value of the firm will remain constant. The market price of the shares will also not change with the change in the debt-equity ratio. There is nothing such as an 'optimum capital structure'. Any capital structure is optimum, according to the NOI approach.

4. Miller and Modigliani Position

Modigliani and Miller supplied rigorous challenge to the traditional view. Thus approach closely resembles with NOI approach. According to this approach, cost of capital and so also value of firm remains unaffected by leverage employed by the firm. Thus, Modigliani and Miller argued that any rational choice of debt and equity results in the same cost of capital under there assumptions and that there is no optimal mix of debt and equity financing. The independence of cost of capital argument is based on the hypothesis that regardless of the effect of leverage on interest rates, the equity capitalization rate will rise by an amount sufficient to offset any possible savings from the use of low-cost debt. They contend that cost of capital is equal to the capitalisation rate of a pure equity stream of income and the market value is ascertained by capitalising its expected its expected income at the appropriate discount rate for its risk class. So long as the business risk remains the same, the capitalisation rate (cost of capital) will remain constant. Hence, as the firm increases the amount of leverage in its capital structure, the cost of debt capital remaining constant, the capitalisation rate (cost of equity capital) will rise just enough to offset the gains resulting from applications of low-cost debt.

Thus, the essence of M-M approach is that for firms in the same risk class, the total value of the firm and the overall cost of capital are not dependent upon degree of financial leverage. The K and U remain constant for all degrees of financial leverage and value of the firm is found out by capitalising the expected flow of operating income at a discount rate appropriate for its risk class.

M-M's argument is based on a simple switching mechanism what is called 'arbitrage'. We shall, therefore, explain arbitrage process in detail.

Arbitrage Process

M-M's approach holds the view that the market value of two firms which are identical in all respects except for the difference in the pattern of financing, will not vary because arbitrage process will drive the total values of the firms together. Rational investors, according to M-M. will use arbitrage in the market to present the existence of the two assets in the same class and with same expected returns from selling at different prices.

The arbitrage process is an act of buying an asset in one market and selling it in another to take advantage of price differentials in the two markets. This process is essentially a balancing operation which would not allow the securities of the identical quality being sold at different prices in two markets. M-M applied the 'arbitrage' argument to explain their view. According to them, because of the operation of the arbitrage process the total value of two firms which are similar in all respects expect that one firm is levered and the other is unlevered, will not be different. The investors of the levered firm, whose value is higher, will liquidate their holdings and buy the shares of investors because they will be able to earn the same return with same return with same perceived risk at relatively lower outlary. This behaviour of the investors will result in rise in the share prices of the firm whose shares are being sold. This process will continue till the market prices of the two homogeneous firms become identical. The investors are as indicated above, assured of the same return with identical risks but at lower outlays by the arbitrage process. This is possible because the investors would borrow in the proportion the degree of leverage present in the firm. The use of debt by the investor for arbitrage is called 'home-made' or 'personal' leverage.

The counter arguments are as follows :

(*i*) The assumption that firm and individuals can borrow and lend at the same rate of interest does not hold good in practice.
(*ii*) It is incorrect to assume the 'personal' (home-made) leverage 'is a perfect substitute for' corporate leverage.
(*iii*) The existence of transaction costs also interferes with the working of the arbitrage.
(*iv*) Institutional restrictions also impede the working of arbitrage.
(*v*) M-M's conclusions will be frustrated by the incorporate of corporate income taxes.

QUESTIONS

1. What do you mean by capital structure?
2. List out the principles that determine the capital structure of a company.

LONG ANSWER QUESTIONS

1. Explain the factors that determine the capital structure.
2. Explain the (*a*) traditional approach; (*b*) net income approach and (*c*) net operating income approach theory of capital structure.
3. Discuss the M-M proposition on the influence of capital structure on the value of the firm. What are the counter arguments?

16

CHAPTER

SOURCES OF FINANCE

INTRODUCTION

After assessing and estimating total capital requirements of an enterprise, the nest important problem of management is to decide about the methods and sources of raising necessary funds to finance different kinds of capital requirements. But the methods of raising finance are linked with the period for which funds are needed. From this point of view funds may be classified into the following three heads.

(*a*) ***Short-term finance:*** Funds required for a period of upto one year form short-term finances of a company such funds are usually needed to meet seasonal working capital requirements or special needs for working capital.

(*b*) ***Medium-term finance:*** Funds that are needed for a period from one to five years are often classified as medium term finance. This kind of finance is generally needed to provide funds for permanent working capital or normal extensions and replacement of fixed assets.

(*c*) ***Long-term finance:*** Funds which are needed for a period of more than five years constitute long-term finances of the company. Long-term finance is generally required for permanent investment in fixed assets of the firm. Modernisation and major expansion programmes also give rise to the need for long-term finance.

Since sources of medium-term finance and long-term finance are virtually the same, the problem of methods and sources of raising funds can broadly be divided into: (*a*) long-term source and (*b*) short-term source.

(1) LONG-TERM SOURCES OF FINANCE

The important sources of raising long-term funds are as follows:

(A) Equity Shares

The Companies Act 1956, defines shares as those which are not preference shares. Thus, to better understand the meaning of equity shares, one should know what are preference shares. Shares that carry preferential rights with regard to payment of dividend so long as company exists, and repayment of capital when company is wound up, are known as preference shares. This means that dividend on equity shares is paid after disbursing a fixed rate of dividend on preference shares. Rate of equity dividend is not fixed and its payment depends upon profit available for payment of dividend and also intentions of the board of directors. When the company goes into liqudation, equity hares capital is repaid only after all other claims, including those of preference share, have been fully settled and paid. Equity shareholders control the company by virtue of their entitlement to vote at the general meetings of the company. These shares have the chance of

earning high dividends and also face the risk of earning nothing. Investors who are bold enough to take risks purchase equity shares. For this reason equity share capital is also known as venture capital. Equity shareholders also enjoy maximum possibility of capital appreciation.

Advantages of Equity Shares

(*a*) Payment of equity dividend is not binding upon the company, nor is the rate of equity dividend fixed. The result is that equity shares do not impose any fixed burden on company's financial resources. Dividend is paid if profits are available and directors deem it fit.
(*b*) Raising funds by issue of equity shares does not create any charge on assets of the company.
(*c*) Equity shares offer financial flexibility to the company in so far as neither rate nor payment of dividend is legally binding upon the company.
(*d*) Equity shares offer cushion to senior securities like preference shares and debentures and thus provide the company with a wide base to raise additional funds with these senior securities.
(*e*) Equity shares offer maximum opportunity of capital appreciation to investors.

Drawbacks of Equity Shares

(*a*) Equity shares are the most risky security from the point of view of investors with the result that equity dividend is generally higher than preference dividend or interest on debentures. Thus it is more costly to finance with equity shares than with other securities.
(*b*) Control of the company may be manipulated by certain groups of equity shareholders for their personal gains and even at the cost of company's interest.
(*c*) To the extent equity shares are issued , company losses the opportunity to trade on equity.
(*d*) Equity shares provide greater scope for speculation over stock exchanges than any other securities.

Equity shares are indispensable as a method of raising long-term funds by corporate entities. These shares provide the base upon which capital structure of the company is built.

(B) Preference Shares

Shares that enjoy preference over equity shares with regard to payment of dividend when company exists, and return of capitals, when the company is wound up, are known as preferenced shares. Rate of dividend payable on preference shares is fixed though its payment is not legally binding. However, when directors resolve to pay dividend, preference dividend is to be paid first.

Types of Preference Shares

On the basis of whether preference shares are entitled or not to share in the profit of the company remaining after payment of equity divident, preference shares may be divided into participating preference shares and non-participating preference shares. If nothing is mentioned, preference shares are assumed to be participating.

Preference shares may also be classified into cumulative preference shares and non-cumulative preference shares. When arrears of preference dividend must be paid first before payment of any dividend in future such shares are known as cumulative preference shares. If preference shares are not entitled to arrears of preference dividend, while paying dividend in future, these are known as non-cumulative preferences shares.

A company may also issue redeemable preference shares when it undertakes to redeem the amount of preference shares under certain conditions. But the intention to redeem the preference shares must be made clear at the time of issue of such shares. However, preference shares can be redeemed subject to provisions of the Companies Act. Thus, only fully paid preference shares can be redeemed, and redemption can be made out of divisible profits or out of proceeds of fresh issue of shares made for this purpose.

Advantages of Preference Shares

(*a*) Preference shares do not place a burden on finances of the company in case profits are inadequate.
(*b*) Issue of preference shares does not create any charge on assets of the company.
(*c*) Preference shares carry fixed rate of dividend and thus facilitate trading on equity by the company.
(d) From company's view point, cost of capital raised by issue of preference shares is less that the cost of equity capital.
(*e*) Preference shares appeal to cautions investors who want to earn higher income but prefer to take very less risks.
(*f*) Preference shares are especially useful when existing assets of the company are inadequate to be accepted as collateral security for purpose of issue of debentures or raising term loans.
(*g*) Unlike equity shares, preference shares offer facility of redemption during life time of the company.

Drawbacks of Preference Shares

(*a*) It is more costly to finance with preference shares than with debentures. The point becomes more obvious when it is remembered that dividend on preference shares is not a deductible item of expense for income tax purpose as interest on debenture is.
(*b*) Restrictive convenants often forming part of the terms and conditions of issue of preference shares tend to restrict flexibility of company management with regard to financial matters. Thus, convenants like instituting a skinking fund for redemption of preference shares or requirement that their consent must be obtained before incurring any further liability in future, tend to restrict management flexibility.
(*c*) Preference shares dilute claims of equity shareholders of the company over its assets.

(C) Debentures

Debenture is an acknowledgement of debt under seal of the comapany. Since those holding debentures are creditors of the company, debentures are also referred to as creditorship security. Evelyin Thosmas defines debentures as a "document under the company's seal which provides for the payment of a principal sum and interest there on at regular intervals, which is usually secured by a fixed or floating charge on the company's property or undertakings, and which acknowledges loan of the company."

The following are the important features of debentures:

(*i*) Debentures carry interest at a fixed rate.
(*ii*) Interest on debentures must be paid even if there are no profits, and interest on debenture is a deductible expense for income tax purposes.
(*iii*) Amount of debentures must be redeemed as per terms of agreement.
(*iv*) Debentures are generally secured by charge on the assets of the company.
(*v*) Debentures are creditors and thus sue the company for unpaid dues.
(*vi*) In India , debentures do not enjoy voting rights.

Types of Bebentures

Debentures may broadly be classified into the following categories:

(i) ***Registered or Bearer debentures:*** Debentures that are recorded in the register of Debenture-holders are known as registered debentures. Debenture-holders whose names appear in this register are entitled to periodic payment of interest and redumption of sum due on debentures. Mere delivery is not enough for transfer of reistered debentures. These can be transfered by following the given procedure as laid down in the articles of association of the company. Bearer debentures on the other hand, are those debentures for which no register is maintained by the company and which are transferable by mere delivery without any intimation to the company.

(*ii*) ***Secured or unsecured debentures:*** When debentures are secured by mortgage or creating charge on assets of the company, these are known as secured debentures. Charge created on assets of the company may be fixed or floating. Such charge is required to be registered with the registrar of companies. In case of default, debt due by the company can be recovered from the assets duly mortgaged in favour of debenture-holders. When debentures are not secured and thus rank as ordinary unsecured creditors for purpose of repaymeent of sums due by the company, these are known as simple maked or unsecured debentures.

(*iii*) ***Redeemable or irredeemable debentures:*** When debentures are issued subject to redemption on certain terms as specified at the time of issue, such debentures are known as redeemable debentures. Conditions of issue may provide for redemption of debentures in lump sum after a given period of time or on demand by debenture-holders or by draw of lots a certain percentage of debentures each year or at company's discretion. Where no time is fixed in which the company is bound to pay, the debentures are known as irredeemable or perpetual. The debenture holders cannot demand payment as long as the company is a going concern and does not make default in payment of interest, although the company may playback at any time it chooses.

(*iv*) ***Convertible debentures:*** Debentures may also be issued on the condition that these will be converted into equity shares after a given period of time instead of being redeemed by cash payment. These debentures are known as convertible debentures.

(*v*) ***First and second debentures:*** These may be preferred or ordinary debentures. Preferred, also known as first debentures are those which are to be paid first in case of winding up of the company while ordinary or second debentures are those which are paid after first debentures have been fully paid off.

Merits of Debentures

(*a*) Company can issue debentures without diluting any control to their holders.
(*b*) Debentures help the company to trade on equity and thus attempt to increase rate of equity dividend.
(*c*) Since debentures are for a specific period, company may adjust its financial plan accordingly.
(*d*) Rate of interest payable on debentures is fixed and generally less than the rate of dividend payable on preference or equity shares.
(*e*) Debentures appeal to cantious and institutional investor who prefer stable rate of return on their investment with minimum or no risk.
(*f*) Funds raised by issue of debentures can be redeemed when these are not longer needed. This helps the company avoid unfortunate situation of over-capitalisation.

Drawbacks of Debenture Finance

(*a*) Issue of debentures often results in creating charge on assets of the company.
(*b*) Issue of debenture may be based upon such convenants as tend to limit financial flexibility of the enterprise. Thus, provisions regarding creating sinking fund for debenture redemption or creating trust in favour of debenture-holders, tend to limit flexibility of the company.
(*c*) From company's point of view, debentures are the riskiest source of raising funds. Default in payment of interest or redemption of debentures as and when due may invite winding up of company.
(*d*) Investors who purchase debentures of the company are denied the right of control. This also weakens safety of their capital.

(D) Ploughing Back of profits

Companies save a part of their profits from distribution to shareholders as dividends use the same to meet financial requirements of business. This process of creating reserves by a company out of its profits and utilising the same for meeting financial requirements of the business from time to time is known as ploughing back of profits. In other words, retaining part of the profits and reinvesting the same into the business is

known as ploughing back of earnings. Since in this case company depends on internal resources for meeting its capital requirements, ploughing back of profit is also known as 'internal financing' or 'self financing'.

Merits

(*a*) It is a good business policy not to distribute all the profits and save a part of them for future use by the company.
(*b*) Reserves built during the years of prosperity can be used to effectively fight out unfavourable business situation arising on account of depression or other risk factors.
(*c*) Self-financing is ideally suited for financing expansion and modernisation programmes of the company.
(*d*) Retained earnings are more definite as a source of financing business operations. Internal financing does not make the enterprise become dependent upon market considerations or investors.
(*e*) Though retained earnings are not cost free source of finance company is under no legal or contractual obligation to pay any return to any outside partly when it reinvests its own profits into the business.

Demerits

(*a*) Continuous and excessive ploughing back of profits over a long period of time may cause a company become a monopoly organisation.
(*b*) Management may consider retained profits as cost-free source of financing capital requirements of the enterprise and thus may not always utilise them efficiently and for the best advantage of shareholders.
(*c*) Excessive ploughing back may tempt management of the company to manipulate share prices. By declaring dividends at very high or very low rates management may cause share prices to change in the direction so as to serve vested interests.
(*d*) The policy of excessive ploughing back of profits withholds flow of funds to capital market and thus does not allow allocation of resources to different companies based upon market forces. In other words, ploughing back of profits makes capital market become inactive and also distorts allocation of resources.
(*e*) Use of accumulated profits for issue of bonus shares may cause a company become over-capitalised.

(E) Specialised Financial Institutions

Faced with the objective of encouraging industrial development in the country through cheap industrial finance, the Government of India established a number of specialised financial instituions to provide cheap financial assistance to business enterprises. Industrial finance corporation of India was the first such financial institution established after independence in 1948. Industrial credit and investment corporation, Industral Development Bank of India and State Financial Corporations are the important finance institutions providing assistance to industrial undertakings. The assistance from these institutions constitute an important source of finance for meeting the requirements of new as well as already established concerns. The assistance from these financial institutions takes the form of direct subscription to securities of companies, underwriting of securities, grant of loans, guaranteeing loans and debentures and guaranteeing of deferred payments against import of capital goods. These institutions also provide expert advice to industrial enterprises for planning and execution of projects. These institutions also ensure that assistance provided by them is effectively utilised for the purpose for which such assistance is granted.

SHORT-TERM SOURCES OF FINANCE

Short-term funds are needed to finance special and seasonal working capital requirements. Following are the important sources of short-term finance.

1. Trade Credit

In a number of cases trade credit is the single most important source of short-term funds. Since it is a a usual trade practice in many cases to allow credit to reliable purchasers of materials and other items, trade credit is often described as the self-generating source of short-term finance. Credit standards as imposed by sellers are generally not very rigid, and the firms enjoying reputation in the market are able to purchase their requirements of stock on credit as a matter of routine. Willingness of the supplier to permit delay in payment and buyers's need for it largely determine the extent to which trade credit is to be used to finance short-term requirements of funds. Moreover, reputation of the buyer for prompt and timely payments also enhances buying firm's ability to get more trade credit.

Trade credit may be allowed to the buyer either on open account or on the basis of exchange of commercial papers between the parties. Trade credit does not create any charge on assets of the purchasing firm.

Importance of trade credit as source of short-term finance is largely determined by the following factors:

(*i*) Terms and conditions at which trade credit is available.
(*ii*) Payment record of the borrowing firms.
(*iii*) Financial position of the supplier.
(*iv*) Volume and amount of purchases to be made by the borrowing firm.

2. Commercial Banks

Bank credit is another important source of short-term finance. Traditionally , banks in India have refrained from providing long-term assistance to business enterprise. Consideration of liquidity, safety of investment and availability of expertise in evaluating proposals for short-term assistance are the basic factors that make commercial banks to confine their assistance to business largely for short-term purposes.

Commercial baks meet short-term requirements of finance of business undertakings in the following ways:

(*a*) By discounting of bills and other commercial papers.
(*b*) By accepting or endorsing bills on behalf of customers.
(*c*) By granting loans, overdrafts, and cash credits.

3. Public Deposits

Public deposits arise when company invites general public to deposit their savings for a certain period of time and at a given rate of interest. Public deposits are external source of finance and thus form part of loan capital of the company. Since public deposits can be upto a period of three years and deposits that fall due for payment can be renewed, these can be used to finance working capital requirements and also serve as source of intermediate financing.

Merits

(*a*) The method of raising funds through public deposits is simple and does not entail any complicated formalities.
(*b*) It is relatively less costly method of raising short-term and intermediate funds.
(*c*) Public deposits are usually unsecured and thus create no charge on assets of the company.
(*d*) Since rate of interest payable on them is fixed, public deposits enable the company to trade on equity and thus increase rate of equity dividend.

Demerits

(*a*) Public deposits are highly unrealiable and uncertain source of finance. For a flourishing company enjoying good reputation, deposits pour in. During depression or financial stringency, this source dries up. Even a slight rumour about financial position of the company makes this source highly unpredictable.

(*b*) The system is also injurious to proper growth of capital market. Use of public deposits as source of 1.intermediate financing may adversely affect supply of funds for industrial securities, more particularly preference shares and debentures.

4. Advances from Customers

Contractors and producers of costly goods with a considerable length of manufacturing period often demand advance money from their customers while accepting orders for executing the contract or supply of goods. Where acceptance of advances from customers is an accepted business practice, prepayments by clients become a useful source of short-term finance.

NEW FINANCIAL INSTRUMENTS AND INSTITUTIONS

1. Certificate of Deposit

Certificate of Deposit is a term deposits with a bank to be paid after certain period with guaranteed rate of interest. This deposit is evidenced by a certificate issued by a bank and hence is popularly known as certificate of deposit. The rate of interest agreed to be paid by the bank is dependent on the cash requirement of the bank and the prevalent rate of interest in market. During the conditions of tight money, bank may offer high rates depending upon its own needs of cash. A certificate of deposit is a negotiable instrument. The holder of certificate of deposit can sell the same by delivery in the market and get payment earlier than maturity. The risk of default in the case of certificate of deposit is comparatively less as it is issued by a bank.

In India, certificate of deposit is issued by banks for a period of 91 days to one year with the minimum amount of Rs.10 lakhs. A certificate of deposit is issued at a discount and the face value is payable at maturity by the issuing bank. The rates of discount keep on varying depending upon cash supply in the money market and bank's own requirement of cash. At times the rates of interest offered by the bank may be 4% to 5% more than the rate for fixed deposit of the identical period. A certificate of deposit is transferable by endorsement and delivery after 45 days of issue. However, in the absence of developed secondary market for certificate of deposits in India , the holder has to reconcile for keeping the same with himself till its maturity.

2. Commercial Paper

Commercial paper is a short-term negotiable money market instrument, consisting of unsecured promissory notes. It is issued in a bearer form with a fixed maturity, typically between 7 days and 3 months. Issues can be made on an occassional basis or more generally, under a medium term revolving programme. Commercial papers may be issued by many types of borrowers including and commercial companies. It is sold either directly by the issuers to investors or placed by intermediary bank or security dealers to investors like insurance companies, pension and provident funds, mutual funds etc.

Advantages of Commercial Papers

The advantage of commercial paper lies in its simplicity. There is hardly any documentation, between the issuer and the investor and there is a flexibility with regard to the maturity of the instrument which can be tailored to the needs of both the issuer and the investor. A well rated company can diversify its sources of finance and raise short-term funds at some what cheaper rates than from banks. This is more true of a financial system where reserve requirements of banks are compulsory,. Investors can earn higher returns than what is obtainable from the banking system or a treasury bills. It also provides an incentive to the issuing companies to remain financially strong and efficient as it reduces the cost of borrowing. It also helps companies in raising long-term funds by becoming better known in the financial world. In the Indian context, commercial papers have another advantage of raising funds from the inter-corporate market, which are, at present, not under the control of monetary authorities.

Eligibility for Issue of Commercial Paper

The Reserve Bank guidelines are aimed at ensuring that only first class corporates enter the commercial paper market. Some of the more important guidelines are:

(*a*) A minimum tangible networth of Rs.10 crores as per the latest audited balance sheet, a working capital limit of Rs.15 crores or above, listing on one or more stock exchange, a P1 + rating from CRISIL and a minimum current ratio of 1.33.
(*b*) Commercial paper maturity has to be minumum 3 months and maximum 6 months from the date of issue.
(*c*) Each issue of commercial paper requires the approval of the RBI.
(*d*) The commercial paper may be issued in multiples of Rs. 25 lakhs, but the minimum amount to be invested by a single investor in the primary market shall be Rs. 1 crore of face value.
(*e*) The aggregate amount to be raised by issue of commercial paper is limited to 20% of the company's working capital limit.
(*f*) Commercial paper is in the form of usance promissory notes, negotiable by endorsement and delivery, and issued at a discount to reflect the interest; the discount rate is to be freely determined by the issuing company. The company issuing commercial paper has also to bear the expenses of the issue, including stamp duty, dealer fee, rating agency fee etc.
(*g*) Commercial papers will be issued to any person or corporate bodies (including banks) registered or incorporated in India as well as incorporated bodies.
(*h*) The issue of commercial paper cannot be underwritten or co-accepted in any manner.

A general permission has been granted by the reserve bank to all companies governed by the Foreign Exchange Regulation Act 1973 (now Foreign Exchange Management Act), to raise deposits by issues of commercial paper.

3. Mutual Funds

A mutual fund is a professionally managed company that pools the funds of investors to invest in diversified portfolio of securities. The mutual fund invests in various types of securities after careful research and analysis. It offers the individual saver advantages of reasonable dividends and capital appreciation coupled with safety and liquidity. Mutual funds offer the golden mean between slow growing bank deposits and high-risk high-yield corporate securities.

4. Stock Invest

This is an instrument newly designed by the banks to avoid the difficulties faced by the investors in company securities. This is an instrument which provides special payment system for investors in the primary capital issues in the last decade. Every public issue of joint stock company is over subscribed by the investing class. This has resulted delay in the allotment process, refund of application money in case of non-allotment, thus causing hardship and loss of interest to the investors. To overcome these difficulties, a new payment instrument called 'stock invest' was designed by the State Bank of India in collaboration with the Securities and Exchange board of India and obtained the permission from RBI to introduce this instruments.

With the introduction of stock-invest, oversubscription of public issues and the resulting refund have been simplified. The refunding of money to the non-allotees for whom (the companies) the oversubscription was a nightmare, the stock invest made the companies to have a sigh of relief.

As far as investor is concerned, he was not getting any interest on the money he paid along with the application upto the date of allotment or rejection. This created float funds for the company which could be used for three months without paying any interest on it. Because of scarce resources and high interest rates some companies were tempted to capitalise float funds.

These funds earned upto 20% interest and this interest was used to meet the expanses in returning the non-allotees.

5. Zero–Interest Bonds (ZIB)

Zero-interest bonds means bonds which are sold at a discount from their eventual maturity value and have zero interest rate.

ZIB is a good instrument for the investors who are ready to wait till the bond is matured. Investors find ZIBs attractive because of low investment cost. Moreover, these bonds mean good tax planning because the bonds do not carry any interest which is otherwise taxable. Another advantage from the investor's point of view is that it eliminates reinvestment risk. For the institutional investors, who are looking for safe and good returns, ZIB's are the best option. Companies also find ZIB's quite attractive to issue because there is no immediate interest commitment on maturity, the bonds can be converted into equity shares or non-convertible debentures, depending upon the requirement of capital structure of the company. ZIBs are best suited for companies with long gestation period as the interest service date is much later.

6. Zero-coupon Bond

It is a process which requires separation of the principal part and interest part of an ordinary bond, and selling them separately to the investors. This process is known as stripping or just strips. This stripping results in two securities, one for the principal part and the other for the interest part which is known as strip. The principal part is stated as a Zero Coupon Bond (ZCB) which is issued and traded at a discount and redeemed at its face value at the maturity. One of the prominent example of ZCB is the IDBI flexibond which would pay Rs. 2 lakhs after 25 years in return for a deposit of Rs. 5300. Essentially, a ZCB is a non-interest bearing instrument that promises a fixed amount upon redemption, which would be higher than the issue price.

QUESTIONS

1. Define debentures.
2. What do you mean by trade credit?
3. What do you mean by certificate of deposit?
4. What do you mean by commercial paper?
5. What is a mutual fund ?
6. What is meant by stock invest?
7. What do you mean by zero-interest bond?
8. What do you mean by zero-coupon bond?

SHORT ANSWER QUESTIONS

1. State the advantages and disadvantages of equity shares capital.
2. Explain the different types of preference shares.
3. State the advantages and disadvantages of preference shares.
4. Explain the different types of debentures.
5. State the advantages and disadvantages of debentures.
6. State the advantages and disadvantages of ploughing back of profit.
7. Explain the various sources of short-term source of finance to a business.
8. Explain the various so new financial instruments which enable a company in raising funds.

17

CHAPTER

WORKING CAPITAL MANAGEMENT

INTRODUCTION

In practice, a firm has also to employ short-term assets, and short-term sources of financing. The management of such assets described as working capital management is an intergral part of the over-all financial management. To that extent, it is similar to the long-term decision-making process because both entail an analysis of the effects of risk and profitablity. The problems involved in the management of working capital differ from those in fixed assets. Probably, the most notable feature of such assets, from the point of view of financial analysis is the time dimension. The operational implication is that discounting and compounding techniques to adjust the value of benefits accuring from such assets over time play a fairly significant role in financial management. In contrast, the stock-in-trade of working capital management, by difinition, is short-term assets which lose their identity fairly quickly, usually within a year. Therefore, in the management of working capital, the time factor is not crucial as a decision-variable. Yet another notable feature of short-term assets is the question of profitability versus liquidity and the related aspect of risk. If the size of such assets is large the liquidity and the related aspect of risk. If the size of such assets is large, the liquidity position would improve, but profitability would be adversely affected as funds will remain idle; conversely, if the holdings of such assets are relatively small, the overall profitability will no doubt increase, but it will have an adversee effect on the liquidity position and make the firm more risky. Working capital management should, therfore, aim at striking a balance such that there is an optimum amount of short-term assets.

DEFINITION AND TYPES AND WORKING CAPITAL

Working capital is that form of capital which flows and changes constantly from one form to another. It is for this reason it is also known as circulating capital. According to Gerstenberg, “circulating capital means current asests of a company that are changed in the ordinary course of business from one form to another, as for example, from cash to inventories, inventories to receivables, receivables into cash.

Gross and Net Working Capital

The total of current assets is known as gross working capital. The excess of current assets over current liabilities is known as net working capital.

Permanent and Variable Working Capital

That irreducible minimum amount of working capital which must remain pemanently invested in diferent current assets of the enterprise is known as permanent working capital. Thus, so long as business is to exist

and run, the firm must always maintain some minimum amount of cash, stock and accounts receivables. Such minimum amount of funds as is permanently locked up in current assets of a business should be regarded as permanent working capital and financed out of long term sources. Permanent working capital is also known as regular working capital.

Working capital requirements of a business firm may increase because of seasonal swings or special needs of the business. Such additional working capital as is required to meet seasonal or special needs of the business is known as variable or irregular working capital.

Significance of Adequate Working Capital

Adequate working capital is significant because of its following advantages:

(*a*) Adequate working capital provides sufficient liquidity to the enterprise and thus ensures its solvency.
(*b*) It adds to credit-worthiness and reputation of the enterprise by ensuring prompt payments to suppliers of raw-materials and other creditors of the firm.
(*c*) Firms maintaining adequate working capital can avail of cash discount and thus add to earnings of their business.
(*d*) Banks and other short-term lenders of money base their decisions for lending short-term loans to the enterprise on the basis of analysis of its working capital. Such analysis is designed to test repaying capacity and liquidity position of the borrowing enterprise.
(*e*) At times, the business may face situation when it needs additional funds to save itself from disaster. Adequate working capital also ensures availability of emergency capital and thus helps the enterprise face such situations more successfully.
(*f*) Earning of profits is not a sufficient guarantee that the company can pay dividend in cash. Adequate working capital ensures that dividends are paid regularly.
(*g*) A firm maintaining adequate working capital can afford to buy raw-materials and other accessories as and when needed. This ensures uninterrupted flow of production. Adequate working capital, therefore, contributes to fuller utilisation of resources of the enterprise.
(*h*) An enterprise maintaining adequate working capital can afford to hold up its stock of finished goods and wait for better marketing opportunities.

Factors Determining the Amount of Working Capital

(*a*) ***Nature of business:*** A trading company requires large working capital. Industrial concern may require lower working capital. A banking company, of course, requires maximum amount of working catpital. Basic and key industries, public utilities, etc. require low working capital because they have a steady demand and continuous cash-inflow to meet current liabilities.
(*b*) ***Size of the business unit:*** The amount of working capital depends directly upon the volume of business. The greater the size of a business unit, the larger will be the requirements of working capital.
(*c*) ***Terms of purchase and terms of sale:*** Use of trade credit may lead to lower working capital, while cash purchases will demand larger working capital. Similarly, credit sales will require larger working capital, while cash sales will require lower working capital.
(*d*) ***Turnover of inventories:*** If inventories are large and their turnover is slow, we shall require larger capital but if inventories are small and their turnover is quick, we shall require lower working capital.
(*e*) ***Process of manufacture:*** Long period, comlex and round about process of production will require larger working capital, while simple, short period process of production will require lower working capital.
(*f*) ***Importance of labour:*** Capital intensive industries, *i.e*., mechanised and automated industries will require lower working capital, while labour intensive industries such as small-scale and cottage industries will require larger working capital.

(*g*) ***Cash requirements:*** If a company has demand for larger cash needs, it requires a larger working capital e.g., at the time of dividend payment, taxation, interest charges, wages and salaries.

(*h*) ***Seasonal variation :*** During the busy season, a business requires larger working capital while during the stock season a company requires lower working capital.

Estimation of Working Capital Requirements

Adequate amount of working capital is essential for the smooth running of a business enterprise. The finance manager should forecast working capital requirement carefully to determine as optimum level of in working capital. While forecasting working capital requirements are to be determined on an averge basis and not on any specific point of time. The estimate of future working capital can be made if the amount of current assets and current liabilities can be estimated.

Problem 1: ABC Ltd. provides you with the following information with the request to prepare a statement of working capital:

(A) Cost Records

Total cost of products is Rs. 10 per unit of which 50% is accounted by materials, overheads are $\frac{2}{3}$ of the labour cost per unit.

(B) Sales Target (Annual)

	Rs.	*Terms*
Zone A – (cost + 50%)	6,00,000	cash
Zone B – (cost + 25%)	5,00,000	1 month credit
Zone C – (cost + 20%)	1,92,000	2 months credit

(C) Other Details

(*i*) Stocks of both raw-materials and finished goods are to be kept for 2 months, while processing takes one month.

(*ii*) 20% of supplies of materials are ensured on cash paymet, 20% of supplies are taken on advance payment for 15 days and remaining suppliers have agreed to extend one month credit.

(D) Time lag in payment of wages and overheads is $\frac{1}{2}$ month.

(E) Debtors are valued at cost.

(F) Cash balance is always kept at 10% of net working capital inclusive of cash.

(*University of Bombay, B. Com., April 1999*)

Solution:

Working note:

(1) Calculation of Selling Price Per Unit

Zone A	Cost price per unit	10
	Add: Profit – 50% of 10	5
		15
Zone B	Cost price per unit	10
	Add: Profit – 25% of 10	2.50
		12.50
Zone C	Cost price per unit	10
	Add: profit – 20% of 10	2
		12

2. Calculation of Annual Units

	SP	*Sales Value*	*Units Annual*
Zone A	15	6,00,000	40,000
Zone B	12.50	5,00,000	40,000
Zone C	12.10	1,92,000	16,000
			96,000

3. Calculation of Units Per Month

$$\frac{96{,}000 \text{ units}}{12 \text{ months}} = 8{,}000 \text{ units per month}$$

4. Monthly Cost Sheet

		8,000 Units
Materials	8,000 @ Rs. 5 per unit	40,000
Labour	8,000 @ Rs. 3 per unit	24,000
Ob	8,000 @ Rs. 2 per unit	16,000
	Total cost	80,000

Statement of Working Capital

1.	Raw-materials – 2 months × Rs. 40,000	80,000
2.	Work-in-progress (1 months)	
	Material – 1 Month × 40,000 = 40,000	
	Labour – 1 Month × $24{,}000 \times \frac{50}{100}$ = 12,000	
	Overheads – 1 Month × $16{,}000 \times \frac{50}{100}$ = 8,000	
3.	Finished Goods (2 month)	60,000
4.	Debtors at cost	1,60,000
	Zone B $\frac{40{,}000 \text{ units} \times \text{Rs. } 10}{12}$ = 33,333	
	Zone C $\frac{16{,}000 \times \text{Rs. } 10 \times 2\text{M}}{12}$ = 26,667	
5.	Advance to suppliers	60,000
	$40{,}000 \times \frac{20}{100} \times \frac{1}{2}$ month	4,000
6.	Cash in Hand	
	$\frac{1}{9}(3{,}64{,}000 - 44{,}000)$	35,556
	$\frac{1}{9} \times 3{,}20{,}000$	
		3,99,556

Less: Current Liabilities

(*a*)	Creditors	$40{,}000 \times \frac{60}{100} \times 1$ month	=	24,000
(*b*)	Labour	$24{,}000 \times \frac{1}{2}$ month	=	12,000
(*c*)	Overhead	$16{,}000 \times \frac{1}{2}$ month	=	8,000
				44,000
		Net working capital		3,55,556

Problem 2: The management of German Collaboration Limited has called for a statement showing the working capital needed to finance a level of activity of 3,00,000 units output for the year. The cost structure for the company's product for the said activity is detailed below:

		Cost per unit (Rs.)
Raw-materials		20
Direct labour		5
Overhead		15
	Total cost	40
	Profit	10
	Selling price	50

1. Past trend indicate that raw-material are held in stock on an average for two months.
2. Work-in-progess will approximate to half a month production.
3. Finished goods remain in warehouse on average for a month.
4. Suppliers of materials extend a month's credit.
5. Two month's credit is normally allowed to debtors.
6. A minimum cash balance of Rs. 25,000 is expected to be maintained.

The production pattern is assumed to be even during the year.

Prepare the statement of working capital determination.

(University of Bombay, B.Com., October 1998)

Solution :

Statement of Estimated Working Capital

Current assets			
1. Stock			
(*a*) Raw-materials:			
5,00,000 × 2 months		10,00,000	
(*b*) Work-in-progress:			
(*i*) Raw-materials			
$5,00,000 \times \frac{1}{2}$m	2,50,000		
(*ii*) Direct labour			
$1,25,000 \times \frac{1}{2}$ m $\times \frac{50}{100}$	3,125		
(*iii*) Overheads			
$3,75,000 \times \frac{1}{2}$ m $\times \frac{50}{100}$	93,750		
		3,75,000	
(*c*) Finished goods			
10,00,000 × 1 M		10,00,000	
			13,75,000
2. Sundry Debtors			25,00,000
12,50,000 × 2M			25,000
3. Cash			49,00,000

Less: Current Liabilities	
Creditors	
5,00,000 × 1 M	5,00,000
	44,00,000
Add: Safety margin (10%)	4,40,000
Required working capital	48,40,000

Problem 3: A company plans to manufacture and sell 400 units of a domestic appliance per month at a price of Rs. 600 each. The ratio of costs to selling price are as follows:

	% of Selling Price
Raw-materials	30%
Packing materials	10%
Direct labour	15%
Direct expenses	5%

Fixed overheads are estimated at Rs. 4,32,000 per annum.

The following norms are maintained for inventory management

Raw-materials	30 days
Packing materials	15 days
Finished goods	200 units
Work-in-progress	7 days

Other particulars are given below:

(*a*) Credit slaes represent 80% of total sales and the dealers enjoy 30 working days credit. Balance 20% are cash sales.
(*b*) Creditors allow 21 working days credit for payment.
(*c*) Lag in payment of overheads and expenses is 15 working days.
(*d*) Cash requirements to be 12% of net working capital.
(*e*) Working days in a year are taken as 300 for budgeting purpose.

Prepare working capital requirement forecast for the budget year. **(ICWA, Inter, June, 2001)**

Solution:

Cost Sheet

Raw-materials $\frac{30}{100} \times 600$	180
Packing materials $\frac{10}{100} \times 600$	60
Direct labour $\frac{15}{100} \times 600$	90
Direct expenses $\frac{5}{100} \times 600$	30
Fixed overhead $\frac{4,32,000}{400 \times 12}$	90
Total cost	450
Profit	150
Selling price	600

Production Details

Production per month	400 units
Production per year 400×12	4,800 units
Production per day $\frac{4,800}{300}$	16 units

Statement showing working capital requirement

Particulars	*No. of units per day*	*Requirements in No. of working days*	*Total requirement in units*	*Cost per units*	*Amt.*
Raw-materials	16	30	480	180	86,400
Packing materials	16	15	240	60	14,400
WIP	16	7	112	285	31,920
Finished goods	–	–	200	450	90,000
Debtors	12.8	30	384	600	2,30,400
$\frac{80}{100} \times 16$					
				Total (A)	4,53,120
Less : Credits					
For raw-materials from suppliers	16	21	336	180	60,480
For packing materials	16	21	336	60	20,160
For overheads and expenses	16	15	240	120	28,800
				Total (B)	1,09,440
Net working capital (A – B)					3,43,680
Add: Cash required at 12% of net working capital					41,242
Total working capital required					3,84,922

Problem 4: The following are the extracts from the balance sheet of a company as on 31.3.1999. Compute the additional working capital required by the company for the year ending 31.3.2000.

Balance Sheet (Extracts only) as on 31.3. 1999

	Rs.	*Rs.*	*Rs.*
Fixed assets:			
Land & Building	5,00,000		
Plant & Machinery	3,00,000		8,00,000
Working capital:			
Current assets:			
Stock	8,00,000		
Debtors	3,00,000		
Cash & Bank	2,00,000		
		13,00,000	
Less: Current liabilities :			
Creditors	3,40,000		

Taxation	80,000		
Bank overdraft	1,40,000		
Bills payable	1,60,000		
		7,20,000	
			5,80,000
			13,80,000

Additional Information

1. It is estimated that sale will increase by 25% next year.
2. Maximum amount of overdraft that can be availed will be only Rs. 1,60,000.
3. There will be no increase in the liability due to increase in exports.
4. Period of credit allowed to customers and stock turnover will remain unaltered.
5. Period of credit allowed by creditors and that for bills payable will remain the same.
6. There will be no increase in total amount of cash and bank balance. **(ICWA, Inter, June 2000)**

Solution:

Statement showing additional working capital requirement

	Current level	*Estimated increase*	*Requirement for next year*
(A) Current assets:			
Stock	8,00,000	2,00,000	10,00,000
Debtors	3,00,000	75,000	3,75,000
Cash & bank balance	2,00,000	–	2,00,000
	13,00,000	2,75,000	15,75,000
(B) Working liabilities			
Creditors	3,40,000	85,000	4,25,000
Taxation	80,000	–	80,000
Bank overdraft	1,40,000	20,000	1,60,000
Bills payable	1,60,000	40,000	2,00,000
	7,20,000	1,45,000	8,65,000
(C) Working capital (A – B)	5,80,000	1,30,000	7,10,000

Additional working capital required:
= 7,10,000 – 5,80,000 = Rs. 1,30,000

Problem 5: A company has prepared its annual budget, relevant details of which are reproduced below:

(*i*)	Sales, Rs. 46.80 Lakhs 25% cash sales and balance on credit	:	78,000 units
(*ii*)	Raw-material cost	:	60% of sales value
(*iii*)	Labour cost	:	Rs. 6 per unit
(*iv*)	Variable overheads	:	Rs. 1 per unit
(*v*)	Fixed overheads (Including Rs. 1,10,000 as depreciation)	:	Rs. 5 lakhs
(*vi*)	Budgeted stock level:		
	Raw-materials	:	3 weeks
	Work-in-progress	:	1 week (material 100% labour and overheads approximately 50%)
	Finished goods	:	2 weeks

(*vii*) Debtors are allowed credit for 4 weeks
(*viii*) Creditors allow 4 weeks credit
(*ix*) Wages are paid bimonthly, *i.e.*, by the 3rd week and by the 5th week for the 1st and 2nd weeks and 3rd and 4th weeks respectively.
(*x*) Lag in payment of overheads : 2 weeks
(*xi*) Cash in hand required : Rs. 50,000

Prepare the working capital budget for a year for the company, making whatever assumptions that you may find necessary. **(ICWA, Inter, June 1998)**

Solution:

Cost Sheet

Raw-materials		36
Labour		6
Variable overheads		1
Fixed overhead (excluding depreciation)		5
	Total cost	48
	Profit	12
	Selling price	60

Statement Showing working capital required

Current Assets	*Duration of period*	*Total No. of units*	*Cost per unit*	*Total cost*
Raw-materials	3 weeks	4,500	Rs. 36	1,62,000
Work-in-progress	1 week	1,500	Rs. 42	63,000
Finished goods	2 weeks	3,000	Rs. 48	1,44,000
Debtors	4 weeks	4,500	Rs. 48	2,16,000
				50,0000
			Total (A)	6,35,000
Current liabilities				
Creditors	4 weeks	6,000	Rs. 36	2,16,000
Lag in wages	2 weeks			18,000
Lag in payment of overheads	2 weeks			18,000
			Total (B)	2,52,000
Net working capital (A – B)				3,83,000

Working Notes:

1. Total sales for 4 weeks is 6,000 units excluding 25% cash sales, credit amounts to 4,500 units.
2. One year is assumed to be 52 weeks.
3. Lag in wages $\frac{2}{52} \times 78{,}000 \times \text{Rs. } 6 = 18{,}000$
4. Lag in payment of overheads $\frac{2}{52} \times 78{,}000 \times \text{Rs. } 6 = 18{,}000$

Problem 6: From the following data, prepare a statement showing working capital requirements for the year 1998:

(*a*) Estimated activity/operations for the year 1,30,000 units (52 weeks)

(*b*) Stock of raw-materials 2 weeks and materials in process for 2 weeks, 50% of wages and overheads are incurred.
(*c*) Finished goods 2 weeks storage
(*d*) Creditors 2 weeks
(*e*) Debtors 4 weeks
(*f*) Outstanding wages and overheads 2 weeks each
(*g*) Selling price per unit Rs. 15
(*h*) Analysis of cost per unit is as follows:

(*i*) Raw-materials $33\frac{1}{3}\%$ of sales
(*ii*) Labour and overheads are in the ratio of 6: 4 per unit
(*iii*) Profit is at Rs. 5 per unit

Assume that operations are evenly spread through the year.

(University of Bombay, B.Com, April 1988)

Solution:

Cost sheet for the week

	Per Unit	*Cost per week*
Raw-materials	5.00	12,500
Labour	3.00	7,500
Overheads	2.00	5,000
Total cost	10.00	25,000
Profit	5.00	12,500
	15.00	37,500

Statement showing estimated working capital for 1998

Current Assets				
(*i*) Raw-materials stock	=	$12,500 \times 2$		25,000
(*ii*) Work-in-progress:				
Material $12,500 \times 2$	=	25,000		
Labour $7,500 \times 2 \times \frac{1}{2}$	=	75,000		
Overheads $5,000 \times 2 \times \frac{1}{2}$	=	5,000		
				37,500
(*iii*) Finished goods				
$(12,500 + 7,500 + 5,000) \times 2$				50,000
(*iv*) Debtors $37,500 \times 4$				1,50,000
				2,62,500
Less : Current liabilities:				
Creditors –	$12,500 \times 2$	=	25,000	
O/s wages –	$7,500 \times 2$	=	15,000	
O/s overheads –	$5,000 \times 2$	=	10,000	
				50,000
Working capital				2,12,500

Management of Cash

Management of cash is an important function of the finance manager. The modern day business comprises numerous units spread over vast geographical areas. It is the duty of the finance manager to provide adequate cash to each of the units. For the survival of the business, it is absolutely essential that there should be adequate cash. It is the duty of the financial manager to have liquidity at all parts of the organisation while managing cash. On the other hand, he has also to ensure that there are no funds blocked in idle cash. Idle cash resources entail a great deal of cost in terms of interest charges and in terms of opportunities lost. Hence, the question of cost of idle cash must also be kept in mind by the finance manager. A cash management scheme, therefore, is a dilicate balance between the twin objectives of liquidity and cost.

Need for Cash

Cash is required to meet three motives. They are as follows:

(*a*) ***Transaction motive:*** Cash is required to meet day-to-day expenses and other payments on due dates. For this reason, inflow of cash from operations should be sufficient. But sometimes this inflow may be temporarily blocked. In such cases, it is only the reserve cash balance that can enable the firm to make its payments in time.

(*b*) ***Speculative motive:*** It implies ability to take advantage of profitable opportunities that may present themselves which may be lost for want of ready settlement.

(*c*) ***Precautionary motive:*** Cash is required to meet contingent events both arising in short run and long run period.

Estimation of Cash Requirement

The first step in cash management is to estimate the requirements of cash. For this purpose cash flow statements and cash budgets are required to be prepared.

The term 'cash flow' depicts the flow of liquid funds as a result of business activities. A cash flow statement records and reflects the quantum and the nature of inflow and outflow of liquid funds. If can either be a projected statement which acts as a guideline for management or a record of actual performance analysing the strength and the weakenss of the short-term financial position. It is thus a vital tool for providing data for a number of managerial decisions.

From the conventional profit and loss account, the management does not know its cash position. It might so happen that, inspite of a big profit, as revealed by the profit and loss account, the company may not have sufficient funds to pay even salaries. This is because adequate profits do not necessarily ensure adequate cash resources. A cash flow statement is actually the summarised form of cash book in which the actual receipts and payments are sectionalised. It shows the sources form where the funds were obtained and the uses to which they were put. Sometimes it is also referred to as 'how come, whre gone' statement, because it explains how the funds came and where they have gone.

Cash flow statements can be prepared in the following two ways: (*i*) showing in detail each item of inflow or outflow of cash irrespective of whether it is capital or revenue in nature; or (*ii*) showing the net inflows/outflows from revenue operations as one consolidated figure and inflows/outflows of capital nature separately.

The preparation of cash flow statement offers the following advantages:

(*a*) It tells the management when to plan and for what amount of liquid funds. Profit is not cash and an increase in profit is not necessarily a comfortable cash situation. The increased inflow from profit may have gone into the financing of stocks and debtors or utilised to acquire fixed assets or repayment of long-term liabilities.

(*b*) It shows the amount of natural accruals, management can assess how much is needed for increase in working capital, and how much can be spared for capital expenditure etc.
(*c*) It reveals the estimated availability of cash, so that advance planning of cash, utilisation becomes possible.
(*d*) It reveals the need for additional cash requirements in advance so that negotiation for obtaining loans could be started in time.

It is because of all these advantages that financial institutions insist on projected cash flows statement for 5-10 years before entertaining loan applications. From the cash flow statement, the financial institutions try to form an idea whether the firm to be financed would be able to generate sufficient cash to pay the interest and instalments in time after meeting their own needs. Recenlty, for the same reason, banks have also started insisting on projected cash flow statement before granting loans for working capital, although the period covered in this case is much shorter.

Cash Budgets for Short Period

Preparation of cash budget month by month would involve making the following estimates:

(*a*) As regards receipts:
  (*i*) Receipts from debtors
  (*ii*) Cash sales, and
  (*iii*) Any other sources of receipts of cash (say, dividend from a subsidiary company)
(*b*) As regards payments:
  (*i*) Payment to be made for purchases
  (*ii*) Payments to be made for expenses
  (*iii*) Payments that are made periodically but not every month:
    1. Debenture interest
    2. Income tax paid in advance
    3. Sales tax etc.
  (*iv*) Special payment to be made in a particular month, for example, dividends to shareholders, redemption of debentures or repayments of loan etc.

Long-range Cash Forecasts

Long-range cash forecasts often resemble the projected source and application of funds statement. The following procedure may be adopted to prepare long-range cash forecasts.

(*i*) Take the cash at bank and in hand in the beginning of the year
(*ii*) Add:
  (*a*) Trading profit (before tax) expected to be earned
  (*b*) Depreciation and other development expenses incurred to be written off
  (*c*) Sale proceeds of assets
  (*d*) Proceeds of fresh issue of shares or debentures; and
  (*e*) Reduction in working capital, *i.e*., current assets (except cash) less current liabilities.
(*iii*) Deduct:
  (*a*) Dividends to be paid
  (*b*) Cost of assets to be purchased
  (*c*) Taxes to be paid
  (*d*) Debentures or shares to be redeemed
  (*e*) Increase in woking capital.

Management of Sundry Debtors

The basic objective of management of Sundry Debtors is to optimise the return on investment on this asset. It is obvious that if there are large amounts tied up on sundry debtors, working capital requirements and consequently interest charges will be high. Also, in such a case, the bad debts and the cost of collection of debts would be high. On the other hand, if the investment in sundry debtors is low, the sales may be restricted, since the competitors may offer more liberal credit terms. Therefore, management of sundry debtors is an important issue and requires proper policies and efficient execution of such policies.

There are basically three aspects of management of sundry debtors. Firstly, the credit policy is to be determined. This involves a trade off between the profits on additional sales that arise due to credit being extended on the one hand and the cost of carrying those debtors and bad debts loss on the other. The second aspect of management of sundry debtors is credit analysis, where by the financial manager determines as to how risky it is to advance credit to a particular party. The third aspect is follow up of debtors and credit collection. Thus, management of sundry debtors involves both laying down credit policies and execution of such policies.

1. **Credit policy:** The credit policy of a firm involves a number of decisons like terms of trade discount, length of the credit period, cash discount and other special terms. These decisions in turn determine investments in sundry debtors, average collection period and bad debt losses. Credit policy involves the following considerations.

What should be the credit period? It the demand of a product is inelastic, the credit period may be small. However, if the product has an elastic demand, the credit period will determine the quantum of sales. The credit period is also dependent on the custom in the industry and the practice followed by various competitors. The availability of funds and the credit risk involved also determine the credit period.

Another important factor in determining the credit period is the possibility of bad debts. It is obvious that this possibility will increase, in case the credit period is too long.

A firm cannot determine the credit period once for all, since the situation in the market keeps on changing. Also, a firm may have a policy of allowing different credit periods to different customers.

2. **Discount policy:** Discounts are normally given to speed up the collection of debts. A cash discount is a means of improving the liquidity of the seller. The rate of discount to be given should depend upon the cost of carrying debts. Suppose, a firm has an annual sales of Rs. 3 crores and an average collection period of two months. It is obvious that at a given point of time the firm will carry debtors amounting to Rs. 50 lakhs. Suppose, it is decided that a 3 % cash discount may be offered to custormers who pay cash immediately. Suppose further that the return on investment of this particular firm is 30%, it is obvious that the firm will gain 30% of 25 lakhs (or Rs. 7.5 kakhs) which can be invested in the expansion programme, etc. Since the firm would spend about Rs. 4.5 lakhs by way of cash discount in such a case would be beneficial to the concern.

Credit information is one of the essential aspect of management of debtors. The credit manager has to refer to a number of sources to obtain credit information. The following are the important sources:

(*a*) *Trade Reference:* The prospective customer may be required to give two or three trade references. Thus, the customer may give a list of personal acquaintances or some other existing creditworthy customers. The credit manager can send a short questionnaire to the referees seeking the relevant information.

(*b*) *Bank References:* Sometime the customer is asked to request the banker to provide the required information. However, bankers in India normally refuse to give detailed and unqualified credit reference.

(*c*) *Credit Bureau Reports:* In some cases the association for specific industries maintain credit bureau which provide useful and authentic credit information for their members.

(*d*) *Past experience:* In case of an existing customer, the past experience of his account would be a valuable source of essential data for scrutiny and interpretation. A shrewd manager can look into the account carefully and try to find out the credit risk involved.

(*e*) *Published Financial Statement:* Sometimes the published financial statements can be examined to see the credit-worthiness of a custormer. Further, if a custormer's name appears in the list of approved suppliers of a government agency or other reputed organisations, it can be taken as a plus point.

(*f*) *Salesman's interriers and reports:* First hand information through personal contact can also aid in judging the credit rating of a customer. Many companies evauate the creditworthiness of their custormers by consulting salesmen or sales representatives. For proper determination of the limit of the customer the salesman should also ascertain the potential sales which the customer can effect to the ultimate customers.

Once the creditworthiness of a client is ascertained, the next question to resolve is to set a limit on the credit. In all such enquries, the credit manager must be discrete and should always have the interest of high sales in view.

3. **Credit Collection:** Efficient and timely collection of debtors ensures that the bad debt losses are reduced to the minimum and the average collection period is shorter. If a firm expends more resources on collection of debts, it is likely to have smaller bad debts. Thus a firm must work out the optimum amount that it should spend on collection of debtors. This involves a trade off between the level of expenditure on the one hand and the decrease in bad debts and investments in debtors on the other.

The collection cell of a firm has to work in a manner that it does not create too much resentment amongst the customers. On the other hand, it has to keep the amount of outstanding under check. It important that clear-cut procedures regarding credit collection are set up. Such procedures must answer questions like the following:

(*a*) How long should a debtor balance be allowed to exist before collection procedures are started?

(*b*) What should be the procedure of following up defaulting customers? How reminders are to be sent and how should each successive reminder be drafted?

(*c*) Should there be a collection machinery whereby personal calls by company's representatives are made?

(*d*) What should be the procedure for dealing with doubtful accounts? Is legal action to be instituted? How should the account be handled?

Management of Inventory

Inventories constitute a major element of working capital. Therefore it is important that investment in inventory is properly controlled. Inventory management covers a large number of problems including fixation of minimum and miximum levels, determining the size of inventory to be carried, deciding about the issues, receipts and inspection procedures, determining the economic order quantity, providing proper storage facilities, keeping check over obsolescence and ensuring control over movement of inventories.

Like management of sundry debtors, management debtors, management of inventories also involves a trade off between the carrying costs and the cost of reduction in sales pursuant to non-availability of inventories for an uniterrupted production programme. Thus, on the one hand, if inventories are kept at a high level, certain cost are incurred like interest lost on money blocked in inventories, cost of storage, cost of obsolescence and other storage losses and cost of maintaining documents concerning the inventories. On the other hand, if inventories are maintained at a low level, there may be interruptions in the production schedule resulting in under-utilisation of capacity and lesser sales. Therefore it is important that inventories are kept at optimum levels and a constant check on the various inventory levels.

QUESTIONS

1. Define working capital.
2. Distinguish between gross and working capital.
3. Distinguish between permanent and variable working capital.

SHORT ANSWER QUESTIONS

1. Explain the significance of adequate working capital in a business.
2. Explain the factors which determine the amount of working capital in a business.
3. Explain the techniques of cash management.
4. Explain the various aspects of managemnt of sundry debtors.
5. Write an analytical note on management of inventory.

EXERCISE 1

Germini Industrial Enterprise propose to manufacture a cosmetic product which has been developed by its research and development. The cost of production is estimated as follows:

	Cost per unit
Raw-materials	Rs. 80
Direct labour	40
Overheads	40
	160

The new product will be sold at Rs. 200 per unit. For the 1st year, sales are estimated at 1,04,000 units. The company is a going concern with its marketing network and it thinks that the maximum credit to be allowed to the customers will be 8 weeks. Other relevant data are given below:

Raw-materials stock required	4 weeks
Processing time (WIP stage)	2 weeks
Finished goods stock	6 weeks
Credit allowed by suppliers	4 weeks

Prepare a statement showing the amount of working capital required by the company. You may make assumptions that may be necessary. **(ICWA, Inter, June 1996)**

[**Answer:** Total amount of working capital required; Rs. 56.50 (in lakhs)]

EXERCISE 2

Maneklal Ltd. newly commencing business in 1997 has the following projected profit and loss account.

	Rs.	*Rs.*
Sales		42,00,000
Less: Cost of goods sold		30,60,000
Gross profit		11,40,000
Administrative expenses		2,80,000
Selling price	2,60,000	5,40,000
Profit before tax		6,00,000

The cost of goods sold is arrived at as follows

Materials used	16,80,000
Wages and manufacturing expenses	12,50,000
Hire charges of machinery	4,70,000
	34,00,000
Less: Stock of finished goods (10% of goods produced not yet sold)	3,40,000
	30,60,000

The figures given above relate only to finished goods and not to work-in-progress.

Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses.

The company keeps materials equivalent to 2 months consumption in stock.

All expenses will be paid one month in arrear.

Suppliers of materials will extend $1\frac{1}{2}$ months credit whereas crefit of 2 months is allowed to customers.

Cash and credit sales are in the ratio of 1 : 4 respectively.

The company wishes to maintain cash balance for contigencies of 10% of the working capital excluding such cash balance.

Prepare an estimate of the requirement of working capital considering investment in debtors at book value.

(University of Bombay, B.Com., October 1997)

[**Answer:** Working capital required Rs. 12,50,553]

EXERCISE 3

Power Link Ltd. furnishes the following information and requests you to prepare statement showing the requirements of working capital for the year 1998.

	Budget for 1998
Production capacity for the year	20,000 units
Production	90%
Cost structure:	
Crude materials	Rs. 30 per unit
Other direct materials	Rs. 20 per unit
Wages	Rs. 9,000 and
Overhead-Fixed	Rs. 15 variable per unit
Profit	20% on sales

Other information:

1. Crude material remains in stock for 2 months.
2. Other direct material remains in stock for 1 month.
3. Finished goods remains in stock for 2 months (to be valued at direct cost)
4. The production process takes place 1 month WIP valuation to be made crude material plus direct material at cost: plus 50% of wages and variable overheads.
5. Time lag in payment of wages 1 month and variable overheads half month.

6. Fixed overheads payable quarterly in advance.
7. Crude material purchased from suppliers against advance payment of two months and other direct material suppliers allows credit of 1 month.
8. Credit allowed to customers as under : (Valued at sales price)
   (*a*) 50% of invoice price against acceptance of bill for 4 months.
   (*b*) 25% of invoice price time lag 2 months.
9. Bank balance to be maintained Rs. 50,000.
10. Production and sales take place evenly throughout the year.

(University of Bombay, B.Com., April 1997)

[**Answer:** Estimated working capital Rs. 9,88,250]

EXERCISE 4

Modern carry on Ltd., manufactured and sold 1,200 TV sets in the year 1995. The production cost per unit was as under:

	Rs.
Materials	5,000
Labour	2,000
Overheads	1,000
Total cost	8,000
Profit	2,000
Selling price	10,000

For the year 1996, it is estimated that:

1. The output and sales will be 1,800 T.V. sets.
2. Price of materials will rise by 20%
3. Wages rate will rise by 25%
4. Overheads will increase by 50%
5. Selling price per unit will be Rs. 12,000

It is also estimated that:

(*a*) Raw-materials remain in stock for half month before issue to production.
(*b*) Finished goods will remain in godown for one month before sale.
(*c*) All sales will be on credit and credit allowed to customers will be as follows:
   (*i*) Acceptance of Bills of exchange for three months against 60% of sales.
   (*ii*) 40% of sales one month credit
(*d*) 60% of Raw-materials requirements will be obtained from the suppliers form Japan by making 3 months advance payments.
(*e*) Wages and overheads are paid one month in arrears.
(*f*) Materials will be in process valued at cost of Raw-materials.

(University of Bombay, B.Com., October 1996)

[**Answer:** Estimated working capital Rs. 75,80,000]

18

CHAPTER

CAPITAL BUDGETING

CAPITAL BUDGETING

Capital budgeting means long-term budgeting for the company as a whole. It is more important than revenue budgeting or financial budgeting since it focuses on the future opportunities and threats of the changing environment on future technological changes, future products and future markets. It involves a period of 7 to 15 years. One of the major functions of top management is to adopt capital budgeting and ensure that the long-term funds are spent wisely.

Equipment, machinery, building, plant, technology etc., have 'economic life' of investment and cash flows from it is spread over a period of years. It differs from 'physical life' in the sense that it refers to risk of diminishing value of cash flow, whereas physical life refers to the number of years the machinery will provide service before it wears out. It may be longer than economic life which is more useful since it helps to scrap old machinery and install latest one in order to cope with competition or changes in demand. If these are not met, economic life is lost and the company faces crisis even though machinery may still have 'physical life'. Such a dynamic factor must form part of capital budgeting.

'Capital expenditure' is cost of acquiring and installing fixed assets. They are different from cost of capital. As they are amortised they become expenditure over a period and so they are 'long-term costs'.

Capital bedgeting includes not merely modernisation, upgradation of technology, expansion and diversification but also research and development and human resource accounting. The latter are more or less qualitative, but produce great impact on the corporate performance. As such capital budgeting is different from 'investment' because the latter is just physical capital and does not involve budgeting which seem to extract a definite predetermined rate of return on investment by various methods. Moreover, it includes not merely long-term cost such as plant capacity expansion, and kind of plant, but also future cost such as R&D, HRA, new processes, new materials, etc. So, capital budgeting must be planned for a number of years and there is a long 'gestation period' between the time when plant/project is planned and the time when it becomes a fruition.

Financial management must focus on capital budgeting in order to achieve its objectives. Otherwise the firm will become sick in course of time.

The proposed investment must be based on careful analysis of future yield or return. In other words 'capital productivity' must be measured by the earnings over the whole life of the asset from which cost of investment or cost of capital is deducted. The estimated earnings must take into consideration risk and uncertainty and indirect effects.

Capital budgeting assumes special significance because of the sophisticated tools or techniques used for evaluating the expected future cash flow so that sound decision will be made as to whether the proposed investment is worthwhile. Since it involves several crores of rupees depending upon the nature of technology, size of investment and complexity of the new process and product involved , it is necessary to appraise the proposal very rigorously to ensure that the expected cash flow is higher than cost of capital. If cost of capital is higher than the cash flow, the proposal should be rejected. Otherwise the company will become sick as it takes in more capital than what it generates. No business firm should ignore this fundamental principle. It is here that cost of capital becomes a very important component of capital budgeting. The importance of capital budgeting as Dr. Weston and Bringham point out, lies in the fact that it ensures survival and growth of a business enterprise. In a competitive environment it can't survive unless equipment, machinery and technology are modernised and upgraded. The future well being of the firm depends on how well this is done and how well it is done better than the competitors. A firm, which lags behind others is bound to become sick. Second, expansion of plant capacity and diversification are essential to achieve economies of scale and higher rate of profit and growth. This is possible when capital is adopted effectively. Third, new buildings and new facilities require capital budgeting. Fourth, research and development and human resources accounting requires capital budgeting.

TECHNIQUES OF CAPITAL BUDGETING

A capital budgeting decision may be defined as the firm's decision to invest its current funds most efficiently in the long-term assets in anticipation of an expected flow of benefits over a series of years. A number of capital budgeting techniques are in use in practice. They are grouped under the following two categories.

1. Non-discounted cash flow or Traditional Technique
   (*a*) Payback period
   (*b*) Accounting Rate of Return
2. Discounted Cash Flow Criteria
   (*a*) Net present value
   (*b*) Internal Rate of Return
   (*c*) Profitability Index

I. TRADITIONAL TECHNIQUES

(*a*) Payback Period

This is one of the traditional methods very much widely employed. It is defined as the number of years required to recover the original cash outlay invested in a project. This is a quantitative method for appraising capital expenditure decisions. This method answers the question; "How many years will it take for the cash benefits to pay the original cost of an investment, normally disregarding salvage value" Cash benefits represent CFAT (Cash Flows After Tax). Thus pay back measures the number of years required for the CFAT to payback the original outlay required in an investment proposal. There are two ways of calculating the payback period. The first method is applied when the cash flow stream is in the nature of annuity for each year of projects life, *i.e.*, CFAT are uniform. In such a situation, the initial cost of investment is divided by the constant annual cash flow:

$$PB = \frac{\text{Cash outlay (Investment)}}{\text{Annual cash inflow}}$$

For example, an investment of Rs.40,000 on a machine is expected to produce CFAT of Rs.8,000 for 10 years, then

$$PB = \frac{\text{Rs. } 40{,}000}{\text{Rs. } 8{,}000} = 5 \text{ years}$$

The payback period of 5 years signifies that the investment in the purchase of the machine will be recovered in 5 years. In other words, 20% of capital invested in the zero time period is recovered every year.

Computation of Payback when a Project's Cash Flows are Unequal

The second method is used when cash flows are not equal but vary from year to year. In such a situation, payback is calculated by the process of cumulating cash flows till the time when cumulative cash flows become equal to the original investment outlay. The following table evaluates an investment proposal which costs Rs.50,000 and yields CFAT of Rs.8,000, Rs.12,000, Rs.15,000. Rs.20,000, Rs.21,000 and Rs. 24,000 in years from 1 to 6 respectively:

TABLE

Year	Annual CFAT	Cumulative CFAT
(1)	(2)	(3)
1	8,000	8,000
2	12,000	20,000
3	15,000	35,000
4	20,000	55,000
5	21,000	76,000
6	24,000	1,00,000

From the table, it is apparent that the payback period would lie between the 3rd and the 4th year. The cumulative figure at the end of 3rd year is Rs.35,000; whereas at the end of fourth year is Rs. 55,000; whereas the initial cost of investment is Rs. 50,000 which is Rs. 15,000 over the cumulative figure at the end of the 3rd year. The cash flow for the 4th year is Rs.20,000. Thus the payback fraction is 0.75, $\left(i.e. \frac{\text{Rs. } 15{,}000}{\text{Rs. } 20{,}000} \right)$.

Therefore the payback period for the project is 3.75 years.

Limitations

(*a*) The first shortcoming of the payback method is that it completely ignores all cash inflows after the payback period. This could be very misleading in capital budgeting evaluations:

Example

TABLE

	Project X	*Project Y*
Total cost of the project	Rs. 15,000	Rs. 15,000
CFAT (Cash in flows)		
Year 1	5,000	4,000
2	6,000	5,000
3	4,000	6,000
4	0	6,000
5	0	3,000
6	0	3,000
Payback period	3 years	3 years

In the above table the projects differ widely in respect of cash inflows generated after the payback period. The cash flow for project X stops at the end of the third year while that of Y continues for a further period upto the sixth year. In project Y, the cash inflows of Rs. 12,000, continues from 4th year to 6th year, whereas project X does not yield any cash inflow after the 3rd year. Under payback method, however, both the projects would be given equal rankings, which is apparently incorrect. Therefore, it cannot be regarded as a measure of profitability. Its failure lies in the fact that it does not consider the total benefits accuring from the project.

(*b*) Another deficiency of the payback technique is that it does not measure correctly even the cash flows expected to be received correctly. It considers only the recovery period as a whole. This happens because it does not discount the future cash inflows but rather treats a rupee received in the second or third year as valuable as a rupee received in the first year. In other words, to that extent the payback method fails to consider the pattern of cash inflows. It ignores the time value of money.

(*c*) Another flaw of the payback method is that it does not take into consideration the entire life of the project during which cash flows are generated. As a result, projects with large cash inflows in the latter part of their lives may be rejected in favour of less profitable projects which happen to generate a larger proportion of their cash inflows in the earlier part of their lives.

Problem 1: ITC Ltd., have decided to purchase a machine to augment the company's installed capacity to meet the growing demand for its products. There are three machines under consideration of the management. The relevant details including estimated yearly expenditure and sales are given below. All sales are on cash. Corporate income tax rate is 40%. Interest on capital may be assumed to be 10%.

	Machines		
	1	2	3
	Rs.	*Rs.*	*Rs.*
Initial Investment required Estimated annual	3,00,000	3,00,000	3,00,000
Sales	5,00,000	4,00,000	4,50,000
Cost of production: (estimated)			
Direct materials	40,000	50,000	48,000
Direct labour	50,000	30,000	36,000
Factory overheads	60,000	50,000	58,000
Administration costs	20,000	10,000	15,000
Selling and distribution costs	10,000	10,000	10,000

The economic life of machine 1 is 2 years, while it is 3 years for the other two. The scrap values are Rs. 40,000, Rs. 25,000 and Rs, 30,000 respectively.

You are required to find out the most profitable investment based on 'pay back method'.

(ICWA, Inter, June 1997)

Solution:

Statement showing payback period of the three machines

	Machine 1		Machine 2		Machine 3	
Initial Investment required		3,00,000		3,00,000		3,00,000
Annual sales expected		5,00,000		4,00,000		4,50,000
Less: Cost of sales:						
Direct materials	40,000		50,000		48,000	
Direct labour	50,000		30,000		36,000	
Factory overhead	60,000		50,000		58,000	

Cost of production	1,50,000		1,30,000		1,42,000	
Depreciation	1,30,000		91,667		90,000	
Adm. cost	20,000		10,000		15,000	
Selling & Distribution	10,000		10,000		10,000	
Interest on capital	30,000		30,000		30,000	
		3,40,000		2,71,667		2,87,000
Profit before tax		1,60,000		1,28,333		1,63,000
Less: Tax @ 40%		64,000		51,333		65,200
Profit after tax		96,000		77,000		97,800
Add: Depreciation		1,30,000		91,667		90,000
Net cash flow		2,26,000		1,68,667		1,87,800
Payback period = $\frac{\text{Initial investment}}{\text{Net Annual Cash flow}}$		1.33		1.78		1.60

Machine 1 is the most profitable as it has the lowest payback period.

2. Average Rate of Return

The other traditional method of evaluating proposed capital expenditure is also known as the accounting rate of return method. It represents the ratio of the average annual profits after taxes to the average investment in the project. It is based upon accounting information, rather than cash flow. There is no unaminity regarding the definition of the rate of return. There are a number of alternative methods for calculating the ARR. The most common usage of the average rate of return expresses it as follows:

$$\text{ARR} = \frac{\text{Average annual Profits after taxes}}{\text{Average investment over life of the project}} \times 100$$

The average profits after taxes are determined by adding up the after tax profits expected for each year of the project's life and dividing the result by the number of years. In the case of annunity, the average after tax profits are equal to any year's profits.

The average investment is determined by dividing the investment by two. The averaging process assumes that the firm is using straight line method of depreciation, in which case the book value of the asset declines at a constant rate from its purchase price to zero at the end of its depreciable life. This means, that on the average, firms will have, one-half of its initial purchase price in the books. Consequently, if the machine has salvage value, then only the depreciable cost (cost-salvage value) of the machine should be divided by two in order to ascertian the average net investment, as the salvage money will be recovered at the end of the life of the project. Therefore, an amount equivalent to the salvage value remains tied up in the project throughout its life time. Hence, no adjustment is required to the sum of the salvage value to determine the average investment. Likewise, if any additional net working capital is required in the initial year of the project life which is likely to be released at the end of the projects life, the full amount of working capital should be taken in determining the relevent investment for the purpose of calculating ARR. Thus, the average investment consists of the following:

$$\text{Net working capital} + \text{Salvage value} + \frac{1}{2}(\text{Initial cost of machine} - \text{Salvage value})$$

Example:

Initial investment	Rs. 11,000
Salvage value	1,000
Working capital	2,000
Service life	5 years

The straight line method of depreciation is adopted

Solution:

Average investment

$$= 2{,}000 + 1{,}000 + \frac{1}{2}(11{,}000 - 1{,}000)$$
$$= \text{Rs. } 8{,}000$$

Limitations

(*a*) The earnings calulations ignore the re-investment potential, and hence the total benefit of the project. This drawback can be overcome by using the modified AR approach which involves average cash flows instead of the average profits.

(*b*) It does not take into account the time value of money. Normally, benefits in the earlier years and later years cannot be valued at par.

(*c*) The ARR criterion of measuring the worth of investment does not differentiate between the size of the investment required for each project competing investment proposals may have the same ARR, but may require different average investment.

(*d*) This method does not take into consideration any benefits which can accrue to the firm from the sale or abandonement of equipment which is replaced by the new investment.

Problem 2: X Ltd. intends to acquire a new machine and finds the following alternatives:

	Machine 'A'	Machine 'B'
Cost	Rs. 10,00,000	Rs. 1,00,000
Estimated residual value	–	–
Estimated life	4 years	4 years
Estimated future profits (before depreciation)		
year 1	50,000	20,000
2	50,000	30,000
3	30,000	50,000
4	10,000	50,000

Based on, accounting rate of return method which of the two machines should be acquired?

Solution:

	Machine 'A' Rs.	Machine 'B' Rs.
Total profit before depreciation	1,40,000	1,50,000
Total profit after depreciation	40,000	50,000
Accounting rate of return	$= \frac{40{,}000}{1{,}00{,}000}$	$\frac{50{,}000}{1{,}00{,}000}$
	= 40%	= 50%
Average profit after depreciation	10,000	12,500
Average return on investment	10%	12.5%
Return on average investment	$= \frac{40{,}000}{50{,}000}$	$\frac{50{,}000}{50{,}000}$
	= 80%	= 100%
Average return on average investment	$= \frac{10{,}000}{50{,}000}$	$\frac{12{,}500}{50{,}000}$
	= 20%	25%

$$\left(\text{Average Investment} = \frac{1,00,000 + 0}{2}\right)$$

$$= 50,000$$

Machine 'B' yielding higher return on investment should be acquired.

II. Discounted Cash Flow or Time Adjusted Techniques

This takes into consideration the time value of money while evaluating the costs and benefits of a project. The discounted cash flows are popularly known as cost of capital. This is defined as the minimum discount rate that must be earned on a project that leaves the firm's market value unchanged. Another important feature of this is that it takes into consideration all benefits and costs occuring during the entire life of the project.

(*a*) Net Present Value (NPV) Method

The best method for investment proposal is the NPV method or the discounted cash flow method. This method takes into account the time value of money. This method involves the following steps.

(*i*) *Determine the Cash Outflow:* Each project will involve cetain investment of cash at certain point of time. For example a project which requires an initial investment of Rs. 10 lakhs has an outflow of Rs. 10 lakhs.

(*ii*) *Determine the Cash Inflow:* This can be calculated by adding depreciation to profit after tax arising out of that particular project.

Example: For calculating the NPV, let us imagine that a project under consideration will give the following inflows:

Year end	Cash inflows
1	2,30,000
2	2,28,000
3	2,78,000
4	2,83,000
5	2,33,000
6	80,000
	(Scrap value)

(*iii*) To discount each cash inflow and work out its present value:

For this purpose, the discounting rate must be determined. Normally, the discounting rate equals the cost of capital, since a project must earn at least that much as is paid out on the funds blocked in the project.

The concept of present value can be explained by considering an example. We know that a rupee recieved this year is not equal to a rupee received next year. This is because the rupee can be deposited in a bank, say at 6% and it becomes Rs. 1.06 next year. Therefore, if somebody offers to give a rupee next year in exchange for a rupee this year, we would ask him to give us 1.06 next year or Re. 1 now. In other words, Rs. 1.06 is the future value of Re 1 at the rate of 6% for one year. or Re. 1 is the present value of Rs. 1.06 at the rate of 6% for one year.

To calculate the present value of various inflows we should refer to the present value table. With the help of this table we can work out the present value of each cash inflow. The present value of Rs. 2,30,000 received after one year at the rate of 6% can be calculated by referring to the 6% column of the table corresponding to year 1. We find a discount factor of 0.943. Thus the present value is Rs. $2,30,000 \times 0.943 = 2,16,890$. In other words, Rs. 2,16,890 received now or Rs. 2,30,000 received after a year are equal, provided we can invest, the monies received now @ 6% p.a.

Similarly, the present value for other cash inflows would be as follows:

Year end	*Cash inflow*	*Discount factor 6%*	*Present value*
1	2,30,000	0.943	2,16,890
2	2,28,000	0.890	2,02,920
3	2,78,000	0.840	2,33,520
4	2,83,000	0.792	2,24,136
5	2,33,000	0.747	1,74,051
6	80,000	0.705	56,400

The total present value of all cash inflows is Rs. 11,07,917 as compared to the total cash outflows of Rs. 10,00,000. Hence Rs. 1,07,917 is the net present value, *i.e.*, the difference between the total of discounted cash inflows and the discounted cash outflows. There is no need to discount the cash outflows in this case since the money is immediately spent. Comparing the two, we know the present-value of inflows is higher than the present value of outflow at 6%.

Problem 3: A Ltd. installed a machine with an estimated life of 5 years and used it or 3 years. The initial cost including installation charges amounted to Rs. 80 lakhs. According to current assessment, the machine can be used for another 4 years. The company has just received an offer of Rs. 50 lakhs for the machine. It is unlikely that a similar offer will be received in the near future. The machine is used for manufacturing a product which has a falling demand. Losses are anticipated over the next two years. Details of profitability projections for the next 4 years are as follows:

	Years			
	1	*2*	*3*	*4*
	(in lakhs of rupees)			
Sales	50	45	40	35
Less: Variable cost	27	24.50	23	18
Fixed cost (allocated)	8	7.50	6.50	6
Depreciation	16	16	–	–
Net profit/(loss)	(1)	(3)	10.50	11

As the estimated working results are not very good and as the company has got a very good offer for the machine, the managing director feels that the machine should be sold immediately.

What is your advice to the managing director? Support your answer with workings.

Cost of capital of the company is 15%. Ignore tax.

Note: Present value of rupee 1 at 15%

At the end of year	Present value
1	0.8696
2	0.7561
3	0.6574
4	0.5717

(ICWA, Inter, December 1998)

Solution:

Statement Showing NPV

Year	*Cash flow (Sales – V.C) (See note) (in lakhs)*	*Discount Factor 15%*	*Present Value*
1	23.00	0.8696	20.00
2	20.50	0.7561	15.50
3	17.00	0.6574	11.18
4	17.00	0.5717	9.72
Present value of the option of retaining the machine			56.40

Present value of the offer received : Rs. 50 lakhs.

Hence it is better to retain the machine and use it for another 4 years.

Note: Allocated fixed costs and depreciation are not relevant costs as they are past cost, irrespective of the decision taken.

Problem 4: National Elecronics Ltd., an electronic goods manufacturing company, is producing a large range of electrical goods. It has under consideration two projects 'X' and 'Y' cash costing Rs. 120 lakhs. The projects are mutually exclusive and the company is considering the question of selecting one of the two. Cash flows have been worked out for both the projects and the details are given below 'X' has a life of 8 years and 'Y' has life of 6 years. Both will have zero salvage value at the end of their operational lives, The company already making profits and its tax rate in 50% the cost of capital of the company is 15%.

Net Cash Inflow

At the end of the year	*Project 'X'*	*Project 'Y' (in lakh rupees)*	*Present value of rupess at 15%*
1	25	40	0.870
2	35	60	0.756
3	45	80	0.685
4	65	50	0.572
5	65	30	0.497
6	55	20	0.432
7	35	–	0.372
8	15	–	0.327

The company follows straight line method of depreciating assets. Advise the company regarding the selection of the project. **(ICWA, Inter, June, 1996)**

Solution:

Statement showing net present value of projects

(Rs. in lakhs)

Project 'X'

End of year	*Cash flow*	*Depreciation*	*PBT*	*Tax*	*PAT*	*Net C.F. (PAT + Dep.)*	*Discount factor*	*PV*
1	25	15	10	5	5	20	0.870	17.40
2	35	15	20	10	10	25	0.756	18.90
3	45	15	30	15	15	30	0.658	19.74
4	65	15	50	25	25	40	0.572	22.88
5	65	15	50	25	25	40	0.497	19.88
6	55	15	40	20	20	35	0.432	15.12

7	35	15	20	10	10	25	0.376	9.40
8	15	15	–	–	–	15	0.327	4.91
					P.V of cash inflows			128.23
					Less : Initial investment			120.00
					Net present value			8.23

Project 'Y'

1	40	20	20	10	10	30	0.870	26.10
2	60	20	40	20	20	40	0.756	30.24
3	80	20	60	30	30	50	0.658	32.90
4	50	20	30	15	15	35	0.572	20.02
5	30	20	10	5	5	25	0.497	12.43
6	20	20	–	–	–	20	0.432	8.64
					P.V. of cash inflows			130.33
					Less: Initial investment			120.00
					Net present value			10.33

As project 'Y' has a higher net present value, it has to be taken up.

Problem 5: A company is considering whether it should spend Rs. 4 lakhs on a project to manufacture and sell a new product. The unit variable cost of the product is Rs. 6. It is expected that the new product can be sold at Rs. 10 per unit. The annual fixed costs (only cash) will be Rs. 20,000. The project will have a life of six years with a scrap value of Rs. 20,000. The cost of capital of the company is 15%. The only uncertain factor is the volume of sales. To start with the company expects to sell at least 40,000 units during the first year.

Required:

(*a*) Net present value of the project based on the sales expected during the first year and on the assumption that it will continue at the same level during the remaining years.

(*b*) The minimum volume of sales required to justify the project.

[**Note:** Annurity of Re. 1 at 15% for 6 years has a present value of Rs. 3.7845 and present value of Re. 1 received at the end of sixth year at 15% is Rs. 04323] **(ICWA, Inter, December 1997)**

Solution:

(*i*) Selling price per unit		Rs. 10
Varialble cost per unit		6
Contribution per unit		4
Total contribution per year @ Rs. 4 per unit for 40,000 units	=	1,16,000
Less: Cash outfllow as fixed cost		20,000
Net cash inflow per year		1,40,000
Total cash inflow at present value for 6 years = 1,40,000 × 3,7845	=	5,29,830
PV of scrap value of Rs. 20,000 at the end of 6th year = 20,000 × 0.4323	=	8,646
		5,38,476
Less: Initial investment		4,00,000
Net present value of the project		1,38,476

(*ii*) Let *x* be the number of units to be sold to justify the project

Present value of x units @ Rs. 4 contribution per unit and Rs. 20,000 as fixed cost = $(4x - 20{,}000)$ 3.7845
Present value of scrap at the end of 6th year = Rs. 8,646
To justify the project its net present value should be positive
Hence, $[(4x - 20{,}000) \times 3.7845 + 8{,}646] - 4{,}00{,}000$
x = 30,853 units

(*b*) Internal Rate of Return (IRR) Method

The internal rate of return is the rate which equates the present value of cash inflows with the present value of cash outflows of an investment. In other words, it is the rate at which the net present value of the investment is zero. It is called the internal rate because it is solely dependent on the outlay and proceeds associated with the project and not on any rate determined outside the investment. If the calculated present value of the expected cash inflows is lower than the present value of cash outflows, a lower rate should be tried. On the other hand, a higher rate should be tried where the present value of inflows is higher than the present value of outflows. This process will be repeated unless the net present value becomes zero. Alternatively, internal rate can be obtained by interpolation method when we come across two rates –one with positive NPV and the other with negative NPV. The Internal rate of return is considered as the highest rate of interest which a business is able to pay on the funds borrowed to finance the project out of cash inflows generated by the project. It is also referred to as the 'break–even' rate of borrowing from the bank.

Example: An investment of Rs. 1,38,500 yield the following cash inflows (profit before depreciation but after tax)

Year	*Rs.*
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000

Let us first discount the various cash inflows at 6% to see whether that is the internal rate of return.

Year	*Amount*	*6% factor*	*Discounted value*
1	30,000	0.943	28,290
2	40,000	0.890	35,600
3	60,000	0.840	50,400
4	30,000	0.792	23,760
5	20,000	0.747	14,940
			Rs. 1,52,900

Since our cash outflow is 1,38,500 and our total discounted cash inflow is much higher than that, it is apparent that the internal rate of return is higher than 6%. Let us try 12% as the discounting rate.

Year	*Amount*	*12%factor*	*Discounted value*
1	30,000	0.893	26,790
2	40,000	0.797	31,880
3	60,000	0.712	42,720
4	30,000	0.636	19,080
5	20,000	0.567	12,340
			Rs. 1,31,810

This time the total discounted cash inflow (Rs. 1,31,810) is lower than the cash outflow (1,38,500). Hence a lower rate than 12% is the internal rate of return. Let us try 10%

Year	*Amount*	*10% factor*	*Discount value*
1	30,000	0.909	27,270
2	40,000	0.826	33,040
3	60,000	0.751	45,060
4	30,000	0.683	20,490
5	20,000	0.621	12,420
			1,38,280

At 10% discounting rate, the sum of the present value of cash inflows is more or less equal to the cash outflow. Hence the internal rate of return is 10%.

Merits

(*a*) This takes into account, the time value of money.
(*b*) The cash flow stream is considered in its entirety by this technique.
(*c*) This technique is more meaningful and acceptable to users because it satisfies them in terms of the rate of return of capital.

Limitation

1. The IRR is difficult to understand and involves complicated computational problems.
2. It may yield results inconsistent with the NPV method if the projects differ in their expected lives; cash outlays or timing of cash flows.
3. It may yield negative or multiple rates under certain circumstances.

Problem 6: United Industries Ltd., has an investment budget of Rs. 100 lakhs for 2001-02. It has short listed two projects A and B after completing the market and technical appraisal. The management wants to complete the financial appraisal before making the investment. Further particulars regarding the two projects are given below:

	A	B
	(*In lakhs of rupees*)	
Investment required	100	90
Average Annual cash inflow before depreciation and tax (estimated)	28	24

Salvage Value: Nil for both projects
Estimated Life : 10 years for both projects.
The company follows straight line method of charging depreciation. Its tax rate is 50%
You are required to calculate:

(*a*) payback period; and
(*b*) IRR of the two projects

Note: P.V. of an annuity of Re. 1 for 10 years at different discount rates is given below:

Rate (%)	Annuity value for 10 years
10	6.1446
11	5.8992
12	5.6502
13	5.4262
14	5.2161
15	5.0188

(ICWA, Inter, June 2001)

Solution:

Statement Showing Payback Period

	Project 'A' *(Rs. in lakhs)*	*Project 'B'* *(Rs. in lakhs)*
Cash flow p.a. before depreciation & tax	28	24
Less: Depreciation	10	9
Profit before tax	18	15
Less: Tax @ 50%	9	7.50
Profit after tax	9	7.50
Add: Depreciation	10	9.00
Post tax cash flow	19	16.50
1 Payback period = $\frac{\text{Investment}}{\text{Post – tax annual cash flow}}$	$= \frac{100}{19}$	$\frac{90}{16.5}$
	= 5.26 yrs.	= 5.45 yrs.

Internal Rate of Return
Present value of cash inflow and NPV
Project A

	12%	*13%*	*14%*
Cash inflow	107.35	103.10	99.11
Less: Investment	100.00	100.00	100.00
	7.35	3.10	(–)0.89

$$\text{IRR} = 13\% + \frac{3.10}{(3.10 + 0.89)}$$

= 13 + 0.775 = 13.78%

Project B

	12%	*13%*	*14%*
Cash inflow	93.23	89.53	
Less: Investment	90.00	90.00	
	3.23	(–)00.47	

$$\text{IRR} = 12\% + \frac{3.23}{3.23 + 0.47}$$

= 12% + 0.87 = 12.87%

Project 'A' is better of the two, although the difference is not very substantial. It may be desirable to assess the risk and locate the vulnerable aspectes of the projects, by using other techniques before taking the final decision.

Problem 7: Orient Enterprises Ltd. have under consideration two projects A and B for the present, it wants to take up only one of the two projects and not both. The details regarding the two projects are given below.

	Project A	*Project B*
	(in lakhs of rupees)	
Investment required	95	200
Estimated net cash flow (PAT + Depr.) at the end of year 1,	40	80

Estimated net cash flow (PAT + Depr.) at the end of year 2,	40	80
Estimated net cash flow (PAT + Depr.) at the end of year 3,	45	120

The cost of capital of the company is 12%. Using NPV method, which project would you recommend? Also calculate the internal rate of return of the two projects.

Note: Present value of Re. 1 at the end of each year during the three year period at various rates of discount are given below:

Year	*Discount rate*								
	10%	11%	12%	13%	14%	15%	16%	17%	18%
1	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8547	0.8475
2	0.8265	0.8116	0.7972	0.7832	0.7695	0.7561	0.7432	0.7305	0.7182
3	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.6244	0.6086

(ICWA, Inter, December 1999)

Solution:

Net present value of projects with cash flows discounted at 12%

(Rs. in Lakhs)

Year	*P.V factor at 12%*	*Project A*		*Project B*	
		Cash flows	*Present value*	*Cash flows*	*Present value*
0	1.0000	(–)95	(–)95	(–)200	(–)200
1	0.8929	40	35.72	80	71.43
2	0.7972	40	31.89	80	63.78
3	0.7118	45	32.03	120	85.42
			NPV (+) 4.64		NPV (+) 20.63

Internal rate of return of project A

(Rs. in Lakhs)

Year	*Cash flows*	*NPV at 14% Discount factor*		*NPV at 15% Discount factor*	
		P.V. factor	*P.V*	*P.V factor*	*P.V*
0	–95	1.0000	–95	1.000	–95
1	40	0.8772	35.09	0.8696	34.78
2	40	0.7695	30.78	0.7561	30.24
3	45	0.6750	30.38	0.6750	29.59
			NPV (+) 1.25		NPV (–) 0.39

IRR or Project 'A' $= 14\% + \frac{1.25}{(1.25 + 0.39)} \times 1\% = 14.76\%$

Internal rate of return (IRR) of project B (Rs. in Lakhs)

Year	*Cash flows*	*NPV (at 17% Discount factor)*		*(NPV at 18% Discount factor)*	
		P.V. factor	*P.V*	*P.V. factor*	*P.V*
0	(–) 200	1.0000	(–) 200	1.0000	(–)200
1	80	0.8547	68.38	0.8475	67.80
2	80	0.7305	58.44	0.7182	57.46
3	120	0.6244	74.93	0.6086	73.03
			NPV 1.75		NPV (–) 1.71

$$\text{IRR of Project B} = 17\% + \frac{1.75}{(1.75 + 1.71)} \times 1\%$$

$$= 17.51\%$$

As there is no capital Rationing it is more profitable to take up Project B.

(*c*) Profitability index or desirability factor: Profitability Index is the ratio of the present value of future cash benefits, at the required rate of return to the initial cash outflow of the investment. Expressed in the form of a formula:

$$\text{Profitability index} = \frac{\text{PV of cash outflow}}{\text{Initial cash outlay}}$$

Suppose, we have three projects in view, each involving discounted cash outflow of Rs. 5,50,000; 75,000 and 1,00,20,000. Suppose further that the sum of discouted cash inflows for these projects are Rs. 6,50,000, 95,000 and 1,00,30,000. The profitability index for the three projects would be as follows:

(*a*) $\frac{6,50,000}{5,50,000} = 1.18$

(*b*) $\frac{95,000}{75,000} = 1.27$

(*c*) $\frac{1,00,30,000}{1,00,20,000} = 1.001$

It would be seen that in absolute terms project (c) gives the highest cash inflow, yet its profitability index is low. This is because the outflow is very high also. This factor helps in ranking the various projects.

Problem 8: Three independent projects which are not mutually connected and any of them can be independenlty considered and any of them can be selected. The overall cost of capital of the company is 10% and the expected cash flows from the projects are given:

Cash flows (income)

Project No.	*Investment required now*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
I	10,000	12,000	3,000	–	–	–
II	14,000	–	–	10,000	5,000	7,000
III	9,000	–	4,000	5,000	5,000	2,000

You are required to advise the management about the choice of the project.

Solution:

Year	*Discount factor @ 10%*	*Project I*		*Project II*		*Project III*	
		cash	*P.V.*	*Cash flow*	*P.V. flow*	*Cash*	*P.V.*
1	0.909	12,000	10,908	–	–	–	–
2	0.826	3,000	2,478	–	–	4,000	3,304
3	0.751	–	–	10,000	7,510	5,000	3,755
4	0.683			5,000	3,415	5,000	3,415
5	0.621			7,000	4,347	2,000	1,242
		15,000	13,386	22,000	15,272	16,000	11,716

As the investment required for each project is different profitability index is the best.

$$\text{P.I.} = \frac{\text{Sum of discounted cash inflows}}{\text{Sum of discounted cash outflows}}$$

$$\text{Project I} = \frac{\text{Rs. } 13{,}386}{\text{Rs. } 10{,}000} = 1.339$$

$$\text{Project II} = \frac{\text{Rs. } 15{,}272}{\text{Rs. } 14{,}000} = 1.091$$

$$\text{Project III} = \frac{\text{Rs. } 11{,}716}{\text{Rs. } 9{,}000} = 1.302$$

Since project I is the hightest, project I is preferable.

Relationship between Risk and Return

In the techniques explained earlier it was assured that cash flow – both inflows and outflows – accrue as a result of the various capital expenditure proposals can be known with certainty. This assumption is not realistic in actual circumstances. We must realise that evaluation of capital expenditure proposals involves projections of the future. Future is always uncertain. Nobody can say with certainty about the quantum and frequency of the future cash flows. In other words, the assumption that the cash flows are certain and, therefore, deterministic in nature is not a realistic assumption. The estimates of cash inflows and outflows can only be what may be termed as probability estimates, *i.e.*, they represent only likely happenings. We must appreciate that there are too many unknown and uncertain factors which influence cash and, therefore, it is important to recognise that each cash inflow or outflow is only a probable figure.

Therefore a more realistic approach for capital budgeting would be to recognise that the cash flows are generally jprobabilistic in nature and in most circumstances only random variables, *i.e.*, they may happen or they may not happen. This approach highlights the need for considering the question of risk and uncertainty while carrying out the capital budgeting exercise.

Actually, if risk and uncertainty factors are not taken into account, there is always a danger that the capital expenditure evaluation may produce misleading results. This is because we know that risk and return have a direct relationship. Higher the return from a project, higher would be the risk normally. Similarly, lower the return, lower would be the risk. Now, if we use the net present value method or the IRR method or any such method which evaluates only the return aspect, there is every possibility that we shall end up in selecting projects with higher risk. In other words, the tendency to ignore risk and uncertainty factors and to rely only on measures of profitability – whether time adjusted or not – can result in accepting highly risky projects. It is therefore, necessary that the capital budgeting exercise should attempt to optimise both, the return and risk factor.

The following are the various methods of accounting for risk.

1. **Application of various possibilities to the cash flows:** Under this method the management has to work out the various possible cash flows in different years, Thus, the management by keeping in view the key factors which would affect the future cash flows may work out not a single set of cash flows but a multiple set of possible cash flows which may arise out of the given capital expenditure proposal. The next step would be to estimate the probabilities attached to each flow. From this the expected cash flows can be calculated.

Suppose there are 2 projects A & B each requiring an initial investment of Rs. 15 lakhs and having 5 years life. Suppose further that the cash flows from the two projects and their probabilities are as follows:

Project A

Probability weights	0.20	0.20	0.40	1.10	0.10
Years 1 (Rs. in lakhs)	3	5	6.5	7.5	8
2	3	4	5.5	7.0	8
3	3	4	4.5	5.0	6
4	1	2	3.2	4.0	5
5	1	2	2.2	4.0	5

In other words, in the first year the probability of earning Rs. 3 lakhs is 0.2, of earnings Rs. 5 lakhs is also 0.2, of earnings Rs. 6.5 lakhs is 0.4 and so on

Project B

Probability	*Cash flows in each of the five years (Rs. in lakhs)*
0.10	3.0
0.20	3.5
0.40	4.5
0.20	5.5
0.10	6.0

The expected cash flows in each of the five years for project A can be calculated by taking the weighted average as below:

Year 1

$0.20(3) + 0.20(5) + 0.40(6.5) + 0.10(7.5) + 0.10(8) =$ 5.75 lakhs

Year 2

$0.20(3) + 0.20(4) + 0.40(5.5) + 0.10(7) + 0.10(8) =$ Rs. 5.10 lakhs

Year 3

$0.20(3) + 0.20(4) + 0.40(4.5) + 0.10(5) + 0.10(6) =$ 4.3 lakhs

Year 4

$0.20(1) + 0.20(2) + 0.40(3.2) + 0.10(4) + 0.10(5) =$ 2.78 lakhs

Year 5

$0.20(1) + 0.20(2) + 0.40(3.2) + 0.10(4) + 0.10(5) =$ 2.78 lakhs

Similarly the expected cash flows for each of the five years for project B will be:

$0.10(3) + 0.20(3.5) + 0.40(4.5) + 0.20(5.5) + 0.10(6) = 4.50$ lakhs

If we calculate internal rate of return for the above projects on the basis of expected cash flows, IRR for project A would be 14% and for project B, it would be 15%. However, if we calculate internal rates of return on the basis of most likely or model cash flows without applying probability weights, *i.e.*, the cash flows with the greatest probability of recurring, they would be 17.3% and 15.2% for projects A and B respectively.

It is clear from the above that when model cash flows are taken into account, project A will be prefered but when expected cash flows are taken into account, it is the project B which should be preferred. It is because of the fact that cash inflows from project A vary from year to year whereas in the case of project B they are stable. Since the expected value take into account all the cash flows and their probabilities they are better indicator of the risk involved.

2. **Varying the discounting rate:** Under this method a higher rate of discount is adopted for projects which are considered more risky. Conversely, lower, discount rate is applied for less risky projects. In

the above example, a glance on the cash flows of project A and B would indicate that project A is comparatively more risky, than project B because the distribution of cash flows of project A is negatively skewed whereas that of project B is normal.

As such the management may decide to discount the cash flows of project A by 15% and those of project B by 10%. It may be noted that it is a difficult task to ascertain the extent of riskiness of different projets and then make adjustments in discount rate. Although with the help of standard deviation and coefficient of variation techniques one may be able to determine which project is more risky but the determination of discounting rates may remain to be a subjective decision.

3. **Adjusting the cash flows:** Under this method, risk element is compensated by adjusting cash inflows rather than adjusting the discount rate. Expected cash flows are converted into certain cash flows by applying certainty-equivalent coefficients, depending on the degree of risk inherent in cash flows. To the cash flows having higher degree of certainty, higher certainty-equivalent co-efficient is applied and for cash flows having low degree of certainty, lower certainty-equivalent co-efficient is used. For evaluation of various projects cash flows so adjusted are discounted by a risk free rate.

QUESTIONS

1. What do you mean by capital budgeting?
2. List out the various techniques of capital budgeting?
3. What do you mean by payback period?
4. What do you mean by Accounting Rate of Return.
5. What is NPV?
6. What is IRR?
7. What is profitability index?

SHORT ANSWER QUESTIONS

1. Explain payback period technique of capital budgeting.
2. Explain ARR technique of capital budgeting.
3. Explain NPV technique of capital budgeting.
4. Explain IRR technique of capital budgeting.
5. Explain the relationship between risk and return.

EXERCISE 1

A company is cosidering to expand its production. It can go in either for an automatic machine costing Rs. 2,24,000 with an estimate life of $5\frac{1}{2}$ year or an ordinary machine costing Rs. 60,000 having an estimated life of 8 years. The annual sales and costs are estimated as follows.

	Automatic machine *Rs.*	*Ordinary machine* *Rs.*
Sales (Goods)	1,50,000	1,50,000
Costs:		
Materials	50,000	50,000
Labour	12,000	60,000
Variable overheads	24,000	20,000

Compute the comparative profitability of the proposals under pay-back period.

(University of Madras, B.Com., March 1994)

[**Answer:** Automatic 3.5 years Ordinary 3 years]

As payback period in case of ordinary machinery is shorter, it is to be preferred.

Exercise 2: Modern Electronics Ltd. is considering the purchase of a machine. Two machines A and B are available each costing Rs. 50,000. In comparing the profitability of these machines a discounted rate of 10% is to be used. Earnings are expected to be as follows:

Year	*Machine A cash inflow* *Rs.*	*Machine B cash inflow* *Rs.*
1	15,000	5,000
2	20,000	15,000
3	25,000	20,000
4	15,000	30,000
5	10,000	20,000

You are given the following data:

Year	:	1	2	3	4	5
P.V. or Re. 1 @ 10% Discount	:	0.909	0.826	0.751	0.683	0.621

Evaluate the project under:

(*a*) Payback period

(*b*) Net present value **(University of Madras, B.Com., September 1994)**

[**Answer:** (*a*) Payback period – A 2.6 years

– B 3.33 years

Machine 'A' is preferable since its payback period is shorter.

(*b*) NPV of machine A – 15,385
NPV of machine B – 14,865
Machine 'B' is preferable since NPV of machine 'A' is higher]

Exercise 3: A Ltd. is considering the question of taking up a new project which requires an investment of Rs. 200 lakhs on machinery and other assets. The projects is expected to yield the following gross profit. (before depreciation and tax) over the next five years:

Year	*Gross profit (in lakhs of rupees)*
1	80
2	80
3	90
4	90
5	75

The cost of raising the additional capital is 12% and the assets have to be depreciated at 20% on 'written down value' basis. The scrap at the end of the five-year period may be taken as zero. Income tax applicable to the company is 50%.

Calculate the NPV of the project and advise the management whether the project has to be implemented. Also calculate the internal rate of return of the project.

Note: Present value of Re. 1 at different rates are as follows:

Present Values

Year	*10%*	*12%*	*14%*	*16%*
1	0.91	0.89	0.88	0.56
2	0.83	0.80	0.77	0.74

3	0.75	0.71	0.67	0.67
4	0.68	0.64	0.59	0.59
5	0.62	0.57	0.52	0.52

(ICWA, Inter, June 1998)

[**Answer:** NPV at 12% = Rs. 19.31 lakhs IRR = 15.6%]

Exercise 4: XYZ has decided to diversify its production and wants to invest its surplus funds on the most profitable project. It has under consideration only two projects 'A' and 'B'. The cost of project 'A' is Rs. 100 lakhs and that of 'B' is Rs. 150 lakhs. Both projects are expected to have a life of 8 years only and at the end of this period 'A' will have a salvage value of Rs. 4 lakhs and 'B' Rs. 14 lakhs. The running expenses of 'A' will be Rs. 35 lakhs per year and that of 'B' Rs. 20 lakhs per year. In either case the company expects a rate of return of 10%. The company's tax rate is 50%. Depreciation is charged on straight line basis. Which project should the company take up?

Note: Present value of annuity of Re. 1 for 8 years at 10% is 5.335 and present value of Re. 1 received at the end of the 8 year is 0.467. **(ICWA, Inter, December 1995)**

[**Answer:** Project B is more profitable than project A, the increase in profit being Rs. 8.020 lakhs (27.258 – 19.238). Hence, project B should be taken up.]

19

CHAPTER

COST OF CAPITAL

MEANING AND SIGNIFICANCE OF COST OF CAPITAL

The term 'cost of capital' means the rate of acquiring the total amount of all funds used within a firm. In the workd of Van Horne, "The explicit cost of source of financing may by defined as the discount rate that equates the present value of the funds received by the firm net of underwriting and other cost with the present value of expected outflows. These outflows may be the interest payment, repayment of principal or dividends." To measure the total cost of all funds used by the firm, it is necessary to assess 'cost' of each source. That is to ascertain the cost of funds received from long and short-term debt and all types of share capital.

Therefore, each type of capital, *i.e.*, debentures, share capital and retained profits has its own cost. Equity capital can be obtained from internal as well as external sources and cost of each is calculated differently.

The main object of calculating cost of capital is to ensure that the return on all funds invested exceeds the cost of capital.

Cost of capital is a very important concept in capital structure though it is of recent origin (say since 1965). It has received much attention especially in the advanced countries. It hepls the finance manager to determine whether a particular investment will be profitable or not.

The actual measurement of cost of capital is subject to wide margin or error and there is no accuracy about it. Therefore, the 'computed value' of it can be regarded as approximation. In spite of enormous study and research, no perfection has been attained so far.

The cost of debt capital is different from the cost of equity capital which is different from cost of retained profits.

Cost of capital is widely used as a criteria in capital budgeting. A proposal for investment is accepted only when it has a positive 'net present value' when discounted over and above cost of capital. In this sense, the cost of capital is the 'discount rate' used in evaluating the yield from an investment. It will be accepted if it has a rate of return higher than the cost of capital. In this sense, cost of capital is the minimum rate of return expected from an investment.

The concept of cost of capital is very useful for designing opitmum capital structure and thereby reduce cost of capital to the minimum for determining the proper method of financing and for retaining control or avoiding risk. This is because heavy equity capital will help management to retain control over the business and avoid risk whereas heavier doses of equity capital and lower doses equaity capital and lower doses of debt capital and lower doses of debt capital will lead to loss of control over business by a few shareholders

and perhaps to greater risk. This concept can also be used to evaluate performance of top management. Finally, it is used in many other decision making areas such as dividend and working capital. Thus cost of capital is of great utility in financial decision, *i.e.*, designing 'optimum capital structure' and in using capital in maximising wealth which was discussed earlier.

TECHNIQUES OF DETERMINING COST OF CAPITAL

There are many refined mathematical techniques to determine cost of capital-cost of share capital, cost of debt capital and cost of retained profit (or dividend).

As prof, Pandey observes, "In financial decision making, the term cost of capital is used in a composite or overall sense. In the past it was frequenlty used to refer to the cost of specific sources of capital such as cost of debt, cost of equity etc. It has been recently recognised that this position is fallacious. A firms's decision to use debt capital to finance its projects not only adversely affects its potential for using low cost debt in future, but also makes the position of the existing shareholders more risky. The increased risk to the shareholders will increase the cost of equity. Similarly the firm's decision to use equity capital to finance its projects would enlarge its potential for borrowings in the future. Because of this connection between the methods of financing and their costs, the term 'cost of capital' should be used in the composite sense. The composite or overall cost of capital is the 'weighted average of the costs' of various sources of funds, weights being the proportion of each source of funds in the capital structure.

Calculation of Cost of Equity Capital

Cost of capital is calculated by using sophisticated techniques. Let us consider here a simple technique. Let us assume that in the case of 'cost of equity capital', the shareholder expects a return which is an 'opportunity cost' of investing in one company rather than in another company. According to prof, Kuchal, a return of 5.5% in 'real terms' before personal taxes, requires a company to earn 35% 'in money terms' before tax if we assume a rate of inflation of 8% per year and corporation tax of 60% and dividend of 5% as the following example shows:

	Rs.
On Rs. 1,000 invested the company earns profit of	350
Less: Corporation tax (60%)	210
	140
Dividend(5%) $\frac{5}{100} \times 1{,}000$	50
Retained profits	90

The shareholders will earn wealth of Rs. 1,000 + 50 + 90 = Rs. 1,140 at the end of the year; but since prices are going up by 8%, they get only Rs. $\frac{1{,}140}{1.08}$ = Rs. 1,055 in 'real terms' and so they would have earned 5.5% on the original investment. It (5.5%) depends on (*a*) rate of dividend, (*b*) rate of tax, (*c*) rate of inflation.

According to prof Kuchal there are four approaches or methods for estimating the cost of equity:

(*a*) $\frac{D}{P}$, *i.e.*, $= \frac{\text{Dividend}}{\text{Price}}$ ratio

(*b*) $\frac{E}{P}$, i.e., $= \frac{\text{Earnings}}{\text{Price}}$ ratio

(*c*) $\frac{D}{P} + g$ *i.e.*, $\frac{\text{Dividend}}{\text{Price}}$ + Growth rate of earnings

(*d*) Realised yield approach.

Briefly stated, the first one means that return is calculated on the basis of what shareholders expect at market price for a share by capitalising a set of dividend which is fixed for all time. It ignores what the company will earn on the 'retained earnings' and what effect the retained earnings will have on shares value.

The second method means that the shareholders will capitalise a defininte level of earnings by capitalising the rate of E/P to judge their holding. The selection of market price to which they relate their expected earning involves 'value judgement'. This approach is not satisfactory because not all earnings are received directly by shareholders by way of dividends and earnings cannot be expected to be constant and share value does not remain costant.

The third method means that the focus is on what the shareholder actually receives, *i.e.*, dividend + rate of growth in dividend. The rate of growth of dividend is assumed to be equal to the rate of growth of 'earnings per share', *i.e.*, if earnings grow at 5% per year, and if dividends are constant portion of the earnings, then the rate of growth of dividend is equal to the rate of growth of earnings per share. It is said by proponents of this approach that it is a more accurate way of estimating the future return which shareholders will receive assuming that the 'future price-earnings ratio' is the same as 'current price-earning ratio' and earnings and dividend increase – at the same level (or rate). However, there are many difficulties in applying this in practice because of inflation and uncertainty.

The fourth approach means that in order to remove uncertainty about future dividend and share value, the rate of return actually received by shareholders in a given company is a better one to determine the cost of capital. For example, if they buy shares of a certain company (X), at Rs. 240 on 1.1.1990, and hold it for 5 years and sell it at Rs. 300 in early 1995, and receive dividend of Rs. 14 in 1990 and 1991 and Rs. 14.50 from 1992-1994, his rate of return, *i.e.*, 'discounted each flow' as follows:

Year	*Dividend Rs.*	*Sale Price Rs.*	*Discount factor at 10%*	*1.1.1980 value Rs.*
1990 ending	14.00	–	0.909	12.7
1991	14.00	–	0.826	11.6
1992	14.50	–	0.751	10.9
1993	14.50	–	0.683	9.9
1994	14.50	–	0.621	9.0
1995 (beginning)		800	0.621	186.3
				240.4

The above table shows that as the proponents of this approach say, that the historic realised rate of return "is an appropriate index of expected shareholder's required future rate of return". It is true that realised return varies according to good and bad years, but over a long period, there is 'control tendency' of realised return over a long period can be determined. This approach tells us as to the shareholders 'required rate of return' assuming the same risk and same 'opportunity cost'.

Hence to determine cost of equity capital it is essential to classify companies on the basis of (*a*) income, (*b*) cyclical characteristics, (*c*) growth characteristics.

Once the quantum of capital that is required is determined, the main consideration are income (cost) risk and control. These arise out of sources of capital, the percentage of each source in the total, the cost, the risk to shareholders and control over the management, *i.e*., capital structure.

WEIGHTED AVERAGE COST OF CAPITAL

A firm does not finance all its projects with only one source. On the other hand, it uses number of sources-equity shares, preference shares, and debt capital. However, the main objects of issuing both equity and debentures is to strike a balance in the capital structure and secondly, to increase the return to equity shareholders. Thus, the earnings per share can be increased only when firm's average cost of financing comes lower in comparison to its total income. Hence, it is quite essential to compute the average cost of capital.

The cost of capital otherwise expressed as a composite or overall cost of capital is the weighted average of the costs of various sources of funds, weights being the proportion of each source of funds in the capital structrue.

Weighted average cost, as the name implies, is an average of the costs of specific source of capital employed in a business properly weighted by the proportion, they hold in the firm's capital structure.

Though the concept of weighted average cost of capital is very simple, yet there are problems in the way of its calculations. Its computation requires:

(*a*) computation of weights to be assigned to each type of funds, and
(*b*) assignment of costs to various sources of capital.

Once these values are known, the calculation of weighted average cost becomes very simple. It may be obtained by adding up the products of sepecific cost of all types of capital multiplied by their appropriate weights.

In financial decision making, the cost of capital should be calculated on after tax basis. Therefore, the component costs to be used to measure the weighted cost of capital should be after tax costs.

Computation of Weights

The assignment of weights to specific sources of funds is a difficult task. Several approaches are followed in this regard but two of them are commonly used, *i.e*., book value approach and market value approach. As the cost of capital is used as a cut-off rate for investment projects, the market value approach is considered better because of the following reasons: (*i*) it evaluates the profitability as well as the long-term financial position of the firm, (*ii*) the investors always consider the committing of his funds to an enterprise and an adequate return on his investment. In such cases, book values are of little significance, (*iii*) it does not indicate the true economic value of the concern, (*iv*) it considers price level changes.

The next problem in calculating the weighted average cost is the selection of capital structure from which the weights are obtained. There may be several possibilities, *i.e*., (*a*) current capital structure either before or after the projected new financing, (*b*) marginal capital structure, *i.e*., proportion of various types of capital in total of additional funds to be raised at a certain time and (c) optimal capital structure. All may agree that firms do seek optimum capital structure, *i.e*., the capital structure that minimises the average cost of capital. Unless we have reasons to believe that the current structure deviates substantially from the optimum capital structure, we may assume that the current capital structure is the optimal structure and use it int the assignment of weights. The marginal capital structure is irrelevant hare.

Illustration

The following is the capital structure and the explicit after tax explicit after tax costs for each component:

Debt	Rs. 15 lakhs	4%
Preference shares	Rs. 5 lakhs	8%
Equity shares	Rs. 10 lakhs	11%
Retained earnings	Rs. 20 lakhs	10%
	50 lakhs	

Source of capital	*Proportion to total capital (W)*	*Specific cost (C)*	*Product (W × C)*
Debt	0.3	4	1.2
Preference share	0.1	8	0.8
Equity share	0.2	11	2.2
Retained earnings	0.4	10	4.0
Weighted average cost of capital			8.2%

If there is not weighted average cost of capital, there is no way of estimating total cost. Weight of each source of capital is very much essential from the view point of future profitability of the concern.

Moreover, it also helps the management in devising the optimal capital structure policy. Suppose, if debt-capital ratio measures say from 40% to 60%, the required rate of return for the equity shareholders must increase because the risk element increases for them in the sense that large portion of earnings go to debenture holders and less will be left to them. As a result their dividends decrease. Therefore, efforts should be made to arrive at a optimal capital structure, so that the shareholder's wealth and market value of the firm are maximised. This is possible only when the concern is able to ascertain the weighted average cost of capital.

Cost of Preference Capital

Preference shares are usually fixed cost bearing securities. Their rate of dividend is fixed well in advance at the time of their issue. So, the cost of preference capital is equal to the ratio of annual dividend income per share to the current market price of the preference shares. This ratio is often called a current dividend yield.

For instance, if 9% preference shares (par value Rs. 100) are sold at Rs. 105 per share and issue expenses incurred by the company amount to Rs. 2 per share; then, the cost of preference shares will be as follows:

$$Cp = \frac{9}{105 - 2} = \frac{9}{103} \text{ of } 8.738\%$$

Therefore, the formula for calculating cost of preference share capital, in case of preference shares having specific maturity date is:

$$Kp = \frac{d}{po(1 - f)}$$

Where Kp = cost of preference shares

d = constant annual dividend

Po = Expected sales price of preference shares

f = Floatation costs

In the case of redeemable ones:

$$Po\,(1-f) = \frac{d_1}{(1+k_i)^1} + \frac{d_2}{(1+k_1)^2} + \frac{d_n}{(1+kp)^n} + \frac{p_n}{(1+kp)^n}$$

$$\sum_{t=1}^{n} = \frac{dt}{(1+kp)^t} + \frac{pn}{(1+kp)^n}$$

Where Po = Expected sale price of preference shares
f = floatation costs as percentage of Po
d = dividend paid on preference shares
Pn = Repayment of preference capital amount.

COST OF DEBT

The cost of debt is defined as the rate of return that must be earned on debt-financial investment in order to keep unchanged the earnings available to equity shareholders. Therefore, the rate of return that the debt-financial investment must yield to prevent damage to the stock holder's position can also be called as cost of debt.

It is easy to calculate cost of debt. The cost of funds raised through debt in the form of debentures or loans from financial institution can be determined explicitly as follows:

Calculation of net income

	I situation	*II situation*
	Rs.	*Rs.*
EBIT	1,00,000	1,00,000
Less: Interest	10,000	Nil
	90,000	1,00,000
Less: Taxes (55%)	49,500	55,000
Net Income	40,500	45,000

We are able to see the difference between the net incomes reported under two situations. It is Rs. 4,500 more when interest is not paid. Thus, we can generalise for any tax rate 'T' and any interest payment 'I', the after tax-interest payment is I, that is interest. Even for this (*i*) net cash proceeds from specific source of debt (cash inflows), (*ii*) the amount of periodic payment of interest and repayment of principal in the year of maturity, are important.

Cash Inflow

The net proceeds from long-term loans and debentures are equal to the issue price of the debentures minus all floatation costs that have been paid. The debenture can be issued: (*i*) at par, (*ii*) at a premium and (*iii*) at a premium. The floatation costs consists of the following expenses-printing of prospectus, advertisement, underwriting and brokerage and so on.

Cash Outflow

These are payments to debenture holders and consists of two kinds of payment (*i*) interest payment and (*ii*) repayment of principal. These two components have different tax treatment and therefore, are separately discussed. Interest payments made by a firm on debt issues qualify as a tax deduction in determining net tax income.

The repayment of principal do not qualify for tax deduction in determining the net taxable income. Therefore, in their case, cash outflows are equivalent to repayments of principal sum and do not require any adjustment for taxes. The mathematical formulation of explicit cost of debt would be:

$$D_o(I-f) = \frac{C_o.I_1}{(1+k_1)^1} + \frac{C_oI_2}{(1+k_1)^2} + \cdots + \frac{C_oI_n + C_oP_n}{(1+k_1)^n}$$

Where D_o = Expected sale price per debenture

f = Total floatation costs expressed as a percentage of D_o

$C_oI_1 + C_oI_2 + C_oI_n$ = cash outflow of interest in time period 1, 2, and the year of maturity

$C_o p_n$ = Principal repayment in the year of maturity

K_1 = cost of debt.

The before-tax cost of debt, K_1 should be converted into an after tax cost of debt K*d*.

$$K_d = K_1(1-t)$$

If the repayment of debt is in a number of instalments instead of one lumpsum payment made at the end of the year, then the equation would be:

$$D_o(I-f) = \frac{CoI_1 + CoF_1}{(1+k_1)^1} + \frac{CoI_2 + CoP_2}{(1+k_1)^2} + \cdots \frac{CoIn + CoPn}{(1+k_n)^n}$$

$$= \sum_{t=1}^{n} \frac{CoIt + CoPt}{(1+k_1)^t}$$

Where CoI + CoP refer to interest payments plus principal repayment. The foregoing demonstrates the computation of cost of debt in different situation.

Cost of Perpetual Debt

The interest yield or the market yield on debt can be said to represent an approximation of the cost of the debt.

$$Kt = \frac{1}{SV}$$

$$Kd = \frac{1}{SV}(I-t)$$

Where: K_1 = Before tax cost of debt

Kd = Tax adjusted cost of debt

I = Annual Interest Payment

Sv = Sales value of the debenture

t = tax rate

Problem 1: A company is considering the following options to raise additional capital for its expansion schemes:

Equity (% of total capital)	*Debt (% of total capital)*	*Cost of equity*	*Cost of debt (pre-tax)*
75	25	16%	12%
50	50	18%	14%
25	75	24%	18%

Tax rate is 50%. Which option would you recommend? Show workings. **(ICWA, Inter, June 2001)**

Solution: Weighted average cost of capital is worked out for each option

Option I : $(16 \times 0.75) + (6 \times 0.25)$

$= 12 + 1.5 = 13.5\%$

Option II : $(18 \times 0.5) + (7 \times 0.5)$

$= 9 + 3.5 = 12.5\%$

Option III : $(24 \times 0.25) + (9 \times 0.75)$

$= 6 + 6.75 = 12.75\%$

Thus, option II is best as the cost of capital in this option is lowest.

Problem 2: AB Ltd. estimates the cost of equity and debt components of its capital for different levels of debt; equity mix is as follows:

Debt as % of total capital	*Cost of equity*	*Cost of debt (before tax)*
0	16%	12%
20%	16%	12%
40%	20%	16%
60%	25%	20%

Suggest the best debt: equity mix for the company. Tax rate applicable to the company is 50%. Show workings.

Solution:

Statement showing weighted average cost of capital

% of Debt to total capital	*Cost of equity*	*After tax cost of debt*	*Weighted Average cost of capital*	
0	16%	6%		= 16%
20	16%	6%	$(0.2 \times 6) + (0.8 \times 16)$	= 14%
40	20%	8%	$(0.4 \times 8) + (0.6 \times 20)$	= 14%
60	24%	10%	$(0.6 \times 10) + (0.4 \times 24)$	= 15.6%

Weighted average cost of capital is lowest when debt is 20% of total capital.

Problem 3: Calculate the approximate cost of a company's debenture capital, when it decides to issue 10,000 nos. of 14% non-convertible debenture, each of face value Rs. 100, at par. The debentures are redeemed at a premium of 10% after 10 years. The average realisation is expected to be Rs, 92 per debenture and the tax rate applicable to the company is 40%. **(ICWA, Inter, December 2000)**

Solution:

$$Kd = \frac{C(1-T) + \frac{F-P}{n}}{\left(\frac{F+P}{2}\right)}$$

Where P = net amount realised

C = annual interest payable

T = tax rate

F = redemption price

n = maturity period

$$= \frac{14(1-0.4)+\frac{(110-92)}{10}}{\frac{110+92}{2}} = 10.099\%$$

Problem 4: Calculate the cost of capital in the following cases:

(*i*) X Ltd. issues 12% debentures of face value Rs. 100 each and realises Rs. 95 per debenture. The debentures are redeemable after 10 years at a premium of 10%.

(*ii*) T Ltd. issue preference shares of face value Rs. 100 each earning 14% dividend and realises Rs. 92 per share. The shares are repayable after 12 years at par. **(ICWA, Inter, Juner 1998)**

Solution:

(I) $$Kd = \frac{C(1-T)+\frac{F-P}{n}}{\frac{(P+F)}{2}}$$

$$= \frac{12(1-0.5)+\frac{(110-95)}{10}}{\frac{110+95}{2}}$$

$$= \frac{6+1.5}{102.50} = 7.32\%$$

(II) $$Kp = \frac{D+\frac{F-P}{n}}{\frac{P+F}{2}}$$

$$= \frac{14+\frac{(100-92)}{12}}{\frac{100+92}{2}}$$

$$= \frac{14+0.67}{96} = 15.28\%$$

OPERATING AND FINANCIAL LEVERAGE

Operating leverage – Leverage may be defined as the ability of an enterprise to use fixed operating costs to increase the effect of changes in sales on its operating profits. it signifies the use of assets with fixed costs in the anticipation of earning sales revenues more than sufficient to meet the total costs including fixed costs. It exists when a change in sales revenue produces more than proportionate change in the operating profit, (*i.e.*, earnings before interest and taxes). It is determined by the sales, variable cost and fixed cost. Thus it is expressed in the form of the following formula

$$\frac{\text{Contribution}}{\text{Operating profit or EBIT}}$$

Illustration

Sales	Rs. 4,000
Variable cost	Rs. 2,000
Fixed cost	Rs. 600

In the above example, the contribution is 2,000 (sales of Rs. 4,000 minus variable cost of Rs. 2,000) and operating profit is Rs. 1,400 as shown below:

Sales	4,000
Less: Variable cost	2,000
Contribution	2,000
Less: Fixed cost	600
Operating profit	1,400

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{Operating profit}}$$

$$= \frac{2,000}{1,400} = 1.429$$

This means that a 1% increase in sales would result in a 1.429% increase in operating profit. Similarly, a 10% decrease in sales would result in a 14.29% decrease in operating profit. Suppose sales increase to Rs. 5,000. This 25% increase in sales would result in 35.725% increase in operating profit. Hence the new operating profit would be 1,900. However, it may be noted that operting leverage is calculated at one level of sales. It will change at another level of sales.

It is risky to have a high operating leverge since a slight fall in sales would result in a disproportionately larger fall in profits. If operating leverage is high, it automatically means that the break even point would also be reached at a high level of sales. Further, in the case of a high operating leverage, the margin of safety ratio would be low.

Financial leverage: Financial leverage also known as trading on equity means the use of fixed interest bearing long-term debts like debentures and other long-term borrowings and/or fixed dividend bearing preference shares capital along with equity share capital with a view to produce more gains for the equity shareholders.

Financial leverage is expressed in the form of formula which is as follows:

$$\frac{\text{Earning before Interest and Tax (EBIT)}}{\text{Profit Before Tax (PBT)}}$$

Illustration

	Rs.
Ordinary shares	1,000
Long-term loans	3,000
Earning Before Interest & Tax	600
Interest at 10%	300
Earning Before Tax	300

$$\text{Financial leverage} = \frac{\text{Earning before Interest and Tax (EBIT)}}{\text{Profit Before Tax (PBT)}}$$

$$= \frac{600}{300} = 2$$

This means that if the operating profit goes up by 100%, the earnings before tax (the shareholders's income) would go up by 200%. Thus, if EBIT is Rs. 1,200, Rs. 300 will have to be paid to the suppliers of long-term funds. This leaves Rs. 900 as residual earning before tax for shareholders. This represents an increase of 200% on the previous figure of Rs. 300. Therefore, it is obvious that the shareholders gain in a situation where a company has a high rate of return and pays a lower rate of interest to the suppliers of long-term funds. The difference obviously accrues to the shareholders. However, where the rate of return on investment falls below the rete of interest, the shareholders suffer because their earnings fall more sharply than the fall in the return on investment. Financial leverage thus accelerates the impact of a rise or fall in the EBIT on shareholder's income. A company must, therefore, carefully consider its likely profitability position before deciding upon the critical mix. Many companies often commit the mistake of having a very high debt equity ratio in times of prosperity. This gives their shareholders a high rate of return. However, since the period of abnormal profits is necessarily a short one, the company may, in depressed condition, have to pay very high rates of interest leaving even negative returns for the shareholders.

The impact of financial leverage gets accntuated because of the indidence of taxation also. We know that interest is allowed as a charge before tax and, therefore, this gain also accrues to the shareholders.

QUESTIONS

1. What do you mean by cost of capital?
2. What do you mean by operating leverge?
3. What do you financial leverage?

SHORT ANSWER QUESTIONS

1. Explain the method of calculating cost of equity capital.
2. Explain the method of calculating cost of preference share capital.
3. Explain the method of calculating cost of debt capital.
4. Explain the significance of (a) operating leverage, (b) financial leverage.

Exercise 1: The capital structure of Hindustan Traders Ltd. as on 31.3.1996 is as follows:

Equity capital; 100 lakh equity shares of Rs. 10 each	Rs. 10 crores
Reserves	Rs. 2 crores
14% Debentures of Rs. 100 each	Rs. 3 crores

For the year ended 31.3.1996 the company has paid equity dividend at 20%. As the company is a market leader with good future, dividend is likely to grow by 5% every year. The equity shares are now traded at Rs. 80 per share in the stock exchange. Income-tax rate applicable to the company is 50%.

Required:

(*a*) The current weighted cost capital.
(*b*) The company has plans to raise a further Rs. 5 crores by way of long-term loan at 16% interest. When this takes place the market value of the equity shares is expected to fall to Rs. 50 per share. What will be the new weighted average cost of capital of the company. **(ICWA, Inter, December 1996)**

[**Answer:** Weighted Average cost of capital = 7.4%

New weighted average cost of capital = 8.45%]

20

CHAPTER

NATURE AND SCOPE OF COST ACCOUNTING

In the modern business world, the nature and functioning of business organizations have become very complicated. They have to serve the needs of variety of parties who are interested in the functioning of the business. These parties constitute the owners, creditors, employees, government agencies, tax authorities, prospective investors, and last but not the last the management of the business. The business has to serve the needs of these different category of people by way of supplying various information from time to time. In order to satisfy the needs of all these group of people a sound organization of accounting system is very essential. In the ancient days the information required by those who were interested with a business organization was met by practising a system of accounting known as financial accounting system. Financial accounting is mainly concerned with preparation of two important statements, *viz*.,income statement (or profit & loss account) and positional statement (or Balance Sheet). This information served the needs of all those who are not directly associated with management of business. Thus financial accounts are concerned with external reporting as it provides information to external authorities. But management of every business organization is interested to know much more than the usual information supplied to outsiders. In order to carry out its functions of planning, decision-making and control, it requires additional cost data. The financial accounts to some extent fails to provide required cost data to management and hence a new system of accounting which could provide internal report to management was conceived of.

NEED FOR COST ACCOUNTING

The need for cost accounting arises owing to the following :

To Overcome the Limitations of Financial Accounting

Financial accounting records in an overall manner the results of the operations of a business, using conventional double entry book-keeping techniques. It suffers from the following limitations:

(*i*) *It provides only past data:* Financial accounting provide out of date information to management. But management is interested in current data but not past data as it does not serve any purpose to it. Therefore it has been rightly pointed out that financial accounting provide only a post-mortem analysis of past activities.

(*ii*) *It reveals only over all result of the business:* Financial accounting does not provide data for each and every product, process, department or operation separately. Instead it provides the financial information in a summary form for the entire organization as a whole.

(*iii*) *It is static in nature:* Modern business is dynamic but not static. Financial accounting does not incorporate the changes that take place within the business.

(*iv*) *It fails to take into account the impact of price level change:* In the modern inflationary conditions the price level has significant impact over financial statement. Under financial accounts, assets are shown at the actual or historical cost. Consequently depreciation is also charged on actual or historical cost. This under charging of depreciation will distort the profit figure.

(*v*) *Possibility of manipulation of financial accounts:* Very often financial accounts are manipulated at the whims and fancies of management so as to project better image in the minds of prospective investors. The chief forms of manipulating the financial accounts assume the forms of over or undervaluation of inventory, excessive or inadequate provision for depreciation, creation of secret reserves, etc.

(*vi*) *It fails to exercise control over resources :* Financial accounting fails to exercise control over materials, labour and other expenses incurred in a business enterprise. As a results, avoidable wastages and losses go unchecked under this system of accounting.

(*vii*) *It fails to provide adequate data for price fixation :* Financial accounts fails to provide adequate cost data on the basis of which selling price is fixed. In the absence of fixation of prices in advance, it is not possible to supply quotations to the prospective customers. To that extent the income from such sales diminish.

(*viii*) *It fails to provide adequate data for management in carrying out its functions:* Management of every organization relies heavily on adequate cost data for formulating policies and in decision-making process. But financial accounting fails to provide such useful cost data to management.

(*ix*) *It does not provide a basis for cost comparison:* Financial accounting does not help in cost comparison over a period of time or between two jobs or two operations. Thus a basis for judging the efficiency of an year with past year or worthfulness of two different jobs or operations cannot be appraised.

(*x*) *It does not make use of control techniques:* Financial accounting fail to make use of certain important cost control techniques such as budgetary control and stantard costing. Thus financial accounts do not facilitate measuring the efficiency of the business with the help of control techniques.

(*xi*) *It fails to ascertain break-even point:* Financial accounting does not help in ascertaining the break-even point, *i.e.*, the sale or output where the revenue equals the cost. Hence, the point of no-profit-no-loss cannot be made out under financial accounts.

To Ensure Optimum Utilisation of Resources

In todays business world, the resources available are very scarce. Hence every business unit must strive hard to obtain maximum output with the available input. In order to ensure the optimum utilization of scarce resources, the value of input is measured against the value of output. This implies matching cost per unit of production against the value of output or selling price. But financial accounting does not provide the information relating to cost per unit of production. Hence the need for cost accounting was felt necessary.

To Achieve Overall Efficiency of Business

Every businessman will make constant effort to improve his business. In order to formulate suitable policy and sound decision, he has to know answers to certain questions such as (*a*) What is the maximum profit which a business can make? (*b*) Is the profit earned by it is more or less compared to the earlier years? (*c*) Which product line is making more profit? (*d*) Has too much capital is blocked in raw materials? (*e*) Whether the cost of production has gone up compared to earlier years? (*f*) Should the selling price requires revision? Cost accounting serves as an useful tool in the hands of management in this direction. By analyzing the cost of production of every unit, it helps management to know the answers to the above questions.

GROWTH AND DEVELOPMENT OF COST ACCOUNTING

The history of cost accounting can be traced back to the fourteenth century. In the course of its evolution it passed through following stages.

1. In the first stage of its development, cost accounting was concerned only with the three prime cost elements, *viz.*, direct material cost, direct labour cost and direct expenses. For recording the transactions relating to materials the important documents used were (*a*) stores ledger, (*b*) a material requisition note, and (c) materials received note. To account for labour cost, employee time card and labour cost card were devised by Mr. Metcalfe. Later on a distinction between manufacturing and non-manufacturing cost was made by Mr. Norton. Thus material cost, labour cost and manufacturing cost constituted prime cost.
2. Secondly, around the turn of the nineteenth century, the importance of non-manufacturing cost (overheads) was recognized as one of the distinct element of cost. The method of charging non-manufacturing cost to the production cost was devised under this stage.
3. Thirdly, the techniques of estimation and standards are devised. Instead of using actual cost, standard costs are used and by comparing with the actual cost the differences are noted, analysed and disposed off accordingly. This helps in knowing the efficiency of the business undertaking.
4. Fourthly, cost accounting methods were applied to all types of business undertakings. The costing principles and techniques were also extended to important functions of a business.
5. In modern times the development of electronic data processing has occupied significant stage in the growth of cost accounting system.

Cost Accounting in Indian Context

The application of cost accounting methods in Indian industries was felt from the beginning of the twentieth century. The following factors have accelerated the system of cost accounting in our country.

(*a*) Increased awareness of cost consciousness by Indian industrialists with a view to ascertain costs more accurately for each product or job.
(*b*) Growing competition among manufacturers led to fixation of prices at a lower level so as to attract more customers.
(*c*) Economic policy of government which laid emphasis on planned economy with a view to achieve the targets led to cost reduction programmes by Indian industrialists.
(*d*) Increased government control over pricing led the Indian manufacturers to give utmost importance to the installation of cost accounts.
(*e*) The establishment of National Productivity Council in 1958 and the Statutory Recognition of Institute of Cost and Works Accountants of India in 1959 gave further encouragement to install cost accounting system in Indian industries.

DEFINITION AND SCOPE OR COST ACCOUNTANCY

The terminology of cost accountancy published by the Institute of Cost and Management Accountants, London defines cost accountancy as "the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived therefrom for the managerial decision-making."

On analysis of the above definition, the following features of cost accountancy become evident:

(*a*) "Cost accountancy" is used in the broadest sense when compared to "cost accounting" and "costing". This is so because cost accountancy is concerned with the formulation of principles, methods and techniques to be applied for ascertaining cost and profit.

(*b*) Having ascertained 'cost' and 'profit', cost accountancy is concerned with presentation of information to management. To enable management to carry out its functions, reports must be promptly made available at the right time, to the right person and in a proper from.

(*c*) The information so provided is to serve the purpose of managerial decision-making such as introducing a new line of new of product, replacement of manual labour by machines, make or buy, decisions, etc.

SCOPE OF COST ACCOUNTANCY

The scope of any subject refers to the various areas of study included in that subject . As regards the scope of cost accountancy is concerned, it has vast scope. The following topics fall under the purview of cost accountancy: (1) Costing, (2) Cost Accounting, (3) Cost Control Techniques, (4) Budgeting and (5) Cost Audit.

1. Costing

The terminology of ICMA, London, defines costing as "the technique and process of ascertaining the cost."

The above definition is very significant in as much as it carries the main theme of cost accountancy. This definition emphasizes two important aspects, *viz*.

(*a*) ***The technique and process of costing :*** The technique of costing involves two distinct steps, namely, (*i*) collection and classification of costs according to various elements and (*ii*) allocation and apportionment of the expenses which cannot be directly charged to production. As a process, costing is concerned with the routine ascertainment of cost with a formal procedure.

(*b*) ***Ascertainment of cost :*** It involves three steps, *viz*. (*i*) collection and analysis of expenses, (*ii*) measurement of production at different stages and (*iii*) linking up of production with the expenses. To achieve the first step, costing has developed different systems such as Historical, Estimated and Standard Cost. For achieving the second step, costing has developed different methods such as single or output costing. Job costing, contract costing, etc. Finally, for achieving the last step costing has developed important techniques such as *Absorption Costing, Marginal Costing and Standard Costing*.

The three terms indicated as 'systems', 'methods', 'techniques' are independent factors but co-exist together. Ascertainment of cost of production is based on all these terms. For example, continuous type of industries may use process costing as a method, using actual cost as a system, under Standard Costing Technique.

2. Cost Accounting

Kohler in his dictionary for Accountants defines cost accounting as "that branch of accounting dealing with the classification, recording, allocation, summarization and reporting of current and prospective costs."

Mr. Wheldon defines cost accounting as "the classifying, recording and appropriate allocation of expenditure for the determination of the costs of products or services, the relation of these costs to sales values, and the ascertainment of profitability".

The above definitions reveal the following aspects of cost accounting:

(*a*) *Cost classification:* This refers to grouping of like items of cost into a common group.

(*b*) *Cost recording :* This refers to posting of cost transactions into the various ledger maintained under cost accounting system.

(*c*) *Cost allocation :* This refers to allotment of costs to various products or departments.

(*d*) *Cost determination or cost finding :* This refers to the determination of the cost of goods or services by informal procedure, *i.e*., procedures that do not carry on the regular process of cost accounting on a continuous basis.

(*e*) *Cost reporting :* This refers to furnishing of cost data on a regular basis so as to meet the requirements of management.

Differences between Cost Accountancy, Costing and Cost Accounting

Points of Differences	*Cost Accountancy*	*Costing*	*Cost Accounting*
1. Scope	Cost accountancy is broadest in its scope.	It is broader in its scope.	It is narrow in its scope.
2. Function	It is concerned with formulation of costing principles, methods, techniques to be adopted by a business.	It is concerned with ascertainment of cost.	It is concerned. recording of cost.
3. Periodicity of functioning	It is a starting Point.	It begins where cost accountancy ends.	It begins where costing ends.
4. Persons involved	The persons involved are experts in the field of cost accountancy such as management accountant.	The person involved is cost accountant.	The persons involved are cost clerks.

3. Cost Control

According to Kohler, cost control represents the employment of management devices in the performance of any necessary operation so that pre-established objectives of quality, quantity and time may be attained at the lowest possible outlay for goods and services. The terminology published by ICMA, London, defines cost control as "The guidance and regulation by executive action of the cost of operating an undertaking". According to this definition, cost control aims at guiding the actuals towards the lines of target and regulates the actuals if they deviate from the targets. This guidance and regulation is done by the executive who is responsible for causing the deviation. This process will become clear by enumerating the steps involved in any cost control technique.

(*a*) Fixation of targets in terms of cost and production performance.
(*b*) Ascertaining the actual cost and production performance.
(*c*) Comparison of actuals with the targets.
(*d*) Analysing the variance by causes and the person responsible for it.
(*e*) Taking remedial steps to set right unfavourable variations.

Cost control is exercised through a variety of techniques such as inventory control, quality control, budgetary control, standard costing, etc. The advantages of cost control are as follows:

(*a*) It helps in utilising the resources to the full extent.
(*b*) It helps in reduction of prices which are benefited by customers.
(*c*) It helps in competing successfully in the market.
(*d*) It increases the profit earning capacity of the business.
(*e*) It increases the goodwill of the business.

4. Budgeting

Mr. Heiser in his book *Budgeting–Principles and Practice*, defines budget as "an overall blue print of a comprehensive plan of operations and actions expressed in financial terms. According to him budgeting process involves the preparation of a budget and its fullest use not only as a devise for planning and co-ordinating but also for control". A detailed study on budgetary control as discussed in a separate chapter.

5. Cost Audit

The terminology of ICMA, London, defines cost audit, as "the verification of the correctness of cost accounts and the adherence to the cost accounting plan. Cost audit is discussed in a separate chapter.

NATURE OF COST ACCOUNTING

The nature of cost accounting can be brought out under the following headings :

1. **Cost accounting is a branch of knowledge :** Though considered as a branch of financial accounting, cost accounting is one of the important banch of knowledge, *i.e.*, a discipline by itself. It is an organised body of knowledge consisting of its own principles, concepts and conventions. These principles and rules of course vary from industry to industry.
2. **Cost accounting is a science :** Cost accounting is a science as it is a body of systematic knowledge relating to not only cost accounting but relating to a wide variety of subjects such as law, office practice and procedure, data processing, production and material control, etc. It is necessary for a cost accountant to have intimate knowledge of all these field of study in order to carry on his day-to-day activities. But it is to be admitted that it is not a perfect science as in the case of natural science.
3. **Cost accounting is an art :** Cost accounting is an art in the sense it requires the ability and skill on the part of cost accountant in applying the principles, methods and techniques of cost accountancy to various management problems. These problems inclued the ascertainment of cost, control of costs, ascertainment of profitability, etc.
4. **Cost accounting is a profession :** In recent years cost accounting has become one of the important professions which has become more challenging. This view is evident from two facts. First, the setting up of various professional bodies such as National Association of Accountants (NAA) in USA. The Institute of Cost and Management Accountants in UK, the Institute of Cost and Works Accountants in India and such other professional bodies both in developed and developing countries have increased the growing awareness of costing profession among the people. Secondly, a large number of students have enrolled in these institutes to obtain costing degrees and memberships for earning their livelihood.

RELATIONSHIP BETWEEN FINANCIAL ACCOUNTING AND COST ACCOUNTING

Cost accounting is very closely-related to financial accounting. Some authorities on the subject consider cost accounting to be the branch of financial accounting. But it may be said that cost accounting is complementary to financial accounting, *i.e.*, a subject which is necessary to make financial accounting whole or complete. Financial accounting and cost accounting are both similar in certain respects. But in some other respects they differ from one another. These points of similarities and dissimilarities and enumerated below :

Points of Similarities

(*a*) The fundamental principles of double entry is applicable in both the systems of accounting.
(*b*) The invoices and vouchers constitute the common basis for recording transactions under both the systems of accounting.
(*c*) The results of business are revealed by both the systems of accounting.
(*d*) The causes for losses and wastages of a business are provided by both these systems of accounting.
(*e*) The determination of future business policy is guided by both these systems of accounting.
(*f*) A basis for comparison of expenses is being provided by both the accounting systems.
(*g*) Accuracy of accounts is maintained under both the systems by means of exercising check over errors and commissions which might creep in either of accounting.

Points of Dissimilarities

Points of differences	*Financial Accounts*	*Cost Accounts*
1. Purpose	The purpose of financial accounting is external reporting mainly to owners, creditors, tax authorities, government, and prospective investors.	The purpose of cost accounting is internal reporting, *i.e.*, to the management of every business
2. Obligation to maintain accounts	This is to be maintained compulsorily by higher forms of business organisations. The preparation of accounts must be in accordance with the statutory provisions.	Cost accounting are maintained voluntarily. In some cases government has directed some companies to maintain cost accounts to improve efficiency.
3. Recording	(*a*) Financial accounting records transactions in a subjective manner, *i.e.*, according to the nature of expenditure. (*b*) In financial accounting expenses are recorded in totals. (*c*) Financial accounting records all transactions which takes place in the business. (*d*) Financial accounting records only historical costs.	(*a*) Cost accounting records transacti-ons in an objective manner, *i.e.*, according to purpose for which costs are incurred. (*b*) In cost accounting costs are expressed by proper analysis and classification in order to find out cost per unit. (c) Cost accounting records only those costs which affect production and sales. (*d*) Cost accounting records both historical and estimated costs.
4. Analyis of profit	Financial accounting disclose profit for the entire business as a whole.	Cost accounting show the profitability or otherwise of each product, process or operation so as to reveal the areas of profitability.
5. Control	(*a*) It does not make use of any control techniques. (*b*) It does not control materials by using any technique. (*c*) Control over labour is not exercised.	(*a*) It makes use of some important control techniques such as Marginal Costing, Budgetary Control, Standard Costing, etc., in order to control cost. (*b*) It exercises control over materials using some techniques such as ABC analysis, level setting, economic order quantity, etc. (*c*) Control over labour is exercised and efforts are taken to minimise idle time, over time etc.
6. Duration of reporting	Generally, financial accounting provides financial information once a year.	Cost accounting furnishes cost data at frequent intervals. Some reports are daily. Some are weekly and some monthly.
7. Evaluation of efficiency	The information provided by financial accounting is not sufficient to evaluate the efficiency of the business.	The cost data helps in evaluating the efficiency of the businesses.
8. Pricing	It fails to guide the formulation of pricing policy.	It provides adequate data for formulating pricing policy.
9. Valuation stock	Stock is valued at cost or market price of whichever is less.	Stock is always valued of cost price.

DIFFERENCES BETWEEN COST AND MANAGEMENT ACCOUNTING

The American Accounting Association 1958, committee on management accounting defines management accounting as "the application of appropriate techniques and concepts in processing the historical and projected economic data of an entity to asist management in establishing a plan for reasonable economic objectives and in the making of rational decisions with a view towards achieving these objectives". It includes the methods and concepts necessary for effective planning for choosing among alternative business actions, and for control through the evaluation and interpretation of performance. Its study involves consideration of ways in which accounting information may be accumulated, synthesised, analysed and presented in relation to specific problems, decisions and day-to-day tasks of business management.

The terminology published by ICMA, London, defines management accounting as "the application of professional knowledge and skill in the preparation and presentation of accounting information in such a way as to assist management in the formulation of policies and in the planning and control of the operation of the undertaking."

If we examine the above two definitions of management accounting is appears that both the systems of accounts serve the same purpose. However, they differ from one another in respect of the following :

Points of differences	*Cost Accounting*	*Management Accounting*
1. Growth of Accounting	The history of cost accounting dates back to fourteenth century.	This system of accounting evolved in the middle of 20th century. Hence it is of recent origin where compared to cost accounting.
2. Object	The main objects of cost accounts is to ascertain and control cost.	The main objective of management accounting is to provide useful information to management for decision-making.
3. Basis of recording	It is based on both present and future transactions for cost ascertainment.	It is concerned purely with the transactions relating to future.
4. Scope	Cost accounting has narrow scope as it covers matters relating to ascertainment and control of cost.	It has a wide scope in as much as it covers the areas of financial accounts, cost accounts, taxation, etc.
5. Utility	Cost accounts serves the needs of both internal management and external parties.	Management accounting serves the needs of only internal management.
6. Types of transactions dealt with	It deals only with monetary transactions. *i.e.*, it covers only quantitative aspect.	It deals with both monetary and non -monetary transactions, *i.e.*, both quatitative and qualitative aspects.
7. Observation of principles and format	Cost accounts follow a definite principle for ascertaining cost and a format for recording.	It does not follow a definite principle and format. Instead, the data to be presented depends up on the need of the management.

RELATIONSHIP BETWEEN COST, ESTIMATE AND PRICE

The terms 'estimates', 'costs' and 'prices' are closely related to each other in costing. An estimate is a forecast of the probable cost of a product, job, or process for a future date. Estimation is purely based on past

experience. Cost accounting provide reliable data on the basis of which future cost is estimated. However, an estimate is only an opinion because there is every chance of commiting mistake while estimating. Estimation is also based on the future conditions and much depends on guesswork. Estimation is also based on the future conditions and much depends on guesswork. But such guesswork must be as far as possible closer to the facts.

Cost represents actual total cost incurred in manufacturing a product or in completing a job. The total cost of manufacturing a product broadly consists of material, labour and other expenses. The true cost is ascertained either at the various stages of completing the production or at the end of completion of the job. The current cost serves as the basis for future estimates. Thus cost is considered as a fact as it represents the actual or true cost of manufacturing a product or completing the job.

Price in costing refers to selling price of a product. Selling price is arrived at after adding a certain margin of profit to the actual cost. Of course, certain other factors also determine the price fixation policy such as demand for the product, tastes and preferences of customers, price of competitive products, future trends of prices and so on. So price fixing is regarded as a matter of policy. Hence it has been popularly said that an "estimate is an opinion, cost is a fact and price is a policy".

PURPOSES OR OBJECTS OF COST ACCOUNTS

Costing serves number of purposes among which the following are considered to be most important.

1. **Ascertainment of cost :** This was considered to be the primary objective of cost accounting in the initial stages of its development. However, in modern times this has assumed the secondary objective of cost accounting. Cost ascertainment involves the collection and classification of expenses at the first instance. Those items of expenses which are capable of charging directly to the products manufactured are allocated. Then the other expenses which are not capable of direct allocation are apportioned on some suitable basis. Thus the cost of production of goods manufactured is ascertained. In this process, cost accounts involves maintenance of different books to record various elements of cost. Cost of production is ascertained by using any of the costing technique such as historical costing, marginal costing, etc.
2. **Cost control :** At one time cost control was considered as secondary objective of cost accounts. But in modern times it constitutes the primary purpose because of its utmost importance in all business undertakings. Cost control is exercised at different stages in a factory, *viz*., acquisition of materials, recruiting and deployment of labour force, during the production process and so on. As such we have material cost control, labour cost control, production control, quality control and so on. However, control over cost is exercised through the techniques of budgetary control and standard costing. The control techniques enable the management in knowing the operating efficiency of a business.
3. **Determination of selling price :** Every business organisation aims at maximising profit. Toal cost of production constitutes the basis on which selling price is fixed by adding a margin of profit. Cost accounting furnishes both the total cost of production as well as cost incurred at each and every stage of production. No doubt other factors are taken into consideration before fixing price such as market conditions the area of distribution, volume of sales, etc. But cost plays the dominating role in price fixation.
4. **Frequent preparation of accounts and other reports :** The management of every business constantly rely upon the reports on cost data in order to know the level of efficiency relating to purchase, production, sales and operating results. Financial accounts provide information only at the end of the year because closing stock value is available only at the end of the year. But cost accounts provide the value of closing stock at frequent intervals by adopting a "continuous stock verification" system. Using the value of closing stock it is possible to prepare final accounts and know the operating results of the business.

5. **To provide a basis for operating policy :** Cost data to a great extent helps in formulating the policies of a business and in decision-making. As every alternative decisions involve investment of capital outlay, costs play an important role in decision-making. Therefore availability of cost data is a must for all levels of management. Some of the decisions which are based on cost are (a) make or buy decision, (b) manufacturing by mechanisation or automation, (c) whether to close or continue operations in spite of losses.

FUNCTIONS OF COST ACCOUNTANT

The functions of cost accountant may be enumerated under the following :

Traditional Functions :

The traditional functions comprise of the outline functions of cost accountant. Such functions are as follows :

(*a*) To establish various cost centres in the organisation.
(*b*) To ascertain the cost of every product, job or process both in terms of total and per unit of product.
(*c*) To design suitable system for defining responsibilities and controlling cost.
(*d*) To provide necessary data to enable management in fixing the price.
(*e*) To prepare reports on wastages of material, loss of labour time, idle capacity of machines so as to improve profitability of business.
(*f*) To implement cost control techniques such as budgetary control and standard costing.
(*g*) To prepare cost schedules to assist management in making decisions and in formulating policies.
(*h*) To design suitable forms for organising an effective system of reporting which ensures provision of adequate cost data to all levels of management.
(*i*) To assist management in the valuation of closing stock of raw materials and work-in-progress so that too much of capital is not locked up in unnecessary inventories.
(*j*) To prepare periodical cost statements and profit and loss account.

Modern Functions

In recent times the functions of a cost accountant are not only confined to ascertain and control cost but extend far beyond these functions. This is on account of the additional responsibilities arising from the various branches of accounting, works organisation, office management and administration, methods of statistical analysis,system analysis O and M studies, modern principles of management, use of computers, etc. These modern functions are as follows :

(*i*) Supervising the functions of mechanised accounting.
(*ii*) Organisation of internal audit in the field of accounting.
(*iii*) To work in close co-ordination with various departmental managers so as to implement cost reduction programmes and methods of improvement.
(*iv*) To undertake cost audit programmes as per the directives issued by the government and the provisions of the Indian Companies Act of 1956.

As regards the role of cost accountant in an industry, in has been beautifully summarised by Mr. Wilmot in his article on "the cost accountant's place in management". According to him, the role of cost accountant, is "that of a historian, news agent, and prophet". As historian he must be meticulously accurate, *i.e.*, while supplying cost information to management he has to furnish in greater detail with carefulness and exactness. As news agent, he must be up-do-date, selective and provide full cost information to the needy person. As a prophet he must combine knowledge and experience with foresight and courage.

INSTALLATION OF COST ACCOUNTS

At the outset it is to be understood that a common cost accounting system cannot be installed for all types of business undertakings. The cost accounting system depends upon the nature of business and the product manufactured. Before a suitable system of cost accounting is installed it is necessary to undertake a preliminary investigation so as to know the feasibility of installing cost accounting system to such business. While introducing a system of cost accounts it should be borne in mind that cost accounting system must suit the business. There should not be any attempt to make the business suit the system. One more consideration that is of practical importance is that the benefits derived from cost accounting system must be more than the investment made on it. This means the system must be simple and it must lead to savings through the control of materials, labour and overheads when compared to expenses incurred in maintaining it. For the successful functioning of the costing system, the following conditions are essential :

(*a*) There must be an efficient system of material control.
(*b*) A sound and well designed method of wage payment must be set up.
(*c*) The existence of sound basis for collection of all indirect expenses and a basis for its apportionment to various production departments.
(*d*) The integration of cost and financial accounts to facilitate reconciliation of profit as shown by these two systems of accounts.
(*e*) The use of printed forms so as to facilitate quick compilation of cost reports.
(*f*) The duties and responsibilities of cost accountant must be made clear.

Factors to be Considered before Installing a Cost Accounting System

The following factors are to be considered before installing a cost accounting system :

1. **History of business unit :** The history of a business unit implies the duration of its existence, position in the industry, the rate of growth, policy and philosophy of management and the like. The history of business unit serves as the basis for designing the cost accounts in respect of necessity, simplicity, and investment involved in installing cost accounts.
2. **Nature of the industry :** The nature of business such as manufacturing, mining, trading, etc., determines the costing techniques to be applied. Similarly, the type of product manufactured also determine the method of costing that is to be employed. In other words, there is no all purpose technique and method of costing that can be applied universally.
3. **Product range :** The range of products manufactured and sold also determine the method of costing to be selected. Accordingly range of products must be analysed in terms of size, models, fashions, area of market, competitors and whether the products are made to customers specification or for stocking and selling.
4. **Technical considerations :** Technical considerations that influence the installation of cost accounts are as follows :
   (*a*) Size and layout of the factory
   (*b*) The existence of production and service departments
   (*c*) Flow of production
   (*d*) Capacity of machines and degree of mechanisation
   (*e*) Existence of laboratories
   (*f*) Internal transport and material handling equipments
   (*g*) Production control techniques
   (*h*) Inspection and testing of materials and finished goods.
5. **Organisational factors :** The problem of installing cost accounting is somewhat difficult in case of an existing business when compared to new business. However, the existing set up of the organisation

should be least disturbed should the need arise. In order to fix up responsibility to the executives it may be necessary to group the departments. The organisational factors to be considered are : (*a*) size and the type of organisation such as line, line and staff, functional and committee organisation, (*b*) the levels of management, *viz*., top level, middle level and bottom level management, (*c*) extent of delegation and responsibility, (*d*) extent of centralisation and decentralisation, (*e*) extent of departmentation, (*f*) availability of modern office equipments, and (*g*) number of managerial and supervisory staff.

6. **Selling and distribution method :** The chief factors to be considered with regard to distribution process are the warehousing facilities, external transport, market research and other promotional measures, terms of sale and procurement of orders from customers.
7. **Accounting aspects :** The factors to be considered in respect of accounting are : (*a*) number of financial records, (*b*) existing forms, (*c*) registers used, and (*d*) number of copies required.
8. **Area of control to be exercised :** The areas where cost control is to be exercised is to be identified so that each manager may take action relevant to his activities. If material control occupies significant area of control, it must be given topmost priority for exercising control over materials.
9. **Reporting :** The cost accounting system to be installed must ensure frequency and promptitude in reporting cost data to all levels of management. It must also to be pointed out that duplication of reporting is to be avoided. Further, only those information which are relevant for the management in a particular context alone should be reported.
10. **Uniformity :** The practice of adopting uniform costing facilitates inter-firm comparison among various firms belonging to the same industry. Further it also has the benefit of adopting common costing practice if a holding company has number of subsidiaries.
11. **Use of electronic data processing :** In modern days it has become a common practice to use electronic data processing equipments and computers. In this situation it is essential to ensure that the equipment meets the needs of the system but not the other way round.
12. **Practical considerations :** The cost accounting system to be installed must be flexible in operation and must be capable of adaptation to changing conditions. The system must be periodically scrutinised so as to make necessary changes owing to development in business.

Practical Difficulties in Installing Cost Accounting

In addition to the above problems, a cost accountant will encounter the following practical difficulties at the time of installation of cost accounting system :

1. **Lack of support from management :** Wherever costing system is installed. It is essential to seek the support of various departmental managers. Very often the managers show hostile attitude towards the costing system. They feel that this system will interfere in their routine work and probably as a means of checking their efficiency. Under such circumstances it is better to convince them about the utility of costing system for the business as a whole.
2. **Resistance by existing accounting staff :** Very often the existing accounting staff resist the installation of the cost accounting system on two grounds. Firstly, they feel that the new system of accounting might lead to excess work. Secondly, they are afraid of their job security. But this difficulty may be overcome by encouraging them about the usefulness of cost accounting as a supplement to financial accounts and the generation of more employment opportunities from the installation of cost accounting system.
3. **Non-cooperation from middle and bottom level management :** At times the middle and bottom level managers such as foremen, supervisors and inspectors also fail to extend their wholehearted cooperation fearing additional work which may be entrusted to them. This problem may be overcome by suggesting them about the simplicity of the system and the existence of a separate cost accounting department to look after costing matters. However, they may be required to provide necessary reports

concerning their area of activity so as to enable functioning of cost accounting department efficiently.

4. **Lack of trained staff :** This was no doubt a problem in olden days. Today this problem is overcome, thanks to the establishment of The Institute of Cost and Works Accountant of India in our country which offers professional course in costing and also offers training facilities through various companies to the candidates undergoing the course. In spite of this facility, it is somewhat difficult to get the competent and experienced staff at the time of installation. This problem can be overcome by paying attractive salaries to the cost accountants.
5. **Heavy expenses in installing and maintaining the system :** The setting up of a separate costing department with staff often poses a problem. In addition to installation, the operating expenses in the form of printing and stationery, heating and lighting, depreciation and insurance, rent and rates are to be incurred. However, as was mentioned earlier, the system of cost accounting must be a useful investment, *i.e.*, benefits derived from it must be more than the investment made on it. If this is not possible, for the time being the system must be discarded.

REQUISITES OR ESSENTIALS OF COST ACCOUNTING SYSTEM

The following are the essentials of an ideal cost accounting system :

1. **Accuracy :** The system of cost accounting must provide for accuracy in terms of both cost ascertainment and presentation. Otherwise it will prove to be misleading.
2. **Simplicity :** Cost accounting system involves detailed analysis of cost. To avoid complications in the procedure of cost ascertainment an elaborate system of costing should be avoided and every care must be taken to keep it as simple as possible.
3. **Elasticity :** The cost accounting system should be capable of adopting itself to the changing situations of business. It must be capable of expansion or contraction depending upon the needs of the business.
4. **Economy :** The costs of operating costing system must be less. It must result in increased benefit when compared to the expenditure incurred in installing it.
5. **Comparability :** The records to be maintained must facilitate comparison over a period of time. The past records must serve as a basis to guide the future.
6. **Promptness :** An ideal costing system is one which provides cost data in an analytical form to the management. So all the departments of a factory must analyse and record the relevant items of cost promptly in order to furnish cost information on a regular basis to various levels of management. This helps in checking up the progress of the business on a regular basis.
7. **Periodical preparation of accounts :** With a view to facilitate the comparison of results frequently, it is desirable to prepare accounts periodically. Constant comparison of actual result with standard result enables to spot out areas of inefficiency. This can be set right by taking remedial measures.
8. **Reconciliation with financial accounts :** The system of cost accounts must be capable of reconciling with financial accounts so as to check accuracy of both the system of accounts.
9. **Uniformity :** The various forms and documents used under costing system must be uniform in size and quality of paper. Printed forms must be used to avoid delay in the preparation of reports. This also reduces the burden of clerical staff. Forms of different colours can be used to distinguish different documents.
10. **Equity :** The basis of apportioning indirect expenses to products, departments or jobs must be fair and equitable.

ORGANISATION OF COST ACCOUNTING DEPARTMENT

The organisation of cost accounting department depends upon the size of the concern. Whatever may be the structure of cost accounting department in a factory, it is established to serve the following purposes : (*i*) To

compile cost data in order to meet the statutory requirement wherever applicable, (*ii*) To provide necessary cost data to management to carry out its functions efficiently, and (*iii*) To ensure efficiency and economy in the functioning of cost accounting department. To achieve the above purposes cost accounting department usually performs the following functions :

1. Designing and installation of appropriate method of costing.
2. Accumulation of cost data by process, department and product.
3. Analysis of such cost by elements of cost.
4. Estimation of cost of production.
5. Reporting of cost information to all levels of management.
6. Advising management in relation to investment based on cost information.

In a small and medium-sized concern, the cost accounting department may be set up as a section of financial accounting system. The cost accountant who is incharge of cost accounting department may be authorised to report to the chief accountant. In large-sized concern, a separate cost accounting department is established under the supervision of a full-fledged cost accountant. The cost accounting department is equipped with sufficient staff each to look after different facets of cost accounting function. While important functions such as budgeting, cost analysis, etc., are performed by cost accountant, cost recording, cost reporting and such other functions are performed by cost clerks.

The cost accounting department may be organised either on the principle of centralisation or decentralisation. Under centralised system, the functions of cost accounting departments relating to all firms belonging to same industry is performed at a common central place. The extent of centralisation of cost accounting department depends upon the following factors :

(*a*) The philosophy of management regarding divisional responsibility.
(*b*) The ready availability of cost data from each firm.
(*c*) Size of the firm.
(*d*) The area of operations of every firm.
(*e*) The economy involved in centralisation process.

Advantages of Centralised Cost Accounting Department

1. It facilitates full utilisation of services of costing staff.
2. It permits mechanisation of accounting which is not possible under decentralisation system.
3. It reduces paper work and economise stationery costs.
4. It facilitates prompt reporting.

Under decentralisation system a separate cost accounting department is set up for each and every firm under the supervision of a competent cost accountant. This system has certain advantages.

(a) It tends to increase the initiative of the cost accountants of every firm as the responsibility to control lies in their hands.
(*b*) It eliminates duplication of recording and reporting.
(*c*) It increases the speed of functioning of cost accounting department.

Relationship of Cost Department to Other Departments

1. **Cost accounting department and production department :** It can well be said that production department and cost department are interwoven together as the former cannot function efficiently without the existence of the latter. The production process is concerned with the utilisation of materials, money and human resources. The cost department helps in estimating the material cost, labour cost and other expenses for manufacturing a product. It also helps in controlling these costs so as to minimise the cost or production. In fact, the main objective of cost accounting system is to reduce the cost of

production of goods or services manufactured and rendered by business units. The other areas where cost accounting department is helpful in manufacturing process are : (*a*) Engineering department which is concerned with designing a product, (*b*) Research and development department which is concerned with development of a new product, (*c*) Production planning and control department which ensures completion of production within the time schedule, and (*d*) Quality control section, which ensures quality of products. All these departments heavily rely on cost accounting department because costs to be incurred in these departments have a direct impact over the functioning of these departments.

2. **Cost accounting department and personnel department :** The personnel department which is concerned with proper recruitment, selection, training, time-keeping, fixation of wage rate and preparation of payroll, will work with close co-ordination of cost department. Each and every function performed by personnel department is again influenced by additional cost to be incurred on such function as for example promotion of employees leads to incurrence of additional wages.
3. **Cost accounting department and finance department :** The finance department is concerned with receiving and disbursement of cash. The allocation of investments on fixed and working capital entirely depends upon the cost reports submitted to it by the cost department. Judicious utilisation of available capital is possible only when priority is given for more important areas of investment. This is facilitated by furnishing prompt report by cost department.
4. **Cost accounting department and purchase department :** In majority of firms purchase of raw materials at right quantity, of right quality, from right supplier, at a right time not only ensures ready supply but also at a reasonably low price. Any purchase of substandard quality of materials will lead to dissatisfaction among customers and consequently it leads to loss of orders. Further, purchase of materials at high rate will increase the cost of production tremendously. Delay in getting supplies of materials lead to delay in executing customers orders. In these respects cost accounting department can assist purchase department to ensure efficient purchasing. Cost department also help in reducing (*a*) waste of materials, (*b*) the risk from theft, and (*c*) excessive investment in inventories.
5. **Cost accounting department and marketing department :** Marketing department relies on cost information in order to (*a*) estimate future product cost for fixing the selling price, (*b*) in knowing the expenses incurred in marketing the products so that if the amount exceeds the target, control measures can be taken to reduce such expenses, (*c*) to consider alternative selling methods and promotional measures, and (*d*) to make further investment in warehousing and distribution process. Cost department provides all such information as is required by the marketing department for its efficient functioning.
6. **Cost accounting department and financial accounting department :** The existence of cost accounting department makes the financial accounting department a complete organisation by furnishing additional cost data to the chief accountant. Cost department enable financial accounts department in carrying out the latter's function furnishing necessary data in respect of the following :
   (*a*) supply of material cost, labour cost and expenses to facilitate preparation of manufacturing account.
   (*b*) Provision of the value of closing stock frequently to facilitate the preparation of interim final accounts.
   (*c*) Assist financial accounting department in matters relating to taxation, insurance and in solving legal matters.
   (*d*) Enables financial accounting department to settle the bills by duly approving them.
   (*e*) Helps financial accounting department in budgeting.

ADVANTAGES OF COST ACCOUNTING

A good costing system serves the needs of a large sections of people. The advantages of cost accounting are discussed below.

Advantages of Cost Accounting to Management

1. **Fixation of responsibility :** Whenever a cost centre is established, it implies establishing a kind of relationship between superior and subordinates. Thus responsibilities are fixed on every individual who is concerned with incurrence of cost.
2. **Measures economic performance :** By applying cost control techniques such as budgetary control and standard costing it helps in assisting the performance of business.
3. **Fixation of price :** By providing cost data it helps management to fix the selling price in advance. Hence, quotations can be supplied to prospective customers to secure orders.
4. **Aids in decision-making :** It helps management in making suitable decisions such as make or buy, replace manual labour by machines, shut down or continue operations based on cost reports.
5. **Helps in the preparation of interim final accounts :** By the process of continuous stock taking it enables to know the value of closing stock of materials at any time. This facilitates preparation of final accounts wherever desired.
6. **Helps in minimising wastages and losses :** Cost accounting system enables to locate the losses relating to materials, idle time and under utilisation of plant and machinery.
7. **Facilitates comparison :** It facilitates cost comparison in respect of jobs, process, departments and also between two periods. This reveals the efficiency or otherwise of each job, process or department.
8. **Assists in increasing profitability :** Costing reports provide information about profitable or unprofitable areas of operation. The management can discontinue that product line or that department which are responsible for incurring losses and only profitable line of activities alone are retained.
9. **Reconciliation with financial accounts :** A well maintained cost accounting system facilitates reconciliation with financial accounts to check the arithmetical accuracy of both the systems.
10. **It guides future production policy :** Cost data help management in determining future production policy. Any expansion or contraction of production for the future is based on past cost data.

Advantages to Employees

1. Cost accounting system enables employees to earn better wages through overtime wages and incentive systems of wage payment.
2. By providing better facilities it ensures job security to employees.
3. Employees benefit by merit rating techniques which is conducted by scientific process.

Advantages to Creditors

1. It increases the confidence of creditors in the capital employed in the business.
2. The frequent preparation of reports and statements help in knowing solvency position of the business.

Advantages to the Government

1. It helps government in formulating policies regarding export, import, taxation, price control measures, wage fixation, etc.
2. It helps in assessing excise duty, sales tax and income tax of the business.
3. Costing information helps in preparing national plans.

Advantages to Society

1. Cost reduction and cost control programmes go to minimise cost of production of goods and services. A portion of the reduced cost of production is shared by customers by paying less price for goods and services.
2. It offers employment opportunities in the cost accounting department in the capacity of cost accountants and cost clerks.

LIMITATIONS OF COST ACCOUNTING

1. **It is expensive :** The system of cost accounting involves additional expenditure to be incurred in installing and maintaining it. However, before installing it, care must be taken to ensure that the benefits derived is more than the investment made on this system of accounting.
2. **The system is more complex :** As the cost accounting system involve number of steps in ascertaining cost such as collection and classification of expenses, allocation and apportionment of expenses, it is considered to be complicated system of accounts. Moreover the system makes use of several documents and forms in preparing the reports. This will tend to delay in the preparation of accounts.
3. **Inapplicability of same costing method and technique :** All business enterprises cannot make use of a single method and technique of costing. It all depends upon the nature of business and type of product manufactured by it. If a wrong technique and method is used, it misleads the results of business.
4. **Not suitable for small scale units :** A cost accounting system is applicable only to a large-sized business but not to small-sized one. Hence, there is limitation to its application to all types of busines.
5. **Lack of accuracy :** The accuracy of cost accounts get distorted owing to the use of notional cost such as standard cost, estimated cost, etc.
6. **It lacks social accounting :** Cost accounting fails to take into account the social obligation of the business. In other words, social accounting is outside the purview of cost accounts.

21

CHAPTER

SINGLE OR OUTPUT OR UNIT COSTING

INTRODUCTION

As was discussed in chapter 2, the methods of costing can be broadly classified into two types, *viz*., specific order costing and operation costing. Single or output or units costing is a method of costing that belongs to the group of operation costing method. It is defined by the ICMA terminology as "the basic costing method applicable where goods or services result from a series of continuous or repetitive operations or processes to which costs are charged before being averaged over the units produced during the period". This method is known as "single" method of costing as industries adopting this method manufactures, in most cases a single variety of product. It is termed as unit costing because cost units are identical. Through under this method of costing a single variety of product is manufactured, it may vary in respect of size, grade, colour etc. The examples of industries which make use of this method of costing are : quarries, brick, sugar, both, coal, cement, fisheries, food canning, plantation industry, etc.

FEATURES AND OBJECTS OF OUTPUT COSTING

The features of industries which adopt single or output method of costing are as foollows :

(*a*) The production of goods are undertaken on a continous basis in anticipation of demand both in the short run and long run.
(*b*) The goods are produced on a large scale basis.
(*c*) Excepting in newly started industry in all other cases there always exists opening and closing work -in-progress.
(*d*) Cost of production is ascertained at the end of accounting year which may be a financial year or calender year.
(*e*) The cost is ascertained both per unit of finished product and for all the units manufactured.
(*f*) The end products are always homogeneous or uniform in all respects.
(*g*) Equality of costs is one of the basis feature of unit costing. In other words, identical cost unit will have identical cost.

The specific objects of this method of costing are (*a*) To ascertain total cost and unit cost of production, (*b*) Comparing cost of one period with another period to know efficieny or otherwise of it, and (*c*) To ascertain profit or loss from production.

COST COLLECTION

The various elements of cost is accumulated for the entire accounting period. As under this method, the variety of goods manufactured is restricted to one or to a few varieties, the method does not demand maintaining of elaborate records. The accounting procedure can be summarised under the following stages :

(*a*) The accumulation and tabulating various elements of costs for a given period say, a month, quarter, or year.
(*b*) Measurement of output either in terms of number or quantity.
(*c*) Calculating the cost per unit by dividing the total cost by number or quantity produced.

Collection of Materials Cost

The materials cost is accumulated from materials abstract. Alternatively, cost of raw materials consumed is ascertained by adding purchased raw materials during the period to the opening stock and deducting closing stock of materials therefrom. Any normal loss of materials is adjusted by inflating the rate of good units of raw materials.

Collection of Labour and Overhead

The labour cost is obtained from the pay rolls prepared separately for different sections or departments of the factory.

In majority of the cases overheads are charged at a predetermined rate where quotation prices are to be prepared. Otherwise overheads are collected under the heads of factory, office and administration and selling and distribution for the period for which they relate. When more than one variety of product is manufactured the overheads are apportioned on some suitable basis.

Treatment of Work-in-Progress and Scrap

The incomplete units of production is termed as work-in-progress. It is valued on the basis of material cost, labour cost and factory overheads. The opening stock of work-in-progress is added to the current cost of production (factory cost) and the closing stock of work-in-progress is deducted from the above total. After this treatment is given, the office and administration overheads are added to arrive at office cost.

Alternatively if the work-in-progress is analysed in terms of materials cost, labour cost and overheads, then the amount of materials, wages and overheads included in the work-in-progress in the beginning will be added and that included in work-in-progress at the end, deducted to ascertian the cost of materials labour and factory overheads respectively. There afterwards no other treatment need be given to the work-in-progress.

The value of "scrap" realised is to be deducted from works cost or works overhead. This is so because all the elements of costs are incurred on scrapped units also.

Any extra expenses incurred on rectifying "defectives" is added to work cost. However, if the cost of rectifying is high due to abnormal reasons it should be transferred to a separate "Defective account".

Cost Presentation-Preparation of Cost Sheet

The information derived from various records is presented in the form a statement of cost or a cost sheet. According to Walter W. Biggs, "the expenditure which has been incurred upon production for a period, is extracted from the financial books and the stores' records and set out in a memorandum or statement. If this statement is confined to the disclosure of the cost of the units produced during the period, it is termed as a cost sheet". The purposes which a cost sheet serves and its proforma is already presented in second chapter.

Problem 1. A factory can produce 60,000 units per annum at its 100% capacity. The estimated cost of production are as under :

Direct materials	Rs. 3 per unit
Direct labour	Rs. 2 per unit
Fixed overheads	Rs. 1,50,000 per annum
Variable overheads	Rs. 5 per unit

Semi-variable Rs. 50,000 per annum up to 50% capacity and an extra expenses of Rs. 10,000 per annum for every 25% increase in capacity or part thereof.

The factory produces only against orders. If the production programme of the factory is as indicated below and the management desires to ensure a profit of Rs. 1,00,000 for the year. Work out the average selling price at which unit should be quoted.

First 3 months of the year 50% of capacity, remaining 9 months of the year 80% of capacity.

(Bangalore University, B.Com., Nov. 1991)

Solution :

Cost Sheet

Direct materials	43,500 units @ Rs. 3 per unit			1,30,500
Direct labour	43,500 units @ Rs. 2 per unit			87,000
		Prime cost		2,17,500
Indirect expenses :				
Fixed			1,50,000	
Variable - 43,500 units @ Rs. 5			2,17,500	
Semi-variable :				
For first 3 months at 50% capacity $50,000 \times \frac{3}{12}$			12,500	
For 9 months at 80% capacity $\times \frac{9}{12}$			52,500	4,32,500
		Cost of production		6,50,000
Estimated profit				1,00,000
	Estimated sales			7,50,000

Selling price per unit $= \frac{\text{Estimated sales}}{\text{Total units}}$

$= \frac{7,50,000}{43,500} = \text{Rs. } 17.24$

Working Note : Calculation of units produced

output for first 3 months at 50% capacity

$60,000 \times \frac{50}{100} \times \frac{3}{12}$ = 7,500 units

For next 9 months 80% capacity

$60,000 \times \frac{80}{100} \times \frac{9}{12}$ = 36,000 units

Total units produced 43,500 units

Problem 2. A manufacturing company has an installed capacity of 1,20,000 units per annum. The cost structure of the product manufactured is as under

	Rs.
(*i*) Variable cost per unit :	
Materials	8
Labour (subject to a minimum of Rs. 56,010 per month)	8
Overheads	3

(*ii*) Fixed overhead - Rs. 1,68,750 per annum.

(*iii*) Semi-variable overheads Rs. 48,000 per annum at 60% capacity. Which increase by Rs. 6,000 per annum for increase of every 10% of the capacity utilisation or any thereof, for the year as a whole.

The capacity utilisation for the next year is estimated at 60% for two months; 75% for six months and 80% for the remaining part of the year. If the company is planning to have a profit of 25% on the selling price, calculate price per unit. Assume that there are no opening and closing stocks.

(CA Inter., November 1997)

Solution :

Calculation of Capacity Utilisation for the Next Year

$$\frac{60}{100} \times \frac{2}{12} \times 1{,}20{,}000 = 12{,}000 \text{ units}$$

$$\frac{75}{100} \times \frac{6}{12} \times 1{,}20{,}000 = 45{,}000 \text{ units}$$

$$\frac{80}{100} \times \frac{4}{12} \times 1{,}20{,}000 = 32{,}000 \text{ units}$$

89,000 units

Calculation of Labour Cost (subject to a minimum of Rs. 56,000 PM)

For 2 months	= 12,000 × Rs. 8	= 1,12,000	(Minimum being Rs. 56,000 PM for 2 months it is 56,000 × 2)
For 6 months	= 45,000 × Rs. 8	= 3,60,000	
For 4 months	= 32,000 × Rs. 8	= 2,56,000	
		7,28,000	

Calculation of Semi-Variable

At 60% capacity	= 48,000
For 80% capacity at Rs. 6,000	
For every 10% capacity utilisation	= 12,000
	60,000

Cost Sheet

Materials 89,000 units Rs. 8 per unit		7,12,000
Labour cost		7,28,000
	Prime cost	14,40,000
Variable overhead 89,000 units @ Rs. 3 per unit.		2,67,000
Semi variable overhead		60,000
Fixed overhead		1,68,750
	Factory cost	19,35,750
	Profit $\frac{1}{3}$ on cost price	6,45,250
	Sales	25,81,000
Selling price per unit		25,81,000
		89,000
		Rs. = 29.00

Working note

Calculation of Sales Manager's Commission

Let profit = x

Sales manager's commission 6% of x or $\frac{6x}{100}$

Total profit before charging commission

$$x + \frac{6x}{100}$$

or $$x + \frac{6x}{100} = \text{sales} - \text{cost of sales excluding sales manager's commission}$$

$$x + \frac{6x}{100} = 30,00,000 - 24,70,000$$

$$x + \frac{6x}{100} = 5,30,000$$

$$100x + 6x = 5,30,000 \times 100$$

$$106x = 5,30,00,000$$

$$x = \frac{5,30,00,000}{106} = 5,00,000$$

Sales Managers Commission $= \frac{6}{100} \times 5,00,000$

= Rs. 30,000

Problem 3. Delta Engineering Ltd. produces a uniform type of product and has a manufacturing capacity of 3,000 units per week of 48 hrs. Form the cost records of the company, the following data are available relating to output and cost for three consecutive weeks :

Week no.	*Units manufactured*	*Direct materials Rs.*	*Direct labour Rs.*	*Factory overhead (variable and fixed) Rs.*
1	1,200	9,000	3,600	31,000
2	1,600	12,000	4,800	33,000
3	1,800	13,500	5,400	34,000

Assuming that the company charges a profit of 20% on selling price find out the selling price per unit when the weekly output is 20,000 units. **(ICWA, Inter, June 1990)**

Solution :

Cost Sheet

	Per unit	*Total for 2,000 units*
Materials (In the last three weeks material per unit has been Rs. 7.50)	7.50	1,500
Labour (In the last three weeks labour cost per unit is Rs. 3)	3.00	6,000
Prime cost	10.50	21,000
Overhead :		
Variable overhead 5 per unit (*see note 1*)	5.00	10,000
Fixied overhead (*see note 2*)	12.50	25,000
Total cost	28.00	56,000
Profit 25% on cost	7.00	14,000
Selling price	35.00	70,000

Working note 1 : Calculation or variable overhead :

Week	*Unit manufactured*	*Factory overhead*
1	1,200	Rs. 31,000
2	1,600	Rs. 33,000
Difference	400	Rs. 2,000

For 400 units : Rs. 2,000

For 2,000 units Rs. $\frac{2{,}000 \times 2{,}000}{400}$ = Rs. 10,000

Verification of the above figure of Rs. 10,000 considering figures of third week.

Week	*Units manufactured*	*Factory overhead*
2	1,600	33,000
3	1,800	34,000
Difference	200	1,000

For 200 : 1,000 : 2,000 : x

i.e., $\frac{1{,}000 \times 2{,}000}{200}$ = Rs. 10,000

Working note 2 : Calculation of fixed cost

Total factory overheads for 1,200 units	
Less : Total variable overhead for 1,200 units	= 31,000
For 400 : 2,000	
For 1,200: $\frac{2,000 \times 1,200}{400}$	
(output of 1st week)	– 6,000
Fixed overhead	
Fixed overhead by definition remains fixed throughout.	25,000

PROBLEM ON CALCULATION OF MISSING INFORMATION

Problem 4. (Where selling price and cost of sales is missing)

A firm purchased a plant to manufacture a new product, the cost data for which is given below :

Estimated annual sales	24,000 units
Estimated costs :	
Materials	Rs. 4 per unit
Direct labour	Rs. 0.60 per unit
Overheads	Rs. 24,000 per year
Administrative expenses	Rs. 28,000 per year
Selling expenses	15% on sales

Calculate the selling price if profit per unit is Rs. 1.02 **(ICWA Inter., Dec. 1990)**

Solution :

Cost Sheet

		Cost per unit	*Amount*
Materials		4.00	96,000
Direct labour		0.60	14,400
	Prime cost	4.60	1,10,000
Overheads		1.00	24,000
	Factory cost	5.60	1,34,400
Administrative expenses		1.20	28,800
	Office cost	6.80	1,63,200
Selling and distribution overheads		1.38	33,120
	Cost of sales	8.18	1,96,320
	Profit	1.0200	24,480
	Sales	9.20	2,20,800

Working note : Calculation of selling price

Let the selling price be	= x Rs.
∴ Sales value	= 24,000 × x Rs.
Office cost + Selling expense + Profit	= Sales

$$1{,}63{,}200 + \left(\frac{15}{100} \times 24{,}000x\right) + 24{,}480 = 24{,}000x$$

$$1{,}63{,}200 + 3{,}600x + 24{,}480 = 24{,}000x$$

$$1{,}63{,}200 + 24{,}480 = -3{,}600x - 24{,}000x$$

$$1{,}87{,}680 = 20{,}400x$$

$$x = \frac{1{,}87{,}680}{20{,}400} = 9.2$$

Sales $= 24{,}000 \times 9.2 = 2{,}20{,}800$

Selling and distribution overhead $= \frac{15}{100} \times 2{,}20{,}800 = 33{,}120$

Problem 5. (When the quantity of scrap, value of closing stock of raw materials and value of finished goods are missing)

The following particulars relating to the year 1986 have taken from the books of a chemical works manufacturing and selling a chemical mixture :

	Kg.	*Rs.*
Stock on 1-1-86		
Raw materials	2,000	2,000
Finished mixture	500	1,750
Factory stores		7,250
Purchases :		
Raw materials	1,60,000	1,80,000
Factory stores		24,250
Sales :		
Finished mixture	1,53,050	9,18,000
Factory scrap	?	8,170
Factory wages		1,78,650
Power		30,400
Depreciation of machinery		18,000
Salaries :		
Factory		72,220
Office		37,220
Selling		41,500
Expenses :		
Direct		18,500
Office		18,200
Selling		18,000
Stock on 31-12-86 :		
Raw materials	1,200	?
Finished mixture	450	?
Factory stores		5,550

The stock of finished mixture at the end of 1986 is to be valued at the factory cost of the mixture for that year. The purchase price of raw materials remained unchanged throughout 1986.

Prepare a statement giving the maximum possible information about cost and its break up for the year 1986.

Solution :

Cost Sheet for the Year Ending 31.12.86

	Quantity (Kg.)	*Amount* ***(Rs.)***
Opening stock of raw materials	2,000	2,000
Add : Purchases	1,60,000	1,80,000
	1,62,000	1,82,000
Less : Closing stock of raw materials (*see note 1*)	1,200	1,350
Cost of materials consumed	1,60,800	1,80,650
Factory wages		1,78,650
Direct expenses		18,500
Prime cost		3,77,800
Factory overhead :		
Factory stores consumed (*see note 2*)		25,950
Power		30,400
Depreciation of machinery		18,000
Factory salaries		72,220
		5,24,370
Less : Factory scrap sold (*see note 3*)	7,800	8,170
Works cost	1,53,000	5,16,200
Office salaries		37,220
Office expenses		18,200
Office cost	1,53,000	5,71,620
Add : Opening stock of finished mixture	500	1,750
	1,53,500	5,73,370
Less : Clossing stock of finished mixture (*see note 4*)	450	1,518
Cost of finished mixture sold	1,53,050	5,71,852
Selling & distribution overhead: Salaries of selling dept.		41,500
Selling expenses		18,000
Cost of sales		6,31,352
Profit		2,86,648
Sales	1,53,050	9,18,000

***Working note 1* :** Calculation of value of closing stock of raw materials

For 1,60,000 kgs. of purchases, the value is 1,80,000

For 1,200 kgs. (Purchases price of raw materials remains same throughout 1986)

$$\frac{1{,}80{,}000 \times 1{,}200}{1{,}60{,}000} = \text{Rs. } 1{,}350$$

***Working note 2* :** Calculation of value of factory stores consumed

Opening stock of factory stores	Rs. 7,250
Add : Purchases of factory stores	Rs. 24,250
	31,500
Less : Closing stock of factory stores	5,550
	Rs. 25,950

***Working note 3* :** Calculation of quantity of scrap sold using reverse method

	Kg.
Quantity of finished mixture sold	1,53,050
Add : Closing stock of finished mixture	450
	1,53,500
Less : Opening stock of finished mixture	500
	1,53,000
Quantity of scrap sold (balancing figure)	7,800
Quantity of materials consumed	1,60,800

***Working note 4* :** Calculation of value of closing stock of finished mixture : (at works cost)

For 1,53,000 kgs. the works cost is Rs. 5,61,000

For 450 kgs. $= \frac{5,16,000 \times 450}{1,53,000} =$ Rs. 1,518

Problem 6. (When purchases is missing)

The books of Adarsh Manufacturing Company present the following data for the month of April 1992 :

Direct labour cost Rs. 17,500 being 175% of works overhead

Cost of goods sold excluding administrative expenses Rs. 56,000

Inventory accounts showed the following opening and closing balances :

	April 1 (Rs.)	*April 30 (Rs.)*
Raw materials	8,000	10,600
Work-in-progress	10,500	14,500
Finished goods	17,600	19,000

Other data are :

Selling expenses	3,500
General and Administration expenses	2,500
Sales for the month	75,000

You are required to

1. Compute the value of materials purchased.
2. Prepare a cost statement showing the various elements of cost and also the profit earned.

(CA (Inter), May, 1992)

Solution :

Statement Showing Value of Materials Purchased

Cost of goods sold		56,000
Add : Clossing stock finished goods		19,000
		75,000
Less : Operating stock of finished goods		17,600
	Cost of goods manufactured	57,400
Add : Closing stock of work-in-progress		14,500
		71,900
Less : Opening stock of work-in-progress		10,500
	Work cost	61,400

Less : Factory overhead $\frac{100}{175}$ of direct labour cost		10,000
	Prime cost	51,400
Less : Direct labour		17,500
	Raw materials consumed	33,900
Add : Closing stock of raw materials		10,600
		44,500
Less : Opening stock of raw materials		8,000
Value of materials purchased		36,500

Cost Sheet

Cost of raw materials consumed		33,900
Direct labour cost		17,500
	Prime cost	51,400
Add : Factory overhead		10,000
		61,400
Add : Opening stock of work-in-progress		10,500
Less : Closing stock of work-in-progress		71,900
		14,500
	Net works cost	57,400
Add : Opening stock of finished goods		17,600
		75,000
Less : Closing stock of finished goods		19,000
	Cost of goods sold	56,000
Add : General & administration expenses		2,500
Add : Selling expenses		3,500
	Cost of sales	62,000
	Profit	13,000
	Sales	75,000

Problem 7. (When prime cost is missing)

From the following information prepare a cost statement showing maximum possible breakup of cost and total profit :

		Rs.
Sales for January 1990		30,00,000
Cost of goods sold		24,80,000
Administration expenses		1,80,000
Selling expenses		40,000
	1.1.1990	*31.1.1990*
	(Rs.)	*(Rs.)*
Raw materials stock	3,20,000	4,00,000
Work-in-progress	3,20,000	4,80,000
Finished goods	4,20,000	3,40,000

Direct wages were 30% of prime cost

Raw materials consumed were 50% of prime cost
Direct expenses were 20% of prime cost
Factory overheads were 20% of prime cost **(University of Bombay, B.Com., May 1990)**

Solution :

Cost Sheet for the Period Ending 31.1.1990

Opening stock of raw materials	3,20,000	
Add : Purchases of raw materials	10,71,667	
	13,91,667	
Less : Closing stock of raw materials	4,00,000	
Cost of raw materials consumed		9,91,667
Wages		5,95,000
Direct expenses		3,96,667
Prime cost		19,83,334
Factory overheads		3,96,666
Works cost		23,80,000

Internal transport
Works overhead — 20% on direct charges
Office overheads — 10% on works cost
Cost of removal of overburden @ 0,01 paise per slate manufactured

Opening stock	10,000 slates
Manufactured slates purchased	20,000 @ Re. 1 per slate
Slates sold	1,00,000 @ Re. 2 per slate
Clossing stock	30,000 slates
Selling expenses	0.10 paise per slate sold

Prepare a cost sheet showing the cost per unit of each and every element

Solution :

Cost Sheet

	Cost per unit	*Total for 1,00,000 slates*
Royalty on slates quarried – 10,000 tons @ Rs. 2 per ton	0.20	20,000
Wages	0.40	40,000
Coal	0.10	10,000
Internal transport	0.20	20,000
Direct cost	0.90	90,000
Works overhead – 20% on direct charges		
$\frac{20}{100} \times 90{,}000$	0.18	18,000
Cost of removal of overburden @ 0.01 paise on 1,00,000 slates	0.01	1,000
Works cost	1.09	1,09,000
Office overhead – 10% of works cost	0.10	10,900
Cost of production	1.19	1,19,900

Statement Showing Profit

		Number of slates quarried	*Amount*
Opening stock		10,000	11,990
Add : Quarried quantity		1,00,000	1,19,900
Add : Purchases of manufactured slates		20,000	20,000
		1,30,000	1,51,890
Less : Closing stock of slates		30,000	35,700
Cost of goods sold		1,00,000	1,16,190
Selling expenses — 1,00,000 slates @ 0.10 paise			10,000
	Cost of sales		1,26,190
	Profit		73,810
	Sales		2,00,000
Note : Calculation of number of slates quarried			
Sale of slates		1,00,000	
Add : Closing stock		30,000	
		1,30,000	
Less : Opening stock	10,000		
Less : Slates purchased	20,000	30,000	
Number of slates quarried		1,00,000	
Add : Opening stock of work-in-progress			3,20,000
			27,00,000
Less : Closing stock of work-in-progress			4,80,000
			22,20,000
Office & administration expenses			1,80,000
	Office cost		24,00,000
Add : Opening stock of finished goods			4,20,000
			28,20,000
Less : Closing stock of finished goods			3,40,000
	Cost of goods sold		24,80,000
Selling expenses			40,000
	Cost of sales		25,20,000
	Profit		4,80,000
	Sales		30,00,000

Note : In this problem prime cost is the basis for calculating various elements of cost. Prime cost in this problem is calculated as under :

	Rs.
Let prime cost be	100
Add : Factory overhead	20
Works cost	120

Calculation of factory overheads on work cost

$$\frac{20}{120} \times 23,80,000 = 3,96,666$$

Prime cost = Works cost – Factory overheads

= 23,80,000 – 3,96,666
= Rs. 19,83,334

PROBLEMS ON OUTPUT AS APPLIED TO VARIOUS INDUSTRIES

Problem 8. (Output costing as applied to plastic industry)

From the following particulars supplied by Pure Plastic Ltd. You are required to prepare a monthly cost sheet showing profit for 1,000 plastic spoons. The opening stock was valued at the same price per 1,000 spoons of the production of the month concerned :

Materials	— Plastic granules	1,400 kgs @ Rs. 5 per kg.
	— Stores	Rs. 5,000
Labour	— Direct	Rs. 16,000
	— Indirect	Rs. 3,000
Overheads	— Works	25% of direct labour
	— Office	10% of works cost

Production for the month of October 1992 was 10,00,000 spoons.

Sales for the month : 9,00,000 spoons @ Rs. 50 per 1,000 spoons.

Stock at the end of the month : 3,00,000 spoons.

Solution :

Cost Sheet of Pure Plastic Ltd.

	Cost per 1,000 spoons	*Total for 10,00,000 spoons*
Raw materials (*see note 1*)	7.00	7,000
Labour (*see note 2*)	16.00	16,000
Prime cost	23.00	23,000
Store (*see note 3*)	5.00	5,000
Indirect labour (*see note 4*)	3.00	3,000
Works overhead (*see note 5*)	4.00	4,000
Works cost	35.00	35,000
Office overhead	3.50	3,500
Office cost	38.50	38,500
Add : Opening stock of spoons (*see note 6*)	7.70	7,700
	46.20	46,200
Less : Closing stock of spoons (*see note 7*)	11.55	11,550
Cost of goods sold	34.65	34,650
Profit	10.35	10,350
Sales (*see note 8*)	45.00	45,000

***Working note 1* :** Calculation of material cost per 1,000 spoons

for 10,00,000 spoons : Rs. 7,000

for 1,000 spoons $= \frac{7,000 \times 1,000}{10,00,000} =$ Rs. 7.00

***Working note 2* :** Calculation of labour cost per 1,000 spoons

for 10,00,000 spoons : Rs. 16,000

for 1,000 spoons $= \frac{16,000 \times 1,00}{10,00,000} =$ Rs. 16.00

Working note 3 **:** Calculation of stores cost per 1,000 spoons

for 10,00,000 spoons : Rs. 5,000

for 1,000 spoons $= \frac{5,000 \times 1,000}{10,00,000} =$ Rs. 5.00

Working note 4 **:** Calculation of indirect labour per 3,000 spoons

for 10,00,000 spoons : Rs. 3,000

for 1,000 spoons $= \frac{3,000 \times 1,000}{10,00,000} =$ Rs. 3.00

Working note 5 **:** Calculation of work overheads per 1,000 spoons

for 10,00,000 spoons : Rs. 4,000

for 1,000 spoons $= \frac{4,000 \times 1,000}{10,00,000} =$ Rs. 4.00

Working note 6 **:** Calculation of value opening stock of spoons

for 10,000 spoons cost of production is Rs. 38.50

for 2,00,000 spoons $= \frac{2,00,000 \times 38.50}{1,000} =$ Rs. 7,700

Opening stock = Closing stock + Sales – production

= 3,00,000 + 9,00,000 – 10,00,000 = 2,00,000

Working note 7 **:** Calculation of value of closing stock of spoons

for 1,000 spoons the cost of production is 38.50

for 3,00,000 spoons $\frac{3,00,000 \times 38.50}{1,000} =$ Rs. 11,550

Working note 8 **:** $\frac{50}{1,000} \times 9,00,000 =$ Rs. 45,000

Woriking note 9 **:** For 10,00,000 spoons 45,000

For 1,000 $\rightarrow \frac{45,000 \times 1,000}{10,00,000} = 45$

Problem 9. (Output costing as applied to brick manufacturing industries)

From the following information prepare a monthly cost sheet of the Hard Brickworks showing cost per 1,000 bricks. Also find out the profit per 1,000 bricks.

Materials used :

Lime	895 tonnes @ Rs. 30 per tonne
Coal	820 tonnes @ Rs. 25 per tonne
Sand	Rs. 10 per 1,000 bricks made

Others	Rs. 700
Labour :	
Sand digging	Rs. 1,800
Brick making	Rs. 8,000
Factory overhead	25% of direct charges
Office overhead	10% of factory cost
Bricks sold	35,00,000 @ Rs. 20 per 1,000 bricks
Stock of bricks at the beginning of the month	1,00,000
Stock of bricks at the end of the month	6,00,000

Solution :

Cost Sheet of Hard Brickworks

		Cost per 1,000 bricks	*Amount for 40,00,000 bricks*
Materials used :			
Lime		6.712	26,850
Coal		5.125	20,500
Sand		10.000	40,000
Others		0.175	700
	Total materials cost	22.012	88,050
Labour Sand digging		0.450	1,800
Brick making		2.000	8,000
	Prime cost	24.426	97,850
Factory overheads			
25% direct charges, *i.e.*, prime cost		6.115	24,462
	Factory cost	30.577	1,22,312
Office overheads			
10% of factory cost		3.058	12,231
Office cost or cost of production		33.635	1,34,543

Statement Showing Profit for 1,000 Bricks

	No. of bricks	*Per 1,000 bricks*	*Total*
Opening stock	1,00,000	33.635	3363.50
Add : Cost of production	40,00,000	–	1,34,540.00
	41,00,000	33.635	1,37,903.50
Less : Closing stock	6,00,000	–	20,181.00
Cost of goods sold	35,00,000	33.635	1,17,722.50
Loss			47,222.50
Sales			70,000.00

Working note 1 : Calculation of materials cost, lime per 1,000 bricks

for 40,00,000 bricks, materials cost is 26,850

for 1,000 bricks $= \frac{26,850 \times 1,000}{40,00,000} =$ Rs. 6.712

Working note 2 **:** Calculation of coal consumed per 1,000 bricks

for 40,00,000 bricks : coal cost is Rs. 20,500

$$\text{for 1,000 bricks} = \frac{20,500 \times 1,000}{40,00,000} = \text{Rs. } 5.125$$

Working note 3 **:** Calculation of send cost per 1,000 bricks

for 40,00,000 bricks : sand cost is 40,000

$$\text{for 1,000 bricks} = \frac{40,000 \times 1,000}{40,00,000} = \text{Rs. } 10$$

Working note 4 **:** Calculation of other cost per 1,000 bricks

for 40,00,000 bricks, other cost is Rs. 700

$$\text{for 1,000 bricks} = \frac{700 \times 1,000}{40,00,000} = \text{Rs. } 0.175$$

Working note 5 **:** Calculation of labour cost per 1,000 bricks

for 40,00,000 bricks, labour cost is Rs. 1,800

$$\text{for 1,000 bricks} = \frac{1,800 \times 1,000}{40,00,000} = \text{Rs. } 0.450$$

Working note 6 **:** Calculation of factory overhead per 1,000 bricks

for 40,00,000 bricks, factory overhead is Rs. 24,462

$$\text{for 1,000 bricks} = \frac{24,462 \times 1,000}{40,00,000} = \text{Rs. } 6.115$$

Working note 7 **:** Calculation of office overheads per 1,000 bricks

for 40,00,000 bricks, office overheads is Rs. 12,231

$$\text{for 1,000 bricks} = \frac{24,462 \times 1,000}{40,00,000} = \text{Rs. } 3.058$$

Working note 8 **:** Calculation of value of opening stock

for 1,000 bricks : cost of production is Rs. 33,635

$$\text{for 1,00,000 bricks} = \frac{33,635 \times 1,00,000}{1,000} = \text{Rs. } 3,363.50$$

Working note 9 **:** Calculation of value of closing stock

for 10,000 bricks cost of production is Rs. 33,635

$$\text{for 6,00,000 bricks} = \frac{33,635 \times 6,00,000}{1,000} = \text{Rs. } 20,181$$

Working note 10 **:** Calculation of sales

for 1,000 bricks sale price is Rs. 20

$$\text{for 35,00,000 bricks} = \frac{20 \times 35,000}{1,000} = \text{Rs. } 70,000$$

Working note 11 **:** Number of bricks manufactured

Number of bricks sold	35,00,000
Add : Closing stock	6,00,000
	41,00,000
Less : Opening stock	1,00,000
Bricks manufactured	40,00,000

Problem 10. (Output costing as applied to quarries)

The following particulars relate to a manufacturing company

Slates quarried : 10,000 tons on which a royalty @ Rs. 2 per ton paid

			Rs.
Wages			40,000
Coal			10,000
Rent 20% of 4,00,000	=	80,000	
Selling and administration	=	3,20,000	4,22,000
Cost of sales			28,70,000
Profit			3,30,000
Sales			32,00,000

Problem 11. (Cost sheet when certain rate of return is expected on share capital)

The Government of India has instituted a dual pricing system in the industry in which your organisation operates. You are the head of the costing division of Rajan Textiles Co. Ltd. Your company produces a standard type of cloth 50% of which is procured by the Government at a price of Rs. 4 per metre. You are required by the managing director of your company to suggest a suitable price for the cloth to be sold in the open market. Production during 1990–91 has been 20,00,000 meteres of cloth. Relevant information is given below :

	Rs.
Cotton consumed	10,00,000
Direct labour in factory	10,00,000
Carriage inwards	50,000
Indirect labour in factory	4,00,000
Salary of works manager	2,50,000
Water, power and local taxes (factory)	5,00,000
Dyeing, bleaching, etc.	10,00,000
Excise and other taxes	30,00,000
Depreciation of factory	2,00,000
Depreciation of office	1,00,000
Miscellaneous expenses of factory	1,00,000
Miscellaneous expenses of office	1,00,000
Purchase of computer (office)	20,00,000
Purchase of furniture and machines (office)	5,00,000
Expenditure on sales department	4,00,000
Dividents paid	1,22,00,000
Office salaries	10,00,000
Director's fee	2,00,000
Advertisement and publicity	10,00,000
Salary to M.D.	1,00,000

Commission paid on sales	10,00,000
Commission paid to foreign buyers	1,00,000
Packing and forwarding (sales)	2,00,000

The following further information is made available :

(*i*) The company expects a fair return of 20% on its paid up capital

(*ii*) The paid up capital of the company is Rs. 1,00,00,000.

(*iii*) Marketing expenses outstanding are Rs. 1,00,000.

Suggest the open market price after preparing a cost sheet.

(Sri Sathya Sai University, B.Com., March 1993)

Solution :

Cost Sheet of Rajan Textiles Co. Ltd.

Cotton consumed			10,00,000
Direct labour cost			10,00,000
Carriage inwards			50,000
	Prime cost		20,50,000
Excise and other duties		30,00,000	
Indirect labour		4,00,000	
Salary of works manager		2,50,000	
Water, power, etc.		5,00,000	
Dyeing and bleaching		10,00,000	
Depreciation of factory		2,00,000	
Miscellaneous factory expenses		1,00,000	54,50,000
	Factory cost		75,00,000
Depreciation of office		1,00,000	
Miscellaneous office		1,00,000	
Salary to M.D.		1,00,000	
Office salaries		10,00,000	
Director's fee		2,00,000	
			15,00,000
	Office cost		90,00,000
Expenditure on sales dept.		4,00,000	
Advertisement		10,00,000	
Commission paid		10,00,000	
Commission to forienoers		1,00,000	
Packing		2,00,000	
Marketing expenses o/s		1,00,000	28,00,000
	Cost of sales		1,18,00,000
	Expected rate of return		20,00,000
	Sales		1,38,00,000

Working note

Cost of production and sale of cloth per meter = $\frac{1,18,00,000}{20,00,000}$ = 5.9

Less : Government procurement price = 4.0

Loss per meter 1.9

Total loss on 10,00,000 mts. @ Rs. 1.9 per meter	19,00,000
Fair return on capital (20% on 1 crore)	20,00,000
	39,00,000

Amount to be recovered per meter

$$\frac{39,00,000}{10,00,000} = 3.90$$

Thus the price of remaining 10,00,000 mts. should be fixed up as follows

Cost of sale per meter	5,90
Amount to be recovered per meter	3,90
	9,80

Note 2 : Purchase of computers, furnitures and equipment are assets. They will not come in cost sheet. Dividend paid is a matter of pure finance. It will not affect cost of production and hence excluded from cost sheet.

PREPARATION OF COMPARATIVE COST SHEET

A comparative cost sheet can be prepared for any of the following purposes :

(*a*) To know the comparative profitability of two or more than two lines of existing products.
(*b*) To know the cost of production, profit and sales of two or more than two products over two different period of time.
(*c*) To compare the actual cost of production with predetermined cost to know the efficiency or otherwise.
(*d*) To compare the profit of one line of product with the existing product and there by to decide whether a new line of product could be introduced.
(*e*) To evaluate the performance of different types of machineries.

Problem 12. (On comparative cost sheet)

M/s Vidya Pen Company manufactures two types of pens 'Sharada' and 'Viveka'. The particulars for the year ended 31st March, 1999 were as follows :

	Rs.
Direct materials	5,00,000
Direct wages	2,25,000
Direct expenses	75,000
Total sales	10,00,000

There was no work-in-progress at the beginning or at the end of the year. On the study it is as certained that :

1. Direct material per unit in 'Sharada pen' consists twice as much as that in type 'Viveka pen'.
2. The direct wages per unit for 'Viveka pen' were 40% of those for 'Sharada pen'.
3. Direct expenses were same per unit for viveka as well as 'Sharada pen'.
4. Factory overhead were 20% of the prime cost.
5. Administrative overhead were 50% of direct wages.
6. 2,500 units of Sharda pen were produced of which 2,000 were sold and 5,000 units of Viveka pen were produced of which 4,000 were sold, during the year.
7. Selling overheads were Rs. 8 per unit for Sharada pen and Rs. 9 per unit for Viveka pen.
8. Selling price per unit for Sharada pen was 250 and Viveka pen was Rs. 125 respectively.

You are required to prepare a statement showing cost and profit in total as well as per unit for Sharada pen and Viveka pen. **(University of Bombay, B.Com., October 1999)**

Solution :

Cost Sheet of Vidya Pen Co. for the Year Ended 31st March

	Sharada Pen		*Viveka Pen*	
	Amount	*Cost per pen*	*Amount*	*Cost per pen*
Direct materials	2,50,000	100	2,50,000	50
Direct wages	1,25,000	50	1,00,000	20
Direct expenses	25,000	10	50,000	10
Prime cost	4,00,000	160	4,00,000	80
Factory overheads 20% of Prime cost	80,000	32	80,000	16
Works cost	4,80,000	192	4,80,000	96
Administrative overhead 50% of direct wages	62,500	25	50,000	10
Cost of production	5,42,500	217	5,30,000	106
Less : Closing stock of finished goods	1,08,500	–	1,06,000	–
Cost of goods sold	4,34,000	217	4,24,000	106
Selling overheads	16,000	8	36,000	9
Cost of sales	4,50,000	225	4,60,000	115
Profit	50,000	25	40,000	10
Sales	5,00,000	250	5,00,000	125

***Working notes* :**

1. Calculation of direct materials

Let material used per unit in Viveka be Rs. x

Material used per unit in 'Sharada' = $2x$

$$2x\,(2{,}500) + x(5{,}000) = 5{,}00{,}000$$

$$10{,}000x = 5{,}00{,}000$$

$$x = 50$$

per unit in Viveka = Rs. 50

per unit in sharada = Rs. 100

2. Calculation of direct wages

Let direct wages per unit in 'Sharda' be Rs. x

$\therefore$ Direct wages per unit in 'Viveka' $= \frac{40}{100}x$ or $0.4x$

$$x(2{,}500) + 0.4x(5{,}000) = 2{,}25{,}000$$

$$2{,}500x + 2{,}000x = 2{,}25{,}000$$

$4{,}500x = 2{,}25{,}000$

x = Rs. 50

Wages per unit in Sharada = Rs. 50

Wages per unit in Viveka = Rs. $\frac{40}{100} \times 50$

= Rs. 20

3. Calculation of direct expenses

Per unit : $\frac{75{,}000}{7{,}500}$ = Rs. 10

4. Valuation of closing stock of finished goods

	Sharada	*Viveka*
Quantity produced	2,500	5,000
Less : Quantity sold	2,000	4,000
Qty. in closing stock	500	1,000
Value of closing stock		
Sharada 500 × 217	1,08,500	
Viveka 1,000 × 106		1,06,000

Problem 13. A & Co. manufactures two types of products, *viz.*, A and B. The following information is available for the year ended 31 March, 1998.

	Rs.
Direct material	6,75,000
Direct wages	9,90,000
Works overheads	1,95,000

1. Direct material used per unit in product A were 3 times that of product B.
2. Direct wages per unit in product B were $\frac{2}{3}$ that of product A.
3. Works overheads per unit were the same for both the products.
4. Administration overheads were 100% of the prime cost in each of the products.
5. Selling and distribution cost per unit was Rs. 6 for both A and B.
6. 35,000 units of product A were produced, out of which 32,000 units were sold @ Rs. 100 per unit.
7. 30,000 units of product B were produced, out of which 25,000 units were sold @ Rs. 65 per unit.

Prepare cost sheet showing total cost and cost per unit for both the products.

(University of Bombay, B.Com., October 1998)

Solution :

Cost Sheet for the Year Ended 31st March, 1998

	Product A		*Product B*	
	Per unit	*Total*	*Per unit*	*Total*
Direct materials	15	5,25,000	5	1,50,000
Direct wages	18	6,30,000	12	3,60,000
Prime cost	33	11,55,000	17	5,10,000
Factory overhead	3	1,05,000	3	90,000
Works cost	36	12,60,000	20	6,00,000
Administration overhead	33	11,55,000	17	5,10,000
Cost of production	69	24,15,000	37	11,10,000
Less : Closing stock	–	2,07,000	–	1,85,000
Cost of goods sold	69	22,08,000	37	9,25,000
Selling and Distribution overheads	6	1,92,000	6	1,50,000
Cost of sales	75	24,00,000	43	10,75,000
Profit	25	8,00,000	22	5,50,000
Sales	100	32,00,000	65	16,25,000

***Working notes* :**

1. Calculation of direct materials

Let materials cost per unit of product B = x

$\therefore$ Materials cost per unit of product A = $3x$

$$\therefore \quad 3x \times 35{,}000x + 30{,}000x = 6{,}75{,}000$$

$$1{,}05{,}000x + 30{,}000x = 6{,}75{,}000$$

$$1{,}35{,}000x = 6{,}75{,}000$$

$$x = \frac{6{,}75{,}000}{1{,}35{,}000} = 5$$

Product A $\quad 3x = 15$

$\therefore$ Materials for A $= 35{,}000 \times 15 = 5{,}25{,}000$

Materials for B $= 30{,}000 \times 5 = 1{,}50{,}000$

2. Calculation of direct wages

Let wages per unit of product A = x

$\therefore$ wages per unit of product B = $\frac{2}{3}x$

$$= x \times 35{,}000 + \frac{2}{3}x \times 30{,}000 = 9{,}90{,}000$$

$= 35{,}000x + 20{,}000x = 9{,}90{,}000$

$= 55{,}000x = 9{,}90{,}000$

$$x = \frac{9{,}90{,}000}{55{,}000} = 18$$

$\therefore \quad \frac{2}{3}x = 12$

$\therefore$ Wages for product A $= 35{,}000 \times 18 = 6{,}30{,}000$

Wages for product B $= 30{,}000 \times 12 = 3{,}60{,}000$

9,90,000

3. Calculation of closing stock valuation

	Product A	*Product B*
Units produced	35,000	30,000
Units sold	32,000	25,000
Units in stock	3,000	5,000
Value of closing stock		
A — 3,000 units @ Rs. 69	2,07,000	
B — 5,000 units @ Rs. 37		1,85,000

Preparation of Tender Statement

Very often the purchase of goods and component parts by the buyers are based on the tender price or quotation price quoted by the supplier, i.e., manufacturer. This is to take advantage of the lowest price quoted by the manufacturer. So it is implied that to increase the sales and to attract more customers towards business it is very essential to prepare the quotation price very carefully. At the some time once the tender price is issued it cannot be reversed. Any increased, quotation price results in a loss to the business. Therefore care must be taken to prepare tenders based on actual facts and in precise terms.

The cost accounts plays a significant role in preparing the tender price. First of all, he has to collect all the information relating to cost of materials, wages and other expenses. The exact requirements of the various inputs can be obtained from production planning department. If necessary, advise can also be obtained from industrial engineer. The estimated price of raw materials can be known form market survey. The labour cost for manufacturing so many units can be known from previous years records and providing for additional charges in case of revision of wage rates. Similarly direct expenses and overheads are worked out based on past experience and considering new factors. Wherever it is necessary overheads may be classified into fixed and variable to know the impact of variable overhead. Fixed overheads should be critically examined to ascertain the possible increase for the new work load. The office and administration overheads can be charged on a predetermined basis. Once the estimated cost is prepared the last step is to add a margin of profit to ascertain the quotation price or tender price.

Problem 14.

The following figures relate to the manufacturing of electric fans for three months ending 31st Dec., 2000 :

	Rs.
Completed stock on 1st Oct. 2000	NIL
Completed stock on 31st Dec. 2000	20,250
Stock of raw materials on 1st Oct. 2000	5,000

Stock of raw materials on 31st Dec. 2000	3,500
Factory wages	75,000
Indirect charges	12,500
Materials purchased	32,500
Sales	1,12,500

The number of fans manufactured during these three months was 3,000.

Prepare a statement showing the cost per fan and the price to be quoted for 750 fans to realise the same percentage of profits as was realised during the said period, assuming the same condition.

(Sri Sathya Sai University, B.Com., Feb. 2001)

Solution :

Statement of Cost for the Three Months Ending

			31.12.2000	
			Cost for 3,000	*Cost for fan*
Opening stock of raw materials		5,000		
Add : Purchases		32,500		
		37,500		
Less : Closing stock		3,500		
			34,000	11,33
Factory wages			75,000	25.00
	Prime cost		1,09,000	36.33
Indirect charges			12,500	4.17
	Cost of production		1,21,500	40.50
Less : Closing stock of fans			20,250	
	Cost of goods sold		1,01,250	
	Profit		11,250	
	Sales		1,12,500	

Quotation for 750 fans

			Total	*Per fan*
Materials	Rs. $\frac{34,000}{3,000} \times 750$		8,500	11.33
Wages	Rs. $\frac{75,000}{3,000} \times 750$		18,750	25.00
		Prime cost	27,250	36.33
Indirect wages	Rs. $\frac{12,500}{3,000} \times 750$		3,125	4.17
		Cost of production	30,375	40.50
Add : Profit $\frac{1}{9} \times 30,375$			3,375	4.50
		Quotation price	33,750	45.00

Problem 15. Swadeshi Electronics Ltd., furnishes to you the following information for the year ended 31st March, 1996 :

Production and sales	15,000 units
Sales	Rs. 12,75,000
Direct wages	Rs. 2,70,000
Direct materials	Rs. 3,30,000
Factory overheads	Rs. 2,25,000
Administrative overheads	Rs. 1,05,000
Sales overheads	Rs. 90,000

On account of intense competition following changes are estimated in the subsequent year.

1. Production and sales activity will be increased by one-third.
2. Material rate will be lower by 25%. However there will be increase in consumption by 20% due to quality differences.
3. Direct wages cost would be reduced by 20% due to automation.
4. Out of the above factory overhead, Rs. 45,000 are of fixed nature. The remaining factory expenses are variable in proportion to the number of units produced.
5. Total administrative overheads will be lower by 40%
6. Sales overhead per unit would remain the same
7. Sale price per unit would be lower by 20%

Prepare a statement of cost for both the years ending 31st March, 1996 and 31st March, 1997, showing maximum possible details. **(University of Bombay, B.Com., April 1996)**

Solution :

Cost Sheet for the Year 1996 and 1997

	1996		*1997*	
	Total	*Per unit*	*Total*	*Per unit*
Materials	3,30,000	22	3,96,000	19.80
Wages	2,70,000	18	2,88,000	14.40
Prime cost	6,00,000	40	6,84,000	34.20
Factory overhead	2,25,000	15	2,85,000	14.25
Works cost	8,25,000	55	9,69,000	48.45
Administration overhead	1,05,000	7	63,000	3.15
Cost of production	9,30,000	62	10,32,000	51.60
Selling overheads	90,000	6	1,20,000	6.00
Cost of sales	10,20,000	68	11,52,000	57.60
Profit	2,55,000	17	2,08,000	10.40
Sales	12,75,000	85	13,60,000	68

Working notes :

1. Calculation of prodution and sales

$$15{,}000 + \frac{1}{3} \times 15{,}000 = 20{,}000 \text{ units}$$

2. Calculation of material rate

1996 = $\frac{3,30,000}{15,000}$	= 22.00	
Less : Reduction in price by 25%	5.50	
	16.50	
Add : Rise in consumption by 20%	3.30	
Rate of materials	19.80	

3. Calculation of wages

Wage rate	18.00
Less : 20% reduction	3.60
Rate of wages	14.40

4. Calculation of factory overheads

	1996	*1997*
Fixed	45,000	45,000
Variable	1,80,000	2,40,000
	2,25,000	2,85,000

5. Administration cost in 1996	1,05,000	
Less decrease in expenditure 40%	42,000	
Cost in 1997	63,000	
6. Sales overheads per unit is Rs. 6		
So for 20,000 units it would be 1,20,000		
7. Selling price in 96		85
Less 20% reduction		17
Selling price in 97		68

Problem 16. The following information for the years ending 31st Dec. 1989 is taken from the books of a company manufacturing TV valves :

Materials consumed	6,00,000
Direct wages	4,00,000
Direct expenses	2,00,000
Indirect wages	30,000
Stereo and spares consumed	55,000
Workman's welfare expenses	40,000
Cost of rectifying defective work	15,000
Depreciation on machinery	25,000
Other factory expenses	1,50,000
Sale of factory scrap	15,000
Administrative staff salaries	1,55,000
Other administrative expenses	1,10,000
Professional charges, audit fee, director's fee	35,000
Commission paid to selling agents	1,20,000
Neon sign expenses	25,000
Show room expenses	35,000
Sales	26,40,000

10,000 units has been manufactured and sold for the year ending 31st Dec. 1989

For the year ending 31st Dec. 1990 the following estimates have been made

(*i*) Production and sales will be 12,000 units
(*ii*) Materials cost per unit will rise by 50%
(*iii*) Wage rates per unit will rise by 25%
(*iv*) Direct expenses per unit will be in the same proportion to wages as before
(*v*) Factory expenses will be in the same proportion to prime cost. Administration overheads in the same proportion to factory cost and selling overheads in the same proportion to cost production as before
(*vi*) Profit desired per unit is 25% on selling price.

Prepare a cost statement showing total cost, cost per tin, total profit and profit per unit for 1989 and 1990.

(University of Bombay, B.Com., Oct. 1990)

Solution:

Cost Sheet for 1989 (output 10,000 units)

			Cost per unit	*Amount*
Materials			60.00	6,00,000
Wages			40.00	4,00,000
Direct expenses			20.00	2,00,000
		Prime cost	120.00	12,00,000
Works overheads :				
Indirect wages	30,000			
Stereo wages	55,000			
Workmen's welfare expenses	40,000			
Cost of rectifying defectives	15,000			
Depreciation on machinery	25,000			
Other factory expenses	1,50,000			
	3,15,000			
Less : Sale of factory scrap	15,000		30	3,00,000
		Factory cost	150,00	15,00,000
Administration overheads :				
Adminstration staff salaries	1,55,000			
Other administration expenses	1,10,000			
Profession charges, etc.	35,000		30.000	3,00,000
		Office cost	180.00	18,00,000
Selling & distribution overheads :				
Commission paid	1,20,000			
Neon sign expenses	25,000			
Show room expenses	35,000		18.00	1,80,000
		Cost of sales	198.00	19,80,000
		Profit	66.00	6,60,000
		Sales	264.00	26,40,000

Quotation Price for 1990 (output 12,000 units)

		Cost per unit	*Amount*
Materials	60	90.00	10,80,000
Add : 50% Increase	30		
Labour	40	50.00	6,00,000
Add : 25% Increase	10		

Direct expenses (*see note 1*)		25.00	3,00,000
	Prime cost	165.00	19,80,000
Works overhead (*see note 2*)		41.25	4,95,000
	Factory cost	206.25	24,75,000
Administration expenses (*see note 3*)		41.25	4,95,000
	Office cost	247.50	29,70,000
Selling and distribution expenses (*see note 4*)		24.75	2,97,000
	Cost of sales	272.25	32,67,000
	Profit	90.75	10,89,000
	Sales	363.00	43,56,000

***Working note 1* :** Calculation of direct expenses

In 1989, for Rs. 40 wages : The direct expenses 20

In 1990 for Rs. 50 wages $\frac{50 \times 20}{40}$ = Rs. 25 per unit.

***Working note 2* :** Calculation of factory overheads

For 12,00,000 prime cost, factory expenses was, 3,00,000

For 100 $\frac{3,00,000 \times 100}{12,00,000} = 25\%$

***Working note 3* :** Calculation of administration overhead

For 15,00,000 of factory cost, the adm. overhead is Rs. 3,00,000

For 100 $\frac{3,00,000 \times 100}{15,00,000} = 20\%$

***Working note 4* :** Calculation of selling overheads

For 18,00,000 of cost of prodution the selling overhead is Rs. 1,80,000

For 100 $\frac{1,80,000 \times 100}{18,00,000} = 10\%$

Problem 17. A company produces a plant that sells for Rs. 1,800. An increase of $7\frac{1}{2}$ % in cost of materials and $6\frac{1}{2}$% in cost of labour is anticipated. What must be the selling price to produce the same percentage of gross profit as before. Only data available are :

Material cost have been 50% of cost of sale

Wages cost have been 20% of cost of sale

Overhead cost have been 30% of cost of sale

The anticipated increased costs in relation to the present sales price would cause a 25% decrease in the amount of present gross profit.

Prepare a statement of profit or loss per unit, showing the new selling price desired and new cost per unit.

Solution :

Let x be the present cost of sales

Let y be the present gross profit

Then for the present condition $x + y = 1{,}800$ ... (1)

Rs. x is made up of :

Materials	50% or $= 0.5x$
Labour	20% or $= 0.2x$
Overheads	30% or $= 0.3x$

This would increase :

Materials by	$7\frac{1}{2}\% = 0.5x + 0.0375x =$	$0.5375x$
Labour by	$6\frac{1}{4}\% = 0.2x + 0.125x =$	$0.2125x$
Overhead as before		$0.3000x$
		$1.0500x$

This increase in cost would result in a decrease of gross profit by 25% at the same selling price. So the gross profit would be $0.75y$

i.e., $1.05x + 0.75y = 1{,}800$ ...(2)

$x + y = 1{,}800 \times 1.5$

$1.05x + 0.75y = 1{,}800$

$1.05x + 1.05y = 1{,}890$

$1.05x + 0.75y = 1{,}800$

Substracting $0.30y = 90$

$$y = \frac{90}{0.30} = 300$$

Substituting the value of y in the 1st equation

$x + y = 1{,}800$

$x + 300 = 1{,}800$

$x = 1{,}800 - 300 = 1{,}500$

Cost Sheet Showing Present and Revised Cost

	Present cost		*Revised cost*
Materials 50%	750.00	Add 7½%	806
Labour 20%	300.00	Add 6½%	318
Overhead 30%	450.00		450
Cost of sales	1,500		1,575
Profit	300		315
Selling price	1,800		1,890

Problem 18. (When fixed and variable overheads are given)

The following information is available from the books of a company manufacturing luxury ceiling fans. Production and sales during the year ending 31.3.1988 was 1,000 units.

	Rs.
Direct materials	2,00,000
Direct wages	1,50,000
Factory expenses	1,37,500
Administration expenses	60,000
Selling expenses	45,000
Sales	7,30,000

The following estimates have been made for 1988–89 :

(*i*) Production and sales will be 1,500 units
(*ii*) Materials price per unit will increase by 25% but due to economy in consumption the cost per unit will reduce by 12%.
(*iii*) The wages rates per unit will increase by 20%
(*iv*) Factory expenses Rs. 50,000 are fixed. The remaining factory expenses will be in the same proportion to materials consumed and wages as in the previous year.
(*v*) The total administration expenses will increase by $66\frac{2}{3}$
(*vi*) Selling expenses will be Rs. 90,000
(*vii*) The profit desired is 20% on sales

Prepare a cost statement showing maximum possible break-up of cost per unit and total cost for 1987–88 and 1988–89 profit per unit and total profit for 1987–88 and 1988–89.

(University of Bombay, B.Com., Oct. 1988)

Solution :

Cost Sheet for 1987–88 (output 1,000 fans)

			Cost per fan	*Amount*
Direct materials			200	2,00,000
Direct wages			150.00	1,50,000
		Prime cost	350.00	3,50,000
Factory overheads	— Fixed		50.00	50,000
	— Variable		87.50	87,500
		Factory cost	487.50	4,87,500
Administration expenses			60.00	60,000
		Office cost	547.50	5,47,500
Selling expenses			45.00	45,000
		Cost of sales	592.50	5,92,500
		Profit	137.50	1,37,500
		Sales	730.00	7,30,000

Quotation for 1,500 fans

			Cost per fan	*Amount*
Materials	200		226	3,39,000
Add : 13% increase	26			
Wages	150			
Add : 20% increase	30		180	2,70,000
		Prime cost	406	6,09,000
Factory overhead	— Fixed		33.33	50,000
	— Variable (*see note*)		101.50	1,52,250
		Factory cost	540.83	8,11,250
Administration expenses			66.67	1,00,000
		Office cost	607.50	9,11,250
Selling expenses			60.00	90,000
		Cost of sales	667.50	10,01,250
		Profit	166.875	2,50,132.50
		Sales	834.375	12,51,562.50

Note : For prime cost of 350 variable overhead is 87.50.
For Prime cost of overhead is 101.50.

EXERCISES

Exercises on simple cost sheet

EXERCISE 1

From the following particulars, prepare a cost sheet and as certain the sales by adding a profit of 25% on sales.

	1-1-998	*31-1-1998*
	(Rs.)	*(Rs.)*
Raw materials	30,500	48,500
Work-in-progress	8,000	9,000
Finished goods	2,04,000	10,000

	(Rs.)
Purchase of raw materials	25,000
Direct wages	20,400
Factory expenses	10,500
Office expenses	5,400
Selling and distribution expenses	7,300

(Bangalore University, B.B.M., April 1999)

[**Answer :** Sales Rs. 80,000]

EXERCISE 2

Following data are extracted from Pawan Kishore Industries for the year 1995

Opeing stock of raw materials	25,000

Closing stock of raw materials	40,000
Purchases of raw materials	85,000
Carriage inwards	5,000
Wages (direct)	75,000
Wages (indirect)	10,000
Other direct charges	15,000
Rent and rates—factory	5,000
Rent and rates—office	500
Indirect materials	500
Depreciation—plant	1,500
Depreciation—office furniture	100
Salary—office	2,500
Salary—salesman	2,000
Other office expenses	2,900
Other factory expenses	5,700
Managing Director's remuneration	12,000
Other selling expenses	1,100
Traveling expenses	1,100
Carriage outwards	1,000
Sales	2,50,000
Advance income tax paid	15,000
Advertisement	2,000

Mangaging Director's remuneration is to be allocated as Rs. 4,000 to the factory, Rs. 2,000 to the office and Rs. 6,000 to the selling departments. From the above information prepare a cost sheet shwoing.

(*a*) Prime cost, (*b*) Works cost, (*c*) Cost of production, (*d*) Cost of sales, (*e*) Net profit.

(Andhra University, B.Com., Sept., 1996)

[**Answer :** (*a*) Prime cost : Rs. 1,65,000, (*b*) Works cost : Rs. 1,91,700, (*c*) Cost of production : Rs. 1,97,000, (*d*) Cost of sales Rs. 2,10,100, (*e*) Net profit : Rs. 39,900]

Exercise on comparative cost sheet

EXERCISE 3

In a factory two types of articles viz. O and P are manufactured. From the following particulars prepare a statement of cost showing the total cost of each variety and as certain the total profit. There is no opening stock or closing stock.

	Article O	*Article P*
	Rs.	*Rs.*
Materials	30,000	50,000
Labour	60,000	70,000

Works on cost is charged at 40% of works cost and office on cost is taken at 20% on total cost.

'O' articles sold during the period are 360 at Rs. 600 each and 'P' articles sold are 400 at Rs. 750 each.

(Bharathidasan University, B.Com., Nov. 1998)

[**Answer :** Profit of article 'O' Rs. 28,500, Profit of article 'P' Rs. 50,000]

Exercises on tender statement

EXERCISE 4

AP Scooters Ltd., finds that in 1996, the total cost of producing 100 scooters was Rs. 20,00,000. Which were sold at Rs. 22,000 each. The cost consisted of

Materials	Rs. 8,00,000
Direct wages	Rs. 9,00,000
Factory overhead	Rs. 1,80,000
Office overhead	Rs. 94,000
Distributor overhead	Rs. 260

per scooter.

For 1997, the cost estimate is :

(*a*) That each scooter will required materials of Rs. 9,000 and labour Rs. 9,000

(*b*) That factory overhead will bear the same relation to wages as in the previous period

(*c*) That the percentage of offoce overhead on factory cost will be the same as in the past and

(*d*) That there will be an increase of Rs. 60 per scooter in selling and distribution overhead.

Prepare a statement showing the profit that the company would make per scooter if it increases the price of scooter by Rs. 2,000. **(Karnataka University. B.Com. April 1997)**

[**Answer :** Profit Rs. 2,00,000, per scooter 2,000]

EXERCISE 5

Following are the particulas for the production of 2000 sewing machines of Nath Engineering Company Ltd. for the year 1994. Cost of materials Rs. 1,60,000, wages Rs. 2,40,000, manufacturing expenses Rs. 1,00,000, salaries Rs. 1,20,000, rent rates and insurance Rs. 20,000, selling expenses Rs.60,000, general expenses Rs. 40,000 and sales Rs. 8,00,000.

The company plans to manufacture 3,000 sewing machines during 1999. You are required to submit a statement showing the price at which machines would be sold 50 as to show a profit of 10% on selling price. The following additional information is supplied to you.

(*i*) Price of material is expected to rise by 20%

(*ii*) Wage rates are expected to show an increase of 5%

(*iii*) Manufacturing expenses will rise in proportion to the combined cost of materials and wages

(*iv*) Selling expenses per unit will remain the same

(*v*) The other expenses will remain unaffected by the rise in output.

(Bharathidasan University B.Com., Nov. 1998)

22

CHAPTER

Marginal Costing

ABSORPTION COSTING

Absorption costing is a conventional technique of ascertaining the cost of production. It is, therefore, sometimes referred to as 'orthodox costing'. It is a technique of ascertaining cost of goods services manufactured under which both variable and fixed cost are taken into cosideration. As under this technique all costs-fixed and variable-are taken into account, it is also known as 'full costing' technique. The total or 'full' cost is classified on the functional basis into production cost, administration cost, selling and distribution cost. Under this technique, the total cost per unit remains constant only when the level of output remains same from time to time. But in today's dynamic world the level of activity differs from time to time and so does the cost. The cost of production may be Rs. 18 today and Rs. 20 next week. This change in the cost of production is on account of change in the volume of output and the way in which fixed cost tend to behave. The differences in the cost of production from time to time often poses a problem to the management in decision-making process. Hence, the marginal costing technique is used to enable management in carrying out its day-to-day functions of planning, decision-making and controlling. However, the proponets of absorption costing technique argue that both fixed and variable costs must be charged to the cost production in order to meet the requirements of generally accepted accounting principles and income tax reporting.

The total cost under this technique is classified into two types, *viz*., (*i*) production cost and (*ii*) period cost. These costs are further classified into various types of costs. These costs are shown in the following chart:

COST CLASSIFICATON UNDER ABSORPTION COSTING

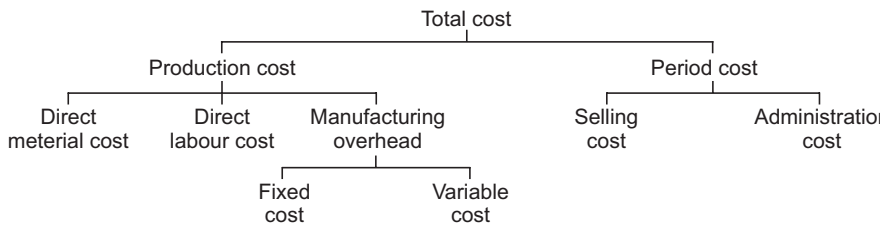


Fig. 22.1 *Chart showing total components of total cost under absorption costing.*

MARGINAL COSTING

Before dealing with the marginal costing technique, it would be appropriate at this stage to know the meaning and difinition of 'marginal cost'.

Marginal Cost

From the Economist's point of view, the cost incurred in producing an additional unit of product is known as marginal cost. However, from the cost accounting point of view marginal cost applies to the total cost obtained by adding prime cost and variable cost. In other words all costs other than fixed costs are the marginal cost.

The ICMA Terminology defines marginal cost as 'the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit. In practice, this is measured by the total variable costs attributable to one unit. In this context a unit may be a single article, a batch of articles, an order, a stage of production capacity, a man hour, a process or a department. It relates to change in output in the particular circumstance under consideration.

Marginal Costing

This is one of the technique of ascertaining cost of production of goods or services manufactured. It is not a method of costing but it could be used in conjunction with any method of costing such as job of process costing. This technique can also be used along with other techniques of costing such as standard costing and budgetary control. This technique is also known by other names such as direct costing, variable costing, attributable costing, out-of-pocket costing and so on. Whereas in USA it is termed as 'direct costing', in UK it is referred to as marginal costing'.

Definition of margianl costing: According to NAA Bulletin on Direct Costing Research Series 23, "direct costing should be defined as seggregation of manufacturing cost between those which are fixed and those which vary directly with volume. Only the prime cost plus variable factory overheads are used to value inventory and cost of sales. The remaining factory expenses are charged off currently to profit and loss account".

In simple words, marginal costing may be defined as "the ascertainment of marginal costs and the effect on profit of changes in volume by differentiating between fixed cost and variable cost".

It is a technique whereby marginal costs of cost units are ascertained. Only variable costs are charged to cost units. The fixed costs attributable to a relevent period being written off in full against the contribution for that period.

The term contribution represents excess of sales over total variable costs. Contribution is also sometimes called as marginal income.

The proponents of marginal costing contend that since fixed manufacturing costs arise from commitment to provide facilities, they are the costs of maintaining readiness to produce rather than costs of producing. As such they are popularly classified as period cost to be charged against revenue when they are incurred. They argue that fixed cost accumulates whether goods are produced or not and that no future benefit (asset) is created by producing in the current period that which could be produced in a later period at no additional cost. The components of total cost under marginal costing is shown below:

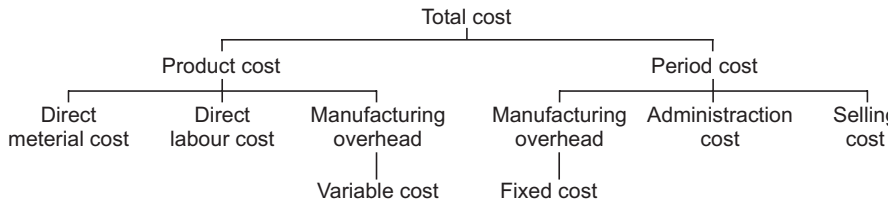


Fig. 22.2 *Chart showing components of total cost under marginal costing.*

Theory of marginal costing: The theory of marginal costing is very clearly laid down by the ICMA, London, in the booklet on *A Report on Marginal Costing*. It can be stated thus; in relation to a given volume of output, additional output can normally be obtained at less than proportionate caot because within limits the aggregate of certain items of cost will tend to remain fixed and only the aggregate of the remainder will tend to rise proportionately with the increase in output. Coversely, a decrese in the volume of output will normally be accompanied by a less than proportionate fall in the aggregate cost. In simple words, when the volume of output increases the cost per unit will decrease. Similarly, if the volume of output is reduced, the cost per unit will increase. For example, if a company produces 100 units at a cost of Rs. 200, and by increasing the output by 2 units, the cost goes up to Rs. 204. The marginal cost of the increased output is Rs. 4.

Features of marginal costing: The features of marginal costing may be summarised under the following points:

(*a*) It is a technique of costing used to ascertain the marginal cost and to know impact of variable cost on the volume of output.
(*b*) All costs are calssified on the basis of variability into fixed and variable cost Semi-variable costs are segregated into fixed and variable costs.
(*c*) Variable costs alone are charged to production. Fixed costs are recovered from contribution.
(*d*) Stock of work-in-progress and finished goods are valued on the basis of marginal cost.
(*e*) Selling price is based on marginal cost plus the contribution.
(*f*) Profit is calculated not in the usual manner. When fixed cost is deducted from sales it gives rise to contribution. When fixed cost is deducted from conbtribution it results in profit.
(*g*) Break-even analysis and cost-volume-profit analysis (discussed in the next chapter) are integral part of this technique.
(*h*) The profitability of product or department is based on contribution made availabe by each department or product.

SIMILARITIES AND DISSIMILARITIES BETWEEN ABSORPTION AND MARGINAL COSTING

Similarities

1. Both the techniques agree that fixed and variable administration and selling expences are period cost.
2. Both agree that the variable maunfacturing costs are product cost.
3. Both agree that marginal costing presents the date for internal use.

Dissimilarities

Absorption Costing	*Marginal Costing*
1. All costs are charged to the cost of production.	1. Only variable cost is charged to cost of production. Fixed costs are recovered form contribution.
2. Stock of work-in-progress and finished goods are valued at full or total cost. Fixed costs are carried over from one period to another period which distort cost comparison.	2. Stock of work-in-progress and finished goods are valued at marginal cost. This facilitates cost comparison.
3. The differences between sales and total cost constitute profit.	3. The excess of sales revenue over variable cost is known as contribution. When fixed cost is deducted form contribution, it results in profit.
4. The apportionment of fixed costs on an arbitrary basis gives rise to under or over absorption of overheads.	4. As only variable costs are charged to products, it does not give rise to over or under absorption of overheads.
5. Costs are classified according to functional basis such as prduction cost, administration cost, selling and distribution cost.	5. Costs are classifed according to vairiability.

Cost Presentation under Absorption and Marginal Costing

The difference between absorption and marginal costing in respect of cost ascertainment and cost presentation can be better understood by considering the following problems:

Problem 1: (Without stock balance): Given the following data:

	Rs.
Direct material cost per unit	5,00
Direct labour cost per unit	9.00
Variable manufacturing overhead per unit	0.60
Total fixed manufacturing overhead per year	92,000
Number of units produced per year	10,000

Calculate the cost of production per unit under (1) absorption costing and (2) marginal costing.

Solution:

Statement of cost under absorption and marginal costing

	Absorption costing	*Marginal costing*
Direct material cost	5.00	5.00
Direct labour cost	9.00	9.00
Variable manufacturing cost	0.60	0.60
Fixed mfg. cost $\frac{92,000}{10,000}$	9.20	–
Cost of produciton per unit	23.80	14.60

Note : Under marginal costing fixed manufacturing cost of Rs. 92,000 is treated as period cost.

Problem 2: (When closing stock balance is given) : Considering the date given in the above problem the following additional information. Calculate the profit under (*i*) absorption costing and (*ii*) marginal costing.

Opening stock of finished goods	*NIL*
Units produced	10,000
Units sold	8,000
Sale price per unit	Rs. 35
Variable selling and administration expenses	Rs. 1.20 per unit sold
Fixed administration and selling expenses	Rs. 58.000

Solution:

Statement of profit under absorption and marginal costing

Absorption costing			*Marginal costing*		
Sales 8,000 × 35		2,80,000	Sales 8,000 × 35		2,80,000
Opening stock	NIL		Opening stock	NIL	
Add : Cost of goods produced			*Add* : Cost of goods produced		
10,000 × 23.80	2,38,000		(10,000 × 14.60)	1,46,000	
(as per the Ist problem)				1,46,000	
	2,38,000		*Less* : Closing stock		
Less : Closing stock			2,000 × 14.60		
2,000 × 23.80	47,600	1,90,400		29,200	1,16,800
		89,600			1,63,200

Less : Selling and distribution Expenses			*Less* : Variable selling and administration expenses		
Fixed	58,000		contribution		9,600
Variable	9,600				1,53,600
8,000 × 1.20		67,600	*Less* : Fixed cost :		
Profit		22,000	Mfg. Overhead 92,000		
			Fixed selling & Admn. exp.	58,000	1,50,000
				Profit	3,600

The difference in the profit of Rs. 18,400 (22,000 – 3,600) is because of the different accounting treatment of fixed manufacturing costs under marginal costing and absorption costing. Under the marginal costing, the fixed manufacturing costs are accounted for as a period cost and the entire fixed manufacturing cost of Rs. 92,000 is deducted in calculating profit. Under absorption costing, the fixed manufacturing costs are treated as a product cost and charged to 10,000 units produced during the year. The means the closing stock of finished goods of 2,000 units will 'absorb' a part of the fixed manufacturing cost. The valuation of closing stock of finished goods under absorption costing is shown below:

Variable manufacturing cost	2,000×14.60	= 29,200
Fixed manufacturing cost	2,000×9.20	= 18,400
Total manufacturing cost	2,000 units @ 23.80	= 47,600

The fixed manufacturing cost of Rs. 18,400 assigned to closing finished goods is carried forward in the balance sheet until these, 2,000 units are sold in the next accounting year. In fact the difference in the profit under the two methods shown earlier is this amount of Rs. 18,400. When this 2,000 units are sold, the fixed cost of Rs. 18,400 is deducted in the profit statement. It the other words, profit absorption costing, the total fixed manufacturing cost of Rs. 92,000 is divided between the unsold fineshed goods (18,400) and finished goods that are sold (73,600).

Thus, in claculating net profit under absorption costing only Rs. 73,600 of fixed manufacturing costs are included in cost of goods sold, whereas, under marginal costing the entire fixed manufacturing cost of Rs. 92,000 is included as part of the fixed cost in the profit statement.

COST BEHAVIOUR AND ITS IMPACT OVER MARGINAL COSTING

The concept of marginal costing is based on the behaviour of the costs with volume of output. The assumption is that some components of costs change drectly in proportio to the change in volume of activity and some remain unchanged with the change in the activity level. The pattern of cost behaviour is the result of an interplay of many forces which cause some costs to fluctuate and others to remain constant. The most important of these forces are the following :

(*a*) Volume
(*b*) Inherent nature of the cost
(*c*) Capacity
(*d*) Managerial policies
(*e*) Effective control
(*f*) Prices of input factors
(*g*) Strikes and lockouts
(*h*) Weather and economic conditions

Accordingly, the costs can be classified on the basis of their behaviour into three types.

They are as follows:

1. Fixed Cost

A fixed cost is defined as "a cost which accrues in relation to the passage of time and which within certain output and turnover limits tend to be unaffected by fluctuations in the level of activity, i.e. output or turnover.

The key points in this definition are:

1. Fixed costs are time related.
2. It remains fixed within the limits of output or turnover.
3. It is unaffected by changes in the level of activity.
4. Though it is called fixed cost in the short run, in the long it may vary as for example when the policy of management is to expand after 10 years, fixed cost will increase no matter what volume of output is produced. Therefore, fixed cost is sometimes called as 'policy cost'.

Fixed costs are of two types. They are as followes:

(*a*) **Committed cost:** These costs are related to the provision of a capacity to do business. The amount of committed costs is fixed by decisions which were made in the past and is not subject to management control in the present on a short run bases. Since there is no direct relationship between committed costs and either the plabbed or actual utilisation of existing facilities, the amout will remain constant over the whole range of operating activity.

(*b*) **Programmed or managed cost :** These costs are related to the utilisation of the capacity provided.

Fixed cost can be shown graphically as under :

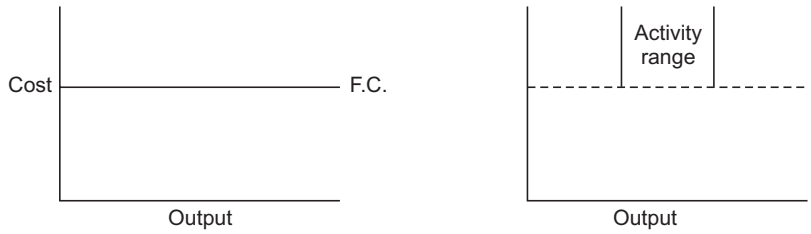


Fig. 22.3 *Graphic presentation of fixed cost*

Fixed cost can be expressed algebraically thus:

$$\text{Cost} = a$$

where '*a*' is contant, '*v*' the volume of output does not appear in this equation to indicate the change in activity is deemed not to affect the fixed cost.

2. Variable Cost

It is defined as a cost which, in the aggregate, tends to vary in direct proportion to chages in the volume of output or turnover.

Variable costs are of two types. They are as follows:

(A) Linear variable cost or engineered cost: When the relationship between variable cost and output can be shown as a straight line on a graph, they termed as linear variable cost. This is shown graphically below :

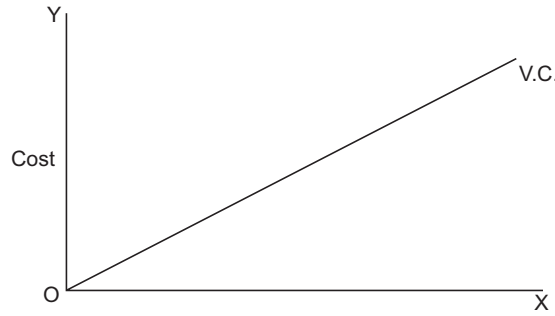


Fig. 22.4 *Graph showing linear variable cost.*

A variable cost is called as engineered cost because an optimum relationship can be carefully determined by work measurement technique between input and ouput. Direct material cost and direct labour cost are good examples of engineered cost.

For calculation and analysis it is more convenient to express the linear relationship algebraically, thus

$$\text{Cost} = bx$$

where x is the volume of output in units, b is a constant representing the variable cost per unit.

(B) Non-linear or curvilinear variable cost: When the relationship between variable cost and output can be shown as a curved line on a graph, it is said to be curvilinear. This is shown graphically below:

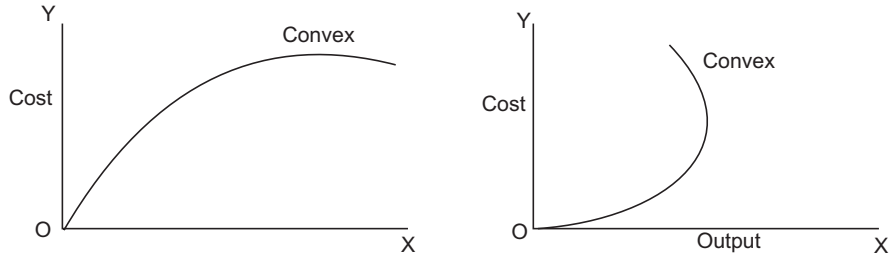


Fig. 22.5 *Graphic presentation on non-linear variable cost*

The non-linear variable cost may be of two types. They are as follows:

(*a*) *Convex-linear variable cost:* It is a cost where each extra unit of output causes less than proportionate increase in cost.

(*b*) *Concave-linear variable cost:* It is a cost where each extra unit of output causes a more than proportionate increase in cost. Differential piece rate system of wage payment is a good example for this type of cost.

Curvilinear variable cost — the parabola : When the slope of the cost function changes uniformy with changes in output, the curve is known as a parabola and is algebraically expressed thus:

Cost : $bx + cx^2 + dx^3 \ldots\ldots\ldots\ldots px^4$

where x is as defined previously and b, c, d, ... p are constant.

Problem 3: (Calculation of variable cost) : Using the equation cost $bx + cx^2 + dx^2$, where $b = 8$, $c = 0.5$ and $d = 0.003$, calculate

(*i*) variable cost when production is 10 units.

(*ii*) variable cost when produciton is 15 units.

Is the function convex or concave?

Solution:

$$\text{Cost} = bx + cx^2 + dx^3\ 8 \times 10 + 0.5 \times 10^2 + 0.03 + 10^3$$

Rs. 160

$$= 8 \times 15 + 0.5 \times 15^2 + 0.003 \times 15^3$$

$$= \text{Rs. } 333.75$$

From the above it is seen that the increase in activity from 10 to 15 units results in more than a doubling or variable cost. This shows that there is a more than propotionate increase in the unit cost of extra production. Hence the function is concave.

3. Semi- variable Cost

It is defined as a cost containing both fixed and variable elements, which is, therefore partly affected by fluctuation in the volume of output or turnover. It is also sometimes called as a stepped cost or hybrid cost.

Semi-variable cost be shown graphically thus:

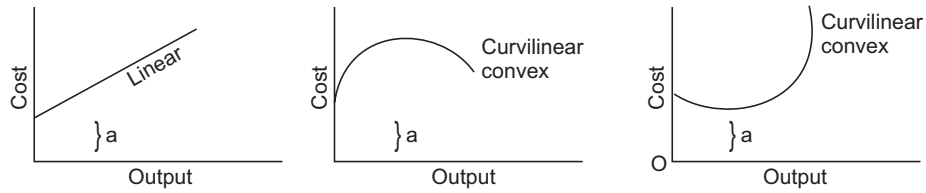


Fig. 33.6 *Graphic presentation of semi-variable cost.*

In the above figures '*a*' represents the fixed element of the cost.

Semi-variable cost can be algebraically expressed by combining the previous equations of fixed and variable cost.

Linear semi-variable cost

$$\text{Cost} = a + bx$$

Curvilinear semi-variable cost

$$\text{Cost} = a + bx + cx^2 + dx^3 \ldots\ldots px^4$$

Problem 4: (Calculation of total cost) : The analysis of repairs department of Jian & Co. shows that there is a fixed cost is Rs. 500 per month and a variable cost related to machine hours amounting to Rs. 2.25 per machine hour.

What is the expected cost for a month when the budgeted activity level is (*i*) 1,500 machine hours and (*ii*) 1,800 machine hours.

Solution:

$$\text{Total cost} = a + bx$$

(*i*) $500 \times 2.25\ (1{,}500)$

$$= \text{Rs. } 3{,}875$$

(*ii*) $500 \times 2.25\ (1{,}800)$

$$= \text{Rs. } 4{,}550$$

As, under marginal costing technique, only variable cost alone is charge to the product, is becomes necessary to segregate semi-variable cost into fixed and variable cost. Besides this, the segregation of semi-variable cost into fixed and variable has the following uses:

1. It facilitates budgeting the expenses for various levels of production.
2. It helps in exercising control over variable cost semi-variable cost is segregated into fixed and variable.
3. It hepls in fixing prices especially during the period of depression.
4. It helps in making useful decisions.

Method of Segregating Semi-variable Cost

1. **High-low method:** This method is based on the analysis of past records of expenses. This method takes into account only the highest and lowest values contained in the data in order to determine the rate of cost change and thereafter variable cost. The variable cost is then deducted from total cost to get fixed cost.

   Limitations : (*i*) It is not based on all the items of the given data.

   (*ii*) It assumes that the variable portion of semi-variable cost has linear relationship. In other words, the variable portion of cost per unit is constant which is not always true.

Steps involved: 1. Take the differenc between high and low costs.

2. Take the difference between level of activity corresponding these costs.
3. Divide the difference in cost by the difference in level of activity. We get variable cost per unit.
4. Find out the variable cost by multiplying the rate so obtained under step 3 by the number of units.
5. Deduct this variable cost from semi-variable cost to get fixed cost.

Problem 5: (Segregation of semi-variable cost under high-low method) : From the following data segregate the semi-variable cost into fixed and variable cost under High-Low method.

Level of activity (Units)	*Cost (Rs.)*	*Level of activity (Units)*	*Cost (Rs.)*
36	800	72	950
48	700	75	1,170
49	970	76	1,020
55	790	82	1,200
57	1,050	86	1,060
59	900	92	1,100
65	880	94	1,310
66	1,020	97	1,250
67	1,180		

Solution:

High point	94 units at a cost of Rs.	1,310
Low point	48 unts at a cost of Rs.	700
Difference	46	610

Variable cost per unit $= \frac{610}{46} = 13.26$ unit.

Semi-variable cost at 48 units	= Rs.	700
Less : Variable cost 48×13.26	= Rs.	636
Fixed cost	= Rs.	64

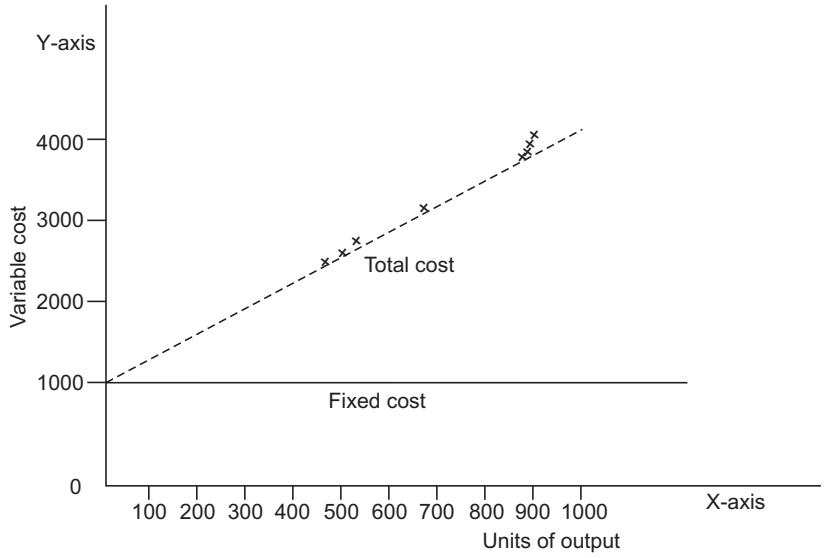
In this process for each level of activity, fixed cost and variable cost can be found out.

2. **Scatter graph technique:** This is a graphic method of segregating semi-variable cost into fixed and variable cost. This methods is also known as regression line method. This method is also based on past data, but it takes into account all the data when compared to the high-low method. The following steps are involved under this method:
   1. On the X-axis is taken to represent the output sales.
   2. On the Y-axis is the cost represented.
   3. Plot the points on the graph.
   4. Draw a line through the points plotted, with the same number of points on each side of the line. In the process of drawing the line ignore any abnormal cost if there is any. The line so drawn is known a sthe line of best fit.
   5. Extend the line so drawn above the Y-axis. The point where the line of best fit intersects the Y-axis is taken to be the amount of fixed cost.

One main limitation of this method is that there will be a change in fixed cost even if there is a slight bias in drawing the atraight line.

Problem 6 : (Scatter graph method of segregating semi-variable cost into fixed and variable cost) : From the following data extracted from the books of Arun Food Products Ltd. Calculate the fixed cost using scatter graph method:

Output (units)	*Semi-variable cost (Rs.)*	*Output (units)*	*Semi-variable cost (Rs.)*
500	2,500	900	3,700
600	2,800	840	3,520
700	3,100	800	3,400
940	3,820	860	3,580
740	3,220	760	3,280
880	3,640	540	2,620



Graph I

Solution:

From the graph it is clear that fixed cost is Rs. 1,000.

3. **Method least squares :** This is a statistical method used for establishing a line of best fit to data. The linear cost function can be represented by the following equation:

$$y = a + bx$$

where y = cost. Other symbols are as defined previously.

To find out the values of 'a' and 'b' which are constants, we have to solve two simultaneous equations :

$$\Sigma y = an + b\,\Sigma x$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2$$

Where n = number of pairs of cost and activity figures.

Problem 7: (Simultaneous equation method of segregating semi- variable cost) : From the following data obtain an equation to indicate the linear cost function under the method of least squares:

Unit x	*Cost y*
4	56
5	62
7	80
7	72
9	88
10	94

Solution:

x	y	xy	x^2
4	56	224	16
5	62	310	25
7	80	560	49
7	72	504	49
9	88	792	81
10	94	940	100
$\Sigma x = 42$	$\Sigma y = 452$	$\Sigma xy = 3{,}330$	$\Sigma x^2 = 320$

$$\Sigma y = ax + b\Sigma x^2$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2$$

$$452 = 6a + 42b \times 7$$

$$3{,}330 = 42a + 320b$$

$$3{,}164 = 42a + 294b$$

$$3{,}330 = 42a + 320$$

Subtracting

$$166 = 26b$$

$$b = 6{,}385$$

Substituting the value of b in equation 1

$$6a + 42b = 452$$
$$6a = -42 \times 6.385 + 452$$
$$6a = -268 + 452$$
$$a = 30.6$$

$\therefore$ The linear cost function is $y = 30.6 + 6.385x$

When the given problems has many digits of variables and costs, it becomes difficult to adopt the above method. An alternate method which could be termed as short-cut method or indirect method can be followed in such situations. The steps involved under this method are as follows:

(*a*) Calculate the average of '*x*' series. This is found out by the formula $x = \frac{\Sigma x}{N}$

(*b*) Calculate the average of '*y*' series. This is found out the formula $y = \frac{\Sigma y}{N}$

(*c*) Take the deviations from the average of '*x*' series for each and every item of '*x*' series.

(*d*) Take the deviations from the average of '*y*' series for each and every item of '*y*' series.

(*e*) Square the deviations of '*x*' series to get x^2.

(*f*) Obtain the products of the deviations of '*x*' and '*y*' series. This is denoted under the column '*xy*'.

(*h*) Add up the following formula $b = \frac{\Sigma xy}{\Sigma x^2}$

Problem 8 : (Short-cut or indirect method of segregating semi-variable cost): The following semi-variable costs are taken from Ajanta Metal Works for the period January to June, 1993:

Month	*Machine hours*	*Semi-vari able cost*
Jan.	2,000	300
Feb.	2,200	320
Mar.	1,700	270
Apr.	2,400	340
May	1,800	280
June	1,900	290

Find out the amout of variable and fixed cost.

Solution:

Month	*Machine hours (x)*	*Semi-variable Cost (y)*	*Deviations from x (2,000)*	*Deviations from y (300)*	x^2	*xy*
Jan.	2,000	300	0	0	0	0
Feb.	2,200	320	+ 200	+ 20	40,000	+ 4,000
Mar.	1,700	270	– 300	– 30	90,000	+ 9,000
Apr.	2,400	340	+ 400	+ 40	1,60,000	+16,000
May	1,800	280	– 200	– 20	40,000	+ 4,000
June	1,900	290	–100	–10	10,000	+ 1,000
	Σx = 12,000	Σxy = 1,800			Σxy = 3,40,000	Σxy =34,000

$$x = \frac{\text{Total machine hrs}}{\text{No. of months}} = \frac{12,000}{6} = 2,000$$

$$y = \frac{\text{Total semi} - \text{variable cost}}{\text{No. of months}} = \frac{1{,}800}{6} = 300$$

$$b = \frac{\Sigma xy}{\Sigma x^2} = \frac{34{,}000}{3{,}40{,}000} = 0.10$$

The variable element of semi-variable cost is 0.10 per unit.

The fixed cost can be calculated thus:

$y = a + bx$

Jan. $300 = a + 2{,}000 \times 0.10$

$300 = a + 200$

$a = 100$

Feb. $320 = a + 2{,}200\,(0.10)$

$320 = a + 220$

$a = 100$

Fixed cost of Rs. 100 is thus same whatever may be the level of activity.

ARGUMENTS IN FAVOUR OF MARGINAL COSTING

The exclusion of fixed costs in the ascertainment of cost of production (marginal costing) is justified on the following grounds:

1. Fixed costs relate to a particular period of time and therefor, it should be charged for that period. Thus, it is treated as a period cost not as a product cost.
2. There is no accurate basis to apportion fixed cost. So it is charged to profit and loss account instead of charging to cost of production.
3. Since fixed cost remain constant irrespective of change in the level of activity, it does not affect production capacity. It is only variable cost that affects various levels of productive activity. Hence fixed cost is excluded from cost of production.
4. To facilitate cost comparison and to maintain accuracy of trading results, fixed costs are excluded from cost of production.
5. Fixed costs under absorption costing is carried over from one period to another as part of inventory value. Such carrying forward is not justified as it does not facilitate matching of cost with revenue.
6. For the current operation of any level of activity only variable cost alone is relevant but not the fixed cost. Hence it is excluded from cost of production.

MARGINAL COST EQUATION

The marginal cost equation is stated below:

Sales – Variable Cost = Contribution

or $S - V = C$

Contribution = Fixed cost + Profit

or $C = FC + P$

or $S - V = FC + P$

If there is loss

$$S - V = FC - L$$

At the point of no-profit no-loss (break-even point)

$$S - V = F + \text{Zero}$$

The usefulness of marginal cost equation is, given any of the three particulars, we can find out the fourth unknown particular. From the above equation it is clear that contribution is used to meet fixed cost and any balance left out is equal to profit.

Problem 9 : From the following particulars extracted from the books of Sunshine Enterprises for the period ending 31st Dec., 1992. Find out the amount of profit.

Number of units produced	= 500 units
Variable cost for the period	= Rs. 2 per unit
Fixed cost for the period	= Rs. 800
Selling price per unit	= Rs. 4

Solution:

$$\text{Sales} - \text{Variable cost} = \text{Fixed cost} + \text{Profit}$$

or $\text{Sales} - \text{Variable cost} - \text{Fixed cost} = \text{Profit}$

$$500\,(4-3) - 800 = P$$

$$1{,}000 - 800 = P$$

$$P = \text{Rs. } 200$$

MARGINAL COSTING AND VALUATION OF FINISHED STOCK

Under marginal costing technique closing stock is valued at marginal cost. However, under absorption costing, fixed cost is included in the value of closing stock. Because of this treatment the amount of fixed overhead charged under absorption costing for the corrent year will differ from the actual fixed overhead pertaining to that year. The reason is the amount of fixed cost carried down from the previous year, will differ from the amount of fixed cost carried forward to the next year. This can better be understood by the following examples:

Example:

On 1.1.92, Opening stock of finished goods of 2,000 units is valued at Rs. 4 of which fixed ocst is Rs. 1.

On 31.12.1992, closing stock of finished goods of 1,600 units valued at Rs. 5 per unit of which fixed cost is Rs. 1.50.

Value of fixed cost brought in is 2,000 (2,000 × Re. 1). Whereas the value of fixed cost carried forward is Rs. 2.400 (1.600× 1.50).

It the actual fixed cost for the year 1992 is Rs. 50,000, then the fixed cost charged for the year will be Rs. 49,600 (50,000 + 2,000 – 2,400).

When compared to absorption costing, considering the output, sales and closing stock the following conclusions are arrivied at:

1. When production volume is equal to sales volume, net profit is same under both marginal costing and absorption costing.

2. When sales are less than production, profit under marginal costing are less than that of absorption costing.
3. When sales exceed production, profit under marginal costing are more than that of absorption costing.

UTILITY, ADVANTAGES AND LIMITATIONS OF MARGINAL COSTING

Utility of Marginal Costing

1. It si used as one of the techniques of costing, *i.e*., to ascertain the cost of production.
2. It aids management for making useful decision by providing useful information.
3. It serves as a tool of cost control.

Advantages

1. It avoids the complications of over or under absorption of fixed cost by excluding it from cost of production.
2. The technique provides useful data for managerial decision-making.
3. By not carrying forward fixed cost from period to period, it facilitates cost comparison.
4. The impact of profit on sales fluctuation sare clearly shown under marginal costing.
5. The technique is flexible in the sense it can be used along with other techniques such as budgetary control and standard costing.
6. It establishes a clear relationships between cost, sales and volume of output and break-even analysis which shows the effect of increasing and decreasing production activity on the profitability of the company.
7. It provides useful data for the management in determination of policies regarding future prodution and sales.
8. Stock of work-in-progress and finished goods are valued at marginal cost, which is uniform.

Limitations

1. The segregation of semi-variable costs often poses a problem.
2. Clossing stock of work-in-progress and finished goods are unerstated which is not acceptable to tax authorities.
3. With the change of technology and owing to automation of industries, it results in more fixed cost. Marginal costing fails to reflect the exact change because of adoption of new technology.
4. It does not provide any yardstick to exercise control. So an effective means of control cannot be exercised.
5. The technique is not suitable under cost plus contract because the technique ignores fixed cost in calculating total cost.
6. Variable cost per unit remains constant only in the short run not in the long run.
7. Cost comparison of two jobs will be difficult. Through marginal costing may be same for both the jobs, yet a job which takes more time to complete involves more of overhead.
8. When sales are based on marginal cost or marginal cost with some contribution, it may result in losses or low profit.

PRECAUTIONS TO BE TAKEN WHILE ADOPTING MARGIANL COSTING

1. As fixed cost is not included in the cost of production, care must be taken to see that while fixing the selling price, profit is realised after full recovery of fixed cost.
2. It is necessary to check composition of marginal cost from time to time. There can be a change of variable cost into fixed and *vice versa* when production method is changed.

3. Based on contribution margin, orders are accepted with a view to increase profits. This may lead to uneconomic expansion in the business involving more capital. Howerver, during the period of falling bussiness this proves to be burden.

APPLICATIONS OF MARGINAL COSTING

The technique of marginal costing is largely used in the managerial decision-making process. The application of marginal costing in the day-to-day decision-making process are as follows:

1. Make or Buy Decision

Very often management is confronted with the problem of deciding whether to buy a component or product from an outside source or to manufacture the same if it is economical as compared to the price quoted by a supplier. In deciding this absorption costing (total cost analysis) would mislead. If the decision is to buy from an external source the price quoted by the supplier should be less than marginal cost. If the decision is to make within the organistion, the cost of production should include all additional cost such as depreciation on new plant interest on capital, etc. If this cost of production is less than the quotation price, it should be decided in making the product rather than procure it from an external source.

Problem 10 : (Make or buy decision) : Expansion Ltd. manufactures automobiles accessories and parts. The following are the total costs of processing 1,00,000 units:

Direct materials cost	Rs. 5 lakhs
Direct labour cost	Rs. 8 lakhs
Variable factory overhead	Rs. 6 lakhs
Fixed factory overhead	Rs. 5 lakhs

The purchase price of the component is Rs. 22. The fixed overhead would continue to be incurred even when the component is bought from outside, although there would have been reduction to the extent of Rs. 2,00,000.

Required:

(*a*) Should the part be made or bought considering that the present facility when released following a buying decision would remain idle ?

(*b*) In case the released capacity can be rented out to another manufacturer for Rs. 1,50,000 having good demand. What should be the decision ? **(C.S., Inter, June 1990)**

Solution:

Cost Analysis

Particulars	*1. Whether to make*	*2. Whether to buy at Rs. 22 each present facility remaining idle*	*3. Whether to buy at Rs. 22 each when released capacity is rented out*
1. Variable cost of production	19	–	–
2. Cost of buying from outside	–	22	22
3. Saving in fixed cost when bought	–	(2)	(2)
4. Rent receipt when idle capacity is rented out	–	–	(1.5)
	19	20	18.5

Recommendations:

1. For decision to situation (*a*) — make the component.
2. For decision to situation (*b*) — buy the component

Problem 11 (Make or buy decision) : Stoner Company use three different components (materials) in manufacturing its primary product. Stoner manufactures two of the components and purchases one (designated as component 1) from outside suppliers. The company is currently developing the annual profit plan. Sales are highly seasonal. Component 2 cannot be acquired from outsiders. However, component 3 can be purchased. The three components have critical specifications. The annual profit plan provided data for the following computations:

		Components 3 (Unit cost at 12,000 units)
Material (direct)		Rs. 1.40
Labour (direct)		Rs. 2.20
Factory overhead (apportioned)		Re. 0.40
Annual machine rectal (special machine used only for component 3)	Re. 0.50	
Variable factory overhead		Rs. 1.00
Average storage cost per year (fixed)		Re. 0.40
	Total	Rs. 5.90
Average inventory level	500 units	

The purchase manager investing outside suppliers and found one that would sign a one year contract to deliver "12,000 top quality units as needed during the year at Rs. 5.20 per unit". Serious consideration is being to this alternative. Should Stoner make or buy component 3 ? Explain the relevant factors inflencing your decision. **(ICWA, Inter, Dec, 1988)**

Solution:

Total cost of component 3 can be bifurcated into fixed and variable portion as follows:

Variable cost:		
Material (direct)		Rs. 1.40
Labour (direct)		Rs. 2.20
Annual machine rental (special machine used only for component 3)	Re. 0.50	
Variable factory overhead		Rs. 1.00
		Rs. 5.10
Fixed cost:		
Fixed overhead apportioned		Re. 0.40
Average storage cost per year		Re.040
		Re. 0.80
	Total	Rs. 5.90

On comparison of the price offered by outside supplier with the variable cost, if made inhouse, it is observed that variable cost of inhouse production is lower (fixed cost remains same whether made in-house or purchased). This is also on the assumption that labour (direct) is variable if it is possile to get rid of the workers when required. Hence, labour cost is treated as fixed. If labour is treated as fixed, variable cost of inhouse production is Rs. 2.90 (5.10 – 5.20) per unit which is per unit less than the purchase price per unit (5.20 – 2.90 = 2.30).

Hence, it is advisable to make component no. 3.

2. Comparing Mannual with Machine Labour: Whenever a new product is launched management may have to decide whether the new product is to be manufacutured mannually or mechanically. Some of the factors which are to be considered in this regard are the (*i*) savings arising in the labour cost, (*ii*) additional investment on machinery, (*iii*) additional capacity of machine, (*iv*) the possible displacement of employees and (*v*) the danger of obsolescence of the machine. However, cost of production is the significant factor which determines the method of production. Under marginal costing that method which gives the largest

contribution, *i.e.*, lowest marginal cost would be preferred. Under absorption costing that method of manufacture which gives lowest cost will be selected.

Problem 12 : (Manual vs. mechanical production): The Navabharath Enterprise has a plan to introduce a new product A numbering 10,000 units for the year 1993. The following details are available:

	Machine (Rs.)	*Mannual labour (Rs.)*
Purchase price of machine	20,000	–
Direct material	5,000 PA	5,000 PA
Direct labour	500 PA	3,000 PA
Variable overheads	2,000 PA	1,000 PA
Fixed overheads (not including depreciation)	1,500 PA	1,00 PA

The selling price of the products has been fixed at Rs. 3 each. If the machines is purchased it will have an estimated life of 10 years with little or no residual; value.

You are required to show the decision to be taken regarding the method of production under (*i*) marginal costing and (*ii*) absorption costing including interest @ 5%.

Solution:

Statement of marginal cost

			Machine (Rs.)	*Mannual labour (Rs.)*
Sales			30,000	30,000
Less : *Variable cost:*				
Direct material	5,000	5,000		
Direct labour	500	3,000		
Variable overheads	2,000	1,000	7,500	9,000
Contribution			22,500	2,000

On this basis (the lower marginal cost and large contribution) the machine is preferable.

Statement of total cost

		Machine (Rs.)	*Mannual labour (Rs.)*
Direct material	5,000	5,000	
Overheads :	Variable	500	3,000
	Fixed	2,000	1,000
		1,500	1,000
Depreciation $\frac{1}{10} \times 20{,}000$		2,000	–
		11,000	10,000
Interest @ 5%		550	500
		11,550	10,500

From the above statement, mannual method of production is cheaper. This problem illustrates a weakness of the marginal costing. Obviously, fixed costs have to be covered as they are incurred on the specific products.

3. Replacing Existing Machinery with New Machinery: Sometimes with a view to derive maximum efficiency an existing plant may have to be replaced by a new one. Again the guiding factors mentioned earlier will help in such decision-making process.

Problem 13 : A factory engaged in the manufacture of electronic good has a ten-year old equipment depreciated on straight-line basis. The useful life of the equipment was estimated to be 20 years with a residual value of Rs. 3 lakhs (original cost of the equipment being Rs. 23 lakhs). The output of the equipment is 1,200 units per hour.

The management now proposes to install a new equipment worth Rs. 50 lakhs which has an estimated life of 15 years and a residual value of Rs. 5 lakhs. The payment terms for the new equipment include a part exchange provision of Rs. 6 lakhs in respect of the existing equipment. The output of the new equipment is 3,000 units per hour.

Other comparative annual cost data relating to the two equipments are as under:

	Existing equipment (Rs.)	*New equipment (Rs.)*
Wages	1,00,000	1,20,000
Repairs and maintenance	20,000	52,000
Consumables	3,20,000	4,80,000
Power	1,20,000	1,50,000
Allocation of fixed cost	60,000	80,000
Total hours run per year	2,400	2,400

You are required to prepare a comparative schedule showing total conversion cost as well as cost per 1,000 units after considering interest @ 10% on net cash out flow for procuring the new equipment and also for providing for the yearly recovery of the loss suffered in the transaction. **(ICWA, Inter, Dec. 1991)**

Solution:

Comprative statement of cost of equipment

	Existing equipment (Rs.)	*New equipment (Rs.)*
Capital cost of equipment including cost of installation	23,00,000	50,00,000
Less : Residual value	3,00,000	5,00,000
	20,00,000	45,00,000
Less : Depreciation written off	10,00,000	
	10,00,000	45,00,000

Comparative statement of operation cost of equipment

Annual depreciation	— New	–	3,00,000
(*See Note 1*)	— Old	1,00,000	70,000
Interest on capital (new cash outflow)		–	4,40,000
(*See Note 2*)			
Wages		10,00,000	1,20,000
Repairs and maintenance		20,000	52,000
Consumables		3,20,000	4,80,000
Power		1,20,000	1,50,000
Allocation of fixed expense	60,000	80,000	
		7,20,000	16,92,000

Total hours run per annum	2,400	2,400	
Operating cost per hour		Rs. 300	Rs. 705
Output per hour (units)		1,200	3,000
Operating cost per 1,000 unit	Rs. 250	Rs. 235	

Therefore, there is a net saving in cost or Rs. 15 per, 1,000 units.

Working Note 1 : Depreciation on new equipment

$$= \frac{\text{Original cost} - \text{Residual value}}{\text{Estimated life}}$$

$$= \frac{45,00,000}{15} = 3,00,000$$

Depreciation (yearly recovery) on loss on sale of existing equipment

$$= \frac{\text{Book value of existing equipment} - \text{Part exchange value}}{\text{Residual life of existing equipment}}$$

$$= \frac{13,00,000 - 6,00,000}{10 \text{ years}} = \text{Rs. } 70,000$$

Working note 2: Interest is calculated on net cash outflow in procuring the new equipment is Rs. 44,00,000 (Cost of old equipment Rs. 50 lakhs less part exchange value Rs. 6 lakhs).

4. Alternative Use of Plant or Productive Facility: To take advantage of alternative use of prodution facility or alternative use of plant it is necessary to know the contribution margin. That alternative which yields highest contribution margin shall be selected.

Problem 14 : The management of Alpha Co. Ltd. are considering the following two alternative proposals:

(*a*) A semi-automatic lathe costing Rs. 58,000. The annual cost for its operation being estimated at Rs. 42,000 and

(*b*) A fully automatic lathe costing Rs. 95,000 the annual costs for its operation being estimated at Rs. 38,000.

The life of each is estimated as 12 years with zero salvage value. The capacity of the automatic plant assessed as 30% more than that of semi- automatic plant, but this extra capacity is likely to remain unutilised for two years. Using straight line depreciation with an interest chage of 6% on the capital investment. Make your recommendations as to which alternative is preferable.

Solution:

	Semi-automatic lathe	*Full automatic lathe*
Purchase cost (Rs.)	58,000	95,000
Expenses on machines:		
Operating expenses	42,000	38,000
Depreciating $\frac{1}{12}$ of cost	4,833	7,917
Interest 6%	3,480	5,700
	50,313	51,617
Percentage increase		2.5%

In the first two years the semi-automatic lathe is more profitable because extra 30% capacity of fully automatic lathe is not utilised. But in the remaining 10 years the fully automatic lathe will be much more profitable because the extra cost incurred by that plant is only about 2.5%, whereas the extra output capacity

is 30%. So the fully automatic lathe is preferable. However, it is assumed that (*i*) additional 30% output will have ready market and (*ii*) revenue from the same is more than the additional expenses imparted above.

Problem 15 : Given below are the details of cost of production of two products X and Y manufactured by Adam's Co. Pvt. Ltd. Both the products use the same raw materials.

	X	*Y*
% of total capacity utilised	60%	40%
Units produced	1,200	2,000
Selling price per unit	Rs. 2,000	Rs. 1,200
Cost per unit:		
Raw materials	Rs. 1,400	700
Direct labour	Rs. 200	150
Variable expense	Rs. 180	230
Contribution per unit	Rs. 220	230
Fixed overhead	Rs. 3,00,000	10

Would you recommend increasing the capacity utilised on product X.

Solution:

	1		2		3	
	X	Y	X	Y	X	Y
Percentage of capacities	60%	40%	50%	50%	70%	30%
Units produced	1,200	2,000	1,000	2,500	1,400	1,500
Contribution per unit	220	120	220	120	220	120
Contribution	2,64,000	2,40,000	2,20,000	3,00,000	3,08,000	1,80,000
Total contribution	5,04,000		5,20,000		4,88,000	
Fixed overhead	3,00,000		3,00,000		3,00,000	
Net profit	2,04,000		2,20,000		1,88,000	

Thus by increasing capacity usage on product *Y* profit is increased whereas capacity usage on product *X*, profit is reduced.

This is so because contribution per unit percentage of capacity for product *X* is $\frac{2,64,000}{60\%}$ = Rs. 4,400 and for product *Y* is $\frac{2,400,000}{40\%}$ = Rs. 6,000. Hence it is better to increase 40% of the capacity utilised on product *Y* and not on product *X*.

5. Product-mix, profit planning and profit maximisation: Companies manufac-turing varieties of products often have ot decide which product-mix is more profitable. The product-mix which gives miximum contribution is to be considered as best product-mix. Similarly, profit planning is often considered so as to earn reasonable profit if not maximum profit. The profit planning is affected by factors such as (*i*) volume of output, (*ii*) product mix, (*iii*) costs to be incurred, (*iv*) prices to be charged and so on. Marginal costing techniques guides the management in this regard.

Problem 16 : The directors of *A* Ltd. are considering the sales budget for the budget period 1993. You are required to present to the board a statement showing the marginal cost of each product and to recommend which of the following product-mix should be adopted:

(*a*) 450 units of *A* and 300 units of *B*
(*b*) 900 unit of *A* only
(*c*) 600 units of *B* only
(*d*) 600 units of *A* and 200 units of *B*

The following additional information is furnished:

	Product A	*Product B*
Fixed overhead Rs. 10,000 p.a.		
Direct labour @ Re.1 per hour	10 hrs.	15 hrs.
Variable overheads — 100% of labour		
Direct material	Rs. 20	Rs. 25
Selling price	Rs. 60	Rs. 100

Solution:

Marginal cost statement

	Product A	*Product B*
Direct materials	20	25
Direct labour	10	15
Variable overhead	10	15
Marginal cost	40	55
Contribution	20	45
Sales	60	100

Product-mix

(*i*) 450 units of *A* and 300 units of *B*

	A	*B*		*Total*
Contribution	9,000	13,500		22,500
Less : Fixed overheads				10,000
			Profit	12,500
(*ii*) 900 units of *A*				
Contribution	18,000			18,000
Less : Fixed overheads				10,000
			Profit	8,000
(*iii*) 600 units of *B*				
Contribution		17,000		27,000
Less : Fixed overhead				10,000
			Profit	17,000
(*iv*) 600 units of *A* and 200 units *B*				
Contribution	12,000	9,000		21,000
Less : Fixed overhead				10,000
			Profit	11,000

Thus alternative (*iii*) is the one recommended.

6. Profitability of the department or products: The preparation of a departmental profit and loss account under marginal costing is useful in determining which department is making profit and which department is

incurring a loss. This enables the management to decide whether a particular department must continue operation or it should be eliminated. The decision is taken by referring to the contribution made or loss incurred by the department of product.

Problem 17 : A company produces three products. The cost data are as under:

		A	*B*	*C*
Direct meterials		Rs. 64	152	117
Direct labour				
Department	Rate per hour (Rs.)	Hrs.	Hrs.	Hrs.
1	5	18	10	20
2	6	5	4	7
3	4	10	5	20
Variable overhead		Rs. 16	9	21

Fixed overheads Rs. 4,00,000 per annum

The budget was prepared at a time, when the market was sluggish. The budgeted quantities and selling prices are as under:

Product	*Budgeted qty.*	*Selling price. (Rs.)/unit*
A	9,750	270
B	7,800	280
C	7,800	400

Later the market improved and the sales quantities could be increased by 20 for product '*A*' and 25% for product '*B*' and '*C*'. The sales manager confirmed that the increased quantities could be achieved at the prices originally budgeted. The production manager stated that the output cannot be increased beyond the budgeted level due to limitation of direct labour hours in department Z.

Required:

(*i*) Present a statement of budeted profitability.
(*ii*) Statement of optimal product mix and calculate the optimal profits. **(C.A., Inter, May 1998)**

Solution:

Statement of budgeted profitability

	A	*B*	*C*	*Total*
Selling price (p.u.)	270	280	400	
Variable cost (p.u.):				
Direct materials	64	152	117	
Direct labour	160	94	222	
Variable overheads	16	9	21	
Total variable cost	240	255	360	
Contribution per unit	30	25	40	
Budgeted qty. (units)	9,750	7,800	7,800	
Total contribution	2,92,500	1,95,000	3,12,000	7,99,500
Less: fixed cost				4,00,000
			Profit	3,99,500

Statement of optimal product mix and profit

	A	*B*	*C*	*Total*
Contribution (*A*)	30	25	40	
Direct labour hors. in dept. 2 (*B*)	5	4	7	
Contribution per hr.	6	6.25	5.71	
$\frac{A}{B}$				
Ranking	II	I	III	
Optimal product-mix				
Units (C) (*See Notes*)	11,700	9,750	5,292	
Total contribution ($A \times C$)	3,51,000	2,43,750	2,11,680	8,06,430
Less : Fixed cost				4,00,000
			Optimal profit	4,06,430

Working note:

Total hours available in dept. 2

Products	*Units*	*Hours per unit*	*Total hours*
A	9750	5	48,750
B	7800	4	31,200
C	7800	7	54,600
			1,34,550

Maximum sales quantities of products (under improved market conditions)

Products	*Units*	*Increase in percentage*	*Total number of units*
A	9750	20	11700
B	7800	25	9750
C	7800	25	9750

7. Selling at or below marginal cost: Some time it may become necessary to sell the goods at a price below the margianal cost. Some such situations are as follows:

(*a*) Where materials are of perishabel nature.

(*b*) Where large quantities of stock is accumulated and whose market prices have fallen. This will save the carrying cost of stocks.

(*c*) In order to popularise a new product.

(*d*) In order to increase sales of those products which have higher margin of profit.

It the selling price is below the total cost but above the marginal cost, the contribution will leave an under-recovering of fixed cost. If the selling price fixed is equal to marginal cost, there will be a loss which is equal to fixed cost. However, where the selling price fixed is lesser than the marginal cost, the loss will be greater then fixed cost.

Problem 18: Garden Product Limited manufactures the 'Rainpour' garden spray. The accounts of the company for the year 1981 are expected to reveal profit of Rs. 14,00,000 from the manufacturer of 'Rainpour' after charging fixed costs of Rs. 10,00,000. The rainpour is sold for Rs. 50 per unit and has a variable unit cost or Rs. 20.

Market sensitivity tests suggest the following response to price changes L.

Alternatives	*Selling price reduced by*	*Quantity sold increased by*
A	5%	10%
B	7%	20%
C	10%	25%

Evaluate these alternatives and state which, on profitability consideration, should be adopted for the forthcoming year assuming cost structure unchanged from 1981.

(University of Delhi, B.Com. (Hons.) 1988)

Solution :

	Present	*Proposed*		
		A	*B*	*C*
Selling price	50	47.50	46.50	45
Less: Variable cost	20	20	20	20
Contribution	30	27.50	26.50	25
Quantity (units)	80,000	88,000	96,000	1,00,000
Total contribution	24,00,000	24,20,000	25,44,000	25,00,000
Less : Fixed cost	10,00,000	10,00,000	10,00,000	10,00,000
	14,00,000	14,20,000	15,44,000	15,00,000

Contribution and profit of proposal *B* is the largest and should, therefore, be adoped.

Note: Units produced and sold is calculated by employing the formula of:

$$= \frac{\text{Total contribution}}{\text{Contribution per unit}}$$

8. Determination of Selling Price and Volume of Output: The determination of selling price and volume of output is based on 'differential costing'. The difference in total cost due to increase in sales volume is known as differential costing. The increase in sales value due to increase in sales volume is known as 'incremental revenue'. The analysis of differential cost and incremental revenue helps in determining selling price which will yield the optimum profit. So long as incremental reneue is more than the differential cost it is advantageous to increase the output. But as soon as incremental revenue equals the differential cost further increase in output is not advantageous. Differential cost analysis thus helps to determine the selling price and the level of activity which are expected to yield the highest profit.

9. Determination of Sales Volume for a Desired Profit: Sometimes one of the decisions that is to be taken by the management is to determine the volume of sales in order to earn a desired profit. The cost-volume-profit analysis which is again based on marginal costing heps management is taking such decisions.

Problem 19 : Frazer Ltd. manufatures and sells a product the selling price and raw material cost which have remained unchanged during the past two years. The followings are the relevant data:

	Year 1	*Year 2*
Quantity sold (kgs.)	100	150
	Rs.	*Rs.*
Sales value	20,000	?
Raw materials	10,000	?
Direct wages	3,000	?
Factory overheads	5,000	5,700
Profit	2,000	2,550

Durin year 2 direct wages rates increased by 50% but there was a saving of Rs. 300 in fixed factory overhead.

Required : What quantity (in kgs) the company should have produced and sold in year 2 in order maintain the same amount of net profit per kg. as it earned during the year.

(*C.A., Inter, Nov., 1988*)

Solution:

Statement of quantity to be produced and sold during year 2

		Rs.
Selling price per kg. (*See Working Note 1*)		200
Variable costs per kg :		
Raw material	100	
Direct vages (*See Working Note 2*)		45
Variable factory overhead (*See Working Note 3*)	20	165
		35
Less : Profit required per Kg. (at 100 kgs. of sales)		20
Balance contribution per kg. for meeting fixed cost		15
Total fixed cost (*See Working Note 4*)		2700

Quantity of kgs. produced sold $\frac{2,700}{15}$ = 180 kgs.

Working notes:

1. Selling price per kg. = $\frac{\text{Rs. } 20,000}{100 \text{ kg.}}$ = Rs. 200 per kg.

2. Direct wages = Rs. $\frac{\text{Rs. } 3,000}{100 \text{ kg.}}$ = Rs. 150% = Rs. 45

3. Variable factory overhead per kg :

	Rs.
Total factory overhead in year 2	5,700
Add: Savings in fixed factory overhead	300
	6,000
Less : Total factory overhead in year 1	5,000
Increase in factory overhead	1,000

Increase in quantity (150 kg. — 100 kg.) = 50 kg.

$\therefore$ Variable factory overhead per kg. $\frac{\text{Rs. } 1,000}{50 \text{ kg.}}$ = Rs. 20

4. Fixed factory overhead

	Year 1	*Year 2*
Total factory overhead	5,000	5,700
Less: Variable factory overhead	2,000	3,000
	3,000	2,700

Problem 20 : X Ltd. manufactures and markets a single product. The following information is available:

	Rs. per unit
Materials	8.00
Conversion costs (variable)	6.00
Dealers margin	2,00
Selling price	20.00

Fixed cost Rs. 2,50,000
Present sales 80,000 units
Capacity utilisation 60 per cent

There is accute competition. Extra efforts are necessary to sell. Suggestions have been made for increasing sales:

1. By reducing sales price by 5%
2. By increasing dealers margin by 25% over the existing rate.

Which of the two suggestions you would recomment if the company desires to maintain the profit? Give reasons:

Solution:

Present marginal cost per unit

Materials		8.00
Conversion costs		6.00
Dealer's margin		2.00
	Total	16.00

Contribution per unit = Selling price – Marginal cost
= 20 – 16 = 4

Total contribution = 90,000 × 4 = 3,60,000

Profit = Contribution – Fixed cost
= 3,60,000 – 2,50,000 = 1,10,000

Since in both suggestions, fixed costs remain unchanged, the preson profit can be maintained by keeping the total contribution at the present level, i.e., Rs. 3,60,000

1. Reducing sales price by 5%

New sales price = (20 –1) = 19

New dealers margin = 10% of Rs. 19
= 1.90

∴ Variable cost = 8 + 6 + 1.90 = Rs. 15.90

Contribution per unit = 19 –15.90 = Rs. 3.10

Sales (units) required to maintain the present level of profit

$$= \frac{\text{Total contribution}}{\text{Contribution per unit}} = \frac{3,60,000}{3.16}$$

= 1,16,111 units

2. Increasing dealers margin by 25%

New dealer's margin = 8 + 6 + 25% = 2.50

New variable cost = 8 + 6 + 2.50 = 16.50

Contribution = 20 – 16.50 = Rs. 3.50

Sales (units) $= \frac{3,60,000}{3.50} = 1.02$

The second proposal in recommended because the contribution per unit si higher and the sales (in units) are lower. Lower sales efforts and less finance would be required in implementing the proposal (*ii*).

10. Acceptance or Rejection of a Special Order within the Country: Sometimes a decision regarding acceptance of a special order is to be made. This, however, depends on the availability of spare capacity. The contribution available from such an order helps in making such decision.

Problem 21 : Z Ltd. manufactures and sells a drink at 0.20 paise per cup. Current output is 4,00,000 cups per month which represents 80% soft capacity. They have the opportunity to utilise their surplus capacity by selling their product at 0.13 paise per cup to a supermarket chain who will sell it as 'own lable' product.

Total costs for the previous month were Rs. 56,000 out of which Rs. 16,000 were fixed costs. This represented a total cost of 14 paise per cup.

Based on the above data should Z accept the super market order. What other factors should be considered.

Solution:

Statement showing the present situation

Sales 4,00,000 @ 0,20 p	80,000
Less: Marginal cost 0.10 per cup	40,000
Contribution	40,000
Less: Fixed cost	16,000
Net profit	24,000

On the assumption that fixed costs are unchanged, the special order will produce the following contribution:

Sales 1,00,000 × 0.1	13,000
Less: Marginal cost 1,00,000 × 0.10)	10,000
Contribution	3,000

However, there are several other factors which would need to be considered before a final decision is taken:

(*a*) Will the acceptance of one order at a lower price lead other costomers to demand lower prices as well?
(*b*) Is this special order the most profitable way of using the spare capacity?
(*c*) Will the special order lock up capacity which could be used for future full price business?

Problem 22 : A manufacturer has planned his level of operation at 50% of his plant capacity of 30,000 units. His expenses are estimated as follows, if 50% of the plant capacity is utilised:

(*i*) Direct materials Rs. 8,280
(*ii*) Direct wages Rs. 11,160

(*iii*) Variable and other manufacturing expenses Rs. 3,960
(*iv*) Total expenses irrespective of capacity utilisation Rs. 6,000

The expected selling price in the domestic market is Rs. 2 per unit. Recently, the manufacturer has received a trade enquiry from an overseas organisation interested in purchasing 6,000 units at a price of Rs. 1.45 per units.

As a professional management what would be your suggestion regarding acceptance or rejection of the offer ? Support your suggestion with suitable quantitative information.

(*ICWA, Inter, Dec. 1991*)

Solution:

Statement of costs and profits

Particulars	*15,000 units (Expected output for domestic market)*		*6,000 units (Additional output for the foreign market)*		*Total*
	Amount	*Unit*	*Amount*	*Unit*	
Direct materials	8,280	0.552	3,312	0.552	11,592
Direct wages	11,160	0.744	4,464	0.744	15,624
Variable and other mfg. expenses	3,960	0.264	1,584	0.264	5,544
Variable cost	23,400	1.560	9,360	1.560	32,760
Sales	30,000	2.000	8,700	1.450	38,700
Contribution	6,600	0.440	(660)	0.11	5,940
Less: Fixed cost	6,000				6,000
Profit (Loss)	600		(660)		(60)

The price that can be obtained from the foreign market is Rs. 1.45 per unit of additional product which is less than the estimated variable cost of production, *i.e*., Rs. 1.56 per unit. This will result in an estimated negative contribution of Re. 0.11 per unit and thereby will generate an expected loss of Rs. 660 on 6,000 additional costs.

Therefore, if the offer from than overseas organisation is accepted, the profit of Rs. 6,000 on 15,000 units (based on the 50% plant capacity utilisation) will be wiped out and expected net loss of Rs. 60 will arise. Therfore, it is suggested not to accept the offer.

Problem 23: A company manufacturing electric motors at a price of Rs. 6,900 each made up as under :

Direct material	Rs. 3,200
Direct labour	400
Variable overheads	1,000
Fixed overheads	200
Depreciation	200
Variable selling overheads	100
Royalty	200
Profit	1,000
	6,300
Central excise duty	600
	6,900

1. A foreign buyer has offered to by 200 such motors at Rs. 5,000 each. As a cost accountant of the company, would you advise acceptance of the offer?
2. What should the company quote for a motor to be purchased by a company under the same management if it should be at cost. **(CS, Inter, June 1990)**

Solution:

Statement showing contribution

	Price offered		5,000
Less:	Variable cost		
(*i*)	Direct material	3,200	
(*ii*)	Direct labour	400	
(*iii*)	Variable overhead	1,000	
(*iv*)	Variable sellign overheads	100	
(*v*)	Royalty (presumed to be production based)	200	4,900
		Contribution	100

From the above it appears that is would be worthwhile to accept the offer since the price offered covers marginal cost in full and gives Rs. 100 contribution towards the recovery of fixed cost. Secondly there will not be the incidence of central excise duty because this is an export order. Further there will also be government incentive for export order. This will help the company to recover further the fixed cost and balance if any the depreciation.

12. Differential pricing in the different markets/pricing in depression or recession : Under normal circumstances, the selling price is fixed by adding a margin of profit to the total cost. However, selling price is not always determined by the total cost of prodution. The market conditions play an important factor and hecne, selling price is sometimes fixed considering market condition. In the long run they tend to equal the cost of production of marginal firm. Occasionally, a factory may have to sell beow he total cost. Such pricing has the following advantages:

(*a*) The services of talented employees can be utilised without discharging them.
(*b*) The idle capacity of plant may be prevented.
(*c*) The factory will be in a position to take the benefit arising out of a favourable condition at a later stage.
(*d*) The business can complete successfully.

Problem 24: A Company is at present is at present working at 90% of its capacity and producing 13,500 units per annum. It orerates a flexible budgetary control system. The following figures (excluding material and labour cost) are obtained from its budget.

		90%	*100%*
(*a*)	Sales	Rs. 15,00,000	16,00,000
(*b*)	Fixed expenses	Rs. 3,00,500	3,00,500
(*c*)	Semi-fixed expenses	Rs. 97,500	1,00,500
(*d*)	Variable expenses	Rs. 1,42,000	1,49,500

Material and labour cost per unit are costant under present conditions. Profit margin is 10% at 90% capacity.

(*a*) You are required to determine the cost of producing an additional 1,500 units.
(*b*) What would you recomment for an export price for these 1,500 units taking into account that overseas are much lower than indigenous prices. **(ICWA, Inter, June 1990)**

Solution :

(*i*) **Calculation of material and labour cost for 13,500 units:**

	Amount (Rs.)	*Per Unit (Rs.)*
Sales of 13,500 units	15,00,000	111.11
Less: 10% profit	1,50,000	11.11
	13.50,000	100.00
Less: Overhead-Fixed, semi-fixed and variable	5,40,000	40.00
Material and labour cost	8,10,000	60,00

Statement of cost of producting 1,500 units

	Total	Per unit
Material & labour cost	90,000	60.00
Semi-fixedd expenses (Differential cost 1,00,500 – 97,500)	3,000	2.00
Variable expenses (Differential cost 1,49,500 – 1,42,000)	7,500	5.00
Marginal cost	1,00,500	67.00

(*ii*) Indegenous price is Rs. 111.11. Though overseas prices are much lower than indigenous prices, an export price of Rs. 67 per unit plus any direct costs incurred for exprot is recommended in view of the foreign exchange earnings.

13. Decision-making and Profit Miximisation Based on Key Factor: It is a situation under which a company has a choice between various tupes of prduct which it can manufacture but subjected ot a limiting factor. A limiting factor or a key factor or a factor involved in the productive activity of a company, which at a point of time will limit the produciton capacity. It is also, therfore, termed as scarce factor, principal budget factor and so on. The limiting factor is affected by both internal and external environment. The contribution per unit of key factor is ascertained and it can be maximised according to the priority needs. Some of the examples of key factors are scarce raw materials, shortage of labour, plant capacity, inefficient, management, shortage of capital and shortage of demanad.

Problem 25: You are given the following information in respect of products *X* and *Y* of *AB* Co. Ltd.

	Product X	*Product Y*
Selling price	Rs. 42	Rs. 33
Direct materials	Rs. 15	Rs. 15
Labour hours	18 hrs.	9 hrs.
(50 paise per hours)		

Variable overheads 50% of direct wages Rs. 6,750

Show which product is more profitable during labour shortage:

Solution:

Statement showing contribution

	Product X	*Product Y*
Selling price 42	33	
Less : Variable cost	28.50	21.75
Contribution	13.50	11.25

Profitability $= \dfrac{\text{Contribution}}{\text{Key factor}}$

Product *X* $= \dfrac{13.5}{18} = 0.75$

Product *Y* $= \dfrac{11.25}{9} = 1.25$

Thus, product *Y* is more profitable then *X* during labour shortage.

14. Dropping out a Product: When a company produces several range of products, a decision that is to be often taken is whether all the products are to be produced in spite of the fact that one or two products are responsible for incurring losses. Marginal costing helps in taking decision of such nature by calculating the margin of contribution.

Problem 26: Synthetic Rubber Co. Ltd. manufacures and sell three varieties of shoes. The income statement for the year ending 31.12.1992 is as follows:

		Varieties of shoes (Rs. in lakh)		
		A	*B*	*C*
Sales		1.00	4.00	2.00
Works cost	Variable	50	1.80	70
	Fixed	30	1.00	40
Selling cost	Variable	12	50	20
	Fixed	10	40	20
Profit/Loss		(2)	30	50

The income statement reveals loss in the product *A*, previous years also. The management is considering a proposal to discontinue *A* and intensify production of *C*. It is anticipated that an advertisement of Rs. 20,000 annually would yield an increase of 30% in its sales volume and this would exactly fit in the plant facilities released by discountinuance of the product *A*.

The variable overheads both works and selling, etc. are directly proportional to sales. The total fixed overheads will remain the same irrespective of the change in production policy. The present allocations are based on capacity utilisation on works side and sales effort on selling side.

The management desires to know comparative positions whether (*a*) the present production/sales policy should be continued, (*b*) the product *A* to be discontinued without any further change or (*c*) the proposal of increasing the product *C* in lieu of the product *A* should be accepted. Present the information assuming sales and costs will remain the same as in last year.

Solution:

(*a*) **Present policy**

				Products (Rs. in lakh)			
				A	*B*	*C*	*Total*
Sales				1.00	4.00	2.00	7.00
Variable cost :				0.62	2.30	0.90	3.82
Works	0.50	1.80	0.70				
Selling	0.12	0.50	0.20				
	0.62	2.30	0.90				
Contribution				0.38	1.70	1.10	3.18

Fixed cost :							
Works	0.30	1.00	0.40				
Selling	0.10	0.40	0.20	0.40	1.40	0.60	2.40
	0.40	1.40	0.60				
			Profit or loss	0.02	0.30	0.50	0.78

(*b*) **If 'A' is discontinued**

		Products		
		B	*C*	*Total*
Sales		4.00	2.00	6.00
Variable cost		2.30	0.90	3.20
	Contribution	1.70	1.10	2.80
Less:	Fixed cost			2.40
	Profit			0.40

(*c*) **If C is expanded**

		Products		
		B	*C*	*Total*
Sales		4.00	2.60	6.60
Variable cost		2.30	1.17	3.47
	Contribution	1.70	1.43	3.13
Fixed cost & Advt.				2.60
	Profit			0.53

From the above statement it is clear that the profit is highest under the present policy. Hence, the present policy should continue.

QUESTIONS

I. Choose the correct answer

1. Production cost under marginal costing include:
   (*a*) Prime cost only
   (*b*) Prime cost and variable overhead
   (*c*) Prime cost and fixed overhead
   (*d*) Prime cost, variable overhead and fixed overhead **[ ]**
2. One of the primary difference between marginal costing and absorption costing is regarding the treatment of:
   (*a*) Direct material (*c*) Fixed overhead
   (*b*) Variable overhead (*d*) Prime cost **[ ]**
3. Period costs are:
   (*a*) Variable costs (*c*) Prime cost
   (*b*) Fixed cost (*d*) Overhead costs **[ ]**
4. Absorption costing offeres from marginal costing in the:
   (*a*) fact that standard costs can be used with absorption costing but not with marginal costing.
   (*b*) amount to fixed costs tat will be incurred
   (*c*) kind of activities for which each can be use.
   (*d*) amount of costs assigned to individual units of products. **[ ]**

5. Choose the true statement from the following:
   (*a*) Variable costing is a method of costing in which only direct materials and direct labour are charged to work-in-process.
   (*b*) Under variable costing, all costs which vary with sales volume are changed to work-in-progress.
   (*c*) Because certain manufacturing costs are treated as period costs, net earnings will always be lower under variable costing than under full costing.
   (*d*) Variable costing clearly points out the fact that if additional units of product can be sold for more than variable costs of producing and selling them, net earnings will increase. **[ ]**

[**Answer :** 1. (*b*), 2. (*c*), 3. (*c*), 4. (*d*), 5. (*d*)]

(II) Mark true of false

1. In marginal costing, fixed costs are excluded in the valuation of work-in-progress and finished goods stocks. *T/F*
2. Marginal costing may be used in conjunction with standard costing or budgetary control. *T/F*
3. In marginals costing, fixed costs are apportioned on some arbitrary basis. *T/F*
4. In absorption costing, the valuation of stock in higher than in marginal costing *T/F*
5. In marginal costing, managerial decisions are guided by cotribution margin than by profit. *T/F*
6. Absroption costing is generally accepted approach to product cost determination. *T/F*
7. Under marginal costing, variable overhead is treated as part of the cost of an assets, the goods produced, while fixed overhead is viewed as an expense. *T/F*
8. Marginal costing is sometimes referred to as variable costing. *T/F*
9. Under marginal costing, variable overhead is a period costs. *T/F*
10. Under variable costing only the costs of materials and labour are reviewed as product cost. *T/F*
11. Fixed factory overhead is not treated as a product cost under variable costing while it so treated under full costing. *T/F*
12. Variable selling expenses are deducted from revenue under the variable costing technique in arriving at net eqrnings. *T/F*
13. In general, if production volume exceeds sales volume, net earnings under full costing will be greated than under marginal costing. *T/F*
14. In the earning statement under marginal costing, marginal earnings are directly related to the volume of units sold. *T/F*
15. An unresolved issue in the variable full costing controversy is whether fixed overhead costs are period cost or products costs. *T/F*
16. The effect upon net earnings of the sale of some additional units of product is readily determinable under full costing. *T/F*

[**Answer :** *True* : 1, 2, 4, 5, 6, 7, 8, 11, 13, 14, 15, *False* : 3, 9, 10, 12, 16]

III. Short answer questions

1. What is 'analysis of margin of contribution'? Discuss the need for it.
   (Calicut University, B. Com., April 1992)
2. Define marginal costing. What are the features of marginal costing ?
   (Bangalore University, B.Com., April 1992)

EXERCISE 1

(High/Low method of segregating semi-variable cost) :

From the following data segregate semi-cariable cost into fixed and variable cost:

Month	*Units*	*Semi-variable cost*
Jan.	15,000	12,000
Feb.	12,000	11,400
Mar.	14,000	11,800
Apr.	16,000	12,200
May	18,000	12,600
June	17,000	12,400
	92,000	72,400

[**Answer :** For the month of Jan. variable cost Rs. 3,000 and fixed cost is Rs. 9,000. For the month of Feb. the variable cost is the Rs. 2,400 and fixed cost is Rs. 9,000 and so on]

EXERCISE 2

(High/Low method and method of least square):

From the following semi-variable cost calculate the fixed and variable cost under (*i*) High and low method, (*ii*) Method of least squares:

Month	*Units*	*Semi-variable cost*
Jan.	500	2,500
Feb.	600	2,800
Mar.	700	3,100
Apr.	940	3,820
May	740	3,220
June	880	3,640
July	900	3,700
Aug.	840	3,520
Sept.	800	3,400
Oct.	860	3,580
Nov.	760	3,280
Dec.	540	2,620

[**Answer :** For the month of Dec. the fixed cost under high-low method is Rs. 1,000 and variable cost is Rs. 2,820. Under method of least squares the fixed cost is Rs. 1,000 and variable cost per unit is Rs. 3]

EXERCISE 3

The following figures have been extracted form the books of a manufatruring company for the first half year ending 30th June, 1979:

Month	*Volume (Units)*	*Semi-variable cost overhead cost (Rs.)*
Jan.	150	2,700
Feb.	300	3,900

Mar.	450	5,100
Apr.	750	7,500
May	1,050	9,900
June	1,350	12,300

Find out the fixed and variable cost. **(University of Kerala, B.Com., May 1989)**

[**Answer :** Adoting indirect method the variable cost per unit is Rs. 8. The fixed cost is Rs. 1,500]

EXERCISE 4

(Make or buy decision):

X Ltd. manufactures component *A*-100 and the costs for the year 1992 when 50,000 units are produced is as follows:

Materials	Rs. 2.50
Labour	Rs. 1.25
Variable overheads	Rs. 1.75
Fixed overhead	Rs. 3.50
Total cost	Rs. 9.00

Component *A*-100 could be bought in for Rs. 7.75 and if so the production capacity at utilised in 1992 would be unused. Assuming that there is no technical consideration. Should component *A* be bought in or manufactured.

[**Answer :** The component should be manufactured and not bought because marginal cost of manufacture is Rs. 5.50 and the buying price is Rs. 7.75. The reason for ths is that the fixed cost of Rs. 17,500 (50,000 units × Rs. 3.50) would continue and as the capacity is not used, the fixed overhead would not be absorbed into production. If component *A*-100 is bought, overall profit will fall by Rs. 1,12,500 being the difference between buying price and marginal cost of manufacture *i.e.*, (7.75 – 5.50 × 50,000)]

EXERCISE 5

(Make or buy decision based on cost savings):

A firm is considering whether to manufacture or purchase a particular component. This would be in batches of 10,000 and the buying price is Rs. 6.50. The marginal cost of manufacturing this component is Rs. 4.75 per unit and the component will have to be made on a machine which was currently working at full capacity. If the component is manufactured, it is estimated that the sales of the finished product would be reduced by 1,000 units. The finished product has a marginal cost of Rs. 60 per unit and is sold at Rs. 80 per unit.

Should the firm manufacture or purchase the component.

[**Answer :** Marginal cost of manufacture is Rs. 47,500.

Add lost contribution of the finished product 100 × Rs. 20 = 20,000/67,500. Buying price is Rs. 65,000 (10,000 × Rs. 6.50). Thus there is a saving of Rs. 1.500 per 10,000 batch by buying rather than manufacture.]

EXERCISE 6

A ratio manufacture company finds that while it costs Rs. 6.75 each to make component of 376 R, the same is available in the market at Rs. 5,75 each with the assurance of continued supply. The breakdown of cost is as follows:

Materials	Rs. 2.75 each
Labour	Rs. 1.75 each
Other variable	Re. 0.50 each
Fixed cost	Rs. 1.25 each
	Rs. 6.25

(*a*) Should you make or buy.
(*b*) What would be your decision if the supplier offered the component at Rs. 4.55 each.

(Bangalore University, M.Com., May 1990)

[**Answer :** The marginal cost of prodution is Rs. 5 whereas market price is Rs. 5.75. Since market price is more, the component is to be manufactured. If the offer is 4.85, the proposal to buy may be examined in relation to other factors, *viz.*, more profitable use of available resources, the fixed cost to be borne by other products, the ability to sell at the same rate in the long run by the supplier etc.]

EXERCISE 7

(Product mix):

Tourus Ltd. produces three products : *A*, *B* and *C* from the same manufacturing facilitites. The cost and other details of the three products are as follows:

	A	*B*	*C*
Selling price per unit (Rs.)	200	160	100
Variable cost per unit (Rs.)	120	120	40
Fixed expenses per unit (Rs.)			2,76,000
Maximum production per month (units)	5,000	8,000	6,000
Total hours available for the month			
Maximum demand per month (unit)	2,000	4,000	2,400

The processing hours cannot be increased beyound 200 hours per month.
You are required to compute the most profitable product mix. **(CA, Inter, May 1988)**

[**Answer :** Contribution of A = 1,60,000, B = 64,000. C = 1,44,000.Total contribution is 3,68,000 and profit is Rs. 92,000]

EXERCISE 8

(Product mix):

A company engaged in plantation activities has 200 hectares of virgin land which can be used for growing jointly or individually tea, coffee and cardamom. The yield per hectare of the difference crops and their selling prices per kg. are as under:

	Yield kg.	*Selling price Rs. per kg.*
Tea	2,000	20
Coffee	500	40

Cardamom	100	25

The relevant cost data are given below:

(*a*) Variable cost per kg.

	Tea (Rs.)	*Coffee* (Rs.)	*Cardamom* (Rs.)
Labour charges	8	10	120
Packing materials	2	2	10
Other costs	4	1	20
Total cost	14	13	150

(*b*) Fixed cost per annum

Cultivation and growing cost	10,00,000
Administrative cost	2,00,000
Land revenue	50,000
Repairs and maintenance	2,50,000
Other costs	3,00,000
Total costs	18,00,000

The policy of the company is to produce and sell all the three kinds of products and maximum and minimum area to be cultivated per products is as follows:

	Maximums area (Hectares)	*Minimum area (Hactares)*
Tea	160	120
Coffee	50	30
Cardamom	30	10

Calculate the priority of production, the most profitable product mix and the maximum profit which can be achieved. **(CS, Inter, June 1988)**

[**Answer :** Contribution per hectare for tea is Rs. 12,000, for coffee Rs. 13,500 and for cardamom Rs. 10,000. Profit is Rs. 6,55,000]

EXERCISE 9

(Acceptance or rejection of an offer)

A factory produces 5,000 articles for home consumption at the following costs:

Materials		Rs. 50,000
Wages		Rs. 30,000
Factory overheads		
Fixed	30,000	
Variable	10,000	40,000
Adm. overheads (fixed)		28,000
Selling and distribution overheads		
Fixed	15,000	
Variable	10,000	25,000
Total		1,73,000

The home market can consume only 5,000 articles at a price of Rs. 40 each and no more. The foreign market for this product can, however, consume 3,000 additional pieces at a price of Rs. 22 each C.I.F. If this export order is extended, the following additional costs will be incurred:

1. Special packing, forwarding charge, etc., Rs. 1.00 per unit.
2. Freight, insuracne etc. Rs. 2.00 per unit.

The following 'export benefits' should also be considered :

1. Duty drawback on direct materials cost at 10%.
2. Cash subsidy at 10% on F.O.B. value if foreign market worth trying?

(Bangalore University, M. Com., May 1990)

[**Answer :** The acceptance of foreign market result in an additional profit of Rs. 5,000. Hence the foreign market is worth trying]

23

CHAPTER

COST-VOLUME-PROFIT ANALYSIS

INTRODUCTION

Earning of maximum profit is the ultimate objective of all business establishments. The profit in its turn is determined by a number of factors, both internal and external. One such factor is the sales revenue of the business. Increase in the sales revenue will lead to increase in the profits. But the sales itself is based on other factors such as demand for the product, the competition, the sellng price fixed, marketing strategies adopted by the management. The other important factor that determines the amount of profit is the cost of production. A reduced cost of production will result in an increased profit, keeping the selling price constant. But cost of production itself is affected by many factors such as volume of production, product mix, capacity utilisation, efficiency in production and so on. Though all these factors affect the profit earning capacity of a business, a special mention about the volume of output deserves to be mentioned in this regard. This is because volume of output changes more frequently and rapidly, and are not susceptible to management control. More than this the profit is more closely related to volume rather than cost. This is because costs seldom vary in direct proportion to volume. Hence, small change in the volume has a significant effect on profit. Whereas a change in other factors such as an order size or lot size will have insignificant effect on profit. However, it is the duty of management to consider the cost and volume while planning the profit earning capacity of the business. One such technique which is used by the management is known as cost-volume-profit analysis. As the name suggests, cost-volume-profit analysis examines the relationship of costs and profit to the volume of business with a view to maximise profit.

Kohler in his *Dictionary for Accountants* defines cost-volume-profit relationship as "the area of interest within an organisation, management and accountants in observing and controlling the relations between prospective and actual manufacturing costs — both fixed and variable — rates of production and gross profit.

OBJECTIVES OF COST-VOLUME-PROFIT

According to *NAA Research Bulletin*, Vol. 31, "the cost-volume-profit analysis appears to be useful principally as a technique for the study of problems encountered in business planning. As such it is a tool used largely by those executives responsible for strategic planning and policy-making". More specifically the objectives of cost-volume-profit analysis are as follows :

(*a*) To forecast the profit accurately.
(*b*) To facilitate in the preparation of flexible budgets.
(*c*) To evaluate the performance of the business. For evaluating the profit earned and cost increased, it is necessary to know the impact of cost on the changed volume of output.
(*d*) To enable management in determining the pricing policies.
(*e*) To enable the charging of overheads to cost of production at different levels of operation.

ASSUMPTIONS OF COST-VOLUME-PROFIT ANALYSIS

1. The analysis is valid for a limited range of values, *i.e*., 'the relevant ranges' and for a limited period of time.
2. Costs can be classified as fixed and variable. The latter type of cost changes proportionately with the volume within the relevant volume range. Fixed costs are constant within the relevant volume of range.
3. Revenues change proportionately with volumes.
4. There exists a constant product mix.
5. There is no significant change in the inventories in terms of physical units. In other words, the units produced are assumed to be sold.
6. Changes in volume alone are responsible for changes in costs and revenues.
7. The analysis is deterministic in nature. It ignores uncertainty and probabilistic approach.

LIMITATIONS OF COST-VOLUME-PROFIT ANALYSIS

1. It is presumed that the anticipated capacity of production remains same. But it may be increased depending upon the need.
2. The analysis of cost-volume-profit gives satisfactory result only if elements of costs remain stable. But in actual practice it varies.
3. It is again presumed that plant capacity remains same. However, the cost-volume-profit relationship does not hold good if manual labour is replaced by machines or high cost of materials are substituted by low cost materials.
4. In a business with many varieties of products, it becomes difficult to forecast the profits more accurately.

PRESENTATION OF COST-VOLUME-PROFIT ANALYSIS OR BREAK-EVEN ANALYSIS

One method of presenting cost-volume-profit analysis is by the method of break-even-analysis. It is a technique which is designed to help management in planning and decision-making functions involving the effect of change in volume on the profitability. This method helps management by establishing relationship between cost, volume and profit at different levels of activity. The management of every business desires to know the impact of changes in sales volume on profit. It is interesting in knowing the level at which the cost of production is equal to the sales value. This point where no profit or no loss is incurred is known as break-even point. Below this point any production will result only loss and beyond this point it brings profit to the business. Hence, break-even analysis and its study beyond the break-even point only relates to cost-volume-profit analysis.

There are two methods of presenting break-even analysis. They are : (*i*) Algebraic method and (*ii*) Graphic method. The method to be used depends upon the choice of management and the data available.

ALGEBRAIC METHOD OF PRESENTING CVP ANALYSIS

This method of analysing cost-volume-profit relationship is based on the fundamental equation of marginal costing, *i.e.*, Sales – Variable cost = Fixed cost + Profit. Given any of the three variables, it is possible to find out the fourth unknown variable. This formula can be modified in different ways according to the need. For example, at the break-even point, the profit is nil. So the equation can be written as S – V = F + 0 (zero). Similarly, in order to calculate the sales, at the break-even point, it is possible to arrive at the following formula by multiplying it with sales :

$$S\,(S - V) = F \times S$$

or S (Sales at break-even point) $= \dfrac{F \times S}{S - V}$

Because sale minus variable cost constitute contribution, the above formula may also be written as follows :

$$S = \frac{F \times S}{C}$$

Alternative, fixed cost and profit must be equal to contribution. So the formula can be written as follows :

$$S = \frac{F \times S}{F + P}$$

In the same way for determining different requirements different formula are available. They are indicated below :

1. To determine the break-even sales in terms of units, the formula is

   BEP (units of Sales) $= \dfrac{\text{Fixed cost}}{\text{Contribution per unit}}$

   or $= \dfrac{\text{Fixed cost}}{\text{Unit selling price} - \text{Unit variable cost}}$

2. To determine break-even Sales in terms of rupees

   BEP (Sales in Rs.) $= \dfrac{\text{Fixed cost} \times \text{Selling price}}{\text{Contribution per unit}}$

   or BEP (Sales in Rs.) $= \dfrac{\text{Fixed cost} \times \text{Sales}}{\text{Fixed cost} + \text{Profit}}$

   or BEP (Sales in Rs.) $= \dfrac{\text{Fixed cost}}{1 - \dfrac{\text{Variable cost}}{\text{Sales}}}$

3. Level of sales in units to earn a desired amount of profit

   BEP (Sales in units) $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}} \times SP$

4. To determine the value of sales to earn a desired profit before tax

   BEP (Sales in Rs.) $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{1 - \dfrac{\text{Variable cost}}{\text{Sales}}}$

5. To determine the level of sales (in units) to result a desired profit after tax.

$$\text{BEP (Sales in units)} = \frac{\text{Fixed cost} + \dfrac{\text{After tax profit}}{1 - \text{Tax rate}}}{\text{Contribution rate per unit}}$$

6. To determine BEP after additional fixed cost owing to plant expansion.

$$\text{BEP} = \frac{\text{Present fixed cost + Additional fixed cost}}{1 - \dfrac{\text{Variable cost}}{\text{Sales}}}$$

7. To determine sales volume required to earn existing profit

$$\text{BEP (Sales in units)} = \frac{\text{Present fixed cost + Additional fixed cost + Existing profit}}{1 - \dfrac{\text{Variable cost}}{\text{Sales}}}$$

8. To determine shut down point

$$= \frac{\text{Fixed cost} - \text{Shut down cost}}{1 - \dfrac{\text{Variable cost}}{\text{Sales}}}$$

Problem 1 : From the following particulars find out break-even point :

Variable cost per unit	Rs.	10
Selling price per unit	Rs.	15
Fixed expenses	Rs.	40,000

What will be the selling price per unit if break-even point is brought down to 5,000 units?

(*SV University, B. Com., October 1999*)

Solution :

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Sales} - \text{Variable cost}} = \frac{40,000}{15 - 10} = \frac{40,000}{5} = 8,000 \text{ units}$$

Selling price per unit if BEP is brought down to 5,000 units

Variable cost	5,000 × 10	= 50,000
Fixed cost		= 40,000
	Toal cost	90,000
	Profit/loss	NIL
	Sales value	90,000

$$\text{Selling price per unit} = \frac{90,000}{5,000} = 18$$

Note : There is no profit or loss as is clear from the following :

Sales (8,000 × 15)		1,20,000
Less : Variable cost	8,000 × 10	80,000
	Contribution	40,000
	Less : Fixed cost	40,000
	Profit	—

Problem 2 : You are given the following particulars :

Selling price	Rs.	200	per unit
Variable cost	Rs.	100	per unit
Total fixed cost	Rs.	96,000	

Calculate :

1. Break-even units and value
2. Sales to earn a profit of Rs. 20 per unit.

(University of Delhi, B. Com., (Pass), April 1993)

Solution :

Contribution = Sales – Variable cost

= 200 – 100 = 100 per unit

(*i*) BEP $= \dfrac{\text{Fixed cost}}{\text{Contribution per unit}}$

$\dfrac{96,000}{100} = 960$ units

BEP in value = 960×200 = Rs. 1,92,000

(*ii*) Sales to earn a profit of Rs. 20 per unit

Let Sales = x units

Then total sales = $200x$

Sales = Fixed cost + Variable cost + Profit

$200x = 96,000 + 100x + 20x$

$200x - 120x = 96,000$

$80x = 96,000$

$x = \dfrac{96,000}{80} = 1,200$ units.

Problem 3 : From the following data calculate :

(*i*) Break-even point expressed in amount of sales in rupees

(*ii*) How many units must be sold to earn a net profit of 10% of sales ?

Selling price	Rs. 20 per unit
Variable cost	Rs. 12 per unit
Fixed cost	Rs. 2,40,000

(University of Delhi, B. Com. (Pass), April 1991)

Solution :

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{2,40,000}{20 - 12} = \frac{2,40,000}{8}$$

= 30,000 units.

(*i*) BEP in rupees = 30,000 units × 20

= Rs. 6,00,000

Units to be sold to earn a net profit of 10% on sales

Let Sales units = x

Selling price = Rs. 20

Total sales = $20x$

Profit 10% of sales = $\frac{10}{100} \times 20x = 2x$

Sales value = Fixed cost + Variable cost + Profit

$20x = 2{,}40{,}000 + 12x + 2x$

$20x - 12x - 2x = 2{,}40{,}000$

$6x = 2{,}40{,}000$

$x = \frac{2{,}40{,}000}{6} = 40{,}000$ units.

Problem 4 : Gifts Land Ltd., is considering hiring a machine at an annual charge of Rs. 12,000 to increase the output of a product from its present level of 6,000 units. It is anticipated that with the introduction of the machine, the variable cost per unit will be reduced by Re. 1 due to saving in labour cost. The new machine will not affect fixed cost in total apart from the hiring charges. The selling price of the product is Rs. 12 per unit. The present cost structure of the products is variable cost Rs. 9 per unit and fixed cost per unit Re. 1 per unit.

(University of Madras, B. Com., September 1995)

Solution :

$$\text{Break-even point for new machine} = \frac{\text{Revised total fixed cost}}{\text{Revised contribution per unit}}$$

Calculation of revised contribution per unit :

Selling price per unit			12
Less : Revised variable cost :			
Variable cost	9		
Less : Saving in labour cost	1		
			8
Revised contribution per unit			4

Calculation of revised total fixed cost :

Present fixed cost	6,000 × 1	=	6,000
Add : Additional hire charges		=	12,000
Revised total fixed cost			18,000

New BEP = $\frac{18{,}000}{4} = 4{,}500$ units

Existing BEP = $\frac{\text{Total Fixed cost}}{\text{Contribution per unit}}$

Existing fixed cost = 6,000 × 1 = 6,000

Contribution per unit = S – V
= 12 – 9 = 3

Existing BEP = $\frac{6,000}{3}$ = 2,000 units

∴ Extra units produced in justifying hiring machine is (4,500 units – 2,000 units) = 2,500 units for break-even.

Problem 5 : Indian Plastics make plastic buckets. An analysis of their accounting reveal

Variable cost per bucket	Rs. 20
Fixed cost	Rs. 50,000 for the year
Capacity	2,000 buckets per year
Selling price per bucket	Rs. 70

Required :

(*i*) Find the break-even point.
(*ii*) Find the number of buckets to be sold to get a profit of Rs. 30,000.
(*iii*) If the company can manufacture 600 buckets more per year with an additional fixed cost of Rs. 2,000 what should be the selling price to maintain the profit per bucket as at (*ii*) above ?

(University of Delhi, B. Com. (Hons.), April 1991)

Solution :

(*i*) BEP = $\frac{\text{Fixed cost}}{\text{SP – VC per unit}}$

= $\frac{50,000}{70 - 20} = \frac{50,000}{50}$ = 1,000 units

Verification :

Total cost (at 1,000 units) = FC + VC = 50,000 + 20,000
Rs. = 70,000

Sales = 1,000 buckets @ Rs. 70 = Rs. 70,000

Total cost of Rs. 70,000 is equal to total sales of Rs. 70,000, *i.e.*, no profit-no loss or BEP.

(*ii*) Number of buckets to be sold to earn profit of Rs. 30,000

$\frac{\text{Fixed cost + Desired profit}}{\text{Contribution}}$

= $\frac{50,000 + 30,000}{50}$ or $\frac{80,000}{50}$ = 1,600 buckets

Verification :

Total cost (at 1,600 buckets) = FC + VC
= 50,000 + 32,000 = 82,000

Sales = 1,600 buckets @ Rs. 70 = Rs. 1,12,000

Profit = Sales – Toal cost
= 1,12,000 – 82,000 = Rs. 30,000

(*iii*) Selling price to maintain the profit per bucket as at (*ii*) :

Further profit per bucket under (*ii*) will be

$$\frac{\text{Rs. } 30{,}000}{1{,}600 \text{ buckets}} = \text{Rs. } 18.75 \text{ per bucket}$$

And fixed cost will be Rs. 52,000 (50,000 + 2,000)

$$\text{Desired sales (units)} = \frac{\text{FC} + \text{Desired profit}}{\text{Contribution}}$$

$$2{,}600 = \frac{52{,}000 + (2{,}600 \times 18.75)}{\text{SP} - \text{VC}}$$

$$2{,}600 = \frac{52{,}000 + 48{,}750}{\text{SP} - 20}$$

$$2{,}600\,(\text{SP} - 20) = 1{,}00{,}750$$

$$\text{SP} - 20 = \frac{1{,}00{,}750}{2{,}600}$$

$$\text{SP} - 20 = 38.75$$

$$\text{SP} = 38.75 + 20 = \text{Rs. } 58.75$$

Verification :

At 2,600 buckets, capacity utilisation :

Fixed cost	= Rs. 52,000
Variable cost	= 20 × 2,600 = 52,000
Total cost	= 52,000 + 52,000 = 1,04,000
Sales	= 2,600 buckets @ Rs. 58.75 = Rs. 1,52,750
Profit	= Sales – Total cost
	= 1,52,750 – 1,04,000 = Rs. 48,750

Problem 6 : Quickwell Ltd., manufactures pressure cookers, the selling price of which is Rs. 300 per unit. Currently, the capacity utilisation is 60% with a sales turnover of Rs. 18 lakhs. The company proposes to reduce the selling price by 20% but desires to maintain the same profit position by increasing the output. Assuming that the increased output could be made and sold, determine the level at which the company should operate to achieve the desired objective.

The following further data are available :

(*i*) Variable cost per unit = Rs. 60.

(*ii*) Semi-variable cost (including a variable element of Rs. per unit) = Rs. 1,80,000

(*iii*) Fixed cost Rs. 3,00,000 will remain constant up to 80% level. Beyond this an additional amount of Rs. 60,000 will be incurred. **(ICWA, Inter December 1998)**

Solution :

Statement of present profitability at 60% capacity

		Amount	*Per unit*
(*a*)	Sales	18,00,000	300
	Variable cost	3,60,000	60
	Variable portion of semi-variable cost	60,000	10
(*b*)	Total variable cost	4,20,000	70

(*c*) Contribution (*a* – *b*)	13,80,000	230
(*d*) Fixed cost	3,00,000	50
Fixed portion of semi-variable cost	1,20,000	20
(*e*) Total fixed cost	4,20,000	70
Profits (*c* – *e*)	9,60,000	160
Revised selling price per unit Rs. 300 – 20% of Rs. 300		240
Total variable cost per unit		70
Revised contribution per unit		170

$$\text{BEP (Sales in units)} = \frac{\text{FC + Profit}}{\text{Contribution per unit}}$$

$$= \frac{4{,}20{,}000 + 9{,}60{,}000}{170}$$

$$= \frac{13{,}80{,}000}{170} = 8{,}118 \text{ units } \textit{i.e.}, 81.18\% \text{ of capacity.}$$

But if the level of capacity is beyond 80%, an additional amount of Rs. 60,000 will be increased towards fixed cost. Then in such care the position will be as follows :

$$\text{Sales in unit} = \frac{(4{,}20{,}000 + 60{,}000) + 9{,}60{,}000}{170}$$

$$= \frac{14{,}40{,}000}{170} = 8{,}470.58$$

8,471 units are to be sold to maintain the same profit. Therefore, the company should operate at 84.71% level of capacity.

Problem 7 : You are given the following data :

Sales price	Rs. 350 per unit
Variable cost	Rs. 200 per unit
Fixed expenses	Rs. 16,50,000

Ascertain :

(*a*) Break-even point.
(*b*) Sales per unit if break-even point is brought up to 15,000 units.
(*c*) Sales per unit if break-even point is brought down to 10,000 units.

(Bangalore University, B. Com., April 1992)

Solution :

$$\text{Contribution} = \text{Sales price} - \text{Variable cost}$$

$$= 350 - 200 = \text{Rs. } 150$$

(*a*) $\text{BEP} \frac{\text{Fixed expenses}}{\text{Contribution}} = \frac{16{,}50{,}000}{150} = 11{,}000 \text{ units}$

(*b*) Selling price if BEP is brought up to 15,000 units.

Variable cost $15{,}000 \times 200$	30,00,000
Add : Fixed cost	16,50,000
Total cost	46,50,000

Selling price $= \frac{46,50,000}{15,000} =$ Rs. 310

(*c*) Selling price if break-even point is brought down to 10,000 units

Variable cost	10,000 × 200	20,00,000
Add : Fixed cost		16,50,000
Total cost		36,50,000

Selling price $= \frac{36,50,000}{10,000} =$ Rs. 365

Problem 8 : A manufacturer provides you the following data regarding his operations for the year 1991 :

	Rs.
Break-even sales	6,66,667
Direct materials	2,20,000
Gross profit	2,50,000
Contribution margin	3,00,000
Direct labour	3,00,000
Sales	10,00,000
Variable manufacturing overhead	5,000

Calculate the following using the above data :

(*a*) Fixed manufacturing overhead.
(*b*) Variable selling and administrative overhead.
(*c*) Fixed selling and administrative overhead. **(Calicut University, M. Com., April 1992)**

Solution :

Cost of goods sold = Sales – Gross profit
= 10,00,000 – 2,50,000 = 7,50,000

(*a*) Fixed factory overhead

Let fixed factory overhead = x

Then cost of goods sold will be equal to

$2,20,000 + 3,00,000 + 5,000 + x = 7,50,000$

$5,25,000 + x = 7,50,000$

$x = 2,25,000$

(*b*) Calculation of fixed selling and administrative overhead

Sales at BEP	6,66,667
Less : Contribution	3,00,000
Total fixed cost	3,66,667
Less : Fixed factory overhead	2,25,000
Fixed selling and administrative overhead	1,41,667

(*c*) Calculation of variable selling and administrative overhead

Sales – Variable cost = Contribution

$10,00,000 – (2,20,000 + 3,00,000 + 5,000 + x) = 3,00,000$

$$10,00,000 - 5,25,000 + x = 3,00,000$$
$$4,75,000 + x = 3,00,000$$
$$x = -4,75,000 + 3,00,000$$
$$x = 1,75,000$$

Problem 9 : Sharda Painters Ltd., manufactures and sells four types of paints under the brand names of P, Q, R and S. The sales mix in value comprises of $33\frac{1}{3}\%$, $41\frac{2}{3}\%$, $16\frac{2}{3}\%$ and $8\frac{1}{3}$ respectively.

The total budgeted sales are Rs. 60,000 per month. Operating costs are :

Variable cost of P	60% of selling price
Variable cost of Q	68% of selling price
Variable cost of R	80% of selling price
Variable cost of S	40% of selling price

Fixed cost amount to Rs. 14,700 per month. Calculate BEP for all paints on an overall basis.

(Bangalore University, M. Com., May 1989)

Solution :

	Products				*Total*
	P	*Q*	*R*	*S*	
Sales mix	$33\frac{1}{3}\%$	$41\frac{2}{3}\%$	$16\frac{2}{3}\%$	$8\frac{1}{3}\%$	100%
Sales (Rs.)	20,000	25,000	10,000	5,000	60,000
Variable cost	12,000	17,000	8,000	2,000	39,000
Contribution					21,000
Less : Fixed cost					14,700
				Profit	6,300

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Contribution}} \times \text{Sales}$$
$$= \frac{14,700}{21,000} \times 60,000 = \text{Rs. } 42,000$$

PROFIT-VOLUME RATIO OR CONTRIBUTION — SALES PERCENTAGE

The profit volume (*P/V*) ratio establishes the relation between contribution to sales. The ratio is expressed as a percentage and it furnishes the details of profitability of various products, processes or departments. A high *P/V* ratio shows that even a slight rise in the volume without a corresponding increase in fixed cost would result in high profit. Therefore, it is advisable for management to increase sales by taking suitable measures such as advertising and other sales promotional measures. The *P/V* ratio can be increased by maximising contribution, which is possible by increasing the selling price, reducing the variable cost and by improving the product mix. The formula to calculate *P/V* ratio is as follows :

$$P/V \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

Uses of P/V Ratio

1. It helps in the determination of BEP. The formula is :

$$\text{BEP} = \frac{\text{FC}}{\text{P/V Ratio}}$$

2. It helps in the determination of profit at any volume of sales. The formula is :

$$\text{Volume} \times \text{P/V Ratio} = \text{Contribution} - \text{FC} = \text{Profit}$$

3. It helps in the determination of sales to earn a desired amount of profit. The formula is :

$$\text{Sales} = \frac{\text{F} + \text{P}}{\text{P/V Ratio}}$$

4. It helps in determining the required selling price per unit. The formula is :

$$\text{Selling price} = \frac{\text{Variable cost}}{(100 - \text{P/V Ratio})}$$

5. It helps in ascertaining the variable cost for any volume of sales by reverse method, *i.e.*, by deducting P/V ratio from sales considering it as 100%.

Margin of Safety

The excess of actual sales over the break-even sales is known as margin of safety. The formula is as follows :

$$\text{MS} = \text{Sales Volume} - \text{breakeven sales volume}$$

The soundness of the business can be known by looking into the margin of safety. If the distance between sales revenue and break-even point on the graph is long, it shows the soundness, of the business. On the other hand, a small margin of safety involving a fall in sales revenue results in a loss. The margin of safety can be improved by taking the following measures :

(*a*) Increasing the selling price.
(*b*) Increasing the sales volume by increasing the capacity.
(*c*) By improving the contribution margin through reducing the variable cost.
(*d*) By lowering BEP through reduction of fixed cost.
(*e*) By adopting a better profitable product mix.

Margin of safety can be calculated by using the following formula :

$$\text{MS (in rupees)} = \frac{\text{Profit}}{\text{P/V Ratio}} \text{ or } \text{Profit} \times \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{MS (in units)} = \frac{\text{Profit}}{\text{Contribution per unit}}$$

It can also be expressed as a percentage using the following formula :

$$\text{MS Ratio} = \frac{\text{MS}}{\text{Sales}} \times 100$$

$$\text{MS Ratio} = \frac{\text{Actual Sales} - \text{BEP Sales}}{\text{Sales}} \times 100$$

The other formulae used to calculate P/V ratio are as follows :

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{P/V Ratio} = \frac{\text{FC + Profit}}{\text{Sales}}$$

$$\text{P/V Ratio} = \frac{\text{FC + Loss}}{\text{Sales}}$$

$$\text{P/V Ratio} = \frac{\text{Change in contribution}}{\text{Change in sales}}$$

$$\text{P/V Ratio} = \frac{\text{Change in profit (or loss)}}{\text{Change in sales}}$$

Angle of Incidence

The angle at which sales line cuts the total cost line is known as angle of incidence. In other words, it represents the angle between sales line and total cost line. The angle of incidence shows the profit earning capacity of the business. Hence, higher the angle of incidence, higher the profit and *vice versa*. A high margin of safety with a broader angle of incidence reveals a highly favourable position of the business.

Problem 10 : Given the following information :

Fixed cost	= Rs.	4,000
Break-even sales	= Rs.	20,000
Profit	= Rs.	1,000
Selling price per unit	= Rs.	20

You are required to calculate :

(*i*) Sales and marginal cost of sales and

(*ii*) New break-even point if selling price is reduced by 10%

(University of Delhi, B. Com. (Pass), April 1999)

Solution :

Contribution at BEP = Fixed cost is 4,000

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{4,000}{20,000} \times 100 = 20\%$$

(*i*) Sales to earn a profit of Rs. 1,000

$$= \frac{\text{Fixed cost + Profit}}{\text{P/V Ratio}}$$

$$= \frac{4,000 + 1,000}{20\%} = \frac{5,000}{20\%} = 25,000$$

Marginal cost at sales of Rs. 25,000 is found as follows :

$$\text{Contribution} = \text{Sales} \times \text{P/V ratio}$$

$$= 25,000 \times \frac{20}{100} = 5,000$$

Marginal cost = Sales – Contribution
= 25,000 – 5,000 = Rs. 20,000

(*ii*) New BEP if selling price is reduced by 10%

New sales = 25,000 – 10%
= 22,500

New contribution = 22,500 – 20,000 = Rs. 2,500

$$\text{New P/V Ratio} = \frac{\text{New Contribution}}{\text{New Sales}}$$

$$= \frac{2,500}{22,500} = \frac{1}{9}$$

$$\text{New BEP} = \frac{\text{Fixed cost}}{\text{P/V Ratio}}$$

$$= \frac{4,000}{\frac{1}{9}} \text{ or } = 36,000$$

Problem 11 : Ascertain profit when

Sales = Rs. 2,00,000
Fixed cost = Rs. 40,000
BEP = Rs. 1,60,000 **(CA, Inter, May 1999)**

Solution :

$$P/V \text{ Ratio} = \frac{\text{Fixed cost}}{\text{BEP}} \times 100$$

$$= \frac{40,000}{1,60,000} \times 100 = 25\%$$

Contribution = Sales × P/V Ratio = FC + Profit
= 2,00,000 × 25% = FC + profit
50,000 = 40,000 – Profit
or Profit = 10,000

Problem 12 : Ascertain sales, when

Fixed cost = Rs. 20,000
Profit = Rs. 10,000
BEP = Rs. 40,000 **(CA, Inter, May 1999)**

Solution :

Contribution = Fixed cost + Profit
= 20,000 + 10,000 = 30,000

$$P/V \text{ Ratio} = \frac{\text{Fixed cost}}{\text{BEP}} \times 100 = \frac{20,000}{40,000} \times 100 = 50\%$$

Also *P/V* Ratio $= \dfrac{\text{Contribution}}{\text{Sales}} \times 100$

or Sales $= \dfrac{\text{Contribution}}{\text{P/V Ratio}} \times 100$

$= \dfrac{30{,}000}{50\%} = \dfrac{30{,}000 \times 100}{50} = 60{,}000$

Problem 13 : Raj Ltd., manufactures three products X, Y and Z. The unit selling prices of these products are Rs. 100, Rs. 160 and Rs. 75 respectively. The corresponding unit variable costs are Rs. 50, Rs. 80 and Rs. 30. The proportions (quantity wise) in which these products are manufactured and sold are 20%, 30% and 50% respectively. The total fixed costs are Rs. 14,80,000.

Calculate break-even quantity and the product wise break up of such quantity. **(CA, Inter, May 1999)**

Solution :

Overall Break-even Quantity

Products	*X*	*Y*	*Z*
Selling price per unit	100	160	75
Less : Variable cost per unit	50	80	30
Contribution per unit	50	80	45
Contribution at break-even point (*see working note*)	$0.20x \times 50$ $10x$	$0.30x \times 80$ $24x$	$0.50x \times 45$ $22.5x$

At break-even point, contribution = Fixed cost

Hence, $10x + 24x + 22.5x$ = Rs. 14,80,000

or $x = \dfrac{14{,}80{,}000}{56.5} = 26{,}195$ units.

Productwise break-up of overall break-even quantity

Product *X*	= 26,195 units × 0.20	= 5,239 units
Product *Y*	= 26,195 units × 0.30	= 7,858 units
Product *Z*	= 26,195 units × 0.50	= 13,098 units

Working note :

Let *x* be the overall break-even quantity of three products X, Y and Z. At break-even X has 20%, 30% and 50% units of X, Y and Z. The product wise production and sale of three given products in terms of overall break-even quantity are 0.20x, 0.30x and 0.50x units respectively.

Problem 14 : When volume is 3,000 units, average cost is Rs. 4 per unit. When volume is 4,000 units, average cost is Rs. 3.50. The break-even point is 5,000 units. Find the P/V ratio. **(ICWA, Inter, Dec. 1999)**

Solution :

	Output	*Average Cost*	*Total Cost*
	3,000	4	12,000
	4,000	3.50	14,000
change	1,000		2,000

Variable cost per unit $= \frac{2,000}{1,000} = \text{Rs. } 2$

Total fixed cost = Total cost – Variable cost
= 12,000 – 3,000 units × Rs. 2
= 12,000 – 6,000
= 6,000

or = 14,000 – 4,000 units × Rs. 2
= 14,000 – 8,000
= 6,000

At BEP, BEP sales = Variable cost + Fixed cost
5,000 units = 5,000 × 2 + 6,000
= 10,000 + 6,000
= 16,000

BEP $= \frac{\text{Fixed Cost}}{\text{P/ V Ratio}}$

or P/V Ratio $= \frac{\text{Fixed cost}}{\text{BEP}}$

$= \frac{6,000}{16,000} = \frac{3}{8}$ or 37.5%

Problem 15 : ABC Ltd., fixed costs of Rs. 2,00,000. It has two products, that it can sell ; A and B. The company sells these products at a rate of 2 units of A to 1 unit of B. The unit contribution is Re. 1 per unit for A and 2 per unit for B. How many units of A and B would be sold at the break-even point.

(ICWA, Inter, Dec. 1999)

Solution :

Products	*A*	*B*	*Total*
Sales unit be (in the ratio of 2 : 1)	2	1	3 units
Contribution per unit	Re. 1	Rs. 2	
Total contribution	Rs. 2	Rs. 2	Rs. 4

Hence, contribution per unit (composite) $= \frac{4}{3}$

Total fixed cost = Rs. 2,00,000

BEP (composite) $= \frac{\text{Fixed cost}}{\text{Contribution per unit}}$

$= \frac{2,00,000}{\frac{4}{3}}$

or BEP in units $= \frac{2,00,000 \times 3}{4}$

= 1,50,000 units

$$\frac{2}{3} A = 1,00,000 \text{ units}$$

$$\frac{1}{3} B = 50,000 \text{ units}$$

Problem 16 : A company had incurred fixed expenses of Rs. 2,25,000 with sales of Rs. 7,50,000 and earned a profit of Rs. 1,50,000 during the first half year. In the second half year, it suffered a loss of Rs. 75,000 calculate :

(*i*) The P/V ratio, break-even point and margin of safety

(*ii*) Expected sales-volume for the second half year assuming that selling price and fixed expenses remained unchanged during second half year. **(CS, Inter, June 1998)**

Solution :

Calculations for the first half-year

P/V Ratio $= \dfrac{\text{Fixed cost + Profit}}{\text{Sales}}$

$= \dfrac{2,25,000 + 1,50,000}{7,50,000} = 50\%$

BEP $= \dfrac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \dfrac{2,25,000}{50\%} = 4,50,000$

Margin of safety = Actual sales – Sales at BEP

= 7,50,000 – 4,50,000 = Rs. 3,00,000

(*ii*) Expected sales volume for second half year

$= \dfrac{\text{Fixed Cost – Loss}}{\text{P/V Ratio}}$

$= \dfrac{2,25,000 - 75,000}{50\%}$

$= \dfrac{1,50,000}{50} \times 100 = 3,00,000$

Problem 17 : The profit volume ratio of X Ltd., is 50% and the margin of safety is 40%. You are required to calculate the net profit if the sales value is Rs. 1,00,000. **(CA, Inter, November 1998)**

Solution : Margin of safety ratio $= \dfrac{\text{Margin of safety in absolute terms}}{\text{Actual sales}} \times 100$

$40 = \dfrac{\text{Margin of safety in absolute terms}}{1,00,000} \times 100$

or Margin of safety in absolute terms $= \dfrac{1,00,000 \times 40}{100}$

$= 40,000$

Also Margin of safety in absolute terms $= \dfrac{\text{Profit}}{\text{P/V Ratio}}$

or $40{,}000 \times \dfrac{\text{Profit}}{50\%}$

or $\text{Profit} = 40{,}000 \times \dfrac{50}{100} = \text{Rs. } 20{,}000$

Problem 18 : A single product company sells its products at Rs. 60 per unit. In 1996, the company operated at a margin of safety of 40%. The fixed costs amounted to Rs. 3,60,000 and the variable cost ratio to sales was 80%.

In 1997, it is estimated that the variable costs will go up by 10% and the fixed costs will increase by 5%.

Find the selling price required to be fixed in 1997 to earn, the same P/V ratio as in 1996.

Assuming the same selling price of Rs. 60 per unit in 1997, find the number of units required to be produced and sold to earn the same profit as in 1996. **(CA, Inter, May 1998)**

Solution :

Calculation of P/V ratio (in 1996)

P/V ratio $= \dfrac{\text{Selling price} - \text{Variable Cost per unit}}{\text{Selling price}} \times 100$

$= \dfrac{60 - 48}{60} \times 100$

$= \dfrac{12}{60} \times 100 = 20\%$

Calculation of units sold (in 1996)

BEP $= \dfrac{\text{Fixed cost}}{\text{Contribution per unit}}$

$= \dfrac{3{,}60{,}000}{12} = 30{,}000 \text{ units}$

Since, Margin of safety is 40%, therefore BEP is 60% of units sold

or, No. of units sold $= \dfrac{\text{BEP}}{60\%}$

$= \dfrac{30{,}000 \text{ units}}{60\%} = 50{,}000$

Calculation of profit earned in 1996

Profit = Total contribution – Fixed cost

$= 50{,}000 \text{ units} \times \text{Rs. } 12 \text{ per unit} - 3{,}60{,}000$

$= 6{,}00{,}000 - 3{,}60{,}000 = 2{,}40{,}000$

Selling price to be fixed in 1997

Variable cost per unit in 1997

= Rs. 52.80 (Rs. 48 + 4.80)

Fixed cost in 1997 : = Rs. 3,78,000 (3,60,000 + 18,000)

P/V ratio in 1996 = 20%

Since P/V ratio is 20% variable cost is 80%

Hence, the required SP $= \frac{52.80}{80\%}$

or $\frac{52.80}{80} \times 100$

= Rs. 66

Number of units to be produced and sold in 1997 to earn the same profit as in 1996

Profit in 1996 = Rs. 2,40,000

Fixed cost in 1997 = Rs. 3,78,000

Desired contribution in 1997 = (2,40,000 + 3,78,000)
= Rs. 6,18,000

Contribution per unit in 1997 = SP – Variable cost per unit
= 60 – 52.80
= 7.20

No. of units to be produced and sold in 1997 $= \frac{\text{Fixed cost in 1997}}{\text{Contribution per unit in 1997}}$

$= \frac{3,78,000}{7.20}$

= 52,500 units.

Problem 19 : A Ltd. maintains, a margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to Rs. 5 lakhs.

Calculate the following :

(*i*) Break-even sales.
(*ii*) Total sales.
(*iii*) Total variable costs.
(*iv*) Current profit.
(*v*) New margin of safety if the sales value is increased by $7\frac{1}{2}\%$.

(ICWA, Inter, December 1998)

Solution :

1. Break-even sales $= \frac{\text{Fixed Cost}}{\text{Contribution / Sales}}$

$$= \frac{5 \text{ lakhs}}{40\%} = 12.50 \text{ lakhs}$$

2. Total sales = Break-even sales + Margin of safety

$$= \text{Break-even sales} + \frac{37.5}{100} \times \text{Sales}$$

[Given *MS* = 37.5% of sales]

or, Break-even sales $= \text{Sales} - \frac{37.5}{100}$ sales

or, 12.50 lakhs $= \frac{62.5}{100}$ sales

or, Sales $= \frac{12.50 \text{ lakhs} \times 100}{62.5} = 20$ lakhs

3. Total variable cost = 60% of Rs. 20 lakhs
= 12 lakhs

Because, Sales – Variable cost = Contribution

4. Current profit = Sales – (Variable cost + Fixed cost)
= 20 lakhs – (12 lakhs + 5 lakhs)
= 20 lakhs – 17 lakhs = 3 lakhs

5. New margin of safety if sales value is increased by $7\frac{1}{2}\%$

New sales value = Rs. 20 lakhs + $7\frac{1}{2}\%$
= 21.50 lakhs

Hence, new margin of safety = New sales – Break-even sales
= 21.50 lakhs – 12.50 lakhs
= Rs. 9 lakhs

Problem 20 :

(*i*) Find out BEP sales if budgeted output is 80,000 units, Fixed cost is Rs. 4,00,000, Selling price per unit is Rs. 20 and variable cost per unit is Rs. 10.
(*ii*) Calculate selling price, if marginal cost is Rs. 2,400 and *P/V* Ratio is 20%.
(*iii*) Find out margin of safety if profit is Rs. 20,000 and *P/V* Ratio is 40%.

(University of Delhi, B. Com. (Pass), April 1997)

Solution :

(*i*) BEP $= \frac{\text{Fixed Cost}}{\text{Contribution}} = \frac{4,00,000}{20-10} = \frac{4,00,000}{10} = 40,000$ units

BEP Sales = 40,000 units × Rs. 20 = Rs. 8,00,000

(*ii*) When *P/V* Ratio is 20%, then variable cost is 80% of sales

Thus, $\text{Selling price} = 2{,}400 \times \frac{100}{80} = \text{Rs. } 3{,}000$

(*iii*) Margin of safety $= \frac{\text{Profit}}{\text{P/V Ratio}} = \frac{20{,}000}{40\%} = \text{Rs. } 50{,}000$

GRAPHIC METHOD OF PRESENTING CVP ANALYSIS

This method is preferred under two conditions *viz*. (*a*) where a simple overview is sufficient and (*b*) to avoid detailed calculations involved under equation method. The following procedure is involved under the graphic method:

(*a*) **Vertical line:** Draw a vertical line on the left side of the graph paper to show cost and sales revenue.
(*b*) **Horizontal line:** Draw a horizontal line to show the number of units in such a way it should intersect the vertical line at the point of zero.
(*c*) **Fixed cost line:** A line parallel to X-axis (horizontal line) is to be drawn to represent the fixed cost considering the units manufactured and fixed cost incurred.
(*d*) **Total sales revenue line:** This line is drawn starting at the zero point on the left hand corner and ending on the right hand side considering the sales revenue.
(*e*) **Total cost line:** This is the total of fixed and variable cost. This line is drawn starting at the Y-axis fixed cost point and moving to the right considering the total cost.
(*f*) **BEP:** This is the point where total cost line intersects the sales line.

A typical graph depicting the BEP is shown in the Fig. 23.1.

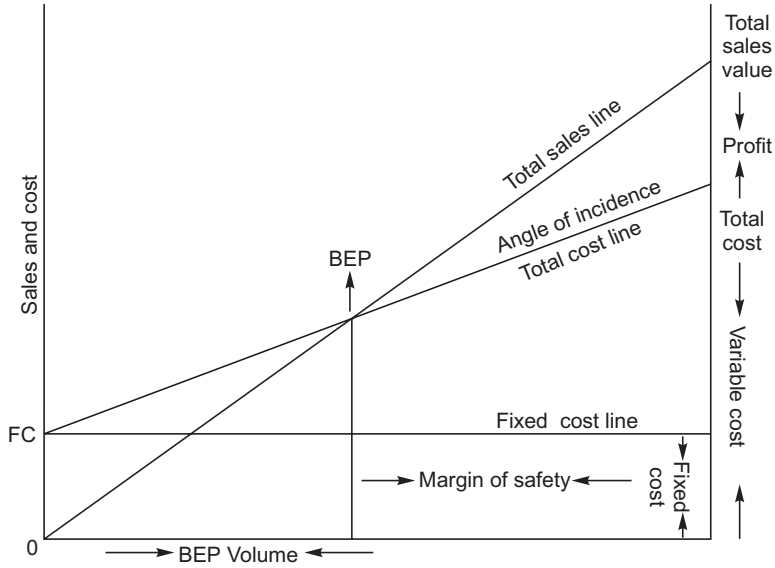


Fig. 23.1 *Break-even chart.*

Problem 21 : From the following data, draw a single break-even chart:

Selling price per unit	Rs. 10.00
Trade discount	5%

Direct material cost per unit	Rs. 3.00
Direct labour cost per unit	Rs. 2.00
Fixed overhead	Rs. 10.000

Variable overhead 100% of direct labour cost. If sales are 10% and 15% above the break even-volume, determine the net profit. **(Bangalore University, M.Com., April 1992)**

Solution :

Contribution = Selling price – Variable cost

Sales			Rs. 10
Less : 5% trade discount			9.50
Less: Variable costs:			
Direct materials	3.00		
Direct labour	2.00		
Variable overhead :			
100% of labour cost	2.00		7.00
Contribution			Rs. 2.50

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{10{,}000}{2.50} = 4{,}000 \text{ units}$$

Profit if sale is 10% above BEP :

Sales = 4,000 × Rs. 9.50 + 10%	41,800
Less: Variable cost 4,400 × 7	30,800
	11,000
Less : Fixed cost	10,000
Profit	1,000

Profit if sales are above 15% :

4,000 × Rs. 9.50 + 15%	43,700
Less: Variable cost = 4,600 × 7	32,200
	11,500
Less: Fixed cost	10,000
Profit	1,500

For break-even chart see Fig. 23.2

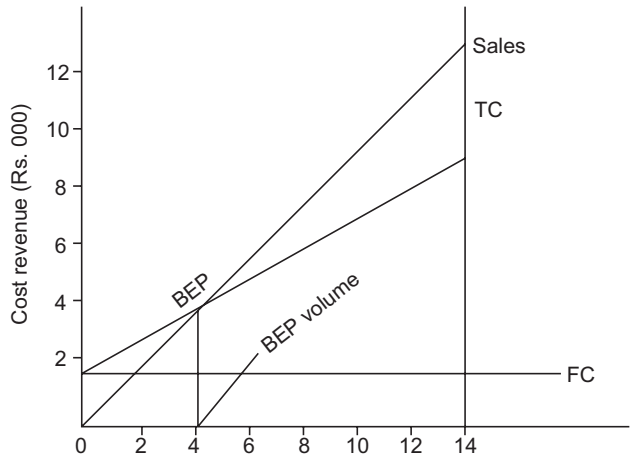


Fig. 23.2

Problem 22 : You are given the following data for a costing year for a factory:

Budgeted output	1,00,000 units
Fixed expenses	Rs. 5,00,000
Variable expense per unit	Rs. 10
Selling price per unit	Rs. 20

Draw a break-even chart showing the break-even point, if the selling price is reduced to Rs. 18 per unit. What will be the new break-even point? **(Bangalore University, M.Com., April 1991)**

Solution :

See Figs. 23.3 and 23.4

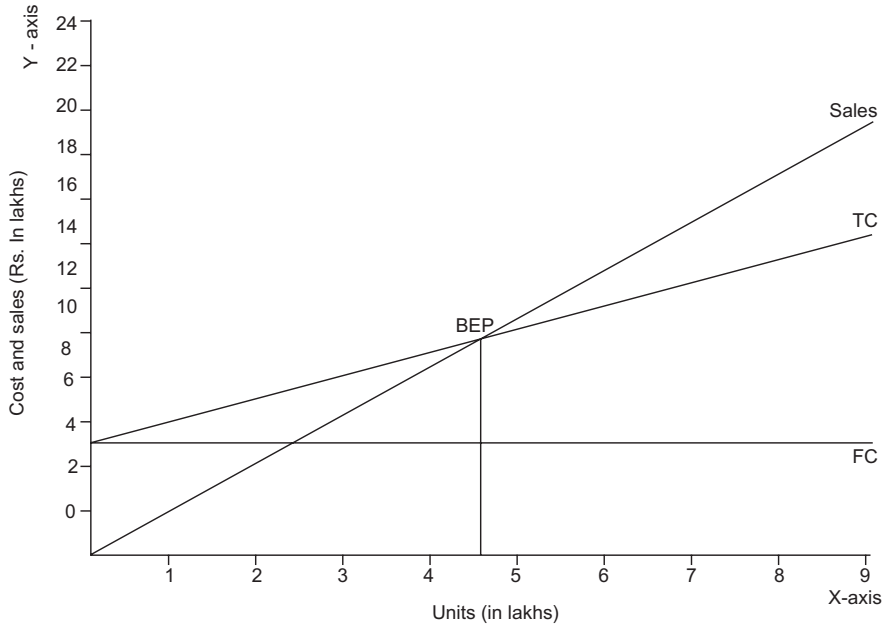


Fig. 23.3 *BEP if selling price is Rs. 20.*

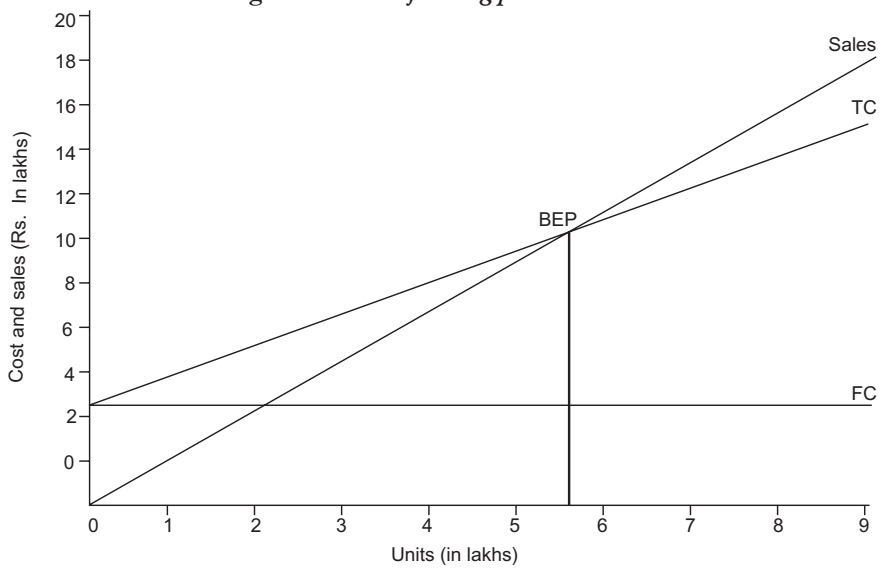


Fig. 23.4 *BEP if selling price is reduced to Rs. 18.*

TYPES OF BREAK-EVEN CHARTS

1. **Break-even chart showing profit appropriation:** This is one of the orthodox type of break-even chart which shows additional information as to how the profit is distributed. This is illustrated below:

Problem 23: From the following information draw up a break-even chart showing the distribution of profit:

Fixed cost	Rs. 20,000
Variable cost	Rs 2 per unit
Debenture interest not included in the fixed cost	Rs. 10,000
Preference shares dividends	Rs. 10,000
Equity shares dividends	Rs. 20,000
Sales	10,000 units at Rs. 10 each

Solution :

See Fig. 34.5.

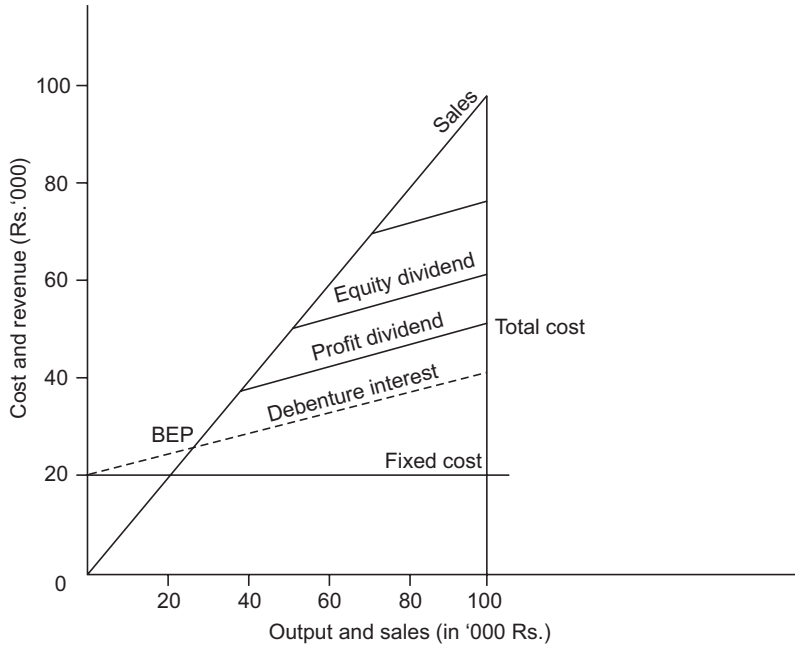


Fig. 23.5 *BEP showing profit appropriation.*

2. **Cash break chart:** Under this type the fixed costs are classified into two types *viz*. (*i*) fixed cost requiring immediate cash. Some examples of this type of cost are rent and rates, wages and salaries, insurance, etc. The term "immediate" here refers to the period covered by the chart and (*ii*) fixed cost not requiring immediate cash. Some examples of such costs are depreciation, advertising, research and development cost. The presentation of these two types of fixed cost in the chart deserve special mention. The fixed cost requiring immediate cash is shown at the base line (horizontal line) of the chart. Whereas the fixed cost not requiring immediate cash is shown last. The variable cost is assumed to be payable in cash. Where credit transactions are involved their impact on cash available is measured and cash payments are adjusted. This is shown in the following problem:

Problem 24 : From the following particulars prepare a cash break-even chart:

Fixed cost	Cash Rs. 1,00,000
Already paid	Rs. 10,000
Variable cost	Rs. 2 per unit
Preference dividend and debenture interest	Rs. 10,000 each
Sales	10,000 units of Rs. 10 each

Solution :

See Fig. 23.6

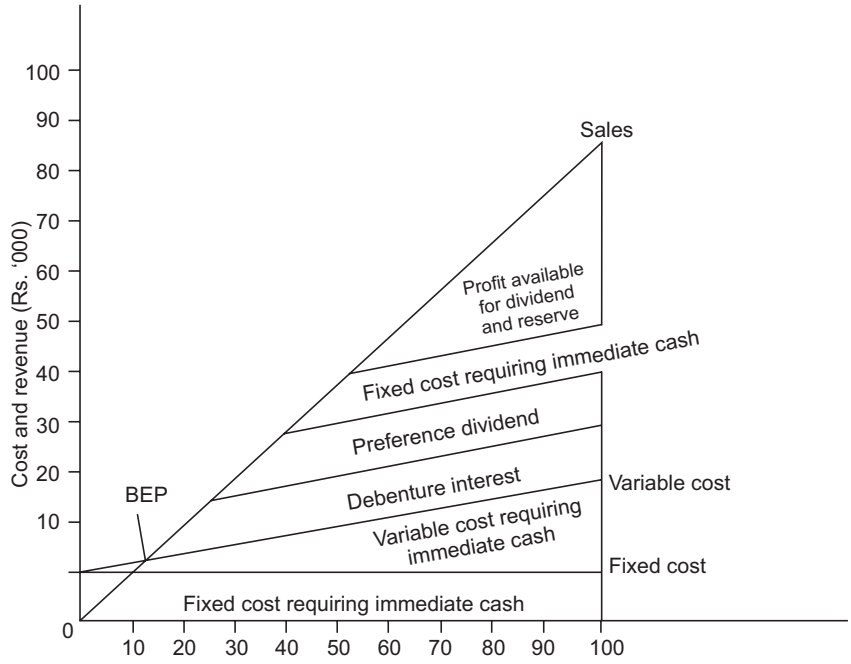


Fig. 23.6 *Cash break-even chart.*

3. Control break-even chart: This chart is extremely useful for comparing budgeted and actual profits, break -even points and sales. This is shown in the following problem :

Problem 25 : From the following particulars prepare a break-even chart:

Budgeted fixed costs	Rs. 15.000
Budgeted variable costs	Rs. 12.000 for budgeted sales
Budgeted sales	Rs. 40,000
Actual fixed costs	Rs, 15.000
Actual variable costs	Rs.16,200
Actual sales	Rs. 45,000

Solution :

See Fig. 23.7

Notes:	Profit for budgeted sales	=	Rs. 13,000
			Rs.
	Profit for actual sales :		16,500
	Budgeted profit — Actual profit		13,800
	Profit variance		2,700

Note: The budgeted total cost line and actual cost line have been drawn on the variable costs for sales amount of Rs. 50,000. For 40,000 amount of sales, the variable costs are Rs. 12,000. Therefore, for Rs.50,000 amount of sales, the variable cost should be Rs. 15,000. *i.e.*, at the rate of Rs. 3,000 for every Rs. 10,000 amount of sales. Hence, the total budgeted costs for Rs. 50,000 amount of sales should be Rs. 15,000 variable + Rs. 15,000 fixed costs, *i.e.*, total Rs. 30,000 as shown by budgeted total cost line. For actual sales amount of Rs. 45,000, variable costs are Rs. 16,200 considering Rs. 50,000 amount of sales, the actual respective costs will be Rs. 18,000 and the actual total cost will be Rs. 18,000 + 15,000 (fixed cost), *i.e.*, Rs. 33,000 which is represented by budgeted actual cost.

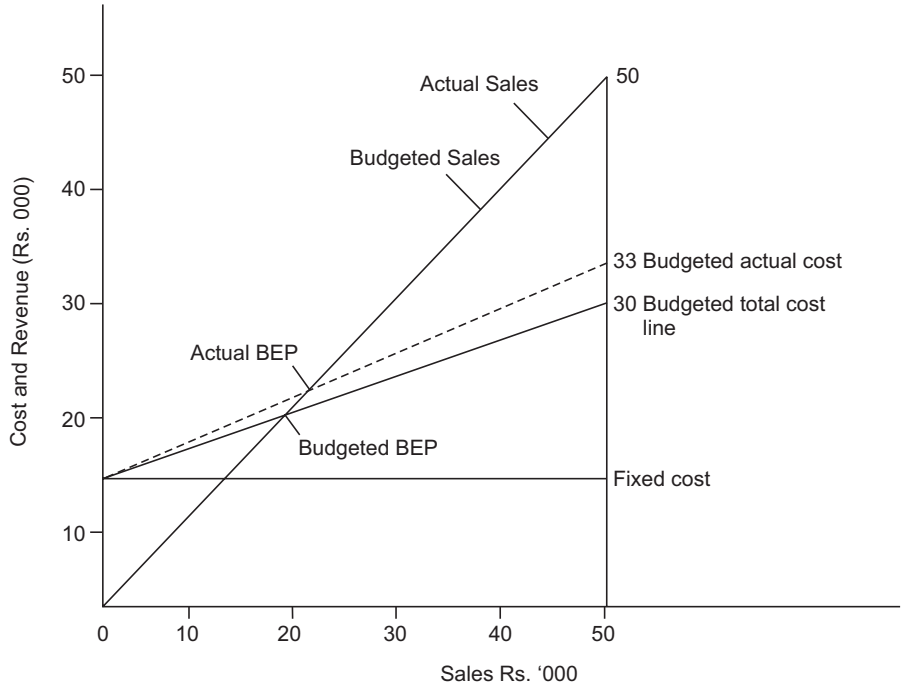


Fig. 23.7 *Control break-even chart.*

4. Profit chart: It is a variety of break-even chart. It shows the profit or loss at different levels of sales. As usual, volume of sales is shown under horizontal line. The vertical lines show the profit or loss position. The line shown above the horizontal line shows profit, whereas the line below shows loss.

Problem 26 : From the following particulars prepare a profit chart:

Fixed cost	Rs. 40,000
Variable cost	Rs. 2 per unit
Sales	10,000 units @ Rs. 10 per unit

Solution:

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{40{,}000}{8} = \text{Rs. } 5{,}000$$

For chart see Fig. 23.8 given below.

5. Profit chart for different prices: This chart shows the effect on profit of charging different prices.

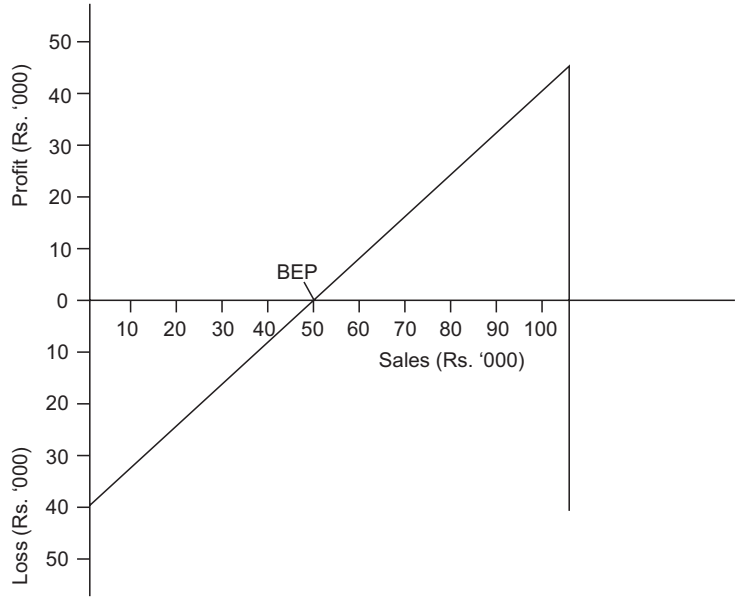


Fig 23.8 *Profit chart.*

Problem 27 : From the following particulars prepare a profit break-even chart considering selling prices to be Rs. 11, Rs. 10 and Rs. 8.

Fixed cost	Rs. 40,000
Variable cost per unit	Rs. 2
Sales units	10,000

Solution : See fig. 23.9

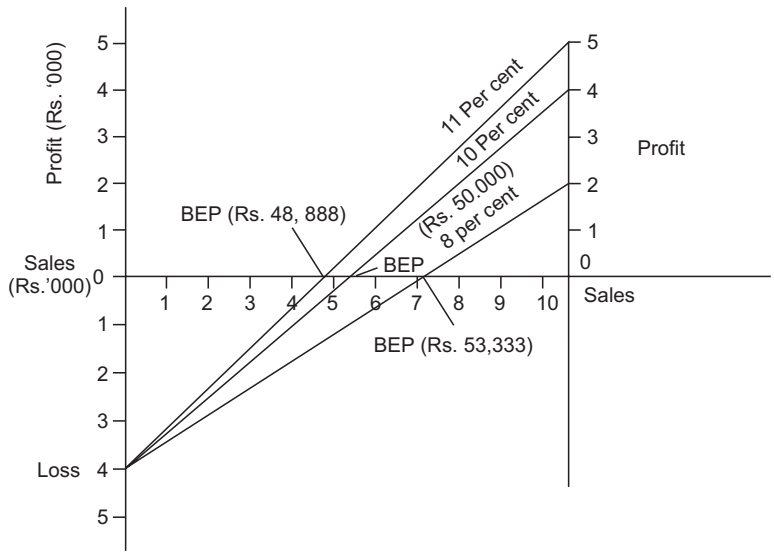


Fig. 23.9. *Profit chart for different prices.*

6. Analysis break-even chart: This chart portrays the components of variable cost such as direct material, direct labour and variable factory, administrative and selling and distribution overheads, the appropriation of profit such as taxation, preference dividend, equity dividends and creation of various reserves.

Problem 28 : From the following particulars prepare an analysis break-even chart :

Fixed cost	Rs. 10,000
Variable cost Rs. 30,000 divided into	
Direct labour	Rs. 5,000
Direct materials	Rs. 4,000
Factory overheads	Rs. 6,000
Administration overheads	Rs. 5,000
Selling overheads	Rs. 5,000
Distribution overheads	Rs. 5,000
Taxation Rs. 2,000 at maximum output decreasing in direct proportion to reduction in profit	
Preference dividend	Rs. 4,000
Equity dividend	Rs. 5,000

Solution :

See Fig. 23.10.

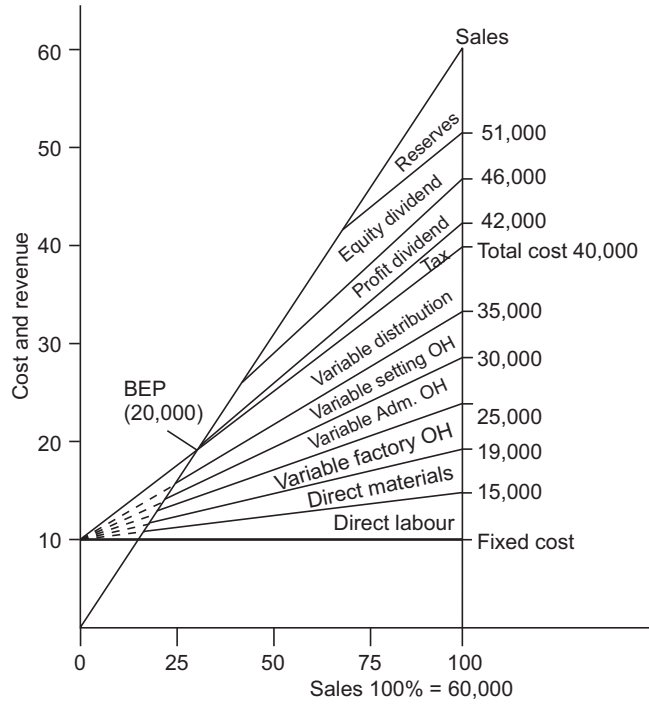


Fig. 23.10 *Analysis break-even chart.*

LIMITATIONS OF BREAK-EVEN CHARTS

1. The preparation of BEP involves separation of semi-variable cost into fixed and variable, which cannot be carried out accurately.
2. It is presumed that the revenue and cost can be represented by straight lines which may not always be true.
3. It assumes that a selling price is costant at different levels of sales which may not be true. Selling price either increases or decreases due to decrease or increase in sales units.
4. Apportionment of fixed cost over a variety of products poses a problem.
5. It assumes that the business conditions may not change which is not true.
6. Under a break-even chart only one product is studied. It fails to provide the effects of various product mixes on profit.
7. Capital employed which is one of the important guiding factors determining profitability is ignored by the break-even chart.

PROFIT-VOLUME CHART OR P/V CHART

Vance in his *Theory and Techniques of Cost Accounting* defines a profit graph as a graph showing the amounts of fixed and variable costs and sales revenue at different volumes of operation. The name P/V chart has arisen from the fact that the difference between the total of fixed on variable costs and the sales revenue at any volume gives the profit at that volume. Because of the importance of the point at which the total costs and revenue are equal the graph is often called a break-even chart. It shows the volume at which the firm covers all costs with revenue or "break-even".

The following points are to be considered while constructing a P/V graph:

(*a*) The graph is divided into two areas, *viz*., a loss area and a profit area. It is the sales line which divides the graph into these two areas. The horizontal line represents sales line.
(*b*) Total fixed costs are marked below the sales line on the left hand vertical line.
(*c*) The profit is computed and is marked on the right hand vertical line above the sales line.
(*d*) The two points, viz., fixed cost and profit point are joined by a diagonal line. The point of intersection is the break-even point.

Problem 28 : From the data given below you are required to present on graph paper a profit volume (P/V) graph to show the expected company performance based on the budget for one year:

	('000 Rs.)
Sales	600
Marginal cost	350
Fixed cost	150

Determine the break-even point and the margin of safety. **(ICWA, Inter., June 1990)**

Solution:

Sales		600
Less :	Marginal cost	350
	Contribution	250
Less:	Fixed cost	150
	Profit	100

Calculation of BEP (for verification)

C/S Ratio $= \frac{\text{Contribution}}{\text{Sales}} = \frac{250}{600} = 41.66\%$

BEP $= \frac{\text{Fixed cost}}{\text{C / S ratio}} = \frac{1{,}50{,}000}{41.66} \times 100$

$= 3{,}60{,}000$

Margin of safety = Sales – BEP

6,00,000 – 3,60,000 = Rs. 2,40,000

For P/V graph see Fig. 23.11

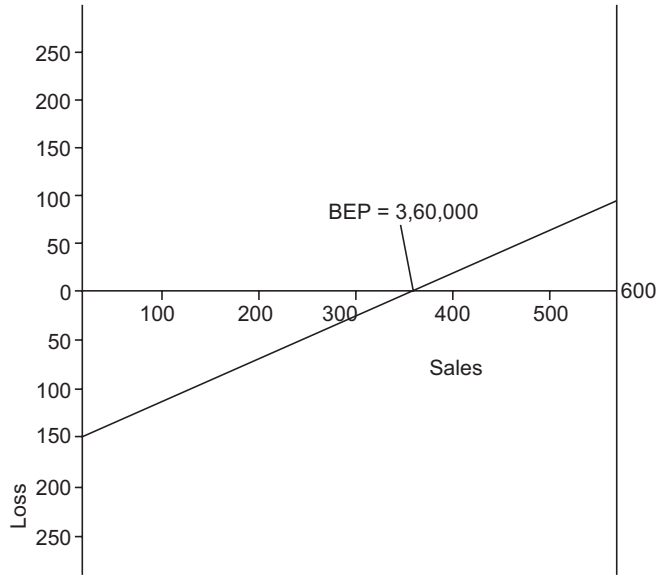


Fig. 23.11. *P/V graph.*

Problem 29:

From the particulars given below relating to Avinash (Pvt.) Co. Ltd. find out (*a*) P/V ratio. (*b*) BEP, (*c*) Margin of safety and (*d*) Plot P/V graph:

Sales	Rs. 1,00,000
Total cost	80,000
Fixed cost	20,000
Net profit	20,000

Solution :

P/V Ratio $= \frac{\text{Sales} - \text{Variable expenses}}{\text{Sales}} \times 100$

$= \frac{1{,}00{,}000 - 60{,}000}{1{,}00{,}000} \times 100 = 40\%$

BEP $= \frac{\text{Fixed cost}}{\text{P / V ratio}} = \frac{20{,}000}{40\%} = \text{Rs. } 50{,}000$

Margin of safety $= \frac{\text{Profit}}{\text{P / V ratio}} = \frac{20{,}000}{40\%} = \text{Rs. } 50{,}000$

For P/V graph see Fig. 23.12.

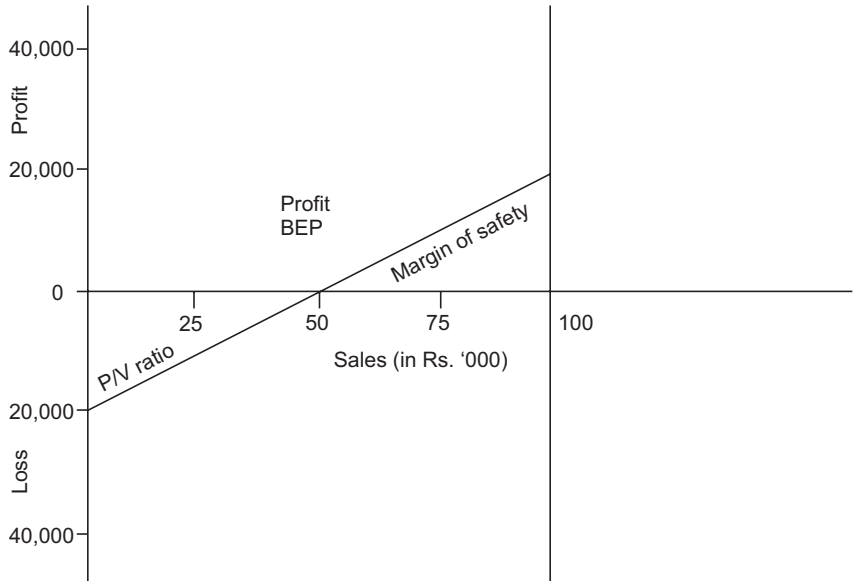


Fig. 23.12 *P/V graph.*

Difference between BE Chart and PV Chart

P/V Chart	*BE Chart*
1. Only one line, *viz*., profit line is shown.	1. Profit line is not shown instead sales and cost lines are shown.
2. Profit line starts below the horizontal line. Fixed cost incurred at zero point of production indicates loss. This loss is indicated below the horizontal line.	2. All lines are drawn above the horizontal line. The area up to the point of break-even shows loss and the area beyond the point shows profit.
3. The break-even point is found on the horizontal axis.	3. The break-even point is at the intersection of cost and sales lines.
4. Fixed cost is always considered as fixed and the ratio of sales and variable cost is again assumed as constant at different levels of sales.	4. The break-even chart can even measure break-even point when sales line is a curve because of price changes at different volumes of sales.
5. It is possible to measure the impact of individual products in a sales mix.	5. This chart can show the effect of a sales mix only in aggragate. For different items of sales, separate charts are to be prepared.
6. The chart shows profit and loss at different sales.	6. It can be drawn even to show the various elements of cost and profit appropriation.

QUESTIONS

I. Choose the correct answer from the following

1. An accountant would typically have the following in mind when referring to the "margin of safety":
   (*a*) The excess of actual sales over the variable expenses and the fixed cost at break-even.
   (*b*) The excess of actual sales revenue over the fixed expenses.
   (*c*) The excess of actual sales over budgeted sales.
   (*d*) The excess of sales revenue over the variable cost. [ ]
2. Which of the following alternatives would generally decrease contribution margin per unit the most?
   (*a*) A 15% decrease in selling price.
   (*b*) A 15% increase in variable cost.
   (*c*) A 15% increase in selling price.
   (*d*) A 15% decrease in variable cost. [ ]
3. If fixed cost decrease while variable cost per unit remains constant, the new contribution margin in relation to the old will be
   (*a*) unchanged (*c*) higher
   (*b*) higher (*d*) intermediate [ ]
4. If a firm has a negative contribution margin, to reach break-even:
   (*a*) Sales volume must be increased. (*c*) Fixed cost must be decreased.
   (*b*) Sales volume must be decreased. (*d*) Fixed cost must be increased. [ ]
5. If total contribution margin is decreased by a given amount, operating profit would
   (*a*) Decrease by the same amount.
   (*b*) Decrease by more than the given amount.
   (*c*) Increase by the same amount.
   (*d*) Remain unchanged. [ ]
6. The break-even point would be increased by
   (*a*) a decrease in fixed cost.
   (*b*) an increase in contribution margin ratio.
   (*c*) an increase in variable cost.
   (*d*) a decrease in variable cost. [ ]
7. Given the following formula, which one represents the break-even sales level in units. P = Selling price per unit, F = Fixed cost, V = Variable cost per unit.

   (*a*) $\frac{F}{P - V}$ (*c*) $\frac{F}{V \div P}$

   (*b*) $\frac{F}{F \div V}$ (*d*) $\frac{F}{SP - V}$ [ ]
8. Which one of the following assumptions is not made in break-even analysis?
   (*a*) Volume is the only factor affecting cost.
   (*b*) No change between beginning and closing stock.
   (*c*) The sales mix is maintained as volume changes. [ ]
   (*d*) All of the above are assumptions sometimes required in break-even analysis.
9. The cost-volume-profit analysis underlying the conventional break-even chart does not assume that
   (*a*) prices will remain fixed.
   (*b*) production will equal sales.

(*c*) some costs vary inversely with volume.
(*d*) costs are linear and continuous over the relevant range. **[ ]**

10. The most useful information derived from a break-even chart is the
(*a*) amount of sales revenue needed to cover enterprise variable cost.
(*b*) amount of sales revenue needed to cover enterprise variable costs.
(*c*) relationship among revenues, variable cost and fixed costs at various levels of activity.
(*d*) volume or output level at which the enterprise break-even. **[ ]**

11. The major assumption as to cost and revenue behaviour underlying conventional cost-volume- profit calculation is the
(*a*) Constancy of fixed cost.
(*b*) Variability of unit prices and efficiency.
(*c*) Curvilinearity of relationships.
(*d*) Linearity of relationships. **[ ]**

12. Given the following notations, what is the break-even sales level in units? SP = Selling price, FC = Fixed cost, VC = Variable cost per unit:

(*a*) $\frac{SP}{FC \div VC}$ (*c*) $\frac{FC}{VC \div SP}$

(*b*) $\frac{VC}{SP - FC}$ (*d*) $\frac{FC}{SP - FC}$ **[ ]**

13. P/V ratio is an indicator of :
(*a*) the volume of sales. (*c*) the rate at which goods are sold.
(*b*) the volume of profit. (*d*) all of the above. **[ ]**

14. When P/V ratio is 40% and sales value Rs. 10,000, the variable cost will be
(*a*) Rs. 4,000
(*b*) Rs. 6,000
(*c*) Rs. 10,000
(*d*) Variable cost cannot be calculated from the data given. **[ ]**

15. Cost-volume-profit analysis is most important for the determination of the
(*a*) volume of operations necessary to break-even.
(*b*) variable revenues necessary to equal fixed cost.
(*c*) relationship between revenues and costs at various levels of operations.
(*d*) sales revenue necessary to equal fixed cost. **[ ]**

II. Mark True or False in the space provided

1. At break-even point, contribution is equal to fixed cost. *T/F*
2. Margin of safety shows the excess of actual sales over budgeted sales. *T/F*
3. When P/V ratio is 50% and margin of safety is 40%, the net profit is 20% of sales. *T/F*
4. Margin of safety may come before or after the break-even point. *T/F*
5. Marginal costing and cost-volume-profit analysis is useful in profit planning. *T/F*
6. If the selling price per unit is assumed to be constant, total revenue will be proportionate to number of units sold. *T/F*
7. Decreasing the selling price decreases the break-even point. *T/F*
8. The contribution margin perunit is proportional to volume. *T/F*
9. It is impossible to obtain a break-even point with a negative contribution margin. *T/F*
10. To obtain the break-even point in units, the total fixed costs should be divided by the contribution margin ratio. *T/F*

11. The margin of safety is found by subtracting fixed cost from sales. *T/F*
12. If the variable cost per unit increase, the contribution margin ratio will increase. *T/F*
13. As production volume increases, the contribution margin rate increases. *T/F*
14. Accountants usually assume that variable costs are linear. *T/F*

III. Simple Questions

1. Define cost-volume-profit analysis.
2. State any four objectives of cost-volume-profit analysis.
3. State any four assumptions of cost-volume-profit analysis.
4. State any four limitations of cost-volume-profit analysis.
5. Define break-even analysis.
6. Mention any four assumptions underlying break-even analysis.
7. What do you mean by margin of safety? What purpose does it?
8. What do you mean by angle of incidence?
9. Define profit-volume ratio.
10. State any usefulness of profit-volume ratio.
11. Distinguish between break-even chart and profit-volume chart.

IV. Short Answer Questions

1. What do you mean by break-even point? Discuss in detail. **(ICWA, Inter., Dec. 1990)**
2. What is meant by cost-volume-profit analysis? What are its limitations? Discuss the utility of determining cost-volume-profit relationship? **(Kakatiya University, M.Com., Aug. 1991)**
3. What do you understand by the term break-even analysis? Enumerate its assumptions and uses. **(Calicut University, B.Com., Oct. 1989)**
4. What is break-even point and state its usefulness to management? **(University of Kerala, B.Com., April 1990)**
5. What are the uses of cost-volume-profit analysis? Discuss the various ways of presenting the CVP relationship? **(Bangalore University, M.Com., May 1990)**

EXERCISE 1

A company budgets a production of 10,000 units. The variable cost is estimated at Rs. 12 per unit. The fixed costs are estimated Rs. 40,000. The selling price is fixed to earn a profit of 25% on cost. You are required to

(*i*) Compute break-even point in terms of units and sales.
(*ii*) Compute how many units must be produced and sold to earn a profit of Rs. 60,000.

(University of Delhi, B.Com., (Pass), April 1986)

[**Answer :** (*i*) BEP 5,000 units. (*ii*) Sales in units to earn a profit of Rs. 60,000 *vs* 125,000 units.]

EXERCISE 2

From the following data calculate:

(*i*) Break-even point expressed in amount of sales in rupees.
(*ii*) Number of units that must be sold to earn a profit of Rs. 60,000 per year.
(*iii*) How many units are to be sold to earn a net income of 10% of sales.

	Rs.
Sale price	20 per unit
Variable manufacturing costs	11 per unit
Variable selling costs	3 per unit
Fixed factory overheads	5,40,000 per year
Fixed selling costs	2,52,000 per year

(University of Delhi, B.Com., (Hons). April 1987)

[**Answer :** (*i*) BEP Rs. 26,40,000, (*ii*) No. of units to be sold to earn a profit of Rs. 60,000 is 1,42,000 units, (*iii*) No. of units to be sold to earn a net income of 10% on sales is 1,98,000 units.]

EXERCISE 3

XY Ltd. has been offered a choice to buy machine A or machine B. From the following data, you are required to compute:

(*a*) Break-even point for each of the machines.
(*b*) The level of sales at which both machine earn equal profits.
(*c*) The range of sales at which one is more profitable than the other.

	Machine	
	A	*B*
Annual output (in units)	10,000	10,000
Fixed cost (Rs.)	30,000	16,000
Profit at given level of production (Rs.)	30,000	24,000

The market price of the product is expected ot be Rs. 10 per unit. **(CS, Inter., June 1989)**

[**Answer:** P/V Ratio is 60% and 40%, BEP is Rs. 50,000 and Rs. 40,000.]

EXERCISE 4

The following figures are available from the records of Venus Enterprises as at 31st March:

	1988	*1989*
	Rs. Lakhs	*Rs. Lakhs*
Sales	150	200
Profit	30	50

Calculate

1. The P/V ratio and total fixed expenses.
2. The break-even level of sales.
3. Sales required to earn a profit of Rs. 90 lakhs.
4. Profit or loss that would arise if the sales were Rs. 280 lakhs. **(CS, Inter., May 1989)**

[**Answer:** (*a*) P/V ratio 40%, (*b*) BEP = 75 lakhs. (*c*) Profit Rs. 82 lakhs.]

EXERCISE 5

The following figures relate to a factory manufacturing a varied range of products :

Period 1	Sales Rs. 15,00,000	Profit Rs. 40,000
Period 2	Sales Rs. 19,00,000	Profit Rs.1,15,000

Calculate

(*a*) The P/V ratio.
(*b*) The profit when sales are 12,00,000.
(*c*) The sales required to earn a profit of Rs. 2,00,000.
(*d*) How the P/V ratio be improved apart from increasing selling prices or reducing cost.

(University of Madras, M.Com., April 1991)

[**Answer :** (*a*) P/V ratio = 18.75%, (*b*) Rs. 16,250, (*c*) Rs. 23,53,333.]

EXERCISE 6

The trading results of a company for two periods are as under:

Period	*Sales (Rs.)*	*Profit (Rs.)*
1	1,30,000	6,000
2	1,50,000	10,000

Calculate

(*a*) P/V ratio.
(*b*) Sales required to earn a profit of Rs. 15,000.
(*c*) Profit when sales are Rs. 1,10,000 and
(*d*) Break-even sales. **(University of Kerala, B.Com., April, 1990)**

[**Answer :** (*a*) P/V ratio = 50%, (*b*) Rs. 1,48,000, (*c*) Rs. 4,000, (*d*) Rs. 1,18,000.]

EXERCISE 7

Find out the break-even point from the following information:

(*a*) Fixed cost Rs. 20,000, variable cost Rs. 2 per unit. Sales price Rs. 4 per unit.
(*b*) Sales Rs. 6,000, Variable cost Rs. 3,600. fixed cost Rs. 2,000.
(*c*) Sales Rs. 4,000, variable costs Rs. 2,400, profit Rs. 400. **(Calicut University, B.Com., April 1988)**

[**Answer :** (*a*) BEP = 10,000 units, (*b*) Rs. 5,000 (*c*) Rs. 3,000]

EXERCISE 8

The following data of a company for the year 1987 are given :

Variable cost (Rs.)	60,000
Fixed cost	30,000
Net profit	10,000
Sales	1,00,000

Find out break-even sales and margin of safety. **(Madurai Kamaraj University, B.Com., Nov. 1988)**

EXERCISE 9

An analysis of S Ltd., cost records gives the following information:

	Variable cost (% of sales)	*Fixed cost (Rs.)*
Direct material	32.8	
Direct labour	28.4	

Factory overhead	12.6	1,89,000
Distribution overhead	4.1	58,400
General administration overhead	1.1	66,700

Budgeted sales for the next year Rs. 18,50,000. You are required to determine

(*a*) Break-even sales value.
(*b*) Profit at the budgeted sales value.
(*c*) Profit if the actual sales (*i*) drop by 10%, (*ii*) decrease by 5% from the sale.

(Bharathidasan University, M.Com., April 1988)

EXERCISE 10

(Preparation of break-even chart): *Prepare a break-even chart from the following information:*

Total costs	(Rs.) 60,000
Fixed costs	30,000
Sales	1,00,000

Also calculate margin of safety. **(University of Delhi, B.Com., (Pass), April 1988)**

[**Answer :** P/U ratio = 70%, BEP = Rs. 42,859, Margin of Safety = Rs. 57,143.]

EXERCISE 11

(Preparation of profit chart): *Following cost data for products X, Y and Z are given:*

Products	*Sales (Rs.)*	*Variable cost*	*Fixed cost*
X(Rs.)	15.000	3,000	–
Y(Rs.)	15,000	10,500	–
Z(Rs.)	7,500	9,000	–
Total (Rs.)	37,500	22,500	10,000

Prepare a profit graph for products *X*, *Y* and *Z*. **(Bangalore University, M.Com., 1992)**

EXERCISE 12

(P/V Graph) : *From the following details prepare a profit-volume graph showing break-even point at different price levels:*

Sales levels	80,000 and 60,000 units
Fixed expenses	Rs. 4,00,000
Variable expenses	Rs. 10 per unit
Selling price	Rs. 20 per unit

Assume that the price is changed to Rs. 18 and Rs. 22. **(Bangalore University, M.Com., May 1991)**

24

CHAPTER

BUDGETARY CONTROL

INTRODUCTION

A budget is a quantitative expression of a plan of action prepared in advance for the period to which it relates. It may be prepared for the entire organisation or for various departments or for various functions involved in that organisation. Budget is a means of translating the overall objectives of the business into detailed feasible plan of action.

The concept of "budget" is being made use of by every individual who undertake a work involving expenditure. While some express it orally others put it in written form. For example, a person who wants to go on a holiday tour will prepare a budget involving expenditure on fares, boarding, lodging, purchasing, etc. After returning, he will compare the actual expenses incurred with budgeted expenses to know whether he spent more or less as compared to budgets and if so what factors were responsible for it. This enables him to increase or decrease his budget for the next year.

In the same way, every business undertakes to budget its expenditure for utilising the available funds more judiciously. Similarly, to ensure proper utilisation of scarce raw materials and other factors of production, the management of every business will prepare a budget relating to material, labour, production and various expenditure. This enables in proper planning of all activities, their co-ordination and finally controlling such activities. In this process it enables the management to know the performance of business for a given period of time.

BUDGET AND BUDGETARY CONTROL

Definition of a Budget

The ICMA terminology defines a budget as "a plan quantified in monetary items, prepared and approved prior to a defined period of time, usually showing planned income to be generated and/or expenditure to be incurred during that period and the capital to be employed to attain a given objective".

George R. Terry defines budget as "an estimate of future needs arranged according to an orderly basis, covering some or all the activities of an enterprise for a definite period of time".

Definition of Budgetary Control

According to F.H. Rowland and W.H. Barr, budgetary control is a "Tool of management used to plan, carryout and control the operations of the business".

In the words of C.L. Van Sickle, "a budgetary control system is a carefully worked out financial plan, including the procedure involved in its operations for conducting the various divisions of a business for the ultimate purpose of earning a profit".

The ICMA terminology defines budgetary control as, "the establishment of budgets relating the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with budgeted result either to secure by individual action the objective of that policy or to provide a basis for its revision".

An analyis of this definition reveal the following important points:

(*a*) **Executive responsibility:** It means that every manager has to do his job directed towards the overall objects of the business, *i.e.*, the policy. In other words, every manager is responsible for attaining the task delegated to him and thereby the ultimate object of the business.

(*b*) **The requirements of a policy:** The budget is a statement of policy relating to the position of business and plans to attain it. The business has to establish certain goals and necessary actions must be taken to achieve those aims. This is essential for proper growth and development of the business and for efficient utilisation of labour force and other assets.

(*c*) **Comparison of actual with budgeted results:** This facilitates control over the planned activities. The actual result is measured and compared with budgets. When there exists any unfavourable difference, management can take remedial steps.

(*d*) **The revision of policy:** The policy may have to be revised in order to make the best use of prevailing situation after considering unfavourable factors.

The budgetary control is exercised by applying the following steps:

1. **Preparation of the budget:** The process of preparing the budget will be explained under the heading "budget organisation".
2. **Publishing the budget:** This implies informing each executive what is expected of him. The publishing of the budget is most important, as no system is able to work unless the people concerned with it understand and are prepared to make it work.
3. **Measuring the results:** This implies the measurement of actual results achieved in order to know whether they are as per plan or otherwise.
4. **Comparing the results with the budget:** The comparison of actual results with the budget enables to know the efficiency or otherwise of the activity.
5. **Reporting the results of the above activity:** This is done by means of budgetary control statements, which enable the budget officer to know whether the objectives set out in the budget are being fulfilled and if not, in which areas attention should be concentrated.
6. **Correcting the unfavourable variances:** Necessary steps are then taken to avoid the occurrence of unfavourable variances. This is the function of the departmental manager or the supervisor. The budgetary control statements will assist as tools to the manager in correcting the unfavourable differences.

OBJECTIVES OF BUDGETARY CONTROL

1. Planning and Co-ordination

Budgeting involves preparation of a detailed operational plans to achieve the objectives of a business. The success of every business depends upon the planning of activities and budgeting forces planning to become more effective. As budgets are prepared covering all the activities and departments of a business, it also serves as a means of co-ordinating the efforts of all concerned in such a way that every department

contributes towards the overall plan. The summary of all such plan is known as master plan. The budget forces every departmental manager to establish relationship with other departments and contribute to the achievement of objectives.

2. Clarification of Authority and Responsibility. Budgeting enables the superior to delegate the authority to his subordinates. This also clarifies the responsibility of each manager who can be held accountable if the targets are not reached. Thus budgeting facilitates management by exception.

3. Communication. Since all levels of management are involved in the preparation of budget, it facilitates communication process to become more effective. The objectives of the business, problems involved in achieving them, and finalisation of budgets are all promptly communicated. It also co-ordinates the various functions such as sales, purchases and production more efficiently.

4. Motivation. The preparation of budgets by middle and lower management against which performance can be judged serves as a good motivation for them.

5. Control. The control over various activities is achieved by comparing the achievements with the targets. If there are any deviations, the causes for the same is investigated and remedial action taken.

ESSENTIAL REQUIREMENTS OF BUDGETARY CONTROL

The essential requirements of a budgetary control system as quoted by Robert I Dickey are as follows:

1. Budget must have the complete cooperation of the chief executive.
2. The ultimate realisation of the maximum amount of profit should always be kept uppermost.
3. Responsibility for the preparation of the estimate should rest on those individuals responsible for performance.
4. The budget must be realistic and the goals attainable.
5. A budget committee should be established consisting of the budget director, the chief executive officer, and the executives of the various divisions of the organisation.
6. The budget should cover all phases of operations.
7. Budgeting should be continuous.
8. Periodic reports should be prepared promptly, comparing budget and actual results.
9. The accounting system must be adequate.
10. A good organisation must be developed.

ADVANTAGES AND LIMITATIONS OF BUDGETARY CONTROL

Advantages

The important advantages of budgetary control are as follows :

1. It helps the process of planning by reducing it to concrete numerical goals. Through the budgets, the executives know what they are to produce or sell, how much they can spend, how much income to expect and so on.
2. It provides an effective means by which top management can delegate authority and responsibility without sacrificing its overall control. Limits for each department or division are laid down in the budget.
3. It keeps expenditure under check and constantly reminds employees and management of the targets and goals to be achieved. It helps in the cautious utilisation of resources and promotion of efficiency.
4. As a control devise, it supplies the means of checking results and comparing performance, of revealing weaknesses and making corrections.

5. The budget is not merely an instrument of planning but also a tool of co-ordination. It brings together the activities of various sections, departments and divisions in an overall perspective.
6. It helps in determining the policies of the factory.
7. It gives complete information in advance regarding the amount of capital needed for the budget period.
8. It gives the idea of where executive action is required.
9. It aids in measuring performance of each department of the factory.
10. It promotes cooperation among the different executives for determining future plans.
11. It acts as a control tool for administration.
12. It centralises management control.

Limitations of Budgetary Control

1. The budget is always based on estimates. The success or failure of a budget, to a large extent, depends upon the accuracy of estimates. The estimates cannot be accurately made in this dynamic world, although many statistical techniques are available.
2. To evolve a budgetary control system, normally, it takes several years as it has to be tried, improved, and discarded, depending upon the changing circumstances.
3. The success of budgetary control depends upon the enthusiastic participation of all levels of management. But it is difficult to secure the wholehearted cooperation of all in a factory.
4. Budgeting is only a tool of management but it cannot replace management.
5. It may be difficult to install a system of budgetary control in small factories owing to expenditure involved.

ORGANISATION FOR BUDGETARY CONTROL

A sound organisation is essential for an effective budgeting programme. It ensures cooperation from all levels of management. The organisation should facilitate control of all elements of cost. The essential ingredients of a sound organisation are as follows:

1. Organisation Chart

An organisation chart depicts the functional responsibilities of every manager. It shows the relative position of every manager and his relationship with others. A typical organisation chart is shown below:

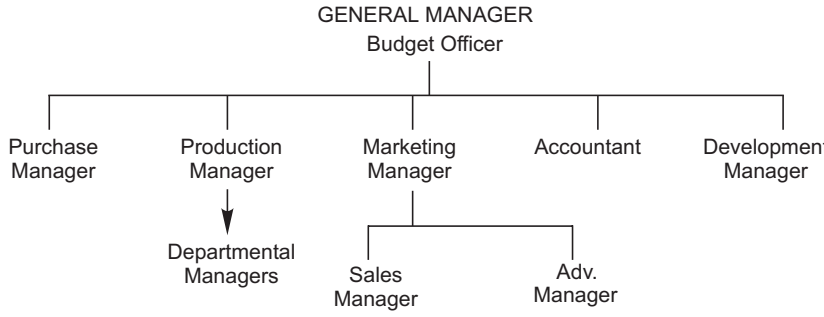


Fig. 24.1 *Budgetary control organisation chart.*

From the chart it is clear that, the entire responsibility of budgetary control process lies with general manager. He entrusts the authority to implement the budget programme to the budget officer. He shall co-ordinate the budgets prepared by all the departmental managers.

2. Budget Officer. A budget officer is a person who is nominated by the general manager to look after the functions of budgeting. He is responsible to general manager for completing the budgeting process. He acts as co-ordinator and adviser integrating the budgets prepared by the departmental managers so as to get a master budget. His functions are as follows:

(*a*) Issuing instructions to departments regarding requirements, dates of submission of data, etc.
(b*)* Providing historical information to departmental managers to help them in their forecasting.
(*c*) Receiving and checking budget estimates.
(*d*) Suggesting possible revisions.
(*e*) Discussing difficulties with managers.
(*f*) Ensuring that budgets are received in agreed time.
(*g*) Preparing budget summaries.
(*h*) Charting the departmental estimates on a master plan.
(*i*) Submitting budgets to the committee and furnishing explanations on particular points.
(*j*) Informing the departmental managers of any revisions made in their budgets by the committee.
(*k*) Preparing the final master plan approved by the committee.
(*l*) Co-ordinating all budget work.

3. Budget Committee. It serves as a co-ordinating authority of the budgeting process. It is concerned with resolving difficulties or disputes which may arise among functional heads and to take decisions so as to alter production, price, etc. The budget officer will submit the draft master budget to the committee for consideration after which it is finally approved by board of directors. The budget committee will functions in an advisory capacity and it performs the following functions:

(*a*) To receive and review individual budget estimates.
(*b*) To suggest revisions.
(*c*) To decide on general policies affecting more than one primary department.
(*d*) To revise and approve the budgets.
(*e*) To receive and consider budget reports showing actual results compared with the budget.
(*f*) To recommend actions where necessary.

4. Budget Centre. A budget centre is a section of an organisation defined for the sake of budgetary control. It is established for the sake of fixation of responsibilities on the executives.

5. Budget Mannual. The ICMA terminology defines a budget mannual as "a document which sets out standing instructions governing the responsibilities of persons and the procedures, forms and records relating to the preparation and use of budgets". It serves as a basis of guidance and information about budgeting process. It is more like an instructional mannual about the way budget operates. Lucey, in his book *Costing* sets out the contents of a budget mannual as under:

***Foreword*:**

Preferably by managing director

Objectives/explanation of the budgetary process.

- Explanation of budgetary control.
- Objectives of each stage of the budgetary process.
- Relationship to long term planning.

Organisation structure and responsibilities:

- Structure of the organisation showing titles, responsibilities and relationships.

- Titles and names of current budget holders.

Main budgets and relationship:

- Outline of all main budgets and their accounting relationships.
- Explanation of key budgets (master budget, cash budget).

Budget development:

- Budget committee, membership and terms of reference.
- Sequence of budget preparation.
- Time-table for budget preparation and publication.

Accounting procedure:

- Name and terms of reference of the budget officer.
- Coding lists.
- Sample forms.
- Time-table for accounting procedures, production of reports, closing date.

6. Chart of Accounts. It refers to maintaining a systematic set of accounting books which should be able to record and analyse the information required. A chart of accounts may be maintained separately for every budget centre. In simple words, a chart of accounts denotes accounting structure useful for budgetary control.

7. Budget Period. It is a period relating to which a budget is prepared. A budget period may relate to a short term period or a long term period. Some time these period may relate even to a month for monitoring and control of budgets. It is always desirable to have a short-term budget period excepting those functions which may prolong for a longer period as for example, research and development. The duration of the budget period depends upon type of business, the length of manufacturing cycle, the ease or difficulty of forecasting future market conditions and so on. The budget period may be accordingly short-term budget period or long-term budget period.

The short-term budget period may cover a period of 3 months to 1 year. According to Matz-Curry and Frank (*Cost Accounting*) the following factors should be considered in determining the length of budget period:

(*a*) The budget period should be long enough to complete production of the various products.
(*b*) For a business of a seasonal nature, the budget period should cover at least one entire seasonal cycle.
(*c*) The budget period should be long enough to allow for the financing of production well in advance of actual needs.
(*d*) Major operations and drastic changes in plant layout or manufacturing methods must be planned far in advance to determine financial requirements.
(*e*) The budget period should coincide with the financial accounting period to compare actual results with budget estimates.

A long-term budget may be taken to mean a budget prepared for a period of more than a year. Such a budget is best suited for research and development activities, long-term capital investment, financial and profit planning. It is mostly based on probability of events. It is very much affected by risk factor.

8. Key Factor. The factor which governs the quantity which is manufactured or sold is known as key factor. The ICMA terminology defines a key factor as "a factor which at any time or over a period may limit the activity of an entity often one where there is a shortage or difficulty of supply". This will have an adverse effect over the achievement of budget. Therefore it must be identified and its effect on each of the budget is to be carefully considered during the preparation of budget. Key factor can be changed by the management action. For example, when production process is hampered by plant capacity, the purchase of additional plant will allow increase in production. The following are considered as key factors:

(*a*) **Materials:**
  (*i*) Availability of supply.
  (*ii*) Restrictions imposed by licences, quotas, etc.
(*b*) **Labour:**
  (*i*) General shortage.
  (*ii*) Shortage in certain key processes.
(*c*) **Plant:**
  (*i*) Insufficient capacity due to lack of capital.
  (*ii*) Insufficient or lack of space.
  (*iii*) Insufficient or lack of market.
  (*iv*) Bottlenecks in certain key processes.
(*d*) **Sales:**
  (*i*) Low market demand.
  (*ii*) Shortage of experienced salesmen.
  (*iii*) Inadequate advertisement for want of money.
(*e*) **Management:**
  (*i*) Lack of "know-how".
  (*ii*) Inefficient executives.
  (*iii*) Insufficient research into product design and methods.
  (*iv*) Lack of capital thereby restricting policy.

ROLLING BUDGET

The concept of rolling budget or continuous budgeting is an attempt to update budgets. The ICMA terminology defines it as "the continuous updating of a short term budget by adding, say, a further month or quarter and deducting the earliest month or quarter, so that the budget can reflect current condition". Rolling budget is used to indicate continuity in the budgeting process. Suppose a budget is prepared for a period of 1 year, then at the end of each month, the results of the previous month's operations together with any new information or changes in business conditions are used to revise the budget for the next 11 months and to prepare a budget for one additional month beyond so that the budget always covers the next 12 months. Each month the budget "rolls" forward one month by adding one month to replace the month just past. The advantage of the rolling budget is that it makes planning a continuous activity.

TYPES OF BUDGET

The various types of budgets are shown in the following chart:

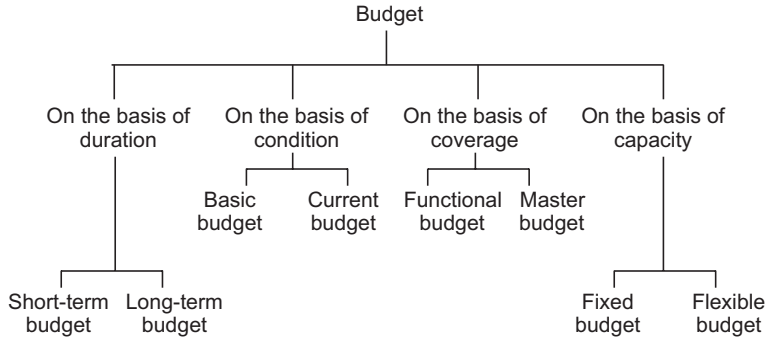


Fig. 24.2 *Chart showing types of budgets.*

1. On the Basis of Duration

On the basis of duration, budget can be classified into two types, *viz*., (*a*) short-term budget and (*b*) long-term budget.

(*a*) **Short-term budget:** A short-term budget is prepared to cover a duration of less than 1 year. Sometimes they are prepared for a month also. Cash budget is an example of short-term budget. Short-term budget is followed in many cases as it is difficult to forecast events on a long-term basis.

(*b*) **Long-term budget:** A budget which is prepared to cover a period of more than a year is known as long-term budget. The examples of a long-term budget are research and development budget, capital expenditure budget.

2. On the Basis of Condition

On the basis of conditions prevailing, a budget can be classified into two types: (*a*) basic budget and (*b*) current budget.

(*a*) **Basic budget:** The ICMA terminology defines a basic budget as "a budget which is established for use unaltered over a long period of time". The budget does not take into account changes occurring from external environment which are beyond the control of management. This budget is more useful to top level management for formulating policies.

(*b*) **Current budget:** The ICMA terminology defines a current budget as "a budget which is established for use over a short period and is related to the current conditions". The budget under review will be adjusted to the current conditions prevailing in the business. This budget motivates the people preparing the budgets as they are sure of attaining the budget.

3. On the Basis of Coverage

On the basis of coverage of information and activities of a business, budget can be classified into two types, *viz*., (*a*) Functional budget and (*b*) Master budget.

(*a*) **Functional budget:** As the name suggests functional budgets are prepared in respect of various functions performed in a business. Accordingly we have the following functional budgets.

1. ***Sales budget:*** A sales budget is a statement of planned sales in terms of quantity and value and analysed by products. It is the most important budget as it is most difficult to forecast and attain. It is prepared by the sales manager based on sales forecast. The factors to be considered in forecasting sales are (*a*) Past year sales, (*b*) Forecast of business conditions, (*c*) Market analysis and (*d*) Assessment by the sales department on the basis of (*i*) Products or group of similar products, (*ii*) Areas, (*iii*) Salesmen, (*iv*) Types of customers, (*v*) Period, such as a month or a quarter. While assessing the probable sales, the following are to be considered:

(*i*) The firms own sales and those of its competitors, areawise.
(*ii*) Whether its share of business is increasing or decreasing.
(*iii*) Seasonal fluctuations.
(*iv*) The effect of rise in the level of population.
(*v*) The changes in consumer's tastes and habits.
(*vi*) The effect of introducing new products.
(*vii*) Advertising.
(*viii*) The effect of sales promotion.
(*ix*) The possibility of extending the market.

Problem 1: Dutta Enterprises sells two products, *A* and *B*. During the year 2003, it plans to sell the following quantities of each product.

Sales budget (in units)

	Total	*I Quarter*	*II Quarter*	*III Quarter*	*IV Quarter*
A	7,00,000	90,000	2,30,000	3,00,000	80,000
B	3,00,000	85,000	75,000	55,000	85,000

Each of these two products is sold on a seasonal basis. Product *A* tends to sell better in summer months, while product *B* sells better during the winter. Dutta Enterprises plan to sell product *A* throughout the year at a price of Rs. 10 a unit and product *B* at a price of Rs. 20 a unit.

A study of the past experience reveals that Dutta Enterprises has lost about 3% of its invoice each year because of returns (constituting 2% of loss of revenue) allowances and bad debts (1% of loss).

Prepare a sales budget incorporating the above information.

Solution:

Sales budget

	I Quarter	*II Quarter*	*III Quarter*	*IV Quarter*	*Total*
Product *A*	9,00,000	23,00,000	30,00,000	8,00,000	70,00,000
Product *B*	17,00,000	15,00,000	11,00,000	17,00,000	60,00,000
(*A*) Total sales	26,00,000	38,00,000	41,00,000	25,00,000	1,30,00,000
Loss of returns @ 2% on total sales	52,000	76,000	82,000	50,000	2,60,000
Loss for bad debts and allowance @ 1% of total sales	26,000	38,000	41,000	25,000	1,30,000
(*B*) Total deductions	78,000	1,14,000	1,23,000	75,000	3,90,000
Net sales (*A* – *B*)	25,22,000	36,86,000	39,77,000	24,25,000	1,26,10,000

Problem 2: Ambitions company Ltd., has three sales divisions at Mumbai, Chennai and Kolkata. It sells two products – product *X* and product *Y*. The budgeted sales for the year ending 31st December, 2000 at each place are given below:

Mumbai:	Product *X*	1,00,000 units @ Rs. 8 each
	Product *Y*	70,000 units @ Rs. 5 each
Chennai:	Product *Y*	1,10,000 units @ Rs. 5 each
Kolkata:	Product *X*	1,50,000 units @ Rs. 8 each

The actual sales during the same period were as follows:

Mumbai:	Product *X*	1,25,000 units @ Rs. 8 each
	Product *Y*	75,000 units @ Rs. 5 each
Chennai:	Product *Y*	1,25,000 units @ Rs. 5 each
Kolkata:	Product *X*	1,55,000 units @ Rs. 8 each

From the reports of the sales personal, it was considered that the sales budget for the year ending 31st December, 2001 would be higher than 2,000 budget in the following aspects

Mumbai:	Product *X*	8,000 units
	Product *Y*	5,000 units
Chennai:	Product *Y*	13,000 units
Kolkata:	Product *X*	10,000 units

Intensive sales compaign in Chennai and Kolkata is expected to result in additional sales of 25,000 units in product *X* in Chennai and 18,000 units of product *Y* in Kolkata.

You are required to prepare a sales budget for the period ending 31st December, 2001.

Solution:

Ascertainment of quantity of Budgeted sales for the year 2001

Mumbai Division		
Product X:–		Units
	Budgeted sales for the year 2000	1,00,000
Add:	Expected increase in the sales for the year 2001	8,000
	Budgeted sales for 2001	1,08,000
Product Y:–		
	Budgeted sales for the year 2000	70,000
Add:	Expected increase in the sales for the year 2001	5,000
	Budgeted sales for 2001	75,000
*Chennai Divisio*n		
Product X:–		Units
	Budgeted sales for the year 2000	NIL
Add:	Expected sales for the year 2001	25,000
	Budgeted sales for the year 2001	25,000
Product Y:–		
	Budgeted sales for the year 2000	1,10,000
Add:	Expected increase in the sales for the year 2001	13,000
	Budgeted sales for the year 2001	1,23,000
Kolkata Division:–		
Product 'X':–		
	Budgeted sales for the year 2000	1,50,000
Add:	Expected increase in the sales for the year 2001	10,000
		1,60,000
Product Y:–		
	Budgeted sales for the year 2000	NIL
Add:	Expected sales for the year 2001	18,000
	Budgeted sales for the year 2001	18,000

Sales Budget

Sales Division	*Product*	*Budget for the year 2000*			*Actuals for the year 2000*			*Budget for the year 2001*		
		Qty.	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*
Mumbai	*X*	1,00,000	8	8,00,000	1,25,000	8	10,00,000	1,08,000	8	8,64,000
	Y	70,000	5	3,50,000	75,000	5	3,75,000	75,000	5	3,75,000
		1,70,000		11,50,000	2,00,000		13,75,000	1,83,000		12,39,000
Chennai	*X*	—	—	—	—	—	—	25,000	8	2,00,000
	Y	1,10,000	5	5,50,000	1,25,000	5	6,25,000	1,23,000	5	6,15,000
		1,10,000		5,50,000	1,25,000		6,25,000	1,48,000		8,15,000
Kolkata	*X*	1,50,000	8	12,00,000	1,55,000	8	12,40,000	1,60,000	8	12,80,000
	Y	—	—	—	—	—	—	18,000	5	90,000
		1,50,000		12,00,000	1,55,000		12,40,000	1,78,000		13,70,000

Problem 3: Adventurous Co. Ltd., manufactures two products *X* and *Y* and sells them through two divisions Bangalore and Cochin. For the purpose of submission of sales budget to the budget committee, the following information has been made available.

Budgeted sales for the current year were:

Product	*Bangalore*	*Cochin*
X	2,000 units @ Rs. 9	3,000 units @ Rs. 9
Y	1,500 units @ Rs. 21	2,500 units @ Rs. 21

Actual sales for the current year were:

Product	*Bangalore*	*Cochin*
X	2,500 units @ Rs. 9	3,500 units @ Rs. 9
Y	1,000 units @ Rs. 21	2,000 units @ Rs. 21

Market survey reveal that product 'Y' is popular but under-priced. It is observed that if the price of product '*X*' is increased by Re. 1, it will still find a ready market. On the other hand, product *Y* is over-priced to the customers and the market could absorb more if the sales price of product *Y* is reduced by Re. 1. The management has agreed to give effect to the above price changes.

From the information relating to these price changes and reports from salesmen, the following estimates have been prepared by divisional managers.

Percentage increase in sales over current budget is

Product	*Bangalore*	*Cochin*
X	+ 10%	+ 5%
Y	+ 20%	+ 10%

With the help of an intensive advertisement campaign, the following additional sales above the estimated sales of divisional managers are possible

Product	*Bangalore*	*Cochin*
X	300 units	350 units
Y	200 units	250 units

You are required to prepare a budget for sales incorporating the above estimates and also show the budgeted and actual sales of the current year.

Solution:

Working notes:

Ascertainment of Quantity of budgeted sales for future period

Bangalore Division:

Product X		*Units*
	Budgeted sales for the current year	2,000
Add:	Expected increase in sales	
	$10/100 \times 2{,}000$	200
Add:	Further increase in sales with intensive advertising	300
	Budgeted sales for future period	2,500
Product Y		
	Budgeted sales for the current year	1,500

Add:	Expected increase in sales	
	$\frac{20}{100} \times 1{,}500$	300
Add:	Further increase in sales with intensive advertising	200
	Budgeted sales for future period	2,000
Cochin Division		
Product X		
	Budgeted sales for the current year	3,000
Add:	Expected increase in sales–5%	150
Add:	Further expected increase	350
	Budgeted sales for future period	3,500
Product Y		
	Budgeted sales for the current year	2,500
Add:	Expected increase in sales–10%	250
Add:	Further expected sales	250
		3,000

Sales Budget

Sales Division	*Product*	*Budget for the current year*			*Actuals for the current year*			*Budget for the future period*		
		Qty.	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*
Bangalore	*X*	2,000	9	18,000	2,500	9	22,500	2,500	10	25,000
	Y	1,500	21	31,500	1,000	21	21,000	2,000	20	40,000
		3,500		49,500	3,500		43,500	4,500		65,000
Cochin	*X*	3,000	9	27,000	3,500	9	31,500	3,500	10	35,000
	Y	2,500	21	52,500	2,000	21	42,000	3,000	20	60,000
		5,500		79,500	5,500		73,500	6,500		95,000

2. *Selling and distribution cost budget:* The success of sales depends upon selling and distribution expenses incurred. Selling expenses are incurred to increase the sales volume. While preparing a selling budget, a classification is made according to the variability of cost. This budget is prepared by the sales managers. Common examples of selling expenses included in a selling cost budget are salesmen's salaries, commissions, and travelling expenses. Sometimes a separate distribution cost budget is prepared apart from selling cost budget. The purpose is to know the expenditure involved in making available finished goods safely to customers. Two important costs go to make up distribution cost budget *viz*., (*a*) storage and warehousing cost and (*b*) transportation cost. As in the case of selling cost budget, distribution costs are also classified into fixed and variable cost. A specimen of selling and distribution cost budget is shown below:

Selling and Distribution Cost Budget
(For the period ending 31st Dec. 2005)

		Previous year's budget	*Previous year's actual*	*Current budget*
A.	Personnel cost:			
	Salaries			
	Commission			
	Travelling			
B.	Sale's office cost			
	Office supplies			
	Salaries			
	Postage			
	Telephone			
	Rent & rates			
C.	Publicity:			
	Salaries			
	Press			
	Journals			
	Television			
	Samples			
D.	Warehousing packing & despatch			
	Salaries			
	Packing wages			
	Driver's wages			
	Sundries			
		_____	_____	_____
		_____	_____	_____

Fig. 24.3. ***Specimen of selling and distribution cost budget.***

Problem 4: Prepare a sales overhead budget for the months of January, February and March from the estimates given below:

	Rs.
Advertisement	2,500
Salaries of sales department	5,000
Expenses of the sales department	1,500
Counter salesman's salaries & D.A.	6,000

Commission to counter salesmen at 1% of their sales

Travelling salesmen's commission at 10% on their sales and expenses at 5% on their sales.

The sales during the period were estimated as follows:

Month	*Counter sales (Rs.)*	*Travelling salesmen's sales (Rs.)*
January	80,000	10,000
February	1,20,000	15,000
March	1,40,000	20,000

(University of Delhi, B. Com., (Hons.) April 1989)

Solution:

Sales overhead budget

	Jan.	*Feb.*	*March*
Estimated sales	90,000	1,35,000	1,60,000
Fixed overhead:			
Advertisement	2,500	2,500	2,500
Salaries of sales dept.	5,000	5,000	5,000
Expenses of sales dept.	1,500	1,500	1,500
Salaries of counter salesmen & their DA	6,000	6,000	6,000
	15,000	15,000	15,000
Variable overheads:			
Commission of counter salesmen—10% of counter sales	800	1,200	1,400
Commission of travelling salesmen—10% of their sales	1,000	1,500	2,000
Expenses of travelling salesmen (5% of their sales)	500	700	1,000
	2,300	3,450	4,400
Total sales overhead	17,300	18,450	19,400
Total sales	90,000	1,35,000	1,60,000
% of sales overhead to sales	19.22%	13.67%	12.13%

3. *Advertising budget:* In large factories, to undertake an intensive sales programme, a separate advertising department is established. It will be looked after by an advertising manager. The advertising manager will have to deal with the following while budgeting advertising cost:

(*i*) Determine the best method or methods of advertising for the business concerned.

(*ii*) Fix the total amount to be spent on advertising in the budget period. This amount is known as the advertising appropriation.

(*iii*) Co-ordinate the sales function and advertising.

(*iv*) Control the expenditure within the limits laid down and also attempt to measure the effectiveness of advertising.

The best method of advertisement to be selected depends upon reference to the product, channel of distribution, method of selling, types of consumers served. Care must be taken to see that the advertisement cost does not increase cost of production drastically. In other words, advertising cost should be incurred as long as there is an increase in sales and net profit. The matching of advertising cost and benefits derived therefrom is a vital part of advertising budget.

A specimen of advertising budget is shown below:

Advertising budget for the year ended.....

Expenses	*Media of Advertisement*						
	Total Rs.	*News-paper*	*Magazines & journals*	*T.V.*	*Cinema*	*Catalogue*	*Samples*
Salaries Rent Travelling expenses Heating & lighting Payment to agencies							
Total							

Fig. 24.4 *Specimen of advertising cost budget.*

4. *Product budget:* This budget is prepared by production manager based upon (*a*) sales budget, (*b*) the production capacity and (*c*) the budgeted finished goods stock requirements. According to Blocker and Weltmer, a production budget deals with:

(*i*) The determination of the total estimated volume of production.
(*ii*) The division of the estimated output into different types of products.
(*iii*) The scheduling of operations by days, weeks and months.
(*iv*) The establishment of finished goods inventory requirements.
(*v*) The storage of finished products until delivery can be made in accordance with sales orders.

Advantages: The preparation of a production budget has the following advanatages:

(*i*) Plans can be made to keep inventories at reasonable levels consistent with production and sales requirements.
(*ii*) The requirements of raw materials and the sources of their supply can be selected for deriving best terms of purchases along with quality.
(*iii*) By maintaining production schedule, the promised delivery dates can be maintained. This increases reputation of the business.

Procedure: According to Heckert and Wilson (*Business Budgeting and Control*) the preparation of a production budget involves the following steps:

(*i*) Determine the period of time to be used as a basis for the production budget.
(*ii*) Ascertain what physical quantities should be produced to meet the sales budget and to provide properly balanced inventories.
(*iii*) Determine when the goods should be produced.
(*iv*) Determine where the goods should be produced.
(*v*) Determine the manufacturing operations required by the production.
(*vi*) Establish standards of production performance for use in measuring production efficiency.
(*vii*) Develop a programme of materials, labour and equipment requirements.
(*viii*) Use the production budget for purpose of cost control.
(*ix*) Make necessary revisions of the production budget.

5. *Production cost budget:* This budget shows the cost of production taking into account the elements of costs *viz*., direct materials cost, direct labour cost and production overheads.

Problem 5: (Production budget and production cost budget): *X* Co. Ltd., manufactures two products *A* and *B*. Forecast of the number of units to be sold in the first seven months of the year is given below:

	Product A	*Product B*
Jan.	1,000	2,800
Feb.	1,200	2,800
Mar.	1,600	2,400
Apr.	2,000	2,000
May	2,400	1,600
June	2,400	1,600
July	2,000	1,800

It is anticipated that:

(*i*) There will be no work-in-progress at the end of every month.
(*ii*) Finished units equal to half of the sales for the next month will be in stock at the end of each month (including previous December).

Budgeted production and costs for the whole year are as follows:

	Product A	*Product B*
Products (units)	22,000	24,000
Direct materials cost per unit	12.50	19
Direct labour cost per unit	4.50	7
Total factory overhead apportioned	66,000	96,000

Prepare for the six months period ending 30th June, 2003 (*a*) production budget for each month and (*b*) summarised production cost budget.

Solution:

Production budget (in units)

Product A	*Jan.*	*Feb.*	*Mar.*	*April*	*May*	*June*	*July*	*Total*
Sales of current month	1,000	1,200	1,600	2,000	2,400	2,400	2,000	
Add: Closing stock	600	800	1,000	1,200	1,200	1,000	—	
	1,600	2,000	2,600	3,200	3,600	3,400		
Less: Opening balance	500	600	800	1,000	1,200	1,200		
	1,100	1,400	1,800	2,200	2,400	2,200		11,100
Product B								
Sales of current month	2,800	2,800	2,400	2,000	1,600	1,600	1,800	
Add: Closing stock	1,400	1,200	1,000	800	800	900		
	4,200	4,000	3,400	2,800	2,400	2,500		
Less: Opening balance	1,400	1,400	1,200	1,000	800	800		
Total units to be produced	2,800	2,600	2,200	1,800	1,600	1,700		12,700

Production cost budget

	Product A	*Product B*
Direct material cost per unit	12.50	19.00
Direct labour cost per unit	4.50	7.00
Factory overhead	3.00	4.00
	20.00	30.00
Total budget cost	11,100 × Rs. 20 = Rs. 2,20,000	12,700 × Rs. 30 = Rs. 3,81,000

Problem 6: (Production cost budget): The production cost of Modern Machine Co. Ltd., for the year 2002 are as under:

Direct material cost		Rs. 1,20,000
Direct wages		75,000
Overheads: Variable	70,000	
Fixed	45,000	1,15,000

The following changes are anticipated in 2003:

(*a*) The purchase price per unit of direct materials, and of other materials included in overheads will remain unchanged.

(*b*) The average rate for direct labour will fall from Rs. 4 per hour to Rs. 3 per hour, and direct labour hours will increase by 10%.

(*c*) Production efficiency will decrease by 4%.

The overheads are absorbed on a direct wages basis. Draw up a production cost budget for 1993.

Solution:

Production cost budget for 2003

		Original budget in 2002	*Budget for 2003*
Direct materials cost	1,20,000	1,32,000	
Direct labour cost		75,000	64,350
	Prime cost	1,95,000	1,96,350
Overheads —Fixed		45,000	45,000
—Variable		70,000	77,000
	Total cost	3,10,000	3,18,350

Notes:

1. Labour hours will increase by 10%. Therefore it is presumed that production will increase by 10% and hence 10% increase in the cost of materials.

2. Direct labour is affected by production efficiency of 4% and increase in labour hours of 10%.

$$\text{Labour hours} = \frac{\text{Rs. } 75{,}000}{\text{Rs. } 4 \text{ per hour}} = 18{,}750 \text{ hrs.}$$

Add: 10% increase in labour hrs. = 1,875 hrs.

20,625 hrs.

Add: 4% decrease in production efficiency

$$\frac{4}{100} \times 20{,}625 = 825 \text{ hrs.}$$

= 21,450 hrs.

Total labour cost = 21,450 × Rs. 3 = 64,350

3. Variable overheads are related to production, 10% rise in production will result 10% rise in variable overhead.

6. *Plant utilisation budget:* This budget indicates the plant capacity required to meet the production budget. While preparing this budget allowance must be made for the time lost in repairs and maintenance, setting up time, etc. For a smooth flow of production the capacity of plant must be balanced. For this purpose it is necessary to decide whether to (*a*) reduce the production volume, (*b*) purchase new machinery, (*c*) work extra shift, (*d*) use of subcontractors and so on. A specimen of plant utilisation budget is shown below:

Plant utilisation budget for the period.....

Department	*Machines*	*Number of hours available during the period (2,000)*	*Normal lost time (200)*	*Standard capacity in hrs. (1,800)*	*Output per std. hr. (5)*	*Std. qty. (units) (9,000)*
A	1					
	2					
	3					
B	4					
	5					
	6					
	Total					

Fig. 24.5 *Specimen showing plant utilisation budget.*

7. *Material purchase budget:* This budget is prepared by the purchase manager for the purchase of raw materials and component parts. While preparing this budget priority must be given for the purchase of materials which are in short supply. This budget is prepared considering both quantities and value of materials. The following factors are to be considered before materials purchase budget is prepared:

(*a*) Planned increase or decrease in the stock of raw materials during the budget period.
(*b*) The date on which materials are required.
(*c*) The fluctuation in the prices of material.
(*d*) The duration of credit allowed.

Problem 7: The following are the estimated sales of a company for eight months ending 30.8.98.

Months	*Estimated sales (units)*
Apr. 1998	12,000
May 1998	13,000
June 1998	9,000
July 1998	8,000
Aug. 1998	10,000
Sept. 1998	12,000
Oct. 1998	14,000
Nov. 1998	12,000

As a matter of policy, the company maintains the closing balance of finished goods and raw materials as follows:

Stock Item	*Closing balance of a month*
Finished goods	50% of the estimated sales for the next month
Raw materials	Estimated consumption for the next month

Every unit of production requires 2 kg of raw material costing Rs. 5 per kg.

Prepare production Budget (in units) and raw materials purchase budget (in units and cost) of the company for the half year ending 30th Sept. 1998. **(ICWA, Inter., June 1999)**

Solution:

Production Budget

Month	*Sales*		*Closing Balance 50% of the estimated sales for next month*		*Operating Balance*	*Production*
1998						
Apr.	12,000	+	6,500	–	6,000	12,500
May	13,000	+	4,500	–	6,500	11,000
June	9,000	+	4,000	–	4,500	8,500
July	8,000	+	5,000	–	4,000	9,000
Aug.	10,000	+	6,000	–	5,000	11,000
Sept.	12,000	+	7,000	–	6,000	13,000
	64,000					65,000

Purchase Budget

Consumption 2 kg per unit	*Closing Balance*	*Opening Balance*	*Purchase in kg*	*Rate*	*Amt.*
25,000	22,000	25,000	22,000	5	1,10,000
22,000	17,000	22,000	17,000	5	85,000
17,000	18,000	17,000	18,000	5	90,000
18,000	22,000	18,000	22,000	5	1,10,000
22,000	26,000	22,000	26,000	5	1,30,000
26,000	26,000	26,000	26,000	5	1,30,000
1,30,000					6,55,000

Problem 8: A company is drawing its production plan for the year 1997–98 in respect of two of its products "Gamma" and "Delta". The company's policy is not to carry any closing work-in-progress at the end of any month. However, its policy is to hold a closing stock of finished goods at 50% of the anticipated quantity of sales of the succeeding month. For the year 1997–98 the company's budgeted production is 20,000 units of "Gamma" and 25,000 units of "Delta". The following is the estimated cost data.

	Gamma	*Delta*
	Rs.	*Rs.*
Direct material per unit	50	80
Direct labour cost per unit	20	30
Other manufacturing expenses apportionable to each type of product based on production	2,00,000	3,75,000

The estimated units to be sold in the first 7 months of the year 1997–98 are as under:

	Apr.	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*
Gamma	900	1,100	1,400	1,800	2,200	2,200	1,800
Delta	2,900	2,900	2,500	2,100	1,700	1,700	1,900

You are required to:

(*a*) Prepare a production budget showing month-wise number of units to be manufactured.

(*b*) Present a summarised production cost budget for the half year ending 30-9-97.

(ICWA, Inter., Dec. 1996)

Solution:

Production budget for half year ending 30th Sept. 97

	Apr.	*May*	*June*	*July*	*Aug.*	*Sept.*	*Total*
Product – Gamma							
Budgeted sales	900	1,100	1,400	1,800	2,200	2,200	9,600
Add: Closing stock to be built up (*See note 1*)	550	700	900	1,100	1,100	900	900
	1,450	1,800	2,300	2,900	3,300	3,100	10,500
Less: Carry-over stock -opening (*See note 2*)	450	550	700	900	1,100	1,100	450
Budgeted production	1,000	1,250	1,600	2,000	2,200	2,000	10,050

Product – Delta							
Budgeted sales	2,900	2,900	2,500	2,100	1,700	1,700	13,800
Add: Closing stock to be built up	1,450	1,250	1,050	850	850	950	950
	4,350	4,150	3,550	2,950	2,550	2,650	14,750
Less: Carry-over stock -opening (*See note 2*)	1,450	1,450	1,250	1,050	850	850	1,450
Budgeted production	2,900	2,700	2,300	1,900	1,700	1,800	13,300

Note-1:

Closing stock of finished goods at the end of each month is to be ascertained as per company's policy, *i.e.*, 50% of the anticipated quantity of sales of the succeeding month. Closing stock under total column is 50% of October month, *i.e.*, $\frac{50}{100} \times 1{,}800 = 900$.

Note-2:

Opening stock of each month is the closing stock of preceeding month. The opening stock under total column is 50% of Sept. closing stock, *i.e.*, $\frac{50}{100} \times 900 = 450$

Summarised production cost Budget for the half-year ending 30th Sept. 1997

	Gamma		*Delta*	
Production (units)	10,050		13,300	
	Cost		Cost	
	Per unit	Amount	Per unit	Amt.
Direct Materials	50	5,02,500	80	10,64,000
Direct labour	20	2,01,000	30	3,99,000
Other manufacturing expenses	10	1,00,500	15	1,99,500
	80	8,04,000	125	16,62,500

Note-3:

Other manufacturing expenses are apportioned on the following basis:

$$\frac{\text{Other Manufacturing expenses}}{\text{No. of units to be produced in } 1997-98}$$

2,00,000	3,75,000
20,000	25,000
= 10	= 15

Problem 9: (Materials purchase budget): Draw a material procurement budget (quantitative) from the following information:

Estimated sales of a product 40,000 units. Each unit of the product requires 3 units of material *A* and 5 units of material *B*.

Estimated opening stock at the commencement of the next year:

Finished product	5,000 units
Material *A*	12,000 units
Material *B*	20,000 units

Materials on order:	
Material *A*	7,000 units
Material *B*	11,000 units
The desirable closing stock at the end of the next year:	
Finished product	7,000 units
Material *A*	15,000 units
Material *B*	25,000 units
Materials on order:	
Material *A*	8,000 units
Material *B*	10,000 units

Solution:

Production budget

Estimated sales	40,000 units
Add: Closing stock	7,000 units
	47,000 units
Less: Opening stock	5,000 units
Production during the year	42,000 units

Materials procurement budget

		A (units)		*B (units)*
Materials required 3 units of *A* and 5 units of *B* for 42,000 units		1,26,000		2,10,000
Add: Closing stock required	15,000		25,000	
Material on order	8,000	23,000	10,000	35,000
		1,49,000		2,45,000
Less: Opening stock	12,000		20,000	
Material on order	7,000	19,000	11,000	31,000
Units to be procured		1,30,000		2,14,000

Problem 10: The *XY* Company expects the following sales by month in units for the first six months of next year:

January	–	5,400	April	–	5,700
February	–	5,700	May	–	6,000
March	–	7,500	June	–	4,500

The company has a policy of maintaining an inventory equal to budgeted sales for the following two months. The beginning inventory reflects this policy. Each unit cost Rs. 10.

You are required to prepare purchase budget for as many months as you can both in units and rupees. Explain also why you had to stop where you did. **(University of Kerala, M. Com., May 1992)**

Solution:

Production budget for 3 months

		Jan.	*Feb.*	*March*
Sales		5,400	5,700	7,500
Add:	Closing stock	5,700	6,000	4,500
		11,100	11,700	12,000
Less:	Opening stock	7,500	5,700	6,000
	Units to be produced	3,600	6,000	6,000

Purchase budget in quantity

	Jan.	*Feb.*	*March*
Units of materials required (*see note 1*)	3,600	6,000	6,000
Add: Desired stock at the end of the year	5,700	6,000	4,500
	9,300	12,000	10,500
Less: Expected stock at the beginning	7,500	5,700	6,000
Quantity of materials to be purchased	1,800	6,300	4,500

Note: In the problem the policy of opening stock is expected to be the sale units equal to the following two months. As the opening stock of every month is the closing stock of the previous month, it has been treated for every month in the same manner. The budget could be prepared only for three months because of the policy of the management in considering opening stock.

Regarding the purchase budget as separate unit of materials required for production, it is presumed that for every unit of finished goods to be produced, one unit of raw materials is required.

Purchase cost budget

Month	*Qty.*	*Rate*	*Amount*
Jan.	1,800	10	18,000
Feb.	6,300	10	63,000
March	4,500	10	45,000
		Total	Rs. 1,26,000

8. ***Labour cost budget:*** This budget represents the direct labour required to meet the production demand of the factory during the budget period. The labour hours required for budgeted production will be determined on the basis of output which must conform standard. It shows the information relating to the number of employees along with the grade required to achieve the output and the probable labour cost for budget period. The advantages of preparing a labour cost budget are as follows:

(*a*) It determines the labour force required.
(*b*) It facilitates the personnel department to plan ahead in recruitment and training of labourer.
(*c*) It helps in the preparation of production cost budget and cash budget. A specimen of labour cost budget is shown below:

Labour cost budget for the period.....

Grade	*Number of employees*	*Hours employed*	*Rate per hour*	*Amount*
(1) Skilled (2) Semi-skilled (3) Unskilled				
			Total	

Fig. 24.6 *Specimen showing labour cost budget.*

Problem 11: The sales director of a manufacturing company reports that next year he expects to sell 40,000 units of a particular product. The production department gives the following particulars:

Two kinds of raw materials *A* and *B* are required for manufacturing the product. Each product requires 3 units of material *A* and 2 units of material *B*. The estimated opening balance of the next year will be:

Finished product	–	10,000 units
Materials *A*	–	12,000 units
Materials *B*	–	15,000 units

The desired closing balances at the end of the year are:

Finished product	–	16,000 units
Material *A*	–	14,000 units
Material *B*	–	15,000 units

Draw up a materials purchase budget **(University of Madras, B. Com., September 1994)**

Solution:

Production Budget

Sales units	40,000
Less: Opening finished goods	10,000
	30,000
Add: Closing finished goods	16,000
Production units	46,000

Purchase Budget

	A	*B*
Raw materials consumed		
A 46,000 × 3	1,38,000	92,000
B 46,000 × 2		
Less: Opening raw materials	12,000	15,000
	1,26,000	77,000
Add: Closing raw materials	14,000	15,000
Purchase of Raw Materials required	1,40,000	92,000

9. *Factory overhead budget:* This budget is prepared by production manager or persons in charge of various production departments. To facilitate control it is necessary to classify the overheads into fixed and variable and controllable and uncontrollable overhead. The budget officer may assist the production manager in supplying the past year's data to prepare this budget more comprehensively.

Problem 12: (Factory overhead budget): The following particulars are extracted from the books of Jai Engineering Co. The production overhead apportionment has been prepared to show overheads for each of the production and service departments. Service departments overheads are apportioned as shown below:

Service department			*Production departments*				
			A	*B*	*C*		
1			30%	20%	50%		
2			25%	30%	45%		
Overhead	*Basis of apportionment*	*Total*	*A*	*B*	*C*	*1*	*2*
Salaries Actual	Actual	14,700	4,000	3,000	5,000	1,500	1,200
Indirect wages	Actual	31,600	9,000	7,000	10,000	3,000	2,600
Consumable stores	No. of employees	1,650	400	350	500	300	100
Depreciation	Value of asset	22,200	6,000	5,000	10,000	700	500
Insurance	Value of asset	2,480	750	650	900	100	80
Rent	Area occupied	3,790	1,200	1,000	1,500	50	40

Power	Meter	2,170	600	700	800	40	30
Light	Area occupied	395	100	110	140	20	25
Maintenance	Value of asset	2,525	800	700	1,000	15	10
Employee's insurance	No. of workers	3,150	900	800	1,000	250	200
Scrap	Actual	775	225	205	345	–	–
Sundries	Actual	1,105	375	235	455	25	15
	Total	86,540	24,350	19,750	31,640	6,000	4,800
Service dept. 1		–	1,800	1,200	3,000		
Service dept. 2		–	1,200	1,440	2,160		
		86,540	27,350	22,390	36,800		

Solution:

Factory overhead budget for the period

	Total	*A*	*B*	*C*
Overhead				
Variable:				
Consumable stores	1,250	400	350	500
Scrap	775	225	205	345
Fixed:				
Salaries	12,000	4,000	3,000	5,000
Depreciation	21,000	6,000	5,000	10,000
Insurance	2,300	750	650	900
Rent	3,700	1,200	1,000	1,500
Sundries	1,065	375	235	455
Service dept. 1	6,000	1,800	1,200	3,000
Service dept. 2	4,800	1,200	1,440	2,160
Semi-variable:				
Indirect wages	26,000	9,000	7,000	10,000
Power	2,100	600	700	800
Light	350	100	110	140
Maintenance	2,500	800	700	1,000
Insurance	2,700	900	800	1,000
	86,540	27,350	22,390	36,800

10. ***Administration cost budget:*** This budget is prepared by chief accountant and approved by the managing director. This budget is likely to pose some problems since most of the administration cost is fixed in nature. The main budget is divided into separate budget covering separate administrative activity such as accounting, secretarial work and so on. The factors to be considered in preparing this budget are (*a*) the existing number of staff, (*b*) their rates of pay, (*c*) change in volume of work and (*d*) legal and other administrative overheads. A specimen of administrative cost budget is shown below:

Specimen of administration cost budget

For the period ----------

Items of expenses	*Previous year's budget*	*Previous year's actual*	*Current budget*
***Materials*:**			
Stationery			
Supplies			
***Salaries & wages*:**			
Manager's salary			
Director's salary			
Clerical salary			
***Expenses*:**			
Rent & rates			
Telephone			
Postage			
Travelling			
Insurance			
Bank charges			
Audit fee			
Subscriptions			
Total			

11. ***Research and development budget:*** The preparation of this budget is governed by the policy of the Board of Directors and head of production departments. This budget may be prepared by elements of cost or by specific project. Similarly this budget can be prepared from the point of view of short-range or long-range activities. While long-range research programme is carried out in tune with future market trends and demands, short-range programme are carried out to achieve a satisfactory margin of profit. The research and development budget may relate to (*a*) Basic research, (*b*) New product development, (*c*) Product improvement, (*d*) Cost and capacity improvement and (*e*) Safety, health and welfare. A specimen of research and development budget is shown below:

Research and development budget for the period .....

	Projects				
	1	*2*	*3*	*4*	*Total*
Project costs:					
Materials:					
Raw materials					
Small tools					
Oil & lubricants					
Sundries					
Wages & salaries:					
Chemists					
Technicians					
Others					
Expenses:					
Professional fees					
Total					
General costs:					
Supervisory salary					
Laboratory cost					
Technical publications					
Office costs					
Subscriptions					
				Total	

12. ***Capital expenditure budget:*** This budget shows the estimated expenditure on fixed assets during the period concerned. This budget is subject to strict management control as it involves heavy amount of investment requiring the approval of top management. This budget is prepared based on the requirements of various assets for the following departments:

(*i*) Production department—For the purchase of machineries and plant either for replacing the existing machinery or new machinery for producing new products.
(*ii*) Transport department—For the purchase of new vehicles.
(*iii*) Office department—For the purchase of new office equipments.
(*iv*) Service departments—For purchasing equipments peculiar to such departments.
(*v*) Equipments to control pollution such as liquid, gaseous and noise pollution.

The capital expenditure budget offers the following advantages:

(*i*) It estimates the capital expenditure requirements and accordingly provides or arranges for it.
(*ii*) The priority of procuring assets can be determined. Those assets which are very important and unavoidable is given first preference and others are postponed to a later period.
(*iii*) It serves as a tool of controlling capital expenditure.

13. ***Cash budget:*** This budget is prepared to know the estimated cash balance each month along with the estimated receipts and payments during the month. It performs two important functions, *viz*., (*i*) to ensure sufficient availability of cash and (*ii*) to take necessary action when there is shortage of cash. If there is any surplus, which is not immediately required, the same may be invested for a short period. According to Matz-Curry-Frank, a cash budget serves the following purposes:

(*i*) It indicates the effect on the cash position of seasonal requirements, large inventories, unusual receipts and slowness in collecting bills receiveable.
(*ii*) It indicates cash requirements for a plant or equipments expansion programme.
(*iii*) It points to the need for additional funds from external sources such as bank loans, issue of securities.
(*iv*) It indicates the availability of cash for taking advantage of discounts offered.
(*v*) It helps in planning redemption of preference shares or redeemable debentures, payments of pension, etc.
(*vi*) It shows the availability of excess funds for short or long term investments.

A cash budget can be prepared under any of the following three methods.

(*i*) *The receipts and payments method:* Under this method all the cash receipts and payments expected during the budget period is considered. However care must be taken to ensure that cash adjustments and accruals are not shown in the cash budget. The cash transactions for preparing this budget is obtained from various functional budgets discussed above. For example, materials cost from material budget, labour cost from labour budget, overheads from overhead budget, sales revenue from sales budget and so on.

Problem 13: (Cash budget under receipts and payments method): The following particulars are extracted from the books of Ajanta Co. Ltd. for the quarter ending 31.3.1993:

Opening cash balance as on 1.1.93 Rs. 30,000

Sales budget were as follows:

	Rs.
November 1992	80,000
December 1992	90,000
January 1993	75,000
February 1993	75,000
March 1993	80,000

Analysis of records shows that debtors settle according to the following pattern:

60% within the month of sale.

25% the month following.

15% the month following.

Extracts from the purchase budget were as follows:

	Rs.
December 1992	60,000
January 1993	55,000
February 1993	45,000
March 1993	55,000

All purchase are on credit and past experience show that 90% are settled in the month of purchase and the balance settled the month after.

Wages are Rs. 15,000 per month and overheads Rs. 20,000 per month (including Rs. 5,000 depreciation) are settled monthly.

Taxation of Rs. 8,000 has to be settled in February and the company will receive settlement of an insurance claim of Rs. 25,000 in March.

Prepare a cash budget for January, February and March 1993.

Solution:

Calculation of sales revenue

	January
	Rs.
November 1992 (15% of 80,000)	12,000
December 1992 (25% of 90,000)	22,500
January 1993 (60% of 75,000)	45,000
	79,500
	February
December 1992 (15% of 90,000)	13,500
January 1993 (25% of 75,000)	18,750
February 1993 (60% of 75,000)	45,000
	77,250
	March
	Rs.
January 1993 (15% of 75,000)	11,250
February 1993 (25% of 75,000)	18,750
March 1993 (60% of 80,000)	48,000
	78,000

Payments for purchases

	January
	Rs.
December 1992 (10% of 60,000)	6,000
January 1993 (90% of 55,000)	49,500
	55,000

	February
	Rs.
January 1993 (10% of 55,000)	5,500
February 1993 (90% of 45,000)	40,500
	46,000
	March
February 1993 (10% of 45,000)	4,500
March 1993 (10% of 55,000)	49,500
	54,000

Cash budget for the quarter ending March 1993

	Jan.	*Feb.*	*March*
Opening balance	30,000	24,000	17,250
Receipts from sales	79,500	77,250	78,000
Insurance claim			25,000
Total cash available	1,09,500	1,01,250	1,20,250
Purchases	55,500	46,000	54,000
Wages	15,000	15,000	15,000
Overhead (less depreciation)	15,000	15,000	15,000
Taxation		8,000	
Total payment	85,500	84,000	84,000
Closing balance c/o	24,000	17,250	36,250

Problem 14: (Cash budget): The Swadeshi Manufacturing Co. has a cash balance of Rs. 27,000 at the beginning of March 1993, you are required to prepare a cash budget for March, April and May 1993 having regard to the following information:

Creditors give 1 month credit.

Salaries are paid in the current month.

Fixed costs are paid one month in arrears and include a charge for depreciation of Rs. 5,000 per month.

Credit sales are settled as follows:

40% in month of sale, 45% in next month and 12% in the following month. The balance represents bad debts.

Month	*Cash sales (Rs.)*	*Credit sales (Rs.)*	*Purchases (Rs.)*	*Salaries (Rs.)*	*Fixed overhead (Rs.)*
Jan.	–	74,000	55,200	9,000	30,000
Feb.	–	82,000	61,200	9,000	30,000
March	20,000	80,000	60,000	9,500	30,000
April	22,000	90,000	69,000	9,500	32,000
May	25,000	1,00,000	75,000	10,000	32,000

Solution:

Statement showing receipts from debtors

	March		*April*		*May*
40% of March sales	32,000	40% of April sales	36,000	40% of May sales	40,000
45% of Feb. sales	36,900	45% of March sales	36,000	45% of April sales	40,500
12% of Jan. sales	8,880	12% of Feb. sales	9,840	12% of March sales	9,600
	77,780		81,840		90,100

Cash budget for the months of March, April & May 1993

	March	*April*	*May*
Opening balance	27,000	29,080	38,420
Receipts from debtors	77,780	81,840	90,100
Cash sales	20,000	22,000	25,000
Total cash available	1,24,780	1,32,920	1,53,520
Salaries	9,500	9,500	10,000
Fixed overheads	25,000	25,000	27,000
Purchases	61,200	60,000	69,000
Total disbursement	95,700	94,500	1,06,000
Closing balance c/o	29,080	38,420	47,520

Problem 15: (Cash budget): From the following budgeted figures prepare a cash budget in respect of the three months to June 30, 1993:

Month	*Sales*	*Materials*	*Wages*	*Overhead*
Jan.	30,000	20,000	5,500	3,100
Feb.	28,000	24,000	5,800	3,300
March	32,000	25,000	6,000	3,400
April	40,000	28,000	6,200	3,600
May	42,000	31,000	6,500	4,300
June	38,000	25,000	7,000	4,000

Estimated cash balance on April Ist 1993 Rs. 10,000.

Materials and overheads are paid during the month following the month of supply. Wages are paid during the month in which they are earned.

Credit items of sale are payment by the end of the month following the month of sale. It is estimated that one-half of sales are paid when due, the other half being paid during the next month.

A sales commission of 5% on sales is to be paid within the month following actual sales.

Preference share dividend of 10% on capital of Rs. 3,00,000 is to be paid on May 1, 1993.

Plant and machinery to be installed in May at a cost of Rs. 10,000 will be payable on 1st June, 1993.

10% calls on equity shares capital of Rs. 2,50,000 are due on April Ist and June Ist 1993.

Solution:

Statement showing sales

	April		*May*		*June*
½ of March	16,000	½ of April	20,000	½ of May	21,000
½ of Feb.	14,000	½ of March	16,000	½ of April	20,000
	30,000		36,000		41,000

Cash budget for period ending 30th June, 1993

	April	*May*	*June*
Opening balance	10,000	28,800	(5,300)
Sales	30,000	36,000	41,000
Capital	25,000	–	25,000
Total receipts	65,000	64,800	60,700

Materials	25,000	28,000	31,000
Wages	6,200	6,500	7,000
Overheads	3,400	3,600	4,300
Sales commission	1,600	2,000	2,100
Pref. share dividend	–	30,000	–
Plant & machinery	–	–	10,000
Total payment	Rs. 36,200	70,100	54,400
Balance c/o	Rs. 28,800	Rs. (5,300)	Rs. 6,300

Problem 16: From the following data prepare a cash budget for the 3 months commencing 1st June, 1996, when the bank balance was Rs. 1,00,000.

Month	*Sales*	*Purchases*	*Wages*	*Production expenses*	*Adm. expenses*
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*	*(Rs.)*
April	80,000	41,000	5,600	3,900	10,000
May	76,500	40,500	5,400	4,200	14,000
June	78,500	38,500	5,400	5,100	15,000
July	90,000	37,000	4,800	5,100	17,000
August	95,000	35,000	4,700	6,000	13,000

There is two month credit period allowed to customers and received from suppliers. Wages, production expenses and administration expenses are payable in the following month.

(University of Madras, B. Com., Sept. 1997)

Solution:

Cash budget from June to August 1996

		June	*July*	*August*
Opening balance		1,00,000	1,15,400	1,25,900
Add:	Receipts:			
	Collection from debtors	80,000	76,500	78,500
		1,80,000	1,91,900	2,04,400
Less:	Payment			
	paid to creditors	41,000	40,500	38,500
	wages	5,400	5,400	4,800
Production expenses		4,200	5,100	5,100
Administration expenses		14,000	15,000	17,000
		64,600	66,000	65,400
Closing balance		1,15,400	1,25,900	1,39,000

Note 1:

Delay in payment allowed to customers from suppliers is 2 months *i.e.*, April payment paid in June.

Note 2:

Delay in payment allowed to wages, production expenses, administration expenses are one month *i.e.*, May payment paid in June.

Problem 17: Infotech Ltd., commences business on 1st April, 2000 and deposits Rs. 1,00,000 in the Global Trust Bank. The sum deposited would not be sufficient to finance its operations over a period of four months. As a company secretary, you are asked to prepare a cash budget from 1st April, 2000 to 31st July, 2000 to ascertain the monthly overhead limits to seek from the company's bankers.

Requisite data is as under:

(*i*) Sales are made to one distributor only in 30 days terms 2% discount and cheques are received on the first date of the following due date.

(*ii*) Furniture purchases for Rs. 10,000 preferred to be made in April, 2000.

(*iii*) Budget figures are:

	April	*May*	*June*	*July*
Purchases	50,000	40,000	30,000	40,000
Wages	40,000	50,000	40,000	40,000
Cash expenses	4,000	5,000	4,000	4,000
Sales	60,000	70,000	80,000	80,000

All purchases are made on net 30 days terms and cheques are posted to creditors on the last day of the month due. **(CS, Inter, June 2000)**

Solution:

Cash budget for April to July

		Apr.	*May*	*June*	*July*
(*A*)	Cash receipts:				
	Cash receipts from distributor (Sales – 2% discount with one month time lag.)	–	58,800	68,600	78,400
(*B*)	Cash payments:				
	Payment to Creditors (one month) time lag)	–	50,000	40,000	30,000
	Wages	40,000	50,000	40,000	40,000
	Cash expenses	4,000	5,000	4,000	4,000
	Furniture purchases	10,000	–	–	–
	Total cash payments	54,000	1,05,000	84,000	74,000
(*C*)	Net cash receipts/ Deficit (A – B)	(54,000)	(46,200)	(15,400)	4,400
	Balance (overdraft) at the start of the month (crummilative)	1,00,000	46,000	(200)	(15,600)
	(Overdraft) required monthwise	–	(200)	(15,400)	–

Problem 18: Prepare a cash budget for the three months ended 30th September 1998 based on the following information:

				Rs.
Cash at bank on 1st July 1998				25,000
Monthly salaries and wages (estimated)			10,000	
Interest payable in August 1998				5,000
Estimated	*June*	*July*	*August*	*September*
	Rs.	*Rs.*	*Rs.*	*Rs.*
Cash sales (actual)	1,20,000	1,40,000	1,52,000	1,21,000
Credit sales	1,00,000	80,000	1,40,000	1,20,000

Purchases	1,60,000	1,70,000	2,40,000	1,80,000
Other expenses	18,000	20,000	22,000	21,000

Credit sales are collected 50% in the month of sale and 50% in the month following. Collections from credit sales are subject to 10% discount if received in the month of sale and to 5% if received in the month following:

10% of the purchases are in cash and balance is paid in next month. **(CS, Inter, June 1999)**

Solution:

Calculation of collection from Debtors (Credit sales)

		July	*Aug.*	*Sept.*
July	50% of 1,00,000	50,000		
	50% of 80,000	40,000		
Aug.	50% of 80,000		40,000	
	50% of 1,40,000		70,000	
Sept.	50% of 1,40,000			70,000
	50% of 1,20,000			60,000
	Total collections	90,000	1,10,000	1,30,000
Less:	Discount allowed			
(*a*)	5% on 50,000 + 10% on 40,000	6,500		
(*b*)	5% on 40,000 + 10% on 70,000		9,000	
(*c*)	5% on 70,000 + 5% on 60,000			9,500
	Net collections after discount	83,500	1,01,000	1,20,500

Calculation of payments to creditors

(*a*)	90% of 1,60,000 + 10% of 1,70,000	1,61,000		
(*b*)	90% of 1,70,000 + 10% of 2,40,000		1,77,000	
(*c*)	90% of 2,40,000 + 10% of 1,80,000			2,34,000
		1,61,000	1,77,000	2,34,000

Cash budget for three months July to Sept.

		July	*Aug.*	*Sept.*
	Opening balance	25,000	57,500	96,500
Add:	Receipts ;			
	Sales cash	1,40,000	1,52,000	1,21,000
	Credit	83,500	1,01,000	1,20,500
	Total cash	2,48,500	3,10,500	3,38,000
Payments:				
	Purchases	1,61,000	1,77,000	2,34,000
	Other expenses	20,000	22,000	21,000
	Interest	–	5,000	–
	Salaries & wages	10,000	10,000	10,000
	Total payment	1,91,000	2,14,000	2,65,000
	Closing cash balance	57,500	96,500	73,000

Problem 19: On 30th September, 1996, The balance sheet of M Ltd. (retailer) was as under:

Equity shares of		Equipment	20,000	
Rs. 10 each fully paid	20,000	*Less*: Dep.	5,000	
Reserves	10,000			15,000
Trade creditors	40,000	Stock		20,000
Proposed dividend	15,000	Trade debtors		15,000
		Bank		35,000
	85,000			85,000

The company is developing a system of forward planning and on 1st October 1996 it supplies the following information:

	Sales		*Purchases*
	Credit	*Cash*	*Credit*
	Rs.	*Rs.*	*Rs.*
September 1996 (actual)	15,000	14,000	40,000
October 1996 (budget)	18,000	5,000	23,000
November 1996 (budget)	20,000	6,000	27,000
December 1996 (budget)	25,000	8,000	26,000

All trade debtors are allowed one months credit and are expected to settle promptly. All trade creditors are paid in the month following delivery:

On 1st October, 1996, all equipment were replaced at a cost of Rs. 30,000 Rs. 14,000 was allowed in exchange for the old equipment and a net payment of Rs. 16,000 was made.

The proposed dividend will be paid in December 1996.

The following expenses will be paid:

Wages Rs. 3,000 per month.

Administration Rs. 1,500 per month.

Rent Rs. 3,600 for the year upto 30th Sept., 1997 (to be paid in October 1996).

You are required to prepare a cash budget for the months of October, November and December 1996.

(CS, Inter, June 1997)

Solution:

Cash budget for 3 months ending 1996

			October	*November*	*December*
Opening balance of bank/Bank overdraft			35,000	(9,100)	(12,600)
Add:	Cash inflows:				
	Sales:	cash sales of current month	5,000	6,000	8,000
		Credit sales of previous month	15,000	18,000	2,000
		Total receipts	55,000	14,900	15,400
Less:	Cash inflow:				
	Credit purchases of previous month		40,000	23,000	27,000
	Equipment		16,000	-	-
	Wages		3,000	3,000	3,000
	Administration		1,500	11,500	1,500
	Rent		3,600	-	-
	Dividend		-	-	15,000
	Total payment		64,100	27,500	46,500
Closing balance/overdraft (A – B)			(9,100)	(12,600)	(31,100)

(*ii*) *Adjusted profit and loss method:* This method presents the cash budget in the form of cash flow statement. When compared to receipts and payments method, this method is less detailed but more useful for long-term budgeting. In preparing a long-term budget management is concerned with overall position of cash rather than cash receipts and payments. The preparation of a cash flow statement involves the use of the following information:

(*a*) Cash balance in the begining.
(*b*) Net profit forecast for the period (before charging depreciation and other provisions)
(*c*) Changes in working capital.
(*d*) Capital expenditure and sale of plant and machinery.
(*e*) Capital receipts.
(*f*) Dividends.

This method differs from the previous method in one respect, *i.e.*, it considers particularly non-cash transactions. That is to say, this method is based on the assumption that profit = cash. In other words, if there were no credit transactions, capital transactions, accrual, provisions, or appropriation of profit, the amount of profit shown in the profit and loss account will be equal to the balance of cash shown by the cash book. But in practice such a situation rarely arises and hence requires adjustments. Hence the name adjusted profit and loss method.

(*iii*) *Balance sheet method:* This method resembles the adjusted profit and loss method explained above. In addition to a cash flow statement a budgeted balance sheet is prepared for the next period under this method. In preparing the balance sheet all assets and liabilities are taken into account except cash. The two sides of balance sheet is then balanced and the balancing figure represents cash. When the asset side is heavier than liabilities side, it denotes bank overdraft and if the liability side is heavier than asset side it denotes cash on hand or at bank.

Problem 20. (Preparation of different budgets): Ratna Enterprises manufactures three products *A*, *B* and *C*. You are required to prepare (*a*) Sales budget, (*b*) Production budget, (*c*) Material budget for the month of January 1993.

Sales of products	*Quantity*	*Rate*
A	1,000	100
B	2,000	120
C	1,500	140

Materials used in the company's products are:

Material	M_1	M_2	M_3
Rate	Rs. 4	Rs. 6	Rs. 9
Quantities used in	*Units*	*Units*	*Units*
A	4	2	–
B	3	3	2
C	2	1	1
Finished stock as on:	*A (units)*	*B (units)*	*C (units)*
1.1.93	1,000	1,500	500
31.1.93	1,100	1,650	550
Material stocks:	M_1	M_2	M_3
1.1.93	(units) 26,000	20,000	12,000
31.1.93	(units) 31,200	24,000	14,400

Solution:

Sales budget

	A	*B*	*C*
Sales quantities	1,000	2,000	1,500
Selling price (per unit)	Rs. 100	120	140
Sales	Rs. 1,00,000	2,40,000	2,10,000

Statement showing production budget

	A	*B*	*C*
Sales units	1,000	2,000	1,500
Add: Closing stock	1,100	1,650	550
	2,100	3,650	2,050
Less: Opening stock	1,000	1,500	500
Production	1,100	2,150	1,550

Statement showing material usage budget

	M_1		M_2		M_3	
Production Budget	*Unit per product*	*Total*	*Unit per product*	*Total*	*Unit per product*	*Total*
A—1,100	4	4,400	2	2,200	–	–
B—2,150	3	6,450	3	6,450	2	4,300
C—1,550	2	3,100	1	1,550	1	1,550
Material usage		13,950		10,200		5,850

Material purchase budget (Qty, and value)

		M_1	M_2	M_3
Material usage	(units)	13,950	10,200	5,850
Add: Closing stock	(units)	31,200	24,000	14,400
		45,150	34,200	20,250
Less: Opening stock		26,000	20,000	12,000
Required purchases	(units)	19,150	14,200	8,250
Unit rate		Rs. 4	6	9
Value of materials		76,600	85,200	74,250

(*b*) **Master budget:** It is a summary of all the functional budgets discussed above. According to the ICMA terminology, "A master budget is the summary budget incorporating its component functional budgets and which is finally approved, adopted and employed. A master budget shows the operating profit of the business for the budget period and budgeted balance sheet at its close.

Problem 21: (Master budget): A glass manufacturing company requires you to calculate and present the budget for the year from the following information:

Toughened glass	–	Rs. 3,60,000
Bent toughened glass	–	Rs. 5,40,000
Direct material cost	–	60% of sales
Direct wages of 20 workers at the rate of	–	Rs. 200 per month
Factory overheads:		

Works manager	–	Rs. 600 per month
Foreman	–	Rs. 500 per month
Stores and spares	–	2½% on sales
Depreciation on machinery	–	Rs. 12,500
Light and power	–	Rs. 5,000
Repairs and maintenance	–	Rs. 8,000
Other sundries	–	10% on direct wages
Administration, selling and distribution expenses	–	Rs. 16,000 per year.

(University of Kerala, M. Com., May 1992)

Solution:

Master budget for the period ending

Sales budget		
Toughened glass		3,60,000
Bent toughened glass		5,40,000
		9,00,000
Less: Administration and selling and distribution overheads		16,000
	Net sales revenue	8,84,000
Product cost budget:		
Direct materials—60% of sales		5,30,400
Direct wages—$20 \times 200 \times 12$		48,000
	Prime cost	5,78,400
Variable factory overheads:		
Stores and spares 2½% on sales	22,500	
Light	5,000	
Repairs	5,000	37,500
Fixed factory overhead:		
Works manager's salary	7,200	
Foreman's salary	6,000	
Depreciation	12,500	
Sundries 10% of wages	4,800	30,500
	Works cost	6,46,400

Expected profit = Sales – Works cost
= 8,84,000 – 6,46,400 = 2,37,600.

(*a*) **Fixed budget:** The ICMA terminology defines fixed budget as "a budget which is designed to remain unchanged irrespective of the volume of output or turnover attained. All the budgets explained above are fixed budgets, *i.e.*, they are based on a fixed level of operation. In other words, it is assumed that the various departments of a factory work at a stated level of activity and that a specified production level is going to be achieved and that sales budget will be attained. A fixed budget does not help as a controlling tool. Hence flexible budgets are made use of.

(*b*) **Flexible budget or variable budget:** It is defined by the ICMA terminology as "a budget which by recognising the difference in behaviour between fixed and variable costs in relation to fluctuations in output, turnover or other variable factors such as number of employees, is designed to change appropriately with such fluctuation". A flexible budget is not rigid as in the case of fixed budget. Instead it adapts itself to any level of activity. The budget varies according to a change in the level of output. Hence it is also known as variable budget. It serves as a useful tool of controlling cost.

Problem 22: (Flexible budget): Prepare a flexible budget from the following data:

Capacity	50%
Volume	10,000 units
Selling price per unit	Rs. 200
Material	Rs. 100
Labour	Rs. 30
Factory overhead	Rs. 30 (Rs. 12 fixed)
Administration overhead	Rs. 20 (Rs. 10 fixed)

At 60% working, material cost per unit increased by 2% and selling price per unit falls by 2%.

At 80% working, material cost per unit increases by 5% and selling price per unit falls by 5%. Estimate the profit at 60% and 80% working. **(Nagarjuna University, M. Com., March 1992)**

Solution:

Flexible budget

		Level of activity					
		50%		*60%*		*80%*	
		Per unit	*Amount*	*Per unit*	*Amount*	*Per unit*	*Amount*
Units		10,000		12,000		16,000	
Raw materials		100	10,00,000	102	12,24,000	105	16,80,000
Labour		30	3,00,000	30	3,60,000	30	4,80,000
Factory overhead	– Fixed	12	1,20,000	10	1,20,000	7.5	1,20,000
	– Variable	18	1,80,000	18	2,16,000	18.0	2,88,000
Administration overhead							
	– Fixed	10	1,00,000	8.33	1,00,000	6.25	1,00,000
	– Variable	10	1,00,000	10	1,20,000	10	1,60,000
Total cost		180	18,00,000	178.33	2,14,000	176.75	28,28,000
Profit		20	2,00,000	17.67	2,12,000	13.25	2,12,000
Sales		200	20,00,000	196.00	23,52,000	190	30,40,000

Problem 23: Draw up a flexible budget for overhead expenses on the basis of the following data and determine the overhead rates at 70%, 80% and 90% plant capacity.

	Capacity level		
Variable overheads:	70%	80%	90%
Indirect labour	–	12,000	–
Indirect materials	–	4,000	–
Semi-variable overheads:			
Power (30% fixed)	–	20,000	–
Repairs and maintenance 60% fixed	–	2,000	–
Fixed overhead:			
Depreciation	–	11,000	–
Insurance	–	3,000	–
Salaries	–	10,000	–
Total overheads	–	62,000	–
Estimated direct labour hours	–	1,20,000	–

(Madurai Kamaraj University, B. Com., April 1992)

Solution:

Flexible budget

	Level of activity		
	70%	*80%*	*90%*
Variable overheads :			
Indirect labour	10,500	12,000	13,500
Stores	3,500	4,000	4,500
Semi-variable overhead :			
Power —Fixed	6,000	6,000	6,000
—Variable	12,250	14,000	15,750
Repairs —Fixed	1,200	1,200	1,200
—Variable	700	800	900
Fixed Overhead :			
Depreciation	11,000	11,000	11,000
Insurance	3,000	3,000	3,000
Salaries	10,000	10,000	10,000
Total overheads	58,150	62,000	65,850
Estimated labour hours	1,08,500	1,24,000	1,39,500
Overhead rate	0.53	0.50	0.47

Problem 24: For production of 10,000 articles the following are budgeted expenses per unit:

	Rs.
Direct materials	60.00
Direct labour	30.00
Variable overhead	20.00
Fixed overhead (Rs. 1,60,000)	16.00
Variable expenses (direct)	5.00
Selling expenses (20% fixed)	15.00
Administration expenses (Rs. 50,000 fixed for all level of production)	5.00
Distribution expenses (20% fixed)	5.00
	156.00

Prepare a flexible budget for production of 6,000, 7,000 and 8,000 units of articles, showing clearly variable cost, fixed cost and total cost. **(University of Madras, B. Com., March 1997)**

Solution:

Flexible budget

	6,000 units		7,000 units		8,000 units		10,000 units	
	Per unit	*Amount*	*Per unit*	*Amount*	*Per unit*	*Amount*	*Per unit*	*Amount*
Material	60	3,60,000	60	4,20,000	60	4,80,000	60	6,00,000
Labour	30	1,80,000	30	2,10,000	30	2,40,000	30	3,00,000
Variable overhead	20	1,20,000	20	1,40,000	20	1,60,000	20	2,00,000
Fixed overhead	26.66	1,60,000	22.85	1,60,000	20	1,60,000	16	1,60,000
Variable expense	5	30,000	5	35,000	5	40,000	5	50,000
Selling expense:								
—Fixed	5	30,000	4.28	30,000	3.75	30,000	3	30,000
—Variable	12	72,000	12	84,000	12.00	96,000	12	1,20,000
Administration expense	8.34	50,000	7.14	50,000	6.25	50,000	5	50,000

Distribution expense								
—Fixed	1.66	10,000	1.42	10,000	1.25	10,000	1	10,000
—Variable	4.00	24,000	4.00	28,000	4.00	32,000	4	40,000
Total cost	172.66	10,36,000	166.69	11,67,000	162.25	12,98,000	156	15,60,000

Problem 25: The following figures are available from sales and costs forecast of M/s. Asiad and Company for the year ended 31st December, 1984 at 50% (5,000 units) capacity utilisation:

(*i*) Fixed expenses remain constant for all levels of production and sales.
(*ii*) Selling price between 50% and 75% capacity is Rs. 25 per unit.
(*iii*) Semi-variable expenses will remain unchanged at 50% to 65% capacity but will increase by 10% between 65% and 80% capacity and 30% between 80% and 100% capacity.
(*iv*) At 90% level, material cost increases by 5% and selling price is reduced by 5%.
(*v*) At 100% level both material and labour costs increase by 10% and selling price is reduced by 8%.
(*vi*) Semi-variable expenses are Rs. 50,000.
(*vii*) Fixed expenses are Rs. 58,000.
(*viii*) Variable expenses are, material Rs. 5 per unit, labour Rs. 2 per unit and direct expenses, Re. 1 per unit.
Prepare a profit forecast statement through flexible budget at 60%, 75%, 90% and 100% capacity.
(*Bangalore University, M. Com., May 1989*)

Solution:

Flexible budget

	60% (6,000 units)	75% (7,500 units)	90% (9,000 units)	100% (10,000 units)
Materials	30,000	37,500	47,250	55,000
Labour	12,000	15,000	18,000	22,000
Expenses	6,000	7,500	9,000	10,000
Semi-variable cost	50,000	55,000	65,000	65,000
Fixed cost	58,000	58,000	58,000	58,000
Total	1,56,000	1,73,000	1,97,250	2,10,000
Profit/Loss	(6,000)	14,500	16,500	20,000
Sales	1,50,000	1,87,500	2,13,750	2,30,000

Working Note: Sales value for 9,000 units and 10,000 units

9,000×25 =	2,25,000	10,000×25 =	2,50,000
Less: 5%	11,250	Less: 8%	20,000
	2,13,750		2,30,000

Problem 26: The following data are available for a manufacturing company for a yearly period:

Fixed expenses:	*Rs. (in lakhs)*
Wages and salaries	9.5
Rent, rates and taxes	6.6
Depreciation	7.4
Sundry administration expenses	6.5
Semi-variable expenses (at 50% capacity)	
Maintenance and repairs	3.5
Indirect labour	7.9
Sales department salaries	3.8
Sundry administrative expenses	2,8

Variable expenses (at 50% capacity)	
Materials	21.7
Labour	20.4
Other expenses	7.9
Total cost	98.0

Assume that the fixed expenses remain constant at all levels of production, semi-variable expenses remain constant between 45% and 65% capacity increasing by 10% between 65% and 80% capacity and by 20% between 80% and 100% capacity.

Sales at various levels are:

	Rs. (in lakhs)
50% Capacity	100
60% Capacity	120
75% Capacity	150
90% Capacity	180
100% Capacity	200

Prepare a flexible budget for the year at 60% and 90% capacities and estimate the profit at these levels of budget. **(C.S., Inter. Dec. 1991)**

Solution:

Flexible budget

	Rs. (in lakhs)	
	60%	*90%*
Variable cost:		
Materials	26.04	39.06
Labour	24.48	36.72
Other expenses	9.48	14.22
Semi-variable cost:		
Maintenance	3.5	4.20
Indirect labour	7.9	9.48
Sales department salaries	3.8	4.56
Sundry administration expenses	2.8	3.36
Fixed cost:		
Wages and salaries	9.50	9.50
Rent, rates and taxes	6.60	6.60
Depreciation	7.40	7.40
Sundry administration expenses	6.50	6.50
Total cost	108	141.60
Profit	12	38.40
Sales	120	180

ZERO BASED BUDGETING (ZBB)

Zero based budgeting is a new technique of budgeting introduced first in USA in the year 1969. This system of budgeting was developed by Peter Pyhrr of Texas Instruments of USA. This technique of budgeting is more useful in government budgeting but can also be used in factories for non-manufacturing activities, such as administration and selling activities.

The ICMA terminology defines ZBB as "a method of budgeting whereby all activities are re-evaluated each time a budget is formulated. Each functional budget starts with the assumption that the function does not exist and is a zero cost. Increments of cost are compared with increments of benefits culminating in the planned maximum benefits for a given budgeted cost".

The technique of budgeting is considered to be an improvement over traditional method of budgeting, which is also known as 'incremental budgeting'. Under incremental budgeting every departmental manager would prepare a budget for his department based upon the previous experience and allow for a certain increase in amount in the budget for meeting contingency. However, in spite of a best forecast, sometimes the targets may not be achieved owing to inefficiency. Thus whenever previous budget is taken as a basis to prepare a current budget, the current budget involves an element of inefficiency that is carried forward from the previous year. Hence under ZBB, the budget is prepared by considering the base for the current year as zero and this eliminates the accrual of inefficiency for preparing future years budget.

The basic steps in implementing ZBB are as follows:

(*i*) Identify each function and activity of the organisation—this is referred to as a 'decision packing'.
(*ii*) Evaluate each decision package so as to ensure that is cost effective.
(*iii*) Compare each activity with possible alternatives.
(*iv*) Rank each activity—in some cases decision packages can be evaluated in terms of profitability or in any subjective terms using cost-benefit analysis.
(*v*) Allocate resources in accordance with the ranking of activities and with resources available to the organisation.

BUDGET REPORT

The work of a budget officer does not end with the preparation and approval of budgets. He has to prepare reports on a continuous basis so as to facilitate comparison of actuals with budgets. The budget reports are sent to various departmental managers showing favourable or adverse variance from the budget. Based on this the departmental managers will prepare a report to be submitted to the managing director pointing out the reasons for the variances. This enable remedial actions to be taken to set right unfavourable variance. The reports so furnished will also help as a guide for future planning.

According to W.W. Bigg, while preparing reports on budgets it is necessary to follow the undermentioned principles so as to make reports more effective:

1. The report should be clearly headed and the period covered shown. The unit, *viz*., cash, tonnes, litre, etc., should be indicated.
2. Like must be compared with like and there must be no ambiguity of description. For example, it must be clear whether a sales report refers to 'deliveries made and invoiced' or to 'orders received'.
3. Information not relevant to the purpose for which the report is prepared should be omitted so that conclusions from the report can be drawn quickly and with certainty.
4. The report should not attempt to portray so much information that clarity is lost. If the information to be conveyed is complicated, more than one statement may be desirable. For example, to show actual sales compared with budget, analysed over both 'areas' and 'commodities', a separate statement for each analysis would improve clarity.
5. The information included should be limited to the sphere of the person to whom it is furnished. The data to be given to a foreman would normally be confined to that affecting his particular shop, but the factory manager would require broader information covering all departments for which he is responsible.

6. Promptness is to be preferred to absolute accuracy, the purpose is not merely to convey information but to convey it promptly and to the person who has the authority to take action.
7. All reports should be reviewed periodically to ensure that they are still useful and to ascertain whether they should be expanded, contracted or discontinued.

QUESTIONS

I. Choose the correct answer from the following:

1. A budget that gives a summary of all the functional budgets and projected profit and loss account is known as
   (*a*) Capital budget (*c*) Master budget
   (*b*) Flexible budget (*d*) Discretionary budget [ ]
2. The fixed-variable cost classification has a special significance in the preparation of
   (*a*) Flexible budget (*c*) Cash budget
   (*b*) Master budget (*d*) Capital budget [ ]
3. The basis difference a fixed budget and a flexible budget is that a fixed budget
   (*a*) includes only fixed costs and a flexible budget only variable cost.
   (*b*) is a budget for a single level of some measures of activity, what a flexible budget consists of several budgets based on different activity levels.
   (*c*) is concerned with future acquisition of fixed assets, while a flexible budget is concerned with expenses that vary with sales.
   (*d*) cannot be changed after a fiscal period begins, while a flexible budget can be changed after a fiscal period begins. [ ]
4. Which of the following is usually a long-term budget ?
   (*a*) Sales budget (*c*) Capital expenditure budget
   (*b*) Cash budget (*d*) Fixed budget [ ]
5. Under flexible budgeting
   (*a*) statements included in the budget report vary from period to period.
   (*b*) budget standards may be adjusted at will.
   (*c*) reporting dates vary according to the activity level reported upon.
   (*d*) planned activity level is adjusted to the actual activity level before the budget comparison report is prepared. [ ]

[**Answer:** 1. (*c*), 2. (*a*), 3. (*b*), 4. (*c*), 5. (*d*)]

II. Mark 'T' or 'F' in the space provided

1. A budget is nothing but an estimate. *T/F*
2. Budgets are drawn up by the chief accountant. *T/F*
3. Budgets are blue prints for action. *T/F*
4. On the basis of budgets, next year's balance sheet and P & L a/c can be drawn up. *T/F*
5. Raw material supply is always the key factor. *T/F*
6. Diverse production is reduced to common basis on the basis of standard hours involved. *T/F*
7. Standing costing can operate without budgetary control. *T/F*
8. A system of budgetary control cannot be operated when standard costing system is in use. *T/F*
9. All functional budgets should be co-ordinated with sales budget which is always prepared first. *T/F*
10. A budget mannual is a summary of all the functional budget. *T/F*
11. Budgetary control system does not suit small business concern. *T/F*

12. Purchase budget and material budget is the same thing. *T/F*
13. A flexible budget is one which changes from year to year. *T/F*
14. A flexible budget system will recast quickly for changes in the volume of activity. *T/F*
15. A flexible budget carefully differentiates between fixed and variable cost. *T/F*

[**Answer:** True—3, 4, 5, 6, 7, 14. Rest are all false]

III. Short and long answer questions

1. Define budgetary control and state its advantages.
(Kakatiya University, B. Com., Oct. 1989)
2. Write notes on: (*a*) Limiting factor, (*b*) Budget mannual.
(Calicut University, M. Com., April 1992)
3. What are 'budget' and 'budgetary control' ? Discuss various advantages and essentials for success of budgetary control. **(Kakatiya University, M. Com., August 1991)**
4. What is budgetary control and how it is exercised ? Discuss various advantages and essentials for the success of budgetary control. **(Mangalore University, B. Com., Oct. 1991)**
5. Briefly explain the steps in the installation of a system of budgetary control.
(University of Kerala, B. Com., April 1989)
6. What is meant by 'budgetary control' ? State the essentials of good budgetary control system". What are the advantages and limitations of a budgetary control system ?
(Calicut University, B. Com., Oct. 1989)
7. What is a flexible budget ? How does it differ from a fixed budget ?
(University of Kerala, B. Com., March 1990)
8. What are the facts to be considered in setting up an annual sales budget ?
(ICWA, Inter, Dec. 1989)
9. What is zero base budgeting ? What are the advantages of zero based approach over the traditional approach ? **(ICWA, Inter, Dec. 1989)**
10. (*a*) Define the terms 'budget' and 'budgetary control'.
(*b*) List down any five objectives of a budgetary control system. **(CA, Inter, Nov. 1990)**

EXERCISE 1

(Sales budget): *The Sunshine Co. Ltd., has four sales divisions each consisting of four regions ; North, South, East and West. The company sells two products X and Y. Budgeted sales for the six months ended 30th June, 1993, in each area of division 1 were as follows:*

North	— *X*	10,000	units @ Rs. 10 each
	— *Y*	6,000	units @ Rs. 5 each
South	—*Y*	12,000	units @ Rs. 5 each
East	— *X*	15,000	units @ Rs. 10 each
West	— *X*	8,000	units @ Rs. 10 each
	— *Y*	5,000	units @ Rs. 5 each

Actual sales for the same period in division 1 were as follows:

North	— *X*	11,500	units @ Rs
	— *Y*	7,000	units @ Rs. 5 each
South	— *Y*	12,500	units @ Rs. 5 each
East	— *X*	16,500	units @ Rs. 10 each
West	— *X*	9,500	units @ Rs. 10 each
	— *Y*	5,250	units @ Rs. 5 each

From the salesmen's report, it is thought that sales could be budgeted for the six months ended June 30, 1994 as follows:

North	— *X*	Budgeted increase of	2,000	units on 30.6.93
	— *Y*	Budgeted increase of	500	units on 30.6.93
South	— *Y*	Budgeted increase of	1,000	units on 30.6.93
East	— *X*	Budgeted increase of	2,000	units on 30.6.93
West	— *X*	Budgeted increase of	1,000	units on 30.6.93
	— *Y*	Budgeted increase of	500	units on 30.6.93

At a meeting of area sales manager with the divisional sales manager it is decided that sales campaign will be undertaken in areas South and East. It is anticipated that these campaigns will result in additional sales of 3,000 units of *X* in the South area and 5,000 units of *Y* in the East area.

Prepare a sales budget for the period ending 30th June, 1994. Showing also the budgeted and actual sales for June 30th, 1993.

[**Answer:** Total sales for all areas and for products *X* and *Y* for the budgeted period 30.6.94 is Rs. 5,60,000 for the budgeted period 30.6.93 is Rs. 4,45,000 and actual total sales for 30.6.93 is Rs. 4,98,750]

EXERCISE 2

(Selling and distribution cost budget): *Hardcore Ltd., incurred the following selling costs in its last budget year.*

	Sales area			*Head office*	*Total*
	A	*B*	*C*		
Personnel cost:					
Salesmen's salary	27,000	33,000	5,000	—	65,000
Commission	5,000	7,000	500	—	12,500
Travelling expenses	8,000	11,000	3,000	—	22,000
Sales management:					
Salaries	—	—	—	11,000	11,000
Building services	—	—	—	7,000	7,000
Other costs	—	—	—	1,500	1,500
Publicity:					
	30,000	45,000	8,000	—	83,000
	70,000	96,000	16,500	19,500	2,02,000

From the above particulars and the following additional information prepare a selling cost budget for the year 1993:

1. A new sales area *D* is to be formed to cover what is mostly virgin territory, but to take in certain areas previously covered by *B* sales are. Salemen's salaries of the new area are estimated to be Rs. 8,000, which includes Rs. 2,000 to bd paid to *B* salesmen transferred to the *D* area. Travelling expenses of *B* representative in the *D* area last year was Rs. 900. For the whole *D* area they are expected to be Rs. 2,400 next year.
2. An additional clerk will be needed in the sales manager's office at a salary of Rs. 900 per annum and the building service budget shows an increase of 5%.
3. The publicity budget allows for expenditure of *A*—Rs. 25,000, *B*—Rs. 40,000, *C*—Rs. 10,000, *D*—Rs. 25,000. Rs. 15,000 is budgeted as the cost of an international exhibition.
4. Commission is paid at the rate of ½% of all sales. The sales budget specifies sales of *A*—Rs. 12,00,000, *B*—Rs. 15,00,000, *C*—Rs. 5,00,000, *D*—Rs. 4,00,000.

[**Answer:** Selling budget cost for *A*—Rs. 66,000, *B*—Rs. 88,600, *C*—Rs. 20,500, *D*—Rs. 37,400, H.O. Rs. 35,750, Total Rs. 2,48,250]

EXERCISE 3

(Production budget and production cost budget): *Gaira Engineering Co. Ltd. manufactures two products X and Y. An estimate of number of units expected to be sold in the first seven months of 1985 is given below:*

	Product X	*Product Y*
Jan.	500	1,400
Feb.	600	1,400
Mar.	800	1,200
Apr.	1,000	1,000
May	1,200	800
June	1,200	800
July	1,000	900

It is anticipated that:

(*a*) There will be no work-in-progress at the end of any month.

(*b*) Finished units equal to half the anticipated sales for the next month will be in stock at the end of each month (including December 1984). The budgeted production and production costs for the year ending 31st Dec., 1985 are as follows:

	Product X	*Product Y*
Production units	11,000	12,000
Direct material cost per unit	Rs. 12	Rs. 19
Direct wages per unit	5	7
Other manufacturing charges apportioned	33,000	48,000

You are required to prepare:

(*a*) Production budget showing the number of units to be manufactured for each month.

(*b*) A summarised production cost budget for the 6 months period to June 1985.

(**Answer :** Production of *x* — 5,560 units and that of *y* — 6,350 units. Total cost of X Rs. 1,11,000 and Y Rs. 1,90,500).

25

CHAPTER

STANDARD COSTING

HISTORICAL COSTING

Historical costing is one of the technique of ascertaining cost of prodution. It is based on accumulation of actual or historical cost. The National Association of Accountants has defined historical cost as "the cost which is accumulated during the process of production by the usual historical costing technique as opposed to the cost which has been determined in advance of the production process. The term 'actual' is not intended to convey any implication as to the accuracy with which costs are measured. "Historical costing is not a very popular technique as it suffers from the following limitations:

(*a*) It provides cost information only after the completion of production. So cost of production cannot be ascertained until production is completed. The fixation of selling price becomes difficult under such situation.
(*b*) It is not possible to exercise control over the costs which are actually incurred.
(*c*) It becomes difficult to take decisions based on actual costs.
(*d*) Actual costs may vary from period to period and fixation of selling price on the basis of actual cost will lead to differences in selling price which may not be accepted by customers.
(*e*) It is an expensive and time consuming technique. For example, in a larger sized business, to ascertain the cost of production of say 1 lakh units involving different materials and various expenses will involve more time and clerical work.

In order to overcome the above limitations, standard costing was developed.

STANDARD COST AND STANDARD COSTING

A standard cost has been defined by Lucey (*Costing*) a "as predetermined calculation of how much costs should be under specified working conditions".

Brown and Howard in their book *Principles and Practice of Management Accountancy* define a standard cost as a predetermined cost which determines what each product or service should cost under given circumstances.

The ICMA terminology defines a standard cost as "a predetermined cost calculated in relation to a prescribed set of working conditions, correlating technical specifications and scientific measurements of materials and labour to the prices and wage rates expected to apply during the period to which the standard cost is intended to relate, with an addition of an appropriate share of budgeted overhead".

The objects of standard costs are as follows:

1. Promoting and measuring efficiencies.
2. Controlling and reducing costs.
3. Simplifying costing procedure.
4. Valuing inventories.
5. Fixing selling price.

Standard costing has been defined by Brown and Howard as "a technique of cost accounting which compares the 'standard cost' of each product or service with the actual cost to determine the efficiency of the operation, so that any remedial action may be taken immediately".

The ICMA terminology defines standard costing as "the preparation and use of standard costs, their comparison with actual cost and the analysis of variances to their causes and points of incidence".

According to the above two definitions, standard costing involves the following steps :

(*a*) Setting of standards.
(*b*) Measurement of results.
(*c*) Comparison of actuals with standards to determine the variance.
(*d*) Investigation of variance.
(*e*) Taking remedial action to set right adverse variance.

DIFFERENCE BETWEEN A BUDGET AND STANDARD

1. A standard is a unit concept, *i.e.*, that apply to a particlular product, process or operation, whereas budget are concerned with totals, *i.e.*, for the firms as a whole.
2. Standards are revised only when they are inappropriate for current operating conditions, whereas budget are revised on a periodic basis generally once a year.
3. Standards and the resulting variances are part of the double entry system of accounting, whereas budgets are memorandum figures and do not form part of double entry system of accounting.

Differences between a Budgetary Control and Standard Costing

Budgetary control	*Standard costing*
1. It is prepaed to cover various functions of a business such as purchases, sales, production, finance, etc. In other words, it has a macro-approach.	1. It is prepared in respect of a cost unit. In other words, it has a micro-approach.
2. It is more extensive as it covers all the operations of the bussiness.	2. It is more intensive technique of controlling costs.
3. It is a projection of financial accounts.	3. It is a projection of cost accounts.
4. It can be implemented even in parts, *i.e.*, to cover one or more than one area of business.	4. It covers all items of expenses without leaving any item. So it cannot be operated in part.
5. It can be operated without standards.	5. It cannot exist without budget.
6. It is more management oriented.	6. It is more engineering oriented.
7. It can be implemented in all industries.	7. It is not possible in certain industries.
8. It does not involve any accounting after computing variances.	8. Variances are accounted for under standard costing.
9. Its objects are formulation of policy, coordination of activities, and delegation of authority.	9. Its aim is to enable management in making decisions, in price-flxing and valuation of closing stock.

STANDARD COSTING AND STANDARDISED COSTING

Standard costing should not be confused with standardised costing as both are completely different. Standard costing is a tool of cost control whereas standardised costing refers to a uniform application of

costing and cost accounting principles and procedures to a firm having number of plants. The object of standardised costing is to facilitate inter-firm comparison of results.

Secondly, standard costing technique makes use of only standard cost. Whereas standardised costing can be operated with the help of historical cost also.

Thirdly standard costing is operated on the principles of exception, whereas, standardised costing in based on the principle of example.

Lastly, the objective of standard costing is to set and maintain the standard. Whereas, the objective of standardised costing is to improve upon the standard in addition to maintaining the standard.

ADVANTAGES AND LIMITATIONS OF STANDARD COSTING

The advantages of standard costing are as follows:

1. It provides a yardstick against which actuals are measured.
2. Standard costing helps in standardising the various activities of a business. Thus, it enables use of standard materials and better method of production.
3. It increases the cost consciousness among all concerned by fixing targets and to achieve them.
4. This technique follow the principles of management by exception.
5. It simplifies the accounting procedure which involves less clerical work and time.
6. It helps in valuing the closing stock.
7. It pinpoints the responsibility of everybody concerned in the organisation.
8. It facilitates cost control by analysing the causes of inefficiency and by taking remedial measures. This will result in reduced cost of production.
9. It enables in periodic preparation of profit and loss account which helps management in knowing the trends of the business.
10. It helps in introducing incentives to employees and provides a basis for motivating them.
11. It helps in fixing selling price in advance of production. Thus quotations can be sent and orders secured.

The limitations of standard costing are as follows:

1. It is difficult to establish standards in practice.
2. Standards established may have to be revised owing to changing conditions. But frequent revision of standards is costly and may create problems.
3. Standards which are inaccurate, unreliable and outdated may do more harm than good.
4. If the standards set are not attained it will lead to psychological effects resulting in frustration.
5. It may not be suitable for small concerns.
6. It cannot be applied to non-standardised industries and in industries where goods are to be manufactured according to specification of customers.

PRELIMINARIES IN ESTABLISHING A SYSTEM OF STANDARD COSTING

Before establishing a system of standard costing the following preliminary factors are to be considered.

1. **Establishment of Cost Centre.** In order to identify the area of efficiency or otherwise of it and to fix responsibilities for the persons who are concerned with attaining the standards, it is necessary to establish cost centre. A main cost centre can again be sub-divided into sub-cost centre for exercising better conrol. Having established cost centres, the next requirement is to fix up responsibility on the persons who are incharge of such cost centres.

2. **Classification of Accounts.** It refers to classifying the costs under a suitable accounting heading. This facilitates quick identification and collection of expenses, their analysis and in prompt reporting. As was explained under chapter 2, costs can be classified on the basis of number of characteristics. Having classified, it is desirable to give a code number for each heading of cost. For example, raw materials may be given a code number from 0 to 10, direct labour cost 11 to 20 factory overheads 21 to 30 and so on. This results in convenience in dealing with costs and ensures secrecy.
3. **Determination of Duration.** This refers to the period for which standard are used. It may be a short or long duration.
4. **Determination of Capacity.** It refers to fixation of standard output for the sake of fixing fixed and variable overheads.
5. **Types of Standard.** It refers to the level of attinment accepted by management as the basis on which standard costs are determined. The following are the important types of standards.
   (*a*) **Basic or fixed or static standard:** It is defined by the ICMA terminology as "a standard established for use over a long period from which a current standard can be developed. These standards remain constant for a long period of time and hence they are also termed as long -term standards. They show the trend over a period of time relating to material prices, labour rates, effects of changing methods. They serve at the most as the statistical data and is not used to evaluate current efficiency or inefficiency.
   (*b*) **Ideal standard:** It is defined by the ICMA terminology as "a standard which can be attained under the most favourable conditions". Such standards are based on the best possible operating conditions. In other words, the productive activity is carried out assuming that there are no breakdown in machineries, no wastage in materials, no idle time. This standard, while using is revised periodically to reflect improvement in methods, materials and technology. It is difficult to attain ideal standard in practice and hence rarely used. Therefore, such standards are used for the purpose of investigation and development but not for controlling day-to-day activities.
   (*c*) **Attainable or expected or practical standard:** It is defined by the ICMA terminolgy as "a standard which can be attained if a standard unit of work is carried out efficiently, a machine properly operated or materials properly used. This is most widely used in practice. This standard is based on efficient operating condition though not a perfect condition. This standards covers allowances for normal material wastages, for fatigue, machine breakdown, etc. This standard is more realistic in nature and hence used for cost control, valuing stock and a basis for budgeting.
   (*d*) **Current standard:** It is defined by the ICMA terminology as "a standard established for use over a short period of time related to current conditions". This standard is used to reflect the current condition. It can be equated to attainable standard during the period of stable prices and normal conditions.
   (*e*) **Normal standard:** It is defined by the ICMA terminology as "the average standard which it is anticipated can be attained over a future period of time, preferably, long enough to cover one trade cycle". Accordingly, this standard may be prepared once in 10 years.

STANDARD HOUR

It is a measure used in standard costing by means of which products in different forms such as solid, liquid and gases are measured. The standard hour is the quantity of output or amount of work which should be produced in one hour. In other words, a standard hour is the expression of the actual output in terms of standard time instead of units. The ICMA terminology defines it as "a hypothetical unit pre-established to represent the amount of work which should be performed in one hour under standard performance". The concept of standard hour has a practical advantage in the measurement of efficiency ratio, activity ratio of an organisation.

Problem 1 : A factory produces three products X, Y and Z. The standard time allowed are 10 hours, 15 hours and 12 hours respectively. The actual production in January 2003 and February 2003 are as under:

		Jan. 2003 (units)	*Feb. 2003 (units)*
Product	X	20,000	12,000
	Y	10,000	12,000
	Z	15,000	18,000

By what percentage has production changed in February over January. If the actual hours paid for each in January and February were 6,00,000 what is the rate of labour efficiency?

Solution :

Statement showing production in Jan. & Feb.

	January		*February*	
	Units	*Std. hrs.*	*Units*	*Std. hrs.*
X	20,000	2,00,000	12,000	1,20,000
Y	10,000	1,50,000	12,000	1,80,000
Z	15,000	1,80,000	18,000	2,16,000
Total	45,000	5,30,000	42,000	5,16,000

Output in February has declined by 14,000 hrs. (5,30,000 – 5,16,000), *i.e.*, by 2.6% over January.

Labour efficiency in :

January $\quad \dfrac{5{,}30{,}000}{6{,}00{,}000} \times 100 = 88.33\%$

February $\quad \dfrac{5{,}16{,}000}{6{,}00{,}000} \times 100 = 86\%$

STANDARD COST CARD

A standard cost card is used for recording the standard cost. It is prepared for each product or service. It contains particulars relating to quantity and price of materials consumed, time and rate of labour required, overheads and the total cost. A specimen of standard cost card is shown below:

Standard Cost Card

*Part No.*_____ *Description* _____ *Batch Qty.* _____

Elements of cost	Standard rate	Dept. 1	Dept. 2	Dept. 3	Total
Direct material					
Direct labour					
Production overhead					
Administration overhead					
Selling and distribution					

Fig. 25.1 *Specimen showing standard cost card.*

PROCEDURE FOR INTRODUCING STANDARD COSTING

Introduction of standard costing system involves a number of steps. Setting up of standard cost for each element of cost—direct material, direct labour and overheads is a complex task. Standards must be setup carefully since a low standard which everyone can achieve does not bring out the best performance. Too high a standard on the other hand, is being impossible to achieve, is treated with disdain and indifference. Setting up of standards is not merely an accounting job, it involves the cooperation of various functional departments. The following steps are to be followed while introducing a standard costing in a factory.

1. To study the technical aspects of the factory. This involves a study of the various methods of manufacture and the process involved. The input-output relationship of each process is to be worked out. For this purpose, the total production process has to be sub-divided into various sub-process of manufacture. The pattern of losses — normal and abnormal in each sub-process over a considerable period of time should be examined. By going through the previous production records, the number of defectives and their cost of rectification should also be looked into. Previous records should be studied in order to work out the normal efficiency of labour in each production process. This study of the technical aspect of the factory is essential since a system of standard cost must be based on the actual situation in the factory.
2. The existing cost system should be reviewed with special reference to the existing records and forms. This is important since the standard costing system has to be established as an extension to the existing system of maintaining cost.
3. The organisation chart showing the various lines of authority and responsibilities should be studied so that the responsibility of supplying basic data regarding the various operations of the undertaking can be established.
4. One of the important steps involved in the implementation of standard costing is to secure the cooperation of all executive in the factory in order to fix the quality and efficient standard. The standard costing will be successful only if it receives full-fledged support from various line managers. If line managers view it merely as an imposition by the accounting department they will never cooperate with it. It is essential to classify that the system is for the benefit and would be run only if they find it useful. A standard cost committee may be formed comprising important line managers to discuss the various problems regarding standard costing system.
5. The existing cost policies specially with regard to the methods of allocation and apportionment of overheads should be studied so that what should constitutes as the standard cost can be clearly defined.
6. The budgetary control and internal control procedures should also be reviewed since the standard costing system is to be built-up to the existing system of control and budgeting.
7. A detailed manual should be prepared for the guidance of the staff. This manual should briefly describe the system about to be enforced and should list benefit arising there from. It should then clearly demarcate responsibilities of generating the activity and cost data. The various definitions must be clearly defined and the following procedure of the system outlined:
   (*a*) Estabilishment of standard cost.
   (*b*) Target dates for fixing the standards.
   (*c*) Target dates for fixing standard cost.
   (*d*) Various reports of actual performances to be sent to accounts department for ascertaining the variances.
   (*e*) Variance analysis reports to be sent by the accounts department.
   (*f*) Any other relevant information.

8. The office-staff required to work the system should be properly trained. When the system goes into force, a number of alterations would be required in the scheme of making entries and in document flow.
9. To fix up the material quantity standard. The following is the procedure involved in setting material quantity standards.
   (*a*) *Standardisation of products:* This involves drawing detailed specifications, blue prints, norms for normal wastage.
   (*b*) *Classification of products:* This involves preparation of detailed lists of products to be manufactured.
   (*c*) *Standardisation of materials:* This involves determination of quality, specifications, etc. to be used in the standard products.
   (*d*) *Bill of materials:* This involves preparation of a bill of materials for each product showing the quantity of materials needed.
   (*e*) *Test runs:* This helps in setting standards when production is to be undertaken under regulated conditions.

The material price standards are then fixed based on the following factors:

(*a*) Stock of materials on hand and its value.
(*b*) The prices at which orders for future deliveries of materials have been placed.
(*c*) Possible price fluctuations.

10. To fix-up labour quantity standards by applying the following steps:
    (*a*) Standardisation and classification of products.
    (*b*) Training facilities required.
    (*c*) Time and motion studies.
    (*d*) Production planning techniques.
    (*e*) Selection of right machines, deciding the method of operation.

The labour cost standard can be set up by studying data regarding the wage rates paid.

11. Determination of standard overhead rate: This involes the following steps:

(*a*) Determination of standard overhead cost.
(*b*) Estimation of the level of activity.

By dividing standard overhead for the budget period by the estimated level of activity, the standard overhead rate can be compiled.

12. Determination of standard administration cost: The purpose of setting standard administration cost is to secure maximum service at minimum cost. This objective can be achieved by a study conducted by organisation and method department. Setting up of standards also depends upon standardisation and simplification of office procedure. The standard quantity of work to be performed can be set on the following basis:
    (*a*) Past performance.
    (*b*) On the advise of O & M studies.
    (*c*) Time and motion studies.
13. Determination of standard selling and distribution cost: Selling and distribution expenses bears a close relationship with sales volume. Hence a sales forecast is necessary before setting standard cost for selling and distribution. The classification into fixed and variable will help in setting standard cost.

VARIANCE ANALYSIS

The ICMA terminology defines a variance as "the difference between a standard cost and the comparable actual cost incurred during a given period. The purpose of knowing the variance is to enable the management to exercise control over cost. It enables to know whether the standards set is achieved or not.

Variance analysis has been defined by the terminology as "the process of computing the amount of and isolating the cause of variances between actual costs and standard cost". Thus variance analysis involves: (*a*) computation of individual variances and, (*b*) determination of the cause of each variance. The purpose of variance analysis is to enable management to improve operations, increase efficiency, utilise resources more effectively and reduce cost. To serve these purpose variance analysis must be easy to understand, they must be calculated immediately and the causes must be immediately enquired and remedial measures quickly taken.

A variance is said to be favourable when the actual results are better than the standards and an adverse or unfavourable variance when actuals are not up to the standard. Similarly, a variance is said to be controllable when it is amenable to control by an executive action and an uncontrollable variance when it is not amenable to control by executive action. An unfavourable variance is caused by external environment such as market conditions, fluctuations in demand, supply etc. In other words, no individual in the organisation can be held responsible for it.

Before calculating various cost variances it would be appropriate to know the meaning of the following concepts:

(*a*) *Actual produciton:* It means actual quantity produced during the actual hours worked.
(*b*) *Budgeted production:* It means the budgeted quantity to be produced during the budgeted hours to be worked.
(*c*) *Standard production:* It means the quantity which should have been produced during the actual hours worked.
(*d*) *Actual cost:* It means the actual quantity produced at the actual cost per unit.
(*e*) *Budgeted cost:* It means the budgeted quantity to be produced at the standard cost per unit.
(*f*) *Standard cost:* It means the actual quantity produced at the standard cost per unit. The various cost variances are as follows:

1. Material Variance

The various material cost variances can be shown under the following chart:

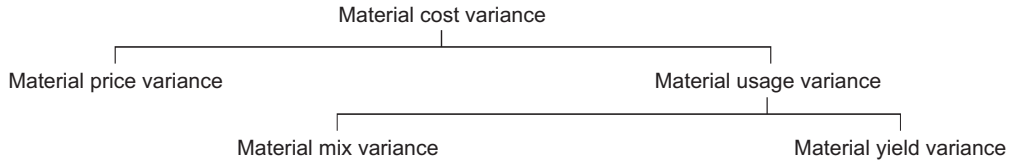


Fig. 25.2. *Chart showing material cost variance.*

(*a*) **Material cost variance:** It refers to the difference between the standard cost of materials specified and the actual cost of materials used. It arises owing to variation in the price of the material or in its usage. The ICMA terminology defines it as, "the difference between the standard direct material cost of the actual production volume and the actual cost of direct material". The following formula is used to calculate this variance.

Material cost variance = (Standard units × Standard price) – (Actual units × Actual price)

Material cost variance is the aggregate of material price and usage variance.

(*b*) **Material price variance:** It refers to that portion of material cost variance which is due to the difference between the standard price and the actual price paid. The ICMA terminology defines it as, "that portion of the direct material cost variance which is the difference between the standard price specified and the actual price paid for the direct material used". This variance arises on account of extra price paid on the units purchased. It can be calculated at the time of purchase or at the time of usage.

Generally the former is preferable. The formula to calculate material price variance is as follows:

Direct material variance = (Standard price –Actual price) × Actual quantity

The direct materials price variance arises on account of the following causes:

(*a*) Higher or lower prices paid than planned.
(*b*) Discounts received or foregone depending upon quantity bought.
(*c*) Purchase of superior or inferior quality of materials than planned.
(*d*) Buying substitute materials.
(*e*) Increase in charges such as transport cost, etc.

(*c*) **Material usage variances:** It refers to that portion of material cost variance owing to the difference between the standard quantity of materials specified and the actual quantity used. The ICMA terminology defines it as "the difference between the standard quantity specified for the actual production and the actual quantity used at standard purchase price". The following formula is used to calculate this variance:

Material usage variance = (Standard quantity – Actual quantity) × Std. price

The following causes give rise to materials usage variance:

(*a*) Low or high yield from material expected.
(*b*) Gain or loss arising out of substitute materials.
(*c*) Difference in the quality of materials than planned.
(*d*) Increased or decreased quantity of scrap than expected.
(*e*) Use of sub-standard or defective materials.
(*f*) Carelessness in the use of materials.
(*g*) Pilferage.
(*h*) Defective method of production.
(*i*) Wrong mixture of raw materials.

The materials usage variance can be sub-divided into material mix and material yield variance.

(*d*) **Materials mix variance:** The calculation of this variance arises in those industries where different types of raw materials are mixed to obtain required output. Examples of such industries are fertilisers, chemical, cement, food processing industries and so on. One distinct feature of such industries is, it involves losses by way of evaporation, breakage, shrinkage , etc. and are responsible for difference in the output. The ICMA terminology defines it as "the difference between total quantity in standard proportion, priced at the standard price and the actual quantity of materials used, at the standard price. In simple words, it is that portion of material usage variance which is due to the difference between the standard and the actual composition of mixture.

Material mix variance may arise under the following two situations:

1. Where the ratio of standard mix differ from the ratio of actual mix, but the total quantity of both the actual mix and standard mix remaining the same.

The following formula is used in this situation.

Material mix variance = (Revised std. qty. – Actual qty.) × Std. price

In this case the revised standard quantity is the same as the standard quantity.

2. Where both the ratio as well as total quantity differ between the standard and the actual mix.

The above formula is applicable in this situation also with a difference in calculating the revised standard quantity. The following formula is used to calculates the revised standard quantity.

$$\text{Revised std. qty.} = \frac{\text{Total weight of actual mix}}{\text{Total weight of std. mix}} \times \text{Std. qty. of material in question}$$

This is because, the standard quantity of each material will be revised, when the total weight of actual mix varies from the total weight of standard mix.

(*e*) **Material yield variance:** It is the difference between the standard yield specified and the actual yield obtained. The ICMA terminology defines it as "the difference between the standard yield of the actual material input and the actual yield both valued at the standard material cost.

There are two situations under which material yield variance can arise, *viz.*, (*i*) where actual mix does not differ from standard mix. In this situation the following formula is used

Material yield variance = (Total actual yield – Total std. yield) × Std. yield rate

where, Std. yield rate = $\frac{\text{Standard cost of std. mix}}{\text{Net standard output}}$

(*ii*) Where actual mix differ from standard mix. The following formula is used in this situation.

Material yield variance = (Actual yield –Revised std. yield) × Std. yield rate

where, Std. yield rate = $\frac{\text{Std. cost of revised std. mix}}{\text{Net std. output}}$

Material yield variance will arise owing to the following causes :

(*a*) Uses of sub-standard quality of materials.
(*b*) Losses arising out of chemical reaction.
(*c*) Defective method of production.
(*d*) Inadequate supervison.

Problem 2 : Bello Chemical Industries provide the following information from their records:

For making 10 kgs. of OMO, the standard material requirement is:

Material	*Qty. (kg.)*	*Rate per kg.*
X	8	6
Y	4	4

During December 1990, 100 kgs. of OMO were produced. The actual consumption of material is as under :

Material	*Qty. (kg.)*	*Rate per kg.*
X	75	7
Y	50	5

Calculate (*i*) Material cost variance.
(*ii*) Material price variance.
(*iii*) Material usage variance. **(University of Delhi, B.Com. (Hons.) 1991)**

Solution:

Material	*Standard*		*For 100 kgs.of OMO Actuals*	
	Qty.	*Rate*	*Qty.*	*Rate*
X	80[*1]	6	75	7
Y	40[*2]	4	50	5

(*i*) Material cost variance = (Std. units × Std. price) – (Actual units × Actual price)

$X = (80 \times 6) - (75 \times 7)$

$= 480 - 525 = -45\,(A)$

$Y = (40 \times 4) - (50 \times 5)$

$= 160 - 250 = -90\,(A)$

Total (–) 135 (*A*)

(*ii*) Material price variance = (Std. price – Actual price) × Actual qty.

$X = (6 - 7) \times 75 = 75\,(A)$

$Y = (4 - 5) \times 50 = 50\,(A)$

Total 125 (*A*)

(*iii*) Material usage variance = (Std. qty. – Actual qty.) × Std. price

$X = (80 - 75) \times 6 = 30F$

$Y = (40 - 50) \times 6 = 40A$

Total $10A$

Varification:

Material cost variance = Material price variance + Material usage variance

135 (*A*) = 125*A* + 10*A*

*1 For 10 kgs. → 8 kg in required

For 100 kgs. $\rightarrow \frac{8}{10} \times 100 = 80$

*2 For 10 kgs. → 4 kg. is required

For 100 kgs. $\rightarrow ? \frac{4}{10} \times 100 = 40.$

Problem 3 : From the given data, calculate:

(*a*) Material price variance.
(*b*) Material usage variance.
(*c*) Material cost variance.

Standard:

1. 250 kg. of raw materials is required for producing 175 kgs. of finished products.
2. Price of material per kgs. Rs. 4.

Actuals:

1. Production 52,500 kg.
2. Materials consumed 70,000 kgs.
3. Cost of materials Rs. 2,73,000. **(SV, University, B.Com., April 1999)**

Solution :

Calculation of actual price $= \frac{\text{Actual material cost}}{\text{Actual material consumed}}$

$= \frac{2,73,000}{70,000 \text{ kg}} = \text{Rs. } 3.90 \text{ per kg.}$

1. Material price variance = (Std. price – Actual price) × Actual usage

$= (4.00 - 3.90) \times 70{,}000$

$= 0.10 \times 70{,}000 = 7{,}000\ F$

Calculation of standard usage

For 175 kgs. of production, 250 kgs. of raw materials

For 52,500 kgs. $\rightarrow$?

$$\frac{52{,}500}{175} \times 250 = 75{,}000 \text{ kgs.}$$

2. Material usage variance = (Std. qty. – Actual qty.) × Std. price

$= (75{,}000 - 70{,}000) \times 4$

$= 5{,}000 \times 4 = 20{,}000\ F$

3. Material cost variance = (Std. qty. × Std. price) – (Actual qty. – Actual price)

$= (75{,}000 \times 4) \times (70{,}000 \times 3.90)$

$= 3{,}00{,}000 - 2{,}73{,}000$

$= 27{,}000\ F$

Varification:

Material cost variance = Material price variance + Material usage variance

$27{,}000\ F = 7{,}000\ F + 20{,}000\ F$

$27{,}000\ F = 27{,}000\ F$

Problem 4 : From the given data below, calculate (*i*) the material price variace, (*ii*) Material usage variance, (*iii*) Material cost variance

Quantity of materials purchased	3,000 units
Value of materials purchased	Rs. 9,000
Standard quantity of materials required per tonne of output	30 units
Standard rate of materials	Rs. 2.50 per unit
Opening stock of materials	NIL
Closing stock of materials	500 units
Output during the period	80 tonnes

Solution:

Calculation of quantity of materials used

Qty. of opening stock of materials	Nil
Add: Qty. of materials purchased	3,000
	3,000
Less: Qty. of closing stock of materials	500
	2,500

Calculation of actual price of materials purchased

$$= \frac{\text{Value of materials purchased}}{\text{Qty. of materials purchased}}$$

$$= \frac{9,000}{3,000} = 3$$

Calculation of standard qty. of materials for actual output

= Std. qty. of materials required per tonne of output × Actual output during the year

= 30 × 80 = 2,400 units

1. Materials price variance = (Std. price – Actual price) × Actual qty.
   = (2.50 – 3.00) × 2,500
   = 0.50 × 2,500 = 1,250 *A*
2. Materials usage variance = (Std. qty. – Actual qty.) × Std. price
   = (2,400 – 2,500) × 2.50
   = 100 × 2.50 = 250
3. Materials cost variance = (Std. qty. × Std. rate) – (Actual qty. × Actual rate)
   = 2,400 × 2.50) – (2,500 × 3)
   = 6,000 – 7,500 = Rs. 15,000 (*A*)

Problem 5 : From the following data extracted from the books Arvind Parimal Works, calculate the material mix variance:

	Standard	*Actual*
Material *A*	70 units @ Rs. 6 per unit	60 units @ Rs. 10 per unit
Material *B*	30 units @ Rs. 4 per unit	40 units @ Rs. 2 per unit
Output	100 units	100 units

Solution:

In this problem the total weight of the standard mix (70 + 30) = 100 units and the total weight of the actual mix (60 + 40) = 100 units are the same. So the revised standard quantity of each material will be the same as its standard quantity.

Materials mix variance = (Revised Std. qty. – Actual qty.) × Std. price

A = (70 – 60) × 6
= 10 × 6 = 60 *F*

B = (30 – 40) × 4
= 10 × 4 = 40 *A*

Total material mix variance:

Material *A* = 60 *F*

Material *B* = 40 *A*

20 *F*

Problem 6 : Calculate the material mix variance from the following data:

	Standard			*Actual*		
	Qty.	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*
	kg.	*Rs.*	*Rs.*	*kg.*	*Rs.*	*Rs.*
Material *X*	6	1.50	9	5	2.40	12
Material *Y*	2	3.50	7	1	6.00	6
	8	2.00	16	6	3.60	18

Solution:

In the problem, the total standard mix is different from the total actual mix. So, we have to calculate the revised standard quantity in respect of each materials.

$$\frac{\text{Total weight of actual mix}}{\text{Total weight of standard mix}} \times \text{Std. Qty. of the material in the mix}$$

Material *A* $= \frac{6}{8} \times 6 = 4.5$ kgs.

Material *B* $= \frac{6}{8} \times 2 = 1.5$ kgs.

Materials mix variance = (Revised Std. Qty. – Actual Qty.) × Std. price

A = $(4.5 - 5) \times 1.50$

$= 0.5 \times 1.50 = 0.75\ (A)$

B = $(1.5 - 1) \times 3.50$

$= 0.50 \times 3.50 = 1.75\ (F)$

Net material mix variance:

Material *A*	= 0.75 (*A*)
Material *B*	= 1.75 (*F*)
	1.00 (*F*)

Problem 7 : From the given data below, calculate the material price variance, the material usage variance, material cost variance and material mix variance.

Consumption per 100 units of product

Raw material	*Standard*	*Actual*
A	40 units @ Rs. 50 per unit	50 units @ Rs. 50 per unit
B	60 units @ Rs. 40 per unit	60 units @ Rs. 45 per unit

(*S.V. University, B.Com., October 1999*)

Solution:

Calculation of actual quantity used

A = 100 units @ 50 units per unit = 5,000 units

B = 100 units @ 60 units per units = 6,000 units

1. Material price variance = (Std. price – Actual price) × Actual Qty.

$A = (50 - 50) \times 5{,}000$

$= 0 \times 5{,}000 = \text{Nil}$

$B = (40 - 45) \times 6{,}000$

$= 5 \times 6{,}000 = 30{,}000A$

Calculation of standard quantity

$A = 100 \times 40 = 4{,}000$ units

$B = 100 \times 60 = 6{,}000$ units

2. Materials usage variance = (Std. Qty. – Actual Qty.) × Std. price

$A = (4{,}000 - 5{,}000) \times 50$

$= 1{,}000 \times 50 = 50{,}000A$

$B = (6{,}000 - 6{,}000) \times 40$

$= 0 \times 40 = \text{NIL}$

3. Materials cost variance = (Std. qty. × Std. price) – (Actual qty. × Actual price)

$A = (4{,}000 \times 50) - (5{,}000 \times 50)$

$= 2{,}00{,}000 - 2{,}50{,}000 = 50{,}000\,(A)$

$B = (6{,}000 \times 40) - (6{,}000 \times 45)$

$= 2{,}40{,}000 - 2{,}70{,}000 = 30{,}000\,(A)$

Verification:

Material cost variance = Material price variance + Material usage variance

$A \quad 50{,}000A = \text{NIL} + 50{,}000A$

$B \quad 30{,}000A = 30{,}000A + \text{NIL}$

4. Calculation of Revised Std. Qty.

$$\text{Revised Std. Qty.} = \frac{\text{Total weight of actual mix}}{\text{Total weight of std. mix}} \times \text{Std. qty. of material in question}$$

$$A = \frac{11{,}000}{10{,}000} \times 4{,}000 = 4{,}400$$

$$B = \frac{11{,}000}{10{,}000} \times 6{,}000 = 6{,}600$$

Material mix variance = (Revised std. qty. – Actual qty.) × Std. price

$A = (4{,}400 - 5{,}000) \times 50$

$= 600 \times 50 = 30{,}000A$

$B = (6{,}600 - 6{,}000) \times 40$

$= 600 \times 40 = 24{,}000F$

Problem 8 : Mixers Ltd. is engaged in producing a standard mix by using 60 kgs. of Chemical *X* and 40 kgs. of Chemical *Y*. The standard loss of production is 30%. The standard price of *X* is Rs. 5 per kg. and *Y* is Rs. 10 per kgs.

The actual mix and yield were as follows:

X — 80 kgs. @ Rs. 4.5 per kg.

Y — 70 kgs. @ Rs. 8 per kg.

Actual yield is 115 kgs.

Calculate material variance. **(CS, Inter, December 1998)**

Solution:

	Standard cost			*Actual cost*			*Standard cost per actual input qty.*		
	Qty.	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*
$X = \frac{60}{70} \times 115$	= 98.571	5	493	80	4.50	360	80	5	400
$Y = \frac{40}{70} \times 115$	= 65.714	10	657	70	8.00	560	70	10	700
	164.3		1,150	150		920	150		1,100
Less: 30%	49.3		–	35		–			
	115		1,150	115		920			

1. Material cost variance $= (SQ \times SR) - (AQ \times AR)$

$X = (98.571 \times 5) - (80 \times 4.50)$

$= 492.86 - 360 = 132.56F$

$Y = (65.714 \times 10) - (70 \times 8)$

$= 657.14 - 560 = 97.14F$

$230F$

2. Material usage variance $= (SQ - AQ) \times SP$

X $= (98.571 - 80) \times 5 = 92.86F$

Y $= (65.714 - 70) \times 10 = 42.86A$

$50.00F$

3. Material price variance $= (SP - AP) \times SQ$

X $= (5 - 4.50) \times 80 = 40F$

Y $= (10 - 8) \times 70 = 140F$

$180F$

4. Calculation of Revised Std. Qty.

$$\frac{\text{Total weight actual mix}}{\text{Total weight of std. mix}} \times \text{Std. qty. of material in question}$$

$$X = \frac{150}{164.3} \times 98.6 = 90$$

$$Y = \frac{150}{164.3} \times 65.7 = 60$$

Material mix variance = (Revised std. qty. – Actual qty.) × Std. price

$X = (90 - 80) \times 5 = 50F$

$Y = (60 - 70) \times 10 = 100A$

$50A$

5. Calculation of standard yield

$$\frac{115}{164.3} \times 150 = 105 \text{ kgs.}$$

Material yield variance = (Actual yield – Std. yield) × Std. price

$= (115 - 105) \times 10 = 100F$

Problem 9 : The standard cost of a certain chemical mixture was:

40% Materials *A* at Rs. 200 per ton
60% Materials *B* at Rs. 300 per ton
A standard loss of 10% is expected in production. During the period the following materials were used:
90 tons. Materials *A* at the cost of Rs. 180 per ton.
110 tons. Materials *B* at the cost Rs. 340 per ton.
The weight produced was 182 tons of good production.
Calculate:

(*i*) Material price variance.
(*ii*) Material usage variance.
(*iii*) Material mix variance.
(*iv*) Material yield variance.

(CS, Inter, Dec. 1997)

Solution:

Calculation of variances

		Standard			*Actual*		
		Qty.	*Rate*	*Amt.*	*Qty.*	*Rate*	*Amt.*
A	40%	80	200	16,000	90	180	16,200
B	60%	120	300	36,000	110	340	37,400
		200		52,000	200		53,600
Less: Normal Loss		20			18		
		180			182		

(*i*) Material price variance = (SP – AP) × AQ

$A = (200 - 180) \times 90$

$= 20 \times 90 = 1800F$

$B = (300 - 340) \times 110$

$= 40 \times 110 = 4400A$

$2600A$

(*ii*) *Material usage variance :*

Calculation of Std. Qty. for actual output

$$\frac{\text{Std. Qty}}{\text{Std. output}} \times \text{Actual output}$$

$$A = \frac{80}{100} \times 182 = 80$$

$$B = \frac{120}{100} \times 182 = 121$$

Material usage variance = (Std. qty. for actual output – Actual qty.) × Std. price

$A = (80 - 90) \times 200 = 2{,}000A$

$B = (121 - 110) \times 300 = 330F$

$= 1{,}670A$

(*iii*) *Material mix variance:*

As the Std. mix (200) is equal to actual mix (200), Revised Std. Qty. for both A and B is the same as std. qty.

Material mix variance = (Revised std. qty. – Actual qty.) × Std. price

$A = (80 - 90) \times 200$

$= 10 \times 200 = 2{,}000A$

$B = (120 - 110) \times 300$

$= 10 \times 300 = 3{,}000F$

$= 1{,}000F$

Calculation of std. cost per unit

$$= \frac{\text{Total cost of std. mix}}{\text{Std. output}}$$

$$= \frac{52{,}000}{180} = \text{Rs. } 288.88$$

(*iv*) Material yield variance = (Std. output for actual mix – Actual output) × Std. yield price

$= (180 - 182) \times 288.88$

$= 2 \times 288.88 = 577.$

2. Labour Cost Variance

The various labour cost variances can be shown under the following chart:

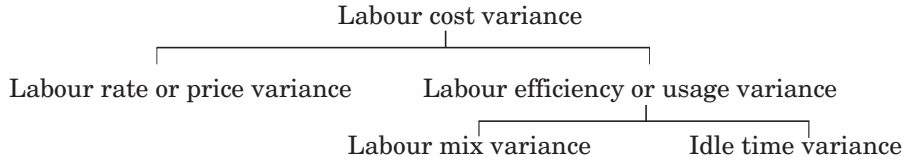


Fig. 25.3. *Chart showing labour cost variance.*

(*A*) *Labour cost variance*

This is also known as direct wages variance and represents the difference between standard direct wages specified for the actual production and the actual direct wages paid. The formula to calculate labour cost variance is as follows:

Labour cost variance = (Actual hours × Actual rate) – (Std. hours × Std. rate)

Labour cost variance is analysed into the following two variances.

(*a*) Labour rate or price variance: The ICMA terminology defines labour rate variance as "the difference between the standard and actual direct labour hour rate per hour for the total hours worked". In order words, it is that portion of labour cost variance owing to difference between the actual rate and standard rate of pay specified. The following formula is used for calculating this variance.

Labour rate variance = (Standard rate – Actual rate) × Actual hour

The following factors are responsible for direct labour rate variance:

(*i*) Payment of high wage rate than estimated.
(*ii*) Use of more skilled or unskilled labourers than planned.
(*iii*) Payment of excess bonus than estimated.
(*iv*) Payment of more overtime premium than estimated.

(*b*) Labour Efficiency or usage variance : It refers to that portion of the wage variance which is due to the difference between the standard labour hours specified and the actual labour hours expended. The following formula is used to calculate this variance.

Labour efficiency variance = (Standard hours – Actual hours) × Standard rate.

The following factors cause this variance:

(*a*) Use of inferior grade of labour.
(*b*) Lack of good supervision.
(*c*) Use of sub-standard quality of materials.
(*d*) Breakdown of machines during production process.
(*e*) Inadequate working conditions such as poor lighting, lack of ventilation, heating, etc.
(*f*) Lack of proper production organisation involving defective production planning, routing, scheduling, inspection, etc.

B. Idle Time Variance

Sometimes idle time may occur in spite of fixing standard carefully. Such idle time should not be included in efficiency variance but shown separately. Otherwise, employees are made responsible for inefficiency although idle time is beyond their control as for example, breakdown of machine or power supply. The following formula is used to calculate idle time variance:

Idle time variance = Idle hours × Standard rate variance

Idle time variance is always an adverse variance.

C. Labour Mix Variance or Gang Composition Variance

Sometimes employees of different grade may have to be used in place of specific grade because of shortage of labourers. In such a situation a labour mix variance is calculated to show management how much of labour cost variance is due to change in labour force. It is defined as the portion of the wage variance which is due to the difference between the standard labour grades specified and the actual grades utilised. It arises under two situations.

(*a*) Where Standard composition of labour force is revised owing to shortage of a particular type of labour but the total labour time spent is equal to the total standard time.

The following formula is used:

$$\text{Labour mix variance} = (\text{Revised std. mix on time} - \text{Actual mix or time}) \times \text{Std. wage rate per hour}$$

Note: The revised standard mix is the same as the standard mix or time.

(*b*) Where the standard composition of labour force is revised due to shortage of a particular type of labour and total actual time of labour differs from total standard time of labour. The following formula is used.

$$\text{Labour mix variance} = (\text{Revised std. mix} - \text{Actual std. mix or time}) \times \text{Std. wage rate per hour}$$

Where,

$$\text{Revised standard mix or time} = \frac{\text{Total time of actual mix of workers}}{\text{Total time of std. mix of workers}} \times \text{Std. time of the respective category of workers}$$

Problem 10 : The standard and actual figures of Ashok Metal Works are as under:

Standard time for the job	1,000 hours
Standard rate per hour	Re. 0.50
Actual time taken	900 hours
Actual wages paid	Rs. 360

Compute (*i*) Labour rate variance, (*ii*) Labour efficiency variance and (*iii*) Labour cost variance.

Solution :

Calculation of standard cost = 1,000 hrs. × 0.50 = 500

Calculation of actual rate per hour = $\frac{\text{Rs. } 360}{900}$ = 0.40

(*i*) Labour rate variance = (Standard rate – Actual rate) × Actual hrs.
= (0.50 – 0.40) × 900 = Rs. 90 (*F*)

(*ii*) Labour efficiency variance = (Standard hours – Actual hrs.) × Standard rate
= (1,000 – 900) × 0.50 = Rs. 50 (*F*)

(*iii*) Labour cost variance = Standard labour cost – Actual labour cost
= (500 – 360) = 140 (*F*)

Problem 11 : From the following particulars calculate (1) Labour rate variance, (2) Labour mix variance, (3) Labour efficiency variance and (4) Labour cost variance.

	Skilled	*Semi-skilled*	*Unskilled*
No. in std. gang	16	6	3
Standard rate per hour	3	2	1
Actual number in the gang	14	9	2
Actual rate of pay	4	3	2

In a 40-hours week the gang as a whole produced 900 standard hours.

Solution:

Calculation of standard hours

In a 40-hours week, the standard gang should have produced 1,000 standard hours as shown below:

Skilled	16 × 40 =	640
Semi-skilled	6 × 40 =	240
Unskilled	3 × 40 =	120
		1,000

But the actual output is 900 standard hours. Hence to find out the total labour cost variance the standard cost or cost charged to production is to be computed with reference to 900 standard hours. This is shown in the following statement.

Statement showing the standard cost actual cost and standard cost of actual gang for actual output, *i.e.*, 900 standard hours:

Gang	*Standard cost*			*Actual cost*			*Standard cost of actual gang*		
	Hrs.	*Rate*	*Amt.*	*Hrs.*	*Rate*	*Amt.*	*Hrs.*	*Rate*	*Amt.*
Skilled $\frac{640}{1,000} \times 900$	576	3	1,728	14 × 40 = 560	4	2,240	560	3	1,680
Semi-skilled $\frac{240}{1,000} \times 900$	216	2	432	9 × 40 = 360	3	1,080	360	2	720
Unskilled $\frac{120}{1,000} \times 900$	108	1	108	2 × 40 = 80	2	160	80	1	80
	900	2.52	2,268	1,000	3.84	3,480	1,000	2.48	2,480

1. Labour rate variance = (Standard rate – Actual rate) × Actual hours
   = (3 – 4) × 1,000 = 1,000 (*A*)
2. Labour mix variance = (Std. rate of std. gang or mix – Std. rate of actual gang or mix) × Actual hours
   = 2.52 – 2.48) × 1,000 = 40 (*F*)
3. Labour efficiency variance = (Standard hours – Actual hours) × Std. rate
   = (900 – 1,000) × 2.52 = 252 (*A*)
4. Labour cost variance = (Standard labour cost – Actual labour cost)
   = (2,268 – 3,480) = 1,212 (*A*)

Problem 12 : From the following particulars relating to Karnataka Toys Co. Ltd. calculate (1) Wage rate variance, (2) Labour efficiency variance, (3) Abnormal idle time variance and (4) Total labour cost variance.

Standard time per unit	2.5 hours
Actual hours worked	2,000 hours
Standard rate of pay	Rs. 2 per hour

25% of the actual hours has been lost as abnormal idle time.

Actual output	1,000 units
Actual wages	Rs. 4,500

Solution:

Calculation of standard cost charged to

Production = 1,000 units × 2.5 hrs. × Rs. 2 = Rs. 5,000

Actual wages paid = Rs. 4,500

Actual wage rate per hour = $\frac{4,500}{2,000}$ = 2.25

Standard wage rate per hour = 2.00

Abnormal idle time = $\frac{25}{100} \times 2,000$ = 500 hrs.

1. Wage rate variance = (Standard rate – Actual rate) × Actual hours
   = (2 – 2.25) × 2,000 = 500 (*A*)
2. Labour efficiency variance = (Standard hours – Actual hours) × Standard rate
   = (2,500 – 1,500) × 2 = 2,00 (*F*)

   Standard hrs. = Std. time per unit × Actual output
   = (2.5 × 1,000) = hrs. 2,500
3. Abnormal idle time variance = Idle time × Standard rate
   = 500 × Rs. 2 = Rs. 1,000 (*A*)
4. Total labour cost variance = Standard labour cost – Actual labour cost
   = 5,000 – 4,500 = 500 (*F*)

Problem 13 : Compute labour variance from the following data of a ship building company.

The particulars of labour force engaged on job on. 777, scheduled to be completed in 30 weeks are:

Category	*Standard*		*Actual*	
	Number	*Wage rate (Rs.)*	*Number*	*Wage rate (Rs.)*
Skilled	75	60	70	70
Semi-skilled	45	40	30	50
Unskilled	60	30	80	20

The actual time taken is 32 weeks. **(Nagarjuna University, M.Com., March 1992)**

Solution:

Category	*Standard*			*Actual*		
	*Weeks**	*Rate*	*Amt.*	*Weeks**	*Rate*	*Amt.*
Skilled	2,250	60	1,35,000	2,240	70	1,56,800
Semi-skilled	1,350	40	54,000	960	50	48,000
Unskilled	1,800	30	54,000	2,560	20	51,200
	5,400		2,43,000	5,760		2,56,000

*Total weeks = No. of workers × No. of weeks

1. Labour cost variance = Standard cost – Actual cost
   = 2,43,000 – 2,56,000
   = Rs. 13,000 (*A*)
2. Labour rate variance = (Standard rate – Actual rate) × Actual hours

Skilled	= (60 – 70) × 2,240	=	22,400 (*A*)
Semi- skilled	= (40 – 50) × 960	=	9,600 (*A*)
Unskilled	= (30 – 20) × 2,560	=	25,600 (*F*)
			6,400 (*F*)

3. Labour efficiency variance = (Standard hours – Actual hours) × Standard rate

Skilled	= (2,250 – 2,240) × 60	=	600 (*F*)
Semi-skilled	= (1,350 – 960) × 40	=	15,600 (*F*)
Unskilled	= (1,800 – 2,560) × 30	=	22,800 (*A*)
Total labour efficiency variance			6,600 (*A*)

Verification:

Labour cost variance = Labour rate variance + Labour efficiency variance

13,000 (*A*) = 6,400 (*A*) + 6,600a (*A*)

4. Labour mix variance = (Revised std. time* – Actual time) × Std. rate

Revised std. time $= \frac{\text{Actual mix}}{\text{Std. mix}} \times \text{Std. time}$

Skilled	$= \frac{5,760}{5,400} \times 2,250$	=	2,400
Semi-skilled	$= \frac{5,760}{5,400} \times 1,350$	=	1,440
Unskilled	$= \frac{5,760}{5,400} \times 1,800$	=	1,920
Skilled	= (2,400 – 2,240) × 60	=	9,600 (*F*)
Semi-skilled	= (1,440 – 960) × 40	=	19,200 (*F*)
Unskilled	= (1,920 – 2,560) × 30	=	19,200 (*A*)
	Labour mix variance		9,600 (*F*)

Revised labour efficiency variance = (Std. time – Revised std. time) × Std. rate

Skilled	= (2,250 – 2,400) × 60	=	9,000 (*A*)
Semi-skilled	= (1,350 – 1,440) × 40	=	3,600 (*A*)
Unskilled	= (1,800 – 1,920) × 30	=	3,600 (*A*)
		=	16,200 (*A*)

Verification:

Labour efficiency variance = (Labour mix variance + Revised labour efficiency variance)

6,600 (*A*) = (9,600 (*F*) + 16,200 (*A*)

3. Overhead Variance

Overhead variances arise on account of difference between actual overhead and absorbed overheads. In order to calculate overhead variance it is necessary to know the actual and absorbed overheads. The absorbed overhead rates are also known as the standard overhead recovery rate or standard overhead absorption rate. It is calculated by applying the following steps:

(*a*) To make the estimate of probable overheads to be incurred for each department for the next year.
(*b*) This estimated overhead is to be classified into fixed and variable overheads.
(*c*) The capacity utilisation either in terms of machine hours or labour hours or production units is to be estimated.
(*d*) Apply the following formula for calculating the standard overhead absorption rate:

$$\text{Standard fixed overhead rate} = \frac{\text{Budgeted fixed overhead}}{\text{Normal volume}}$$

$$\text{Standard variable overhead rate} = \frac{\text{Budgeted variable overhead}}{\text{Normal volume}}$$

(*A*) **Variable overhead cost variance:** It is defined as the difference between the actual variable overheads incurred and the variable overheads absorbed. This variance arises on account of over or under absorption of overheads. Calculation of this variance can be based on either hours or output. The following formula is used:

Variable overhead cost variance = Standard overhead cost recovered – Actual overhead cost

Where Std. overhead cost when overhead rate is per hours

= (Std. hours for actual output × Std. overhead rate per hour)

Standard overhead cost when overhead rate is output

= (Actual output × Std. overhead rate per unit)

(*a*) ***Variable overhead expenditue variance:*** It is defined as the difference between the actual variable overheads incurred and the allowed variable overheads based on the actual hours worked. Calculation of this variance is based on hours or output. The following formula is used:

Based on rate per hour

Variable overhead expenditure variance = (Std. variable overhead absorption rate per hr. × Actual hrs. worked) – Actual variable overhead

Based on rate per unit

Variable overhead expenditure variance = (Std. variable overhead absorption rate per unit – Actual variable rate per unit) × Actual output

(*b*) ***Variable overhead efficiency variance:*** This is defined as the difference between the allowed variable overheads and the absorbed variable overhead. The following formula is used to calculate this variance.

Variable overhead efficiency variance = (Actual hours – Std. hours for actual output) × Standard variable overhead aborption rate

or = (Std. qty. of output – Actual qty. of output) × Std. rate per unit.

(*B*) Fixed overhead variance: This is defined as the difference between the standard cost of fixed overhead absorbed in the production achieved, whether completed or not, and the fixed overhead attributed and charged to that period. The formula is:

(Std. hrs. for actual output × Std. fixed overhead rate) × Actual fixed overheads

(*a*) ***Fixed overhead expenditure overhead:*** This is defined as the difference between the budget cost allowance for production for a specified control period and the actual fixed expenditure attributed and charged to that period. In other words, it represents the difference between the fixed overhead as per budget and the actual fixed overhead incurred. The following formula is used to calculate this variance:

Fixed oh. expenditure variance = (budgeted qty. × Std. fixed oh. rate per unit) – Actual fixed oh.

or = (Budgeted fixed overhead – Actual fixed overhead)

(*b*) ***Fixed overhead volume variance:*** It is that portion of the fixed overhead variance which is the difference between the standard cost of the overhead absorbed in actual output and the standard allowance for that output. In this definition standard allowance means the budgeted overhead. The fixed overhead volume variance arises mainly because of the use of a pre-determined overhead recovery rate based on a normal volume of activity and of the actual level of activity being less or more than the normal volume so selected. The following formula is used to calculate this variance.

Fixed overhead variance = (Actual qty. – Budgeted qty.) × Standard rate.

or Fixed overhead volume variance = (Std. hours for actual production – Actual hours worked) × Std. fixed overhead rate

(*c*) ***Fixed overhead efficiency variance:*** It is that portion of the volume variance which reflects the increased or reduced output arising from efficiency above or below the standard which is expected. The following formula is used to calculate this variance:

Fixed overhead efficiency variance = (Actual qty. of production – Std. qty. of production for actual capacity) × Std. fixed overhead absorption rate per unit

or = (Std. hours for actual production – Actual hours worked) × Std. fixed overhead rate

(*d*) ***Fixed overhead capacity variance:*** This is defined as that portion of the fixed overhead volume variance which is due to working at higher or lower capacity than standard capacity.

The following formula is used to calculate this variance:

Fixed overhead capacity or usage variance = (Std. qty. of production – Revised budgeted qty. of production) × Std. fixed overhead rate per unit

or = (Std. hours for actual production – Actual hours of the period) × Std. fixed overhead rate per hour

(*e*) ***Calender variance:*** It is that portion of overhead volume variance which is due to the difference between the number of working days in the period to which the budget is applied.

The following formula is used to calculate this variance.

Calender variance = (Standard units – Revised budgeted units) × Std. fixed overhead rate per unit

or = (Std. number of working days or hrs. – Possible number of working days or hours) × Std. fixed overhead rate per day or hour.

Calender variance = (Budgeted hrs. – Actual hrs.) × Std. rate

(*f*) ***Seasonal variance:*** It is that portion of the overhead volume variance which is due to the difference between the seasonally budgeted output and the average output on which standards have been calculated.

The following are the main causes for the overhead volume variance.

Causes Controllable by Management

(*i*) Employees waiting for work.
(*ii*) Avoidable machine breakdown.
(*iii*) Lack of operator.
(*iv*) Lack of tools.
(*v*) Lack of instructions.

Causes Uncontrollable by Management

(*i*) Decrease in customer demand.
(*ii*) Excess plant capacity.

Problem 14 : (Overhead variance) From the following information compute fixed overhead cost, expenditure and volume/capacity variances.

Normal capacity is 5,000 hours.

Budgeted fixed overhead rate is Rs. 10 per standard hours. Actual level of capacity utilised is 4,400 standard hours.

Actual fixed overheads Rs. 52,000. (University of Delhi, B.Com., (Hons), 1991)

Solution:

1. Fixed overhead variance = Budgeted fixed overhead – Actual fixed overhead
   = 44,000 – 52,000 = 8,000 (*A*)
   Budgeted fixed overhead = Std. hrs. × Budgeted fixed overhead rate
   = 4,400 × Rs. 10 = 44,000
   Note: Budgeted fixed overheads are taken at the actual capacity utilised.
2. Expense variance = Budgeted total factory overhead – Actual fixed factory overhead
   = 50,000 – 52,000 = 2,000 (*A*)
3. Volume/capacity variance = (Actual capacity – Budgeted capacity) × Std. rate
   = (4,400 – 5,000) × 10 = 6,000 (*A*)

Verification:

Fixed overhead variance = Expense variance + Volume variance
8,000 (*A*) = 2,000 (*A*) + 6,000 (*A*).

Problem 15 : From the following particulars calculate all variances relating to fixed overheads.

	Budgeted	*Actual*
Fixed overhead for July 1993	Rs. 10,000	Rs. 10,200
Units produced in July 1993	5,000	5,200
Standard for one unit	4 hours	
Actual hours worked		20,100 hours

Solution:

1. Total fixed overhead variance = Absorbed fixed overhead – Actual fixed overhead
   = 10,400 – 10,200 = 200 (*F*)
   Absorbed fixed overhead = 5,200 × 2 = 10,400
   $= \frac{\text{Budgeted oh.}}{\text{Units}} = \frac{10,000}{5,000} = 2$
2. Overhead expenditure variance = Actual overheads – Budgeted overheads
   = 10,200 – 10,000 = 200 (*A*)
3. Overhead volume variance = (Actual qty. – Budgeted qty.) × Std. rate
   = (5,200 – 5,000) × 2 = 400 (*F*)
4. Overhead capacity variance = (Actual hours – Budgeted hours) × Std. hourly rate
   = (20,100 – 20,000) × 0.50 = 50 (*F*)

   $\text{Std. hourly rate} = \frac{\text{Rs. 2}}{\text{4 hrs.}} = 0.50$
5. Overhead efficiency variance = (Actual hrs. × Standard hour) × Std. rate per hr.
   = (21, 000 – 20,800) × 0.50 = 350 (*F*)
   Standard hours produced = 5,200 × 4 = 20,800

Problem 30 : Determine the budget and capacity variance fromtne following data :

Estimated factory overhead	Rs. 25,000
Estimated direct labour hours	5,000
Actual overhead expenses	Rs. 26,500
Applied overhead expenses	Rs. 22,500

(ICWA, Inter, June 1990)

Solution:

Overhead budget variance = Budgeted overhead – Actual overhead
= 25,000 – 26,500 = 1,500 (*A*)

Overhead capacity variance = (Std. hrs. for actual production – Actual hrs.) × Std. overhead rate per hr.
= (4,500 – 5,000) × 5 = 2,500 (*A*)

Problem 17 : The following information is available from the records of a factory

	Budgeted	*Actual*
Fixed overhead for May (Rs.)	5,000	6,000
Production in May (units)	1,000	1,050
Standard time per units (hrs.)	10	–
Actual hours worked in May	–	11,000

Compute:

(*i*) Fixed overhead cost variance
(*ii*) Expenditure variance
(*iii*) Volume variance
(*iv*) Capacity variance
(*v*) Efficiency variance

(CS, Inter, December, 2000)

Solution:

Calculation of Std. overhead rate:

$$= \frac{\text{Budgeted Fixed overhead}}{\text{Budgeted production units}}$$

$$= \frac{5{,}000}{1{,}000} = \text{Rs. } 5$$

Calculation of hourly rate:

$$= \frac{\text{Rs. } 5}{10 \text{ hrs.}} = 0.50$$

(*i*) Fixed overhead cost variance = Overhead recovered on actual output – Actual fixed overheads
= (1,050 units × Rs. 5) – 6,000
= 5,250 – 6,000 = Rs. 750 (*A*)

(*ii*) Expenditure variance = Budgeted fixed oh. – Actual fixed oh.
= 5,000 – 6,000 = Rs. 1,000 (*A*)

(*iii*) Volume variance = (Budgeted output – Actual output) × Std. rate per unit
= (1,000 – 1,050) × 5 = 250 (*F*)

(*iv*) Capacity variance = (Budgeted hours – Actual hours) × Std. rate per hr.
= (10,000 – 11,000) × 0.50 = 500 *F*

(*v*) Efficiency variance = (Std. hours for actual output – Actual hours) × Std. rate per unit
= 10,500 – 11,000) × 0.50 = 250 (*A*)

Problem 18 : Adarsh Ltd. has furnished you the following data:

	Budgeted	*Actual for July 1998*
Number of working days	25	27
Production in units	20,000	22,000
Fixed overhead (Rs.)	30,000	31,000

Budgeted fixed overhead rate is Re. 1 per hour. In July 1998, the actual hours worked were 31,500.

Calculate the following variances:

(*i*) Efficiency variance
(*ii*) Capacity variance
(*iii*) Calender variance
(*iv*) Volume variance
(*v*) Expenditure variance
(*vi*) Total overhead variance. **(CS, Inter, June 1999)**

Solution:

Calculation of Budgeted hours

Budgeted overheads Rs. 30,000

Budgeted overhead rate per hour Re. 1

$$\text{Budgeted hours} = \frac{\text{Rs. } 30{,}000}{\text{Re. } 1 \text{ per hour}} = 30{,}000 \text{ hrs.}$$

Calculation of standard time per unit of output

$$\frac{\text{Budgeted hours}}{\text{Budgeted output}} = \frac{30,000}{20,000} = 1.5 \text{ hrs.}$$

Calculation of std. hours for actual output

Actual output × Std. time per unit

$22,000 \times 1.5 = 33,000$ hrs.

Calculation of std. rate per unit

Std. rate per unit of output = 1.5 hrs. × Re. 1 per hr.

= Rs. 1.50

1. Efficiency variance = (Std. hrs. for actual output – Actual hrs.) × Std. rate per hr.

$= (33,000 - 31,500) \times 1$

$= 1,500 \times 1 = 1,500\,F$

OR

Efficiency variance = (Std. output for actual hrs. – Actual output hrs.) × Std. rate per unit

$= (21,000 \text{ units} - 22,000 \text{ units}) \times 1.50$

$= 1,000 \times 1.50 = 1,500\,F$

Note: *Calculation of std. output for actual hours:*

$$= \frac{\text{Actual Hours}}{\text{Std. time per unit of output}}$$

$$= \frac{31,500 \text{ hours}}{1.5 \text{ hours}} = 21,000 \text{ units}$$

2. Capacity variance = (Revised budgeted hours – Actual hours) × Std. Rate per hour

$= (32,400 - 31,500) \times 1 = 900\,A$

Note : *Calculation of revised budgeted hours:*

Actual working days × Budgeted hours per day

$27 \times 1,200 = 32400$

3. Calender variance = (Budgeted no. of working days – Actual no. of working days) × Budgeted overheads/Budgeted working days

$$= (25 - 27) \times \frac{30,000}{25}$$

$= 2 \times 1,200 = 2,400\,F$

4. Volume variance = (Budgeted output – Actual output) × Std. rate per unit

$= (20,000 - 22,000) \times 1.50$

$= 2,000 \times 1.50 = 3,000\,F$

5. Expenditure variance = Budgeted overheads – Actual overheads

= 30,000 – 31,000 = 1,000 (*A*)

6. Total overhead variance = (Actual output – Std. rate per unit – Actual overheads)

= (22,000 – 1.50 – 31,000)

= 33,000 – 31,000 = 2,000 (*F*).

4. Sales Variance

Sales variance is useful in controlling sales and thereby earn more profit. Sales variances can be calculated on the basis of (1) Sales margin or (2) Turnover.

(*A*) **Sales variances based on sales margin:** Before the various sales margin variances are discussed, it is better to know the concept of standard sales margin.

Standard sales margin: This refers to the difference between the standard selling price of a product and its standard cost and it is the same as the standard profit for the product. The term 'Standard cost' used above is to indicate 'total standard cost'. It includes both fixed and variable cost. When fixed cost is excluded it becomes standard marginal cost. The difference between standard selling price and standard marginal cost is known as standard sales contribution.

The various sales margin variances are as follows:

(*a*) ***Total sales margin variance:*** This is the difference between the budgeted margin from sales and the actual margin, when the cost of sales is valued at the standard cost of production. The following formula is used to calculate this variance:

Total sales margin variance = Standard margin or profit – Actual margin or profit.

(*b*) ***Sales margin price variance:*** This is that portion of total sales margin variance which is the difference between the standard margin per unit and the actual margin per unit for the number of units sold in the period. The following formula is used to calculate this variance:

Sales margin price variance = (Std. margin per unit – Actual margin per unit) × Actual qty.

(*c*) ***Sales margin quantity variance:*** This is that portion of total sales margin variance which is the difference between the budgeted number of units sold and the actual number sold valued at standard margin per unit. The following formula is used to calculate this variance:

Standard margin qty. variance = (Standard proportion for actual sales × Budgeted qty.) × Standard profit

When more than one product is sold, sales margin quantity variance is sub-divided into (*a*) Mix variance and (*b*) Volume variance.

(*d*) ***Sales margin mix variance:*** This is that portion of sales margin quantity variance which is the difference between the actual total number of units at that actual mix and the actual total number of units at standard mix valued at the standard margin per unit. The following formula is used to calculate this variance:

Sales margin mix variance = (Actual qty. × Std. proportion for actual sales) × Std. profit

(*e*) ***Sales margin volume variance:*** This is that portion of the sales margin quantity variance which is the difference between the actual total quantity of units sold and the budgeted total number of units at the standard mix valued at the standard margin per unit. The following formula is used to calculate this variance:

Sales volume variance = (Budgeted units sold – Actual units sold) × Std. margin per unit

(*B*) Sales variances based on turnover or sales value: Sales variances based on turnover is used, by those organisations which would like to exercise control on actual sales by comparing it with budgeted sales. The following are the variances based on turnover.

(*a*) ***Sales value variance:*** This refers to the difference between the budgeted sales and the actual sales. The following formula is used to calculate this variance:

Sales value variance = Budgeted sales – Actual sales

(*b*) ***Sales price variance:*** This refers to that portion of the sales variance which is due to the difference between the standard price specified and the actual price charged. The following formula is used to calculate this variance:

Sales price variance = (Actual price – Std. price) × Actual qty.

(*c*) ***Sales volume variance:*** It refers to that portion of the sales value variance which is due to the difference between the budgeted sales and the standard value of actual mix of sales. The following formula is used to calculate this variance:

Sales volume variance = (Std. qty. of sales – Actual qty. of sales) × Std. price

(*d*) ***Sales quantity variance:*** This refers to that portion of sales volume variance which is due to the difference between standard value of actual sales at standard mix and the budgeted sales. The following formula is used to calculate this variance:

Sales quantity variance = Budgeted sales – Revised standard sales

(*e*) ***Sales mix variance:*** This refers to that portion of the sales volume variance which is due to the difference between the standard and the actual composition of the sales mix. It is the difference between the standard value of actual mix and the standard value of actual sales at standard mix. The following formula is used to calculate this variance:

$$\text{Sales mix variance} = \left(\frac{\text{Std. mix}}{\text{Revised mix of actual qty. sold}} - \text{Actual mix} \right) \times \text{Std. price}$$

Problem 19 : (Sales variances) Ultra Modern Cassette Ltd. had budgeted the following sales for February 1991.

Cassette *A*	1,100	units @ Rs.	50 per unit
Cassette *B*	950	units @ Rs.	100 per unit
Cassette *C*	1,250	units @ Rs.	80 per unit

As against this, the actual sales were:

Cassette *A*	1,300	units @ Rs.	55 per unit
Cassette *B*	1,000	units @ Rs.	95 per unit
Cassette *C*	1,200	units @ Rs.	78 per unit

The cost per unit of Casette *A*, *B* and *C* was Rs. 45, Rs. 85 and Rs. 70 respectively.

Compute the different variance to explain the difference between the budgeted and actual product.

(C.S., Inter, June 1992)

Solution:

	Cassette A	*Cassette B*	*Cassette C*
Standard selling price (*see assumption 1*)	50	100	80
Standard cost (*see assumption 2*)	45	85	70
Standard profit	5	15	10

Assumption 1: Standard selling price is assumed to be equal to the budgeted selling price.

Assumption 2: Standard cost is assumed to be equal to actual cost.

Calculation of actual profit

Actual selling price		55	95	78
Actual cost		45	85	70
Actual profit		10	10	8

Actual profit:

Cassette *A*	—	1,300 @ Rs. 10	=	13,000
Cassette *B*	—	1,000 @ Rs. 10	=	10,000
Cassette *C*	—	1,200 @ Rs. 8	=	9,600
		Total	=	32,600

Budgeted profit:

Cassette *A*	—	1,100 @ Rs. 5	=	5,500
Cassette *B*	—	950 @ Rs.15	=	14,250
Cassette *C*	—	1,250 @ Rs.10	=	12,500
		Total	=	32,250

1. Total sales margin variance = (Std. profit cost or budgeted profit – Actual profit)
   (32,250 – 32,600) = 350 (*F*)

2. Sales margin price variance = (Std. margin per unit – Actual margin per unit) × Actual qty.

Cassette *A*	—	(50 – 55) × 1,300	=	6,500 (*F*)
Cassette *B*	—	(100 – 95) × 1,000	=	5,000 (*A*)
Cassette *C*	—	(80 – 78) × 1,200	=	2,400 (*A*)
			=	900 (*A*)

3. Sales margin volume variance = (Budgeted sales qty. – Actual qty. sold) × std. margin per unit

Cassette *A*	—	(1,100 – 1,300) × 5	=	1,000 (*F*)
Cassette *B*	—	(950 – 1,000) × 15	=	750 (*F*)
Cassette *C*	—	(1,250 – 1,200) × 10	=	500 (*F*)
			=	1,250 (*F*)

4. Sales mix variance = (Actual qty. – Std. proportion for actual sales) × Std. profit

Cassette *A*	—	(1,300 – 1,67) × 5	=	665 (*F*)
Cassette *B*	—	(1,000 – 1,008) × 15	=	120 (*A*)
Cassette *C*	—	(1,200 – 1,325) × 10	=	1,250 (*A*)
			=	705 (*A*)

Calculation of standard proportion for actual sales

Cassette *A*	=	$\frac{3,500}{3,300} \times 1,100$	=	1,167 units
Cassette *B*	=	$\frac{3,500}{3,300} \times 950$	=	1,008 units
Cassette *C*	=	$\frac{3,500}{3,300} \times 1,250$	=	1,325 units
				3,500 units

5. Sales margin qty. variance = (Std. proportion for actual sales – Budgeted qty.) × Std. profit

Cassette *A*	—	(1,167 – 1,100) × 5	=	335 (*F*)

Cassette *B*	—	(1,008 – 950) × 15	=	870 (*F*)
Cassette *C*	—	(1,325 – 1,250) × 10	=	750 (*F*)
			=	1,995 (*F*)

Volume variance = Mix variance + Quantity variance

1,250 *F* = 705 (A) + 1,955 (*F*)

Profit and loss statement

	Cassette A	*Cassette B*	*Cassette C*
Budgeted Sales	55,000	95,000	1,00,000
Less: Budgeted cost	49,500	80,750	87,500
Budgeted profit	5,500	14,250	12,500
Variances:			
Price variance	6,500 (*F*)	5,000 (*A*)	2,400 (*A*)
Mix variance	665 (*F*)	120 (*A*)	1,250 (*A*)
Qty. variance	335 (*F*)	870 (*F*)	750 (*F*)
	13,000	10,000	9,600

Problem 20 : Compute the following variances from the data given below:

1. Total sales margin variance.
2. Sales margin volume variance.
3. Sales margin price variance.
4. Sales margin mix variance.
5. Sales margin quantity (sub-volume) variance.

Product	*Budgeted quantity (Units)*	*Actual quantity (Units)*	*Budgeted sales price per unit (Rs.)*	*Actual sales price per unit (Rs.)*	*Standard cost per unit (Rs.)*
X	240	400	50	45	30
Y	160	200	25	20	15

(CA, Inter, May 1992)

Solution:

1. Total sales margin variance = Actual profit – Budgeted profit

   7,000 – 6,400 = 600 (*F*)

   (*see working note 2*)

2. Sales margin volume variance = (Actual qty. – Budgeted qty.) × Budgeted margin per unit

X	= (400 – 240) × 20	=	3,200 *F*
Y	= (200 – 160) × 10	=	400 *F*
			3,600 *F*

3. Sales margin price variance = (Actual margin per unit – Budgeted margin per unit) × Actual Qty.

X	= (15 – 20) × 400	=	2,000 (*A*)
Y	= (5 – 10) × 200	=	1,000 (*A*)
			3,000 (*A*)

4. Sales margin mix variance = (Budgeted margin per unit on actual mix – Budgeted margin per unit as budgeted mix) × Total actual qty. (*Refer working note 3*)
   = (Rs. 16,666 – 16) × 600 = 400 (*F*)
5. Sales margin qty. (sub-volume) variance = (Total actual qty. – Total budgeted qty.) × Budgeted margin per unit on budgeted mix
   = (600 – 400) × 16 = 3,200 (*F*)
   (*Refer working note 3*)

Verification:

Sales margin variance = Sales margin price variance + Sales margin volume variance

600 (*F*) = 3,000 (*A*) + 3,600 (*F*)

Sales margin volume variance = Sales margin mix variance + Sales margin qty. variance

3,600 (*F*) = 400 (*F*) + 3,200 (*F*)

Working Notes:

1. (*a*) Actual margin per unit = (Actual sales prices per unit – Standard cost per unit)

X	= (45 – 30)	= Rs. 15
Y	= (20 – 15)	= Rs. 5

   (*b*) Budgeted margin per unit = Budgeted sales price per unit – Std. cost per unit

X	= (50 – 30)	= Rs. 20
Y	= (25 – 15)	= Rs. 10

2. (*a*) Actual profit = Actual qty. of product unit sold – Actual margin per unit.

X	= 400 × 15	= 6,000
Y	= 200 × 5	= 1,000
		7,000

   (*b*) Budgeted profit = Budgeted qty. of units to be sold × Budgeted margin per unit.

X	= 240 × 20	= 4,800
Y	= 160 × 10	= 1,600
		6,400

3. (*a*) Budgeted margin per unit on actual mix

$$= \frac{20 \times 400 + 10 \times 200}{600}$$

$$= \frac{8{,}000 + 2{,}000}{6{,}000} = 16.666$$

   (*b*) Budgeted margin per unit on budgeted mix

$$= \frac{20 \times 240 + 10 \times 160}{400}$$

$$= \frac{4{,}800 + 1{,}600}{400} = \frac{6{,}400}{400} = \text{Rs. } 16$$

Control Ratios

Ratios are often used as a control technique in addition to monetary value of variance. The following ratios are commonly used in industries.

Efficiency Ratio

This ratio measures the efficiency at which the factory operates. The ICMA terminology defines efficiency ratio as "the standard hours equivalent to the work produced, expressed as a percentage of the actual hours spent in producing that work. Expressed as a formula:

$$\text{Efficiency ratio} = \frac{\text{Actual production in terms of standard hrs.}}{\text{Actual hours worked}} \times 100$$

Activity Ratio

This ratio measures the level of a activity at which the factory is operating. The ICMA terminology defines it as "the number of standard hours equivalent to the work produced, expressed as a percentage of the budgeted standard hours". Expressed as a formula:

$$\text{Actual ratio} = \frac{\text{Actual production in terms of std. hrs.}}{\text{Budgeted production in terms of std. hrs.}} \times 100$$

Capacity Ratio

The ICMA terminology defines it as "the relationship between the actual number of working hours and the budgeted number". Expressed as a formula:

$$\text{Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted production in terms of standard hours}} \times 100$$

Problem 21 : In a manufacturing shop, product *X* required 2.5 man hours and product *Y* requires 6 man hours. In a month of 25 working days of 8 hours a day 2,000 units of *X* and 1,000 units of *Y* were produced. The company employed 50 workers in the shop and the budgeted man-hours are 1,08,000 for the year. You are required to work out the capacity ratio, activity ratio, and efficiency ratio. (*ICWA, Inter, June 1990*)

Solution:

Standard man-hours produced

Product *X* :	2,000 units @ 2.5 man-hours	=	5,000 man-hours
Product *Y* :	1,000 units @ 6 man-hours	=	6,000 man-hours
	Total		11,000 man-hours

Budgeted standard man-hours per month

$$= \frac{1{,}08{,}000}{12} = 9{,}000 \text{ man-hours}$$

Actual man-hours worked = 50 workers × 25 days × 8 hrs. = 10,000 man-hours

1. Capacity ratio $= \dfrac{\text{Actual man} - \text{hours worked}}{\text{Std. man} - \text{hours budgeted}} \times 100$

$$= \frac{10,000}{9,000} \times 100 = 111.11\%$$

2. Activity ratio $$= \frac{\text{Standard man – hours produced}}{\text{Standard man – hours budgeted}} \times 100$$

$$= \frac{11,000}{9,000} \times 100 = 122.22\%$$

3. Efficiency ratio $$= \text{Standard man} - \frac{\text{Hours produced}}{\text{Actual man hours worked}} \times 100$$

$$= \frac{11,000}{10,000} \times 100 = 110\%.$$

Problem 22 : Calculate from the following figure:

1. Efficiency ratio
2. Activity ratio
3. Capacity ratio

Budgeted production	880 units
Standard hours per unit	10
Actual production	750 units
Actual working hours	6,000

(CA, Inter, May 1999)

1. Efficiency ratio $$= \frac{\text{Std. hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$= \frac{750 \text{ units} \times 10 \text{ hours}}{6,000} \times 100$$

$$= 125\%$$

2. Activity ratio $$= \frac{\text{Std. hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{750 \times 10}{880 \text{ units} \times 10 \text{ hours}} \times 100$$

$$= 85.23\%$$

3. Capacity ratio $$= \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$= \frac{600}{880 \times 10}$$

$$= 68.18\%$$

Problem 23 : If the activity ratio and capacity ratio of a company is 104% and 96% respectively find out its efficiency ratio". **(CA, Inter, May 1997)**

Solution:

$$\text{Activity ratio} = \frac{\text{Std. hours required for actual production}}{\text{Budgeted hours}} \times 100$$

$$\text{Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$\text{Efficiency ratio} = \frac{\text{Std. hours required for actual production}}{\text{Actual hours worked}} \times 100$$

From the above ratios it is clear that efficiency ratio can be obtained by dividing activity ratio by capacity ratio.

So,

$$\text{Efficiency ratio} = \frac{\text{Activity Ratio}}{\text{Capacity Ratio}} \times 100$$

(in percentage)

$$= \frac{104}{96} \times 100 = 108.33\%.$$

INVESTIGATION OF VARIANCE AND REPORTING TO MANAGEMENT

Investigation of variance enables to take prompt control over the variance. The following benefits are derived by the process of investigating the variance:

(*a*) The person responsible for the variance is revealed.
(*b*) It reveals the accuracy of accounting system.
(*c*) Whether variance is on account of abnormal conditions and if so how to take precautionary measures in such situation.
(*d*) To appraise the current standard and revise if need be.

Having investigated the variance, it is necessary to prepare variance anlaysis reports for the sake of submitting to management. In preparing and submitting such reports the following guidelines may be followed:

(*a*) The reports must be prepared and submitted promptly to the management. Otherwise its purpose is lost.
(*b*) Only those reports which are relevant to the persons jurisdiction to exercise control should be sent.
(*c*) Analysis of variance must be based on cost centre.
(*d*) Ratios, percentages, etc. can also be used while reporting in addition to monetary value of variances.
(*e*) The cost accountant should interact with various levels of management in addition to preparation and submission of reports.

The important reports to be sent to various levels of management are (1) Material price variance reports, (2) Material usage variance report, (3) Wage rate variances report, (4) Labour efficiency variance report, (5) Sales value variance report.

Based on the reports of variance analysis, the variances are disposed off. One method of treating variance is to transfer it to costing profit and loss account. The second method advocated by some accountants is to properly distribute over closing stock and cost of sales so that both these items can be shown at actual costs in financial statement.

REVISION AND METHODS VARIANCE

Sometimes standards are revised owing to reasons such as change in wage rate, fiscal policy, etc. It such changes are incorporated in the standards, it may affect the variances and controllable factors may escape the attention of executives. Hence any changes in the factors is included in the revised budget but the standard cost is retained as a matter of policy. This process of retaining the basic standards in spite of change in the factors and analysing the variances on the basis of basic standards is known as revision variance.

A method variance refers to the difference between the standard cost of manufacture performed by normal method and the cost of manufacturing by an alternate method.

QUESTIONS

I. Fill in the blanks

1. The system which determines what the cost 'should be' in advance of production is called ..... technique of costing.
2. For labour, the difference between actual hours at actual rate and actual hours at standard rate is called the ..... variance.
3. Gang composition variance is a sub-variance of ..... variance.
4. When the actual cost is less than the standard cost, the difference is known as ..... variance.
5. Overhead variance is the difference between the ..... cost of overhead absorbed in the output and the ..... overhead cost.
6. Material price variance = (Std. price – Actual price) × .....

[**Answer:** (1) standard costing, (2) labour rate, (3) labour efficiency (4) favourable, (5) standard, actual, (6) actual quantity]

II. Choose the correct answer

1. The cost of a product as determined under standard costing is
   (*a*) fixed cost (*c*) direct cost
   (*b*) historical cost (*d*) predetermined cost **[ ]**
2. While evaluating deviations of actual cost from standard cost, the technique used is
   (*a*) regression analysis (*c*) trend analysis
   (*b*) variance analysis (*d*) linear progression **[ ]**
3. Which one of the following standards can be attained under the most favourable conditions possible?
   (*a*) theoretical standard (*c*) normal standard
   (*b*) expected standard (*d*) basic standard **[ ]**
4. Standard costs are useful in all of the following except
   (*a*) reducing cost
   (*b*) speeding up preparation of operating reports
   (*c*) estabilshing records
   (*d*) costing inventories **[ ]**
5. Controllable variance are best disposed of by transferring to
   (*a*) cost of goods sold
   (*b*) inventories of work-in-progress and finished goods
   (*c*) cost of goods sold and inventories
   (*d*) costing profit and loss account **[ ]**

[**Answer:** 1. (*d*), 2. (*b*), 3. (*a*), 4. (*c*), 5. (*d*)]

III. Mark true or false

1. Standard costs are fixed for each industry by the trade association concerned. *T/F*
2. Standards do not allow for aby idleness and wastage and are therefore idealistic. *T/F*
3. Standards are arrived at on the basis of past performance. *T/F*
4. Standards represent achievable targets but after a purposeful effort. *T/F*
5. Standards for materials labour and overheads are inter-connected. *T/F*
6. Variance means the difference between the budget and standard costs. *T/F*
7. Favourable variances are those that increase the amounts and unfavourable ones reduce the amounts. *T/F*
8. All variances are transferred to the cost of sales account. *T/F*
9. Standard costing help management by exception by showing up the total difference between actual profit and standard profit. T/F
10. Price variances are calculated at actual quantity multiplied by differences in prices. *T/F*
11. Efficiency variance are concerned with quantities used and are calculated as standard quantity multiplied by difference in price. *T/F*
12. Yield variance shows the efficiency of labour. *T/F*

[**Answer:** True—4,5,10, Rest are all False]

IV. Short and long questions

1. Explain the term 'variance' under standard costing and discuss its significance. **(University of Kerala, M.Com., May 1992)**
2. Discuss the utility of variance analysis in cost control. What are the major causes for efficiency, volume, capacity and calender variance? **(Calicut University, M.Com., April 1992)**
3. Distinguish between standard costing and budgetary control. Discuss the advantages and disadvantages of standard costing. **(Kakatiya University, M.Com., May 1991)**
4. Distinguish between standard costing and budgetary control. Are both these systems inter-related? **(Bangalore University, M.Com., August 1989)**
5. Define standard costing. Explain the advantages and limitations of standard costing. **(Bangalore University, M.Com., May 1990)**
6. What are the various circumstances under which material price and usage variances are likely to arise? **(ICWA, Inter, June 1990)**

EXERCISE 1

SV Ltd., Manufactures BXE by mixing three ra materials. For every bactch of 100 kgs. of BXE, 125 kgs. of raw materials are used. In February 1986, 60 batches were prepared to produce and output of 5,600 kgs. of BXE. The standard and actural particulars for February 1986 are as udnder :

Raw	*Standard*		*Actual*		*Quantity of raw materials*
Material	*Mix*	*Price per*	*Mix*	*Price per*	*Purchased*
	%	Kg. (Rs.)	%	KLg.	Kg. (Rs.)
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

Calculate :

1. Material cost variance.
2. Material price variance.
3 Material mix variance.
4. Material yieeld variance.

(University of Delhi. B. Com. (Hons.) 1986)

[**Answer :** Material cost variance = Rs. 17,500 (A)

Material price variance A = 4,500 (*A*)
B = 3,000 (*F*)
C = 1,500 (*A*)
Material mix variance A = 15,000 *A*
B = 7,500 *F*
C = 0
Material yield variance = Rs. 7,000 *F*]

EXERCISE 2

Gemini Chemical Industries provide the following information from their records :

For making 10 kgs. of Gemco the standard material requirement is

Material	*Qty. (Kgs.)*	*Rate per kg. (Rs.)*
A	8	6.00
B	4	4.00

During April 1,000 kgs. of Gemco were produced. The actual consumption of material is as under :

Material	*Qty. (Kgs.)*	*Rate per kg. (Rs.)*
A	750	7
B	500	5

Calculate : (*a*) Material cost variance, (*b*) Material price variance, (*c*) Material usage vaiance.

(CA. Inter, May 1989)

[**Answer :** Tortal material cost Variance - 13,50 (A)
Tortal material price Variance - 1,250 (A)
Tortal material usage Variance - 100 (A)

EXERCISE 3

A company manufacturing 'distempers' operates a costing system. The standard cost for one of the products of the company shows the following macterials standard :

Materal	*Quantity*	*Standard price per kg.*	*Total (Rs.)*
A	40 kg.	75	3,000
B	10 kg.	50	500
C	50 kg.	20	1,000
		Material cost per units	4,500

The standard input mix is 200 kg. and the standard output of the finished product is 90 kg.

The actual results for a period are :

You are required to calculate the material price, mix, yield, usage and cost variance.

(ICWA, Inter, Dec. 1989)

[**Answer :** Material price variance = 15,00.000
Material mix variance = 19,00.00
Material yield variance = 15,00.000
Material usage variance = 34,00.000
Material cost variance = 4,90,000]

EXERCISE 4

Using the following information calculate labour cost variance, labour rate variance, labour efficiency variance and idle time variace.

Standard hours	: 5,000
Standard wage rate	: Rs. 4 per hour
Actual hoursss	: 6,000
Actual wage rate	: Rs. 3.50 per hr.
Time cost aon account of machine breakdown	: 3000 hrs. **(Calicuit Univerisyt, B. Com., April 1986)**

[**Answer :** Labour cost variance = Rs. 1,000 (A)
Labour rate variance = Rs. 3,000 (F)
Labour efficiency variance = Rs. 2,800 (A)
Idle time variance = Rs. 1,200 (A)

EXERCISE 5

(Overhead variance) : Following information is available from the records of a factory :

	Budget	*Actual*
Fixed overhead for June	Rs. 10,000	Rs. 12,000
Production in June (units)	2,000	2,100
Standard time per unt (hrs.)	10	
Actual hours worked in June		

Compute (*i*) Fixed overhead cost variance, (*ii*) Expenditure variance, (*iii*) Volume variance, (*iv*) Capacity variance, (*v*) Efficiency variance.

(CA, Inter, Nov. 1989)

[**Answer :** Fixed overhead expenditure variance = 2,000 (A)
Fixed overhead capacity variance = 1,000 (F)
Fixed overhead efficiency variance = 500 (A)
Fixed overhead volume variance = 500 (F)
Fixed overhead cost variance = 1,500(A)]

EXERCISE 6

(Sales variance) : X Ltd. operate a budgetary control and standard costing system. From the following data calcuate (*i*) sales variance, (*ii*) sales volume variance, (*iii*) sales price variance.

Product	*Budgeted*		*Actucal*	
	Unit of be sold	*Sales value*	*Units sold*	*Sales value*
		(Rs.)		(Rs.)
A	100	1,200	100	1,100
B	50	600	50	600
C	100	900	200	1,700
D	75	450	50	300
	325	3,150	400	3,700

(CS. (Final). June 1987)

[**Answer :** Sales volume variance = Rs. 200 (A)
Sales price variance = Rs. 750 (F)
Sales variance = Rs. 550 (F)]

EXERCISE 7

Budgeted and actual saole for the monthe of December 1984 of two products A and B of M/s. XY Ltd. were as follows :

Product	*Budgedted sales*		*Actual sales*	
	Units	*Price per*	*Units*	*Price per unit*
	Units	*Price per unit*	*Units*	*Price per unit*
A	6,000	5	5,000	5.00
	1,5000	4.75		
B	10,000	2	7,500	2.00
	1,750	1.90		

Budgeted cost for products A and B were Rs. 4 and Rs. 1.50 per unit respectively. Work out from the data the following variances :

(*i*) Sales value variance.
(*ii*) Sales volume varince
(*iii*) Sales prices variance.