

ACCOUNTING FOR MANAGERIAL DECISIONS

Lesson 1- 12

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MC 4.4 ACCOUNTING FOR MANAGERIAL DECISIONS

Max Marks 80

Internal Assessment 20

Note: There will be nine (9) questions in all. The first question is compulsory and consists of ten (10) short-questions having two (2) marks each. The candidates will be required to attempt one question from each unit and each question carries fifteen (15) marks.

Course Contents

Unit I

Introduction to Accounting: Management Accounting as a field of Accounting. The concepts of Management Accounting – objective; Nature and Scope. Financial Accounting, Cost Accounting and Management Accounting Account's position as a member of the management team.

Accounting Plan and Responsibility Centres: Meaning and significance of Accounting, Responsibility Centre, project centres, and investment centres problem of transfer pricing. Objective and determinants of Responsibility Centres.

Unit II

Financial Statement Analysis: Ratio Analysis, Fund and Cash Flow Statements.

Unit III

Marginal costing and Break-even analysis: Concept of marginal cost: Practical application of Marginal costing and Pricing. Cost – Volume- Profit analysis. Break-even-analysis Break even analysis: Assumptions and practical application of Break-even-analysis; Decision regarding sales-mix, make or buy and discontinuation of a product line. Marginal costing versus Direct Costing.

Unit IV

Budgeting: Definition of budget, Essentials of budgeting, Kinds of budgets-operating budget, Master Budget Flexible budget, Budgetary control Decision-marking for capital expenditure-capital budgeting, zero Base Budget, Performance budgeting.

Reporting to Management: Objects of Reporting, reporting needs of different management levels. Types of report, modes of reporting reports to different levels of management.

SUGGESTED READINGS

Murphy, Managerial Accounting ch 4, 5 & 6.

Man Mohan & Goyal: Principles of Management Accounting ch. 13.

Hingorani and others, op Cit. 11.

Welsch, Budgeting, Profit Planning and Control, ch.

Lesson – I

INTRODUCTION TO ACCOUNTING

Structure

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 Definition and Objectives
- 1.3 Nature and Scope
- 1.4 Expanding Horizons of Accounting
- 1.5 Financial Accounting
- 1.6 Cost Accounting
- 1.7 Cost Accounting vs. Financial Accounting
- 1.8 Limitations of Accounting
- 1.9 An Integrated Approach to Accounting
- 1.10 Summary
- 1.11 Glossary
- 1.12 Answers: Self Assessment
- 1.13 Terminal Questions
- 1.14 Suggested Readings

1.0 Learning Objectives:

After studying the lesson, you should be able to understand:

1. The concept of Accounting
2. Meaning of Financial Accounting
3. Difference between cost Accounting and Financial Accounting
4. Limitation of Accounting
5. Various fields of Accounting

1.1 Introduction

The objective of the present course is to develop your knowledge and appreciation of how accounting helps managers to operate effectively. As we shall see in the course of the present series of lessons, accounting and management are inextricably linked. It is precisely due to this reason that “Internal accounting” i.e. accounting as a tool of management and decision making, assumes added significance, regardless of whether you ultimately become an accountant or a manager. It is, however in the fitness of things to start with a discussion on accounting in general and then come to our main subject of management accounting.

The present lesson will, therefore, introduce you to the definition as a part of accounting, and the limitations of financial accounting. In the end we shall also try to give an Integrated view of accounting.

1.2 Definitions and Objectives:

Accounting is the advanced stage of, and includes, book, keeping and accountancy, i.e. keeping written records of incomes and profits, expenses or losses, and belongings and owing of a business or organization. Primarily

concerned only with the recording of transactions for a period of time, and the financial position of an undertaking at the end thereof the scope of accounting has since been widened enormously due to significant development in trade, Industry and commerce, and the variety of uses to which account keeping input.

In its more popular meaning, accounting is looked upon as the discipline of recording and classifying the monetary impact of business transactions and events on an enterprise for the purpose of reporting and interpreting the results to a variety of interested parties. Some of the important definitions of accounting, as discussed hereunder, may be helpful in comprehending the meaning, nature and scope of accounting.

According to Roy A. Foulke "Practical Financial Statement Analysis," "Accounting is the language of finance. It is the means of recording through "Arabic" numerals the forces and Value that represent every day business". A better definition is however, given by the Committee on Terminology of the American Institute of Certified Public Accountants. It defines accounting thus: "Accounting is the art of recording, classifying the summarizing, in a significant manner and it terms of money, the transactions and events, which are in part at least of financial character and interpreting the results thereof". In view of this definition and also in the context of modern business and industry, accounting has to a versatile system serving a large number of varying goals-simultaneously. From simple recordkeeping, it has now emerged to include in its fold a number of information needs of the decision maker. Smitty and Ashburne have this wider perspective in view when they define accounting as the science of recording and classifying business transactions and events, primarily of financial character, and the art of making significant summaries, analysis, and interpretations of these transactions and events, and communicating the result to persons who must make decisions or form judgments".

In a wide sense, therefore, accounting may be defined as the process of collecting, analyzing, interpreting and communicating economic data to meet the informational requirements of the various interests concerned, both externally and internally, with the operations of an enterprise, so as to permit informed judgment and decision by the users of the information. For a better appreciation of the above definitions, as also objective, nature & scope of accounting, the following points may be useful:

- (i) Accounting is both a science and an art.
- (ii) Transactions to be recorded in accounting and "generally" of financial character and historical facts.
- (iii) Non -monetary transactions may also be recorded in accounting (e.g. quantity in cost accounting).
- (iv) Any particular method of recording transactions cannot be made a criterion of accounting though double 'entry' system of book-keeping has become the most acceptable and scientific method of record keeping and accountancy.
- (v) No functional definitions of accounting can be complete without taking into consideration the following facts:
 - (a) Setting up systems of recording financial transactions:
 - (b) Recording and classifying financial transactions:
 - (c) Reporting the results of financial transactions;
 - (d) Checking the recording and reporting of financial data "(auditing)".
 - (e) Preparation of reports for management for planning and control purpose "(management accounting);
 - (f) Determining and controlling the cost of production and processes "(cost accounting)"; and
 - (g) Interpreting financial and managerial reports.

Some of these points will be elaborated in greater detail as we continue unfolding the various aspects of management accounting in the present series of lessons.

1.3 Nature and Scope:

Accounting neither strives for nor attains absolute-truth. It is not a perfect science, either. It is characterized by a rather elaborate theoretical framework, and its results are essentially dependent of judgment.

While there are many limited objectives of accounting, perhaps its principal purpose is to describe "change". Thus, in the case of business, the central goal of accounting is the determination of income i.e. changes resulting from efficiency of operations. The objective of accounting are generally expressed always in terms of monetary measurement. Abstract theories that are not susceptible to such measurement, no matter how pertinent they may appear, are generally beyond the scope of accounting. It may, however, be noted that more and more non-financial and non-monetary facts and data are now finding place in accounting especially in management reports, for planning, decision-making and control purposes.

Accounting is also "utilitarian": Its function can be appraised only from the standpoint of usefulness. George O. May in his book, "Financial Accounting, states that "accounting is utilitarian and – the relative Importance of different uses of accounting is subject to great and sometimes rapid change." In a complex and dynamic society, underlying accounting concepts and conventions as well as basic objectives must constantly be re-examined in the light of changing conditions.

In addition to being utilitarian, accounting is essentially "descriptive," as is required by its analytical and Interpretative functions. It gives the history of an enterprise, or of an individual's business, or of a government organization in financial terms expressed according to certain accepted principles, conventions and concepts of accounting". That being so, it follows that the history of accounting is a reflection of the history of commerce, industry and government. It has always been true in the past and will quite probably continue to be true in the future that accounting has been able to adopt itself to any needs or to any demands made upon it. It can describe anything which takes place and it can do so in financial or numerical terms. Moreover, accounting work requires a sound background of the process of recording transactions and an understanding of the implications of various concepts, conventions and principles used in the field of accounting. Without going into the details of these concepts, suffice it to say that these are essential for accumulating the basic accounting data in an informative manner. These data by themselves, however, do not lead to decision- making either in day-to-day matters or for long-term problems. A considerable amount of work has to be done to make the basic accounting information fit for utilization in the areas of managerial decision making, planning and control.

1.4 Expanding Horizons of Accounting:

During the last fifty years or so, the accounting horizon has been broadened significantly and the nature and scope of its functions have become more varied. The accountant is no longer merely or primarily concerned with ascertaining financial condition of an enterprise. He has been increasingly engrossed in such problems as (i) the determination of Income, (ii) the source and use of entity funds, (iii) the classification, allocation and control of costs, (iv) report presentation both for internal and external use, (v) forecasting and budgeting, (vi) protection and utilization of assets, (viii) conformance to tax and other governmental or legal regulations, and (viii) management information and control system etc.

A myriad of factors have contributed to the development of accounting to the present state, some of these factors may be described as (i) changes in business practices, (ii) form of business organization (iii) public enterprises and government bodies, (iv) taxation laws, (vi) paid and indirect management, and (vii) scientific approach or problems etc.

Scope of accounting has, therefore, enormously widened and the accountant has now emerged from a book-keeper or record keeper to become an expert analyst and the chief adviser to the management. He has also become a social scientist responsible to the whole society rather than individuals, as also an economic planner

making forecasts and providing the statistics of the cost of production and sales. He is also the main source of data and information for management control.

Keeping in view the varied functions, it is called upon to perform; accounting has been divided into the specialized fields of (1) financial accounting and auditing; (2) cost accounting (3) management accounting (4) tax or legal accounting (5) government or national accounting and (6) social accounting.

1. **Financial Accounting and Auditing:-** Financial accounting coupled with auditing, enables the owners of business its creditors and the management to ensure that all transactions dealing with the funds entrusted to management are properly, recorded and that the funds are held intact. Through the segregation of revenue and costs, it measures the income from the enterprise for a given period. The financial accounts are finally summarized and consolidated into (a) profit and loss accounts and (b) the Balance Sheet for a given period of time.
2. **Cost Accounting :-** The objective of cost accounting is to ensure that cost of carrying out the task entrusted to various levels of management remain within desirable limits. It is further designed to enable the management to measure the net income from and cost incurred on each venture or activity or process with a view to devising a plan for future. The assistance rendered by product cost figures in determining price policies is also considerable.
3. **Management Accounting:-** The objective of management is to assist management at all levels (through adequate reporting) to establish plans and exercise control on operations. Through this, top management measures the effectiveness of the policies initiated by it and devices plans and policies for the future. The essence of management accounting is the timely submission of information to the appropriate level of management in such detail as is necessary for the level. It may be useful to appreciate the fact that both cost accounting and management accounting are closely associated with each other in as much as both are designed for the use in the operational needs of the firm.
4. **Tax or Legal Accounting:** A large number of statutes now require the maintenance of accounting and preparing of accounts in a certain form and the submission of returns to government authorities.
5. **Government or National Accounting:** This is a separate branch of accounting because governments and business organizations use somewhat different types of accounting. Then emphasis in government accounting is on compliance with the laws governing the collection of taxes and disbursement of the money. Moreover, there are transactions taking place within the economy or with foreign countries. It helps the nation by keeping a record of the national wealth and its foreign trade, etc. and by ascertaining the national income. It also helps the State in making plans for national planning and development.
6. **Social Accounting:** It is the latest addition to the family of accounting. It involves the recording of the effect of various transactions on the society as a whole. It can hardly be denied that in our present world, there are costs to society involved in the operations of every kind of enterprise. Sooner or later, the technique will be developed to figure them out-to show not merely what it costs a producer to produce but also what it costs the society to produce. Presently, however, this branch of accounting is practically in the theorization stage.¹

1.5 Financial Accounting

Financial Accountancy or financial accounting is the field of accountancy concerned with the preparation of financial statements for decision makers, such as stockholders, suppliers, banks, employees, government agencies, owners, and other stakeholders. Financial capital maintenance can be measured in either nominal

1. Some of these concepts and conventions are: Separate entity, periodicity going concern cost basis, realization marking of cost and revenue, consistency conservatism and objectivity.

monetary units or units of constant purchasing power. The fundamental need for financial accounting is to reduce principal-agent problem by measuring and monitoring agents' performance and reporting the results to interested users.

In short, financial accounting is the process of summarizing financial data taken from an organization's accounting records and publishing in the form of annual (or more frequent) reports for the benefit of people outside the organization.

Financial accountancy is governed by both local and international accounting standards. Financial accountants produce financial statements based on the accounting standards in a given jurisdiction. These standards may be the generally accepted accounting principles of a respective country, which are typically issued by a national standard setter, or International Financial Reporting Standards, which are issued by the International Accounting Standards Board.

Financial accounting serves the following purposes:

- Producing general purpose financial statements.
- Producing information used by the management of a business entity for decision making, planning and performance evaluation.
- Producing financial statements for meeting regulatory requirements.

Objectives of Financial Accounting

- **Systematic Recording of Transactions:** Basic objective of accounting is to systematically record the financial aspects of business transactions i.e. book-keeping. These recorded transactions are later on classified and summarized for their analysis and interpretation.
- **Ascertainment of Result of above recorded transactions-** Accountant prepares profit and loss account to know the result of business operations for a particular period of time. The profit and loss account helps the management and different stakeholders in taking rational decisions. For example, if business is not proved to be remunerative or profitable, the cause of such a state of affairs can be investigated by the management for taking remedial steps.
- **Ascertainment of financial positions of business-** Businessman is not only interested in knowing the result of the business in terms of profits or loss for a particular period but is also anxious to know that what he owes (liability) to the outsiders and what he owns (assets) on a certain date. To know this, accountant prepares a financial position statement of assets and liabilities of the business at a particular point of time and helps in ascertaining the financial health of the business.
- **Providing information to the users for rational decision making:-** Accounting as a 'language of business' communicates the financial result of an enterprise to various stakeholders to meet the financial information needs of the decision-makers and helps them in rational decision-making.

1.6 Cost Accounting:

Cost Accounting is a process of collecting, analyzing, summarizing and evaluating various alternative courses of action. Its goal is to advise the management on the most appropriate course of action based on the cost efficiency and capability. Cost accounting provides the detailed cost information that management needs to control current operations and plan for the future.

Since managers are making decisions only for their own organization, there is no need for the information to be comparable to similar information from other organizations. Instead, information must be relevant for a particular environment. Cost accounting information is commonly used in financial accounting information, but first we are concentrating on its use by managers to make decisions.

Unlike the accounting systems that helps in the preparation of financial reports periodically, the cost accounting systems and reports are not subject to rules and standards like the Generally Accepted Accounting Principles. As a result, there is wide variety in the cost accounting systems of the different companies and sometimes even in different parts of the same company or organization.

1.7 Cost Accounting vs Financial Accounting:

- Financial accounting aims at finding out results of accounting year in the form of Profit and Loss Account and Balance Sheet. Cost Accounting aims at computing cost of production/service in a scientific manner and facilitates cost control and cost reduction.
- Financial accounting reports the results and position of business to government, creditors, investors, and external parties.
- Cost Accounting is an internal reporting system for an organization's own management for decision making.
- In financial accounting, cost classification based on type of transactions, e.g. salaries, repairs, insurance, stores etc. in cost accounting, classification is basically on the basis of functions, activities, products, process and on internal planning and control and information needs of the organization.
- Financial accounting aims at presenting 'true and fair' view of transactions, profit and loss for a period and Statement of financial position (Balance Sheet) on a given date. It aims at computing 'true and fair' view of the cost of production/services offered by the firm.

1.8 Limitations of Accounting:

Every science, however perfect, has its own limitations. Knowledge of these limitations will enable us to interpret accounting information particularly relating to financial accounting, correctly and without any confusion. The following may be mentioned as the main limitations of accounting:-

- (1) Accounting records only those transactions or events which are capable of being expressed in terms of money (or at best quantitatively). Any non-monetary event, however important, does not have any place in accounting. For example labour management or business customer relation, efficiency, honesty and loyalty of the staff and many similar facts though very significant, are not recorded in accounting.
- (2) Accounting records only historical facts, i.e. the events that have already occurred. The transactions in the process of being finalized are also not recorded in accounting, though it may present a misleading picture of the business before those who read the financial reports. For instance, negotiations regarding acquisition of some valuable assets. Friendly settlement with the competitors, or an effort in obtaining an import licence, are not recorded in the books of account, as accounting simply makes a historical record of the business events, it cannot record the future events, however important.

This limitation is, however avoidable to a large extent by budgeting in different fields, as also by providing additional, significant information along with the financial reports.

- (3) The third limitation of accounting relates to price level changes. Accounting does not take into consideration the changes in the value of money-the common denominator of accounting and to that extent fails to record the transactions correctly. As accounting records transactions in fixed rupee, the accounting value may not represent the "true" value at a particular point of time due to price-level changes. This is the most serious criticism of accounting by economics. Owing to this limitation during inflection unduly larger profits may be consumed to the disadvantage, whereas, in deflection, monetary loses bring about demoralizing effect.

The effects or price level changes may be avoided, to a great extent, by using Index numbers for periodical revaluation of assets and by placing the profits and losses arising out of such revaluation to the credit and debit of a currency suspense account respectively.

It may, however, be observed that the aforesaid limitations relate in particular, to historical accounting, generally known as financial accounting. Internal accounting or management, be it cost accounting or managerial accounting goes far beyond the limited scope of financial accounting and seeks to do away with most of these limitations.

1.9 An Integrated Approach to accounting:

Before we conclude this lesson, it may be appropriate to have an overall and integrated view of accounting as we look at it today. Till recently, as we have observed, accounting was considered as a matter of routines encashed within the frame work of business prudence and law. Unfortunately, even when the expanding horizons of accounting are recognized, many accountants view different fields of accounting as various specialised and distinct areas or accounting, thereby suggesting that accounting is not an integrated field. As Hingorani and others "(Management Accounting)" rightly suggest, accounting is a cohesive system comprising a series of interdependent routines, blended together with all other material information designed to achieve these objective and goals through a prescribed strategy. Thus, in the context of modern business and industry, accounting has to be a versatile system serving a large number of varying goals external and internal, simultaneously.

An integrated view of accounting can also be had with reference to the types of information needed by management have been neatly described in a study of seven large U.S. companies, made by H.A. Simon and his associates. Simon "(Administrative Behaviour)" states: "By observation of the actual decision- making process, specific types of data needs were identified at particular organizational levels- each involving quite distinct problems of communication for the accounting department." Three types of information, each serving a different purpose, were identified. Accordingly, the accountant's task of supplying information has three facts:

1. Score keeping: The accumulation of data. This aspect of accounting enables both internal parties to evaluate organizational performance and position.
2. Attention directing: The reporting and interpreting of information which helps managers to focus on operating problems imperfections, inefficiencies, and opportunities. Attention directing is commonly associated with current planning and control and with the analysis and investigation of recurring routine internal accounting reports.
3. Problem solving: This aspect of accounting involves the concise quantification of the relative merits of possible courses of action often with recommendations as to the best procedure. Problem solving is commonly associated with long-range planning, and non-recurring decisions-situations that require special accounting analysis or reports.

The scorecard and attention directing uses of accounting data are closely related. Moreover, as Charles T. Horngren point out, the above distinctions sometimes overlap or merge. Consequently, "It is often difficult to pinpoint a particular accounting task as being score keeping, attention directing, or problem solving. Nevertheless, attempts to make these distinctions provide insight into the objective and and takes of both accountants and managers."

Self Assessment

Fill in the blanks:

1. _____ recorded business transactions on double-entry basis and helped ascertainment of profit or loss for the given period and valuation of stock of assets and liabilities on a given date.

2. Financial accounting enabled the concern with the liabilities and safeguards the assets entrusted and therefore was also known as _____ accounting.
3. _____ identified expenses to the origin by classifying them as direct or indirect expenses and depending upon their variability categorised them as variable or fixed expenses.
4. The fundamental principles of _____ are applicable in financial accounting as well as cost accounting.
5. Accounting has been divided into _____ specialized fields.
6. The specialized fields into which accounting has been divided are _____ (name them).

1.10 Summary:

The rendering of management services by accountants have transformed the accounting function into one dealing with “the measurement and communication of economic data,” and the elements in the accounting function have to deal with the “observing” measuring recording, classifying, summarizing and interpreting financial data.” The accountant has, therefore, to find an important place in the organization structure with the major responsibility for the entire process of quantitative information gathering, inclusive of the accounting function but definitely not limited to it, and communicating the same in right form in time for facilitating effective decision making. The modern management needs a sophisticated management information system for a continuous and timely flow of information both externally and internally. The accounting system will have to be linked with this to serve its purpose in the changed context. From this point of view, the accountant faces a real challenge to look beyond the narrow confines of his own accounting system and examine the total business information needs. As such, the business information system of the future is likely to be a well-integrated, single, multiple-purpose system with a highly selective reporting to serve the three main purpose of score-keeping, attention directing and problem solving.

1.11 Glossary:

Cost Accounting: This helps management to conduct performance appraisal and also facilitates in formulating price policies.

Financial Accounting: Financial accounting is a traditional method of accounting that supplies historical information about the firm during the past.

Human Resource Accounting: Human Resource Accounting means the accounting for human being as now in an organization human being is treated as an asset like other physical assets. It is recorded in the books like other assets.

Management Accounting: Management accounting provides necessary information to assist the management in the creation of policy and in the day-to-day operations.

Responsibility Accounting: Responsibility accounting is a special technique of management under which accountability is established according to the responsibility delegated to the various levels of management

1.12 Answers: Self Assessment:

1. Financial accounting
2. Custodial or stewardship
3. Cost accounting
4. Double entry system
5. Six

6. Financial accounting and auditing; cost accounting, management accounting; tax or legal accounting; government of national accounting and social accounting.

1.13 Terminal Questions:

1. Define the term 'Accounting'.
2. Discuss the nature and scope of Accounting
3. Describe some of the more important limitations of Accounting.
4. Explain the statement:

"In the context of modern business and industry, accounting has to be versatile system serving a large number of varying goals, both external and internal, simultaneously"

1.14 Suggested Readings:

Mongra J. R. Financial Accounting, Mayur Paperbacks, New Delhi.

Horngram, C. T Garg L, Sundem and William O. Stratton, Introduction to Management Accounting, Prentice Hall, Delhi.

Lall, B. M, and I.C. Jain, Cost Accounting: Principles and Practice, Prentice Hall, Delhi.

Lesson – 2

MANAGEMENT ACCOUNTING

Structure:

- 2.0 Learning Objectives
- 2.1 Introduction
- 2.2 Management Accounting
- 2.3 Characteristics or Nature of Management Accounting
- 2.4 Functions or objectives of Management Accounting
- 2.5 Scope of Management Accounting
- 2.6 Controllership
- 2.7 Distinction between Financial Accounting and Management Accounting
- 2.8 Summary
- 2.9 Glossary
- 2.10 Answers: Self Assessment
- 2.11 Terminal Questions
- 2.12 Suggested Readings

2.0 Learning Objectives:

After studying the lesson, you should be able to understand:-

1. Meaning and concept of Management Accounting
2. Nature and Functions of Management Accounting
3. Position of Management Accountant
4. Difference between Financial Accounting and Management Accounting
5. Relation of Accounting information and the decision process.

2.1 Introduction:

In previous lesson, you have seen how the scope of accounting has expanded from its record-keeping function to include in its fold a variety of more important functions: it has now emerged as an aid to management for decision making, planning and control. With this overall background of accounting, we now proceed to discuss in this lesson the meaning and functions of management accounting and how it differs from financial accounting. The main thrust of our discussion here will be on accounting. The main thrust of our discussion here will be on accounting as a tool of management rather than on recording of transactions or account-keeping.

Although we have identified a number of specialized fields of accounting, a closer scrutiny would reveal that, keeping in view the underlying objectives, accounting may be broadly classified into two categories, viz (i) "external accounting" which is meant to serve all parties external to be operating responsibility of the firm, and (ii) "internal accounting" designed for us in the operational needs of the organization by management. The first category, looks to the interests of these who have primarily a financial stack in the affairs of the firm-investors, creditors, employees, government and public in general. This is done through proper and accurate recoding of transactions and reporting the results thereof, and is conveniently referred to as, "Financial Accounting. On the other hand, accounting which is primarily concerned with providing information and reports relating to the

conduct of the various aspects of a business so as to assist management in efficient decision making, planning and control, is called, Management Accounting.

Charles T. Horngren in “Accounting for Management Control” An introduction views accounting system as the major quantitative information system in almost every organization. According to him, an effective accounting system provides information for “three” broad purposes:

- i) Internal reporting to managers, for use in planning and controlling current routine operations:
- ii) Internal reporting to managers, for use in making special non-routine decisions and in formulating major plans and policies and
- iii) External reporting, to shareholders, government and other outside parties.

Both management and the external parties share an interest in all three important purposes, but the emphasis of financial accounting and of management (internal) accounting differ. Financial accounting is mainly concerned with the third purpose, that is with the historical, custodial and stewardship aspects of external reporting. The distinguishing feature of management accounting – of accounting for planning and control- is its emphasis on the first and second purposes of internal reporting.

2.2 Management Accounting:

Management accounting is interwoven with management itself. Accounting is a service function and should be viewed as such. Management accounting is not management but it helps management to perform better and more effectively. In ordinary language, therefore, Management Accounting is used to describe the modern concept of accounting as a tool of management in contrast to conventional financial accounting. The objective is to so expand the financial and statistical information as to shed light on all phases of the organizational activities.

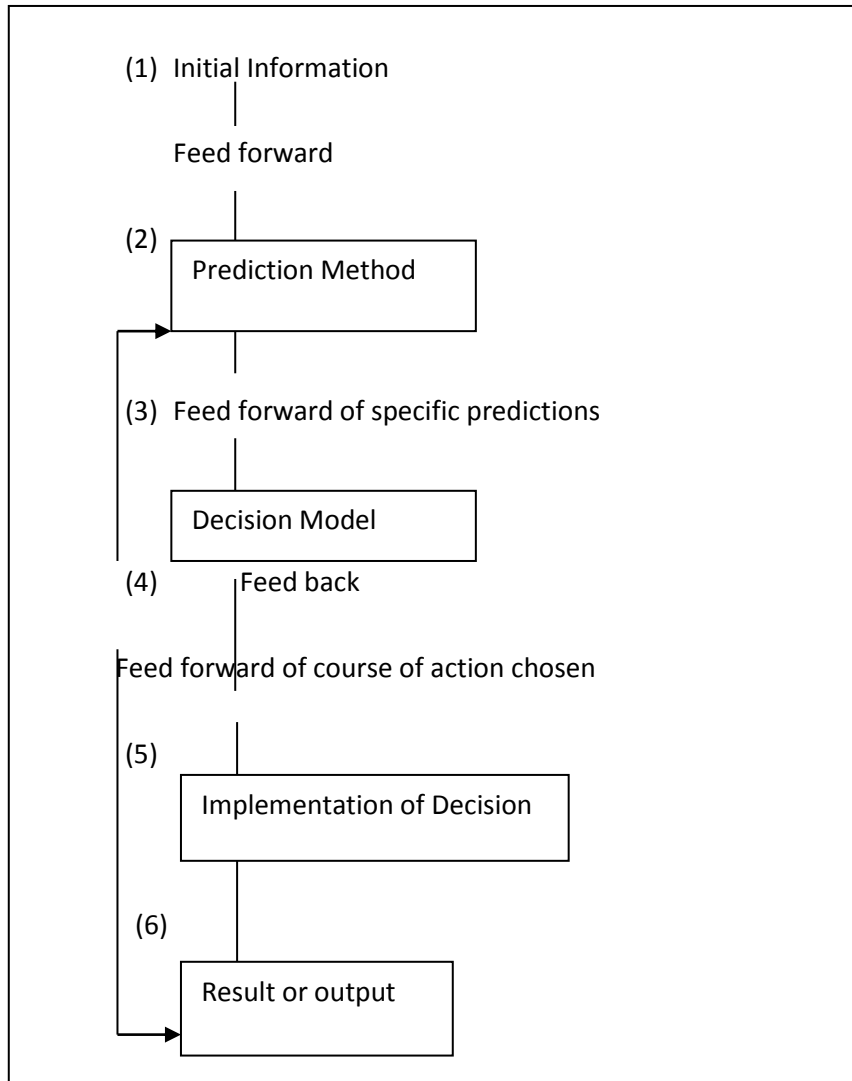
Management accounting may, therefore be defined as the application of appropriate technique and concept in processing the historical and projected financial and economic data of an organization to assist management in establishing a plan, for reasonable economic objectives, and in the making of rational decisions with a view toward achieving these objectives (Choudhary). It is apparent that both accountants and managers must try to become as possible with all phases of their organization and with the viewpoints and needs of all levels of management. Accounts have to supply relevant information that will help managers at different levels to distinguish over-all organizational objectives and assist them in making wise decisions. As mentioned in Lesson 1, the action directing and problem solving functions are the distinguishing features of management accounting.

Before we proceed further, it appears to be in the fitness of things to discuss a few definitions of management accounting as given by different authorities. The Institute of Chartered Accountants of England and Wales simply points out that ‘any form of accounting which enable a business to be conducted more efficiently can be regarded as Management Accounting is concerned with accounting information which is useful to management.’ Almost in the same vein, Smith views management accounting as “a more intimate merger of the two older professions of management and accounting wherein the informational needs of the manager determine the accounting means for their satisfaction, “Elaborating a little further, Batty opines that “management accountancy is the term used to describe the accounting methods, system and techniques which coupled with special knowledge and ability, assist management in its task of maximizing profits or minimizing losses”. Obviously, the common thread underlying all these definitions are the use that management accounting has for efficiency and effectiveness of the various phases of management.

However, perhaps the most elaborate and authoritative definition has been given by the Management Accounting Team of Anglo-American Council on Productivity. In their own words, “Management Accounting is the presentation of accounting information in such a way as to assist management in the creation of policy and the day to day operation of an undertaking. The technique of accounting is of extreme importance as it works in

most nearly universal medium available for the expression of fact so that facts of great diversity can be presented in the same picture. It is not the presentation of this picture that is the function of management but the use of them.”

From all the above definitions of management accounting. It naturally emerges that accountant’s main purpose is to help managers make decisions. As Horngren puts it, the accountant and the manager must be concerned with decision analysis and implementation as a unified whole. Modern management accounting encompasses the gathering and reporting of information for decision process in management of an organization can be had from the following model:



Relation of accounting information and the Decision Process (Adopted from Charles T. Horngren, “Cost Accounting, A Managerial Emphasis.” Prentice Hall, New Delhi 1973 P. 6.

2.3 Characteristics or Nature of Management Accounting:

The task of management accounting involves furnishing of accounting data to the management for basing its decisions on it. It also helps, in improving efficiency and achieving organizational goals. The following are the main characteristics of management accounting:

1. **Providing Accounting Information:** Management accounting is based on accounting information. The collection and classification of data is the primary function of accounting department. The information

so collected is used by the management for taking policy decisions. Management accounting involves the presentation of information in away it suits managerial needs. The accounting data is used for reviewing various policy decisions. Management accounting is a service function and it provides necessary information to different levels of management.

2. **Cause and effect analysis:** Financial accounting is limited to the preparation of profit and loss account and finding out the ultimate result, i.e. profit or loss management accounting goes a step further. The 'cause and effect' relationship is discussed in management accounting. If there is a loss, the reasons for the loss are probed. If there is a profit, the factors different expenditures, current assets, interest payables, share capital, etc. So the study of cause and effect relationship is possible in management accounting.
3. **Use of Special Techniques and concepts:** Management accounting uses special techniques and concept to make accounting data more useful. The techniques usually used include financial planning and analysis, standard costing, budgetary control, marginal costing, project appraisal, control accounting, etc. The type of technique to be used will be determined according to the situation and necessity.
4. **Taking Important Decisions:** Management accounting helps in taking various important decisions. It supplies necessary information to the management which may base its decisions on it. The historical data is studied to see its possible impact on future decisions. The implications of various alternative decisions are also taken into account while taking important decisions.
5. **Achieving of Objectives:** In management accounting, the accounting information is used in such a way that it helps in achieving organizational objectives. Historical data is used for formulating plans and setting up objectives. The recording of actual performance and comparing it with targeted figures will give an idea to the management about the performance of various departments. In case there are deviations between the standards set and actual performance of various departments corrective measures can be taken at one. All this is possible with the help of budgetary control and standard costing.
6. **Increase in Efficiency:** The purpose of using accounting information is to increase efficiency of the concern. The efficiency cab be achieved by setting up goals for each department. The performance appraisal will enable the management to pin point efficient and inefficient spots. An effort is made to take corrective measures so that efficiency is improved. The constant review of working will make staff cost-conscious. Everyone will try to control cost on one's own part.
7. **Supplies Information and not decision:** The management accountant supplies information to the management. The decisions are to be taken by the top management. The information is classified in the manner in which it is required by the management. Management accountant is only to guide and not to supply decisions. 'How is the data to be utilized' will depend upon the caliber and efficiency of the management.
8. **Concerned with forecasting:** The management accounting is concerned with the future. It helps the management in planning and forecasting. The historical information is used to plan future course of action.

2.4 Functions (or objectives) of Management Accounting:

Main functions or objectives of Management Accounting are as follows:

1. **Planning:** Information and date provided by Management accounting helps management to forecast and prepare short-term and long term for the future activities of the business and formulate corporate

strategy. For this purpose management accounting techniques like budgeting, standard costing, marginal costing.

2. **Coordinating:** Management accounting techniques of planning also help to coordinating various business activities. For example, while preparing budgets for various departments like production, sales, purchases, etc., there should be full coordination so that there is no contradiction. By proper financial reporting, management accounting helps in achieving coordination in various business activities and accomplishing the set goals.
3. **Controlling :** Controlling is a vary important function of management and management accounting helps in controlling performance by control techniques such as standard costing, budgetary control, control ratios, internal audit, etc.
4. **Communication:** Management accounting system prepares reports for presentation to various levels of management which show the performance of various sections of the business. Such communication in the form of reports to various levels of management helps to exercise effective control on various business activates and successfully running the business.
5. **Financial analysis and interpretation:** In order to make accounting data easily understandable, the management accounting offers various techniques of analyzing, interpreting and presenting this data in non-accounting language so that everyone in organization understands it. Ratio analysis, cash flow and funds flow statements trend analysis, etc., are some of the management accounting techniques which may be used for financial analysis and interpretation.
6. **Qualitative information:** Apart from monetary and quantitative data, management accounting provides qualitative information which helps in taking better decisions. Quality of goods, customers and employees, legal judgments, opinion polls, logic etc, are some of the expels of qualitative information supplied and used by the management accounting system for better management.
7. **Tax policies:** Management accounting system is responsible for tax policies and procedures and supervises and coordinates the reports prepared by various authorities.
8. **Decision-making:** Correct decision making is crucial to the success of a business. Management accounting has certain special techniques which help management in short term and long term decisions. For example, techniques like marginal costing, differential coasting, discounted cash flow, etc., help in decisions such as pricing of products, make or buy discontinuance of a product line, capital expenditure, etc.

2.5 Scope of Management Accounting:

Management accounting is concerned with presentation of accounting information in the most useful way for the management. Its scope is , therefore, quite vast and includes within its fold almost all aspects of business operations. However, the following areas can rightly be identified as falling within the ambit of management accounting:

1. **Financial Accounting :** Management accounting is mainly concerned with the rearrangement of the information provided by financial accounting\). Hence, management cannot obtain full control and coordination of operations without a properly designed financial accounting system.
2. **Cost Accounting:** Standard costing, marginal costing, opportunity cost analysis, differential costing and other cost techniques play a useful role in operation and control of the business undertaking.
3. **Revaluation Accounting:** This is concerned with ensuring that capital is maintained intact in real terms and profit is calculated with this fact in mind.

4. Budgetary Control: This includes framing of budgets, comparison of actual performance with the budgeted performance, computation of variances, finding of their causes etc.
5. Inventory Control: It includes control over inventory from the time it is acquired till its final disposal.
6. Statistical Methods: Graphs, charts, pictorial presentation, index numbers and other statistical methods make the information more impressive and intelligible.
7. Interim Reporting: This includes preparation of monthly, quarterly, half-yearly income statements and the related reports, cash flow and funds flow statements, scrap reports, etc.
8. Taxation: This includes computation of income in accordance with the tax laws, filing of returns and making tax payments.
9. Office Services: This includes maintenance of proper data processing and other office management services, reporting on best use of mechanical and electronic devices.
10. Internal Audit: Development of a suitable internal audit system for internal control.

In short, management accounting is an important part of company's management information system. With its growth, the horizon of accounting as a tool of or an aid to management has enormously expanded.

As a matter of fact accounting has a unique advantage as a tool of management over other branches of management science it has techniques which are applicable, as a continuous process: to business operating in addition to techniques which apply to "discrete" business situations. Moreover, the role of accountant in management service is not an end in itself. It is a means to a nobler end of servicing the society. The social responsibility of accountant is great not only to his client (management) but also to the external interest as well as society at large.

The needs for management service arise due to the static character of the financial statement, viz., Profit and Loss account and the Balance Sheet. They are true only on a point of time and subject to the generally accepted principles and concepts of accounting. Their static character and historical nature demands a shift in emphasis from financial statement to budgets which project the future and are useful both for planning and control. Management accounting renders useful service to management in this respect.

In order to serve as a tool of management, management accountants have developed a methodology and certain techniques. The methodology of management accounting is largely based on three distinct operations, namely.

- i) "Analysis" of past data.
- ii) On the basis of analysis and other relevant economic data "planning" future course of action: and
- iii) Constant review of the present performance in the light of the predetermined course of action, for the purpose of "controlling" the operational effectiveness of the organization.

For the purpose of analysis, planning and control, the management accountants usually, employs following techniques:

- i) Total the marginal cost analysis;
- ii) Break-even and cost-volume-profit analysis;
- iii) Funds flow statements;
- iv) Ratio analysis;
- v) Budgeting and budgetary control;
- vi) Standard costing and variance analysis;
- vii) Capital budgeting ; and

viii) Performance reports;

Most of these shall be discussed in greater details in following lessons.

2.6 Controllership:

The term 'controller' is applied to various accounting positions. The stature and duties of controller vary from company to company.

Conceptually, he is usually a key executive who aids management in planning and control of all business operations. Controllership is actually a more recent development particularly in U.S. and is the result of recognition of the desirability of segregating management accounting function from treasury function, which is mainly concerned with secretarial and financial, as distinguished from operating, problems. The purpose of this segregation is to make possible a more accurate accounting control over multifarious, complex and dynamic business operation. As Mr. Mohan and Goyal aptly put it "controller has come into being by way of skilled business analyst who, due to his training and experience, is the best qualified to keep the financial records of the business and to interpret these for guidance of the management." The controller however, does not do day-to-day controlling in terms of line authority except over his department. Yet he "does" control in a special sense. That is, by reporting data he exerts a force or influence that impels management towards objective decision in place of intuitive judgment.

It is not surprising; therefore, that controllership function has developed simultaneously with the concept of development of management accounting so much so that often there is a tendency to regard the two as synonymous. The Financial Executives Institute (U.S.A) describes the controllership functions as follows:

1. Planning for control
2. Reporting and interpreting
3. Evaluation and consulting
4. Tax administration
5. Government reporting
6. Protection of assets
7. Economic appraisal

It may be observed that management accounting is the controller's primary "means" of implementation most of those controllership functions, particularly the first three. It is indeed accepted that there is no precise, and universally accepted, concept of controllership as it is still in an evolutionary state. Yet, keeping in view the nature of his functions, whatever his title, he is viewed-as the chief management accounting executive". (Horngren).

2.7 Distinction Between Financial Accounting and Management Accounting:

We are now in a position to distinguish between financial accounting and management accounting. Obviously, these distinctions arise mainly due to the purpose the two are expected to serve. It may, however, be noted that the terms 'financial accounting' and 'management accounting' are not precise and mutually exclusive description of activities they perform. In a way, all accounting is financial, as the 'most' common denomination is money and management decisions have, directly or indirectly financial implication. Nevertheless, some fundamental differences between the two do exist despite their close inter-relation and inter-dependence.

In the first place, while financial accounting deals with enterprise as a whole, management accounting directs its attention to the various parts of it to pinpoint the areas of decision-making. For example, financial statements like balance sheets and profit and loss account report on the overall position and performance of an enterprise whereas most management accounting reports relate to departments or responsibility centres, product

inventories, sales or other sub-division of business entity. Thus financial accounting provides general purpose information, and management needs specific information that management accounting provides.

Secondly, information generated by the financial accounting is of historical nature: It reveals what has happened in the past. Management accounting, on the contrary, is concerned with the future plans and policies as well as the control of current operations. Thus, financial accounting looks back while management accounting looks forward. The use of the former is a post-mortem while the latter aims at maintaining in good health.

Thirdly, financial accounting usually summarizes and reports financial data and results of operations at the end of the accounting period, while management accounting places greater emphasis on furnishing information as quickly as possible to help expedite management action. The essence of management accounting is prompt and continuous reporting system for objective decision making in the nick of time.

Fourthly, financial accounting uses only historical, static, quantitative, monetary, objective and verifiable data, commanding universal acceptance and validity, but management accounting also uses information that is descriptive, static, subjective, qualitative and relating to future. The latter emphasizes those characteristics which enhance the value of information in its variety of uses, such as flexibility, comparability; etc. therefore, there is often less emphasis on precision in management accounting because, unlike financial accounting, these data are not always based on objective evidences and verifiable means. Moreover, approximations are often as useful for decision making as figures worked out accurately and upto the nearest rupee or paisa.

Fifthly, financial accounting is custodial in nature, it performs sort of trusteeship function, safeguarding the interests of external parties like absentee owners, creditors, investors, government and public at large. Certain standards and norms have, therefore, been laid down to ensure integrity, accuracy and consistency. They are also subjected to auditing and verification by independent auditors in many cases. Consequently, financial accounting statements are standardized and are conventional, and they are meant for external reporting and use. Management accounting is not conventional, it need not be rigidly standardized either. Since it is meant for internal use as an aid to management, here the emphasis is on the usefulness of data and reports. Naturally, therefore, management accounting can be smoothly and conveniently adapted to the changing needs of management.

Finally, financial accounting is a must for every business, whether big or small. Often it becomes a purpose. It is not so for management accounting, its installation depends on the discretion and needs of the management.

Self Assessment

Fill in the blanks:

1. _____ deals with detailed analysis of performance of each and every department of the organization.
2. Main purpose of _____ is to ascertain the cost.
3. _____ uses only quantitative information pertaining to the transactions.
4. The causes for losses and wastages of a business or industry are provided by _____ and cost accounting.
5. Few authorities of accounting consider cost accounting to be the branch of _____ accounting.
6. The major objective of _____ is to make decisions through supplement presentation of accounting information.
7. The key objective of _____ is to supply information about the enterprise through P&L A/c and balance sheet to outside parties-Mainly for external use.

8. Put the following activities into the following three categories: Financial Accounting/Cost Accounting/Management Accounting.
- (a) Preparing estimates for working out overhead absorption rates.
 - (b) Taking stocks at the annual closing
 - (c) Preparing income tax return.
 - (d) Preparing balance sheet.
 - (e) Preparing performance ratios of various divisions.
 - (f) Analysis of sales-Product-wise and territory-wise

2.8 Summary:

Despite the new accounting devices, improved techniques and elaborate subsidiary records financial accounting is of limited use to management, it has become necessary to expand it. If accounting is to become truly a tool of management, the management accounting with all its ramifications will have to play the role which is its due. A recognition of the fact that the main purpose of accounting is to help management in planning and controlling the operation of a business will accelerate this process.

Moreover, management accounting systems and techniques should encourage to act in harmony with the overall objectives of the organization. This purpose has been called "goal congruence" whereby goals and sub goals are specified to induce decisions that will blend with top management goals (Horngren). Given the objective(s), the management accounting system should be able to perform effectively as the helpmate of management. Thus, goal congruence may be the key to evaluating an accounting system. Management accounting, as a tool of management, must see to it that the information provided by it should ensure accomplishment of sub goals as well as overall objectives of the firm.

2.9 Glossary:

Cost Accounting: This helps management to conduct performance appraisal and also facilitates in formulating price policies.

Financial Accounting: Financial accounting is a traditional method of accounting that supplies historical information about the firm during the past.

Human Resource Accounting: Human Resource Accounting means the accounting for human being as now in an organization human being is treated as an asset like other physical assets. It is recorded in the books like other assets.

Management Accounting: Management accounting provides necessary information to assist the management in the creation of policy and in the day-to-day operations.

Responsibility Accounting: Responsibility accounting is a special technique of management under which accountability is established according to the responsibility delegated to the various levels of management

2.10 Answers: Self Assessment

1. Management Accounting
2. Cost accounting
3. Cost accounting
4. Financial
5. Financial

6. Management accounting
7. Financial accounting
8. Cost Accounting: a
Financial Accounting: b, c, d.
Management Accounting: e, f.

2.11 Terminal Questions:

1. Explain the term "Management Accounting".
2. Describe the limitations of Financial Accounting and point out how Management Accounting help in overcoming them.
3. Explain the objectives of the subject "Management Accounting".

2.12 Suggested Readings:

Pandey, I.M., Management Accounting, Vani Publication, Delhi.

Horngron, C.T. Garg, L. Sunder and William a Satration introduction to Management Accounting Prentice Hall, Delhi

Mittal , R.K. Management Accounting , V.K. (India) Enterprises, New Delhi.

Lesson – 3

RESPONSIBILITY CENTRES AND CONTROLLABILITY

Structure

- 3.0 Learning Objectives
- 3.1 Introduction
- 3.2 Meaning of Responsibility Accounting
- 3.3 Prerequisites of Responsibility Accounting
- 3.4 Assumptions of Responsibility Accounting
- 3.5 Meaning of Responsibility Centre
- 3.6 Type of Responsibility Centres
- 3.7 Controllability
- 3.8 Transfer Pricing
- 3.9 Methods of Transfer Pricing
- 3.10 Summary
- 3.11 Glossary
- 3.12 Answers: Self Assessment
- 3.13 Terminal Questions
- 3.14 Suggested Readings

3.0 Learning Objectives

After Studying the lesson, you should be able to understand:

- 1 The meaning and concept of Responsibility Accounting.
- 2 Prerequisites and assumptions of Responsibility Accounting.
- 3 Meaning and concept of responsibility centres.
- 4 Different types of responsibility centre
- 5 Concepts of controllable and Non-controllable Costs.
- 6 Methods of transfer pricing

3.1 Introduction:

An organization uses various techniques of costing such as Standard Costing, Budgetary Control for Control of Costs and so on. Under these costing techniques focus is given on the cost and not on the person who has the authority to control the costs. In every well-structured organization, the responsibilities of every person's actions are clearly defined and a manager is engaged in every section of actions of the organization. Every such person is accountable to his/her superior authority for the responsibility assigned to him/her.

3.2 Meaning of Responsibility Accounting:

Responsibility Accounting may be defined as a system of control where a responsibility is assigned to different executives of a concern for control of cost or increase of revenue. It is one of the basic components of good control system. In this system, an executive is held responsible only for those activities for which he/she has been delegated a responsibility.

3.3 Prerequisites of Responsibility Accounting:

Following are the prerequisites of Responsibility Accounting:

- i. Activities of an organization are to be segmented in different Responsibility Centres.
- ii. Clear-cut distinction between Controllable and Non-controllable Costs of the concerned Responsibility Centre should be made.
- iii. Areas of responsibility of each Responsibility Centre in the organization should be clearly defined.
- iv. The charge of each Responsibility Centre is to be given to a manager.
- v. A plan of objective should be set up for each Responsibility Centre.
- vi. The concerned manager must be motivated to attain the objectives of the Responsibility Centre.
- vii. Adequate device should exist in the organization to ascertain the evaluate the actual performance of the Responsibility Centre.

3.4 Assumptions of Responsibility Accounting:

The development of a sound Responsibility Accounting system is based on the following assumptions:

- 1) Goals and responsibilities set out by management are attainable with efficient and effective performance.
- 2) Employees of the organization give their best effort to achieve the goals and responsibilities delegated upon them.
- 3) Employees are held responsible for the areas over which they exercise control.
- 4) Performance of the employees is evaluated by the higher management through Feedback Reports at regular intervals.
- 5) Performance evaluation process of the employees is based on reward providing nature.

The activity of control depends upon a clearly delineated assignment of responsibility. For management control, authority for decision making and responsibility for result should be distributed, throughout the organization. The following general rules may be observed while assigning responsibility:

1. Responsibility for making decision whose effects will last for longer time period should be assigned to higher level manager; and the vice versa.
2. Responsibility for making decisions whose economic effects will be significant should be assigned to high level managers; and the vice-versa.
3. Responsibility for making decisions which occur frequently, and for which a policy can be formulated by the high level managers, can be passed down to the lowest level of organization structure. It may be noted here that the responsibility for decision will be still vested in the high level managers, but the authority for actually making the decisions will be passed to a lower management level.

The above mentioned general rules are helpful in understanding the meaning and significance of responsibility centres.

3.5 Meaning of Responsibility Centre:

According to R.N. Authority, 'A responsibility centre is an organization unit headed by a responsible person. An organization unit is specified by the organization structure of the firm.' According to William C. Fergara, areas of responsibility may be regarded as responsibility centres. "(Responsibility Accounting- A Basic Concept of Control). In the book Reading in Cost Accounting, Budgeting and Control edited by W.E. Thomas). Area of responsibility are also specified or demarcated by organization structure of the firm.

The following points help in understanding the meaning and significance of responsibility centre:-

1. A responsibility centres is a unit of an organization for example, production department, purchase department personnel department.
2. The person heading a responsibility centre is responsible for activities of that centre.
3. Costs of resources used for activities by a responsibility centre are inputs.
4. Performance of activities by a responsibility centre is its output.
5. Within a responsibility centre, there may be several small responsibility centres. For example, while a department is a responsibility centre; its sections are also responsibility centres; sub-section may also be regarded as a responsibility centre.
6. In most of the cases, responsibility centres are also cost centres. According to C.T. Horngren, a cost centre is "The smallest unit of activity or area responsibility for which costs are accumulated (recorded)". For control purposes while dealing with budgetary control some authors regard a responsibility centre as a budget centre. (For example J. Batty, Management Accounting p. 52). But all budget and cost centres are responsibility centres. Sometimes more than one cost centre jointly constitutes a responsibility centre. This depends upon the organization structure and the extent of management control exercised. Similarly one cost centre (a factory or a plant) may have several responsibility centres.
7. Management accounting aims at recording and analyzing cost according to cost centre or according to responsibility centres; whichever is smaller.
8. For management control all costs are charged to some responsibility centres.
9. Responsibility accounting, which is a type of management accounting, aims at assigning costs to one or the other responsibility centre.
10. Some costs are controllable by the head of a responsibility centre, while some costs are not controllable by him. This fact is recognized while identifying a responsibility centre.
11. It is expressed that managers of individual responsibility centres should plan for their 'output' and should feel responsible for the accomplishment of their plans.
12. Identification of responsibility centres is a necessary condition of responsibility accounting. Responsibility accounting if, according to Charles T. Horngren, 'A system of accounting that recognizes various responsibility centres throughout the organization and that reflects the plans and action of these centres by allocating particular revenues and costs to the one bearing the pertinent responsibility'. (Cost Accounting, 3rd ed. P. 951).
13. Responsibility accounting is a basic control concept and responsibility centres are basis of responsibility accounting.
14. Identification of responsibility centre help in removing conflicts, securing performance and controlling performance. This point may be explained with the help of an example.

The production department of ABC Co. asked the purchase department of the company to supply 600 kgs. Of raw material in he month of June. In addition to 800 kgs. Of raw materials which were supplied by the purchase department according to the production schedule of production department for the month of June. This production schedule was given to the purchase department three months earlier for facilitating the acquisition of raw materials on best possible favourable terms (Required volume of raw materials at right price, of right qualify, from right vendors). The purchase department normally takes one and half months in purchasing raw materials. Purchase department refuses to supply additional raw materials of 600 kgs. But the production department

needs this much materials urgently as it promised to additional output to the sales department in the month of June, when sales department approached the production department for meeting the order of a very good customer. The sales department approached the production department for meeting the order of very good customer. The sales department has found this customer only in the month of June. Non –compliance of the demand from this customer will lose this customer. The ground on which the purchase department has refused to supply is that such purchases will involve higher cost; it will not be possible to purchase from the vendor offering most favourable price as such a vendor cannot be contacted and the contract cannot be finished within this short period; and local vendor will charge higher price. In case purchases are made from local vendor, purchase department will show higher cost leading to unfavourable performance against the standards already set. Heated discussions went on between the head of production department and the head of purchase department on the issue; who will be responsible for not supplying the product; and who will be responsible for not supplying the product; and who will be responsible for additional cost of purchases. Later on it was agreed that the extra cost would be duly recorded and charged to the production department. As a result of this agreement, conflict disappeared. Later on Production department also reduced such requisitions from purchase department. So, when responsibility centres are established and understood in its right perspectives by the head of responsibility centres, conflicts are reduced, tensions are minimized and control is secured.

Illustration Explaining Responsibility Centre

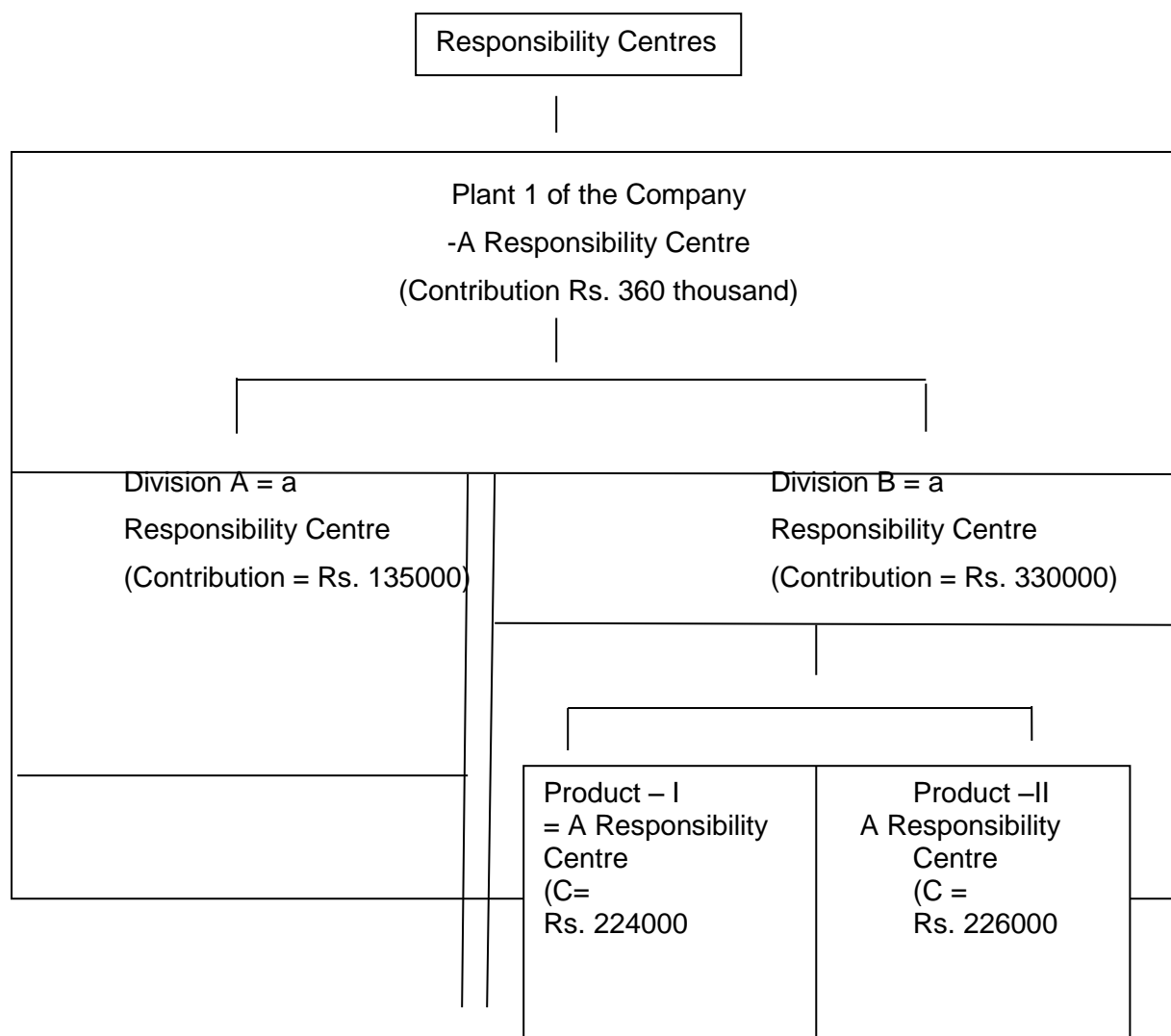
Use of responsibility centres for control purposes recognizes the facts that (i) all costs are controllable: fixed as well as variable, and (ii) all cost are controllable at all levels of management in all departments and in all sections of a department. The later one is crucial, for understanding the concept of a responsibility centre.

An example of allocation of costs is being presented here to explain the concept of responsibility centre. Allocation of cost is done for a cost object which is either a product or a department (responsibility centre). For control purposes, the contribution approach to cost allocation is adopted. Contribution approach underlines the fact that which cost object has contributed how much to the total contribution. Information presented in table 1 (shown on page) serves the purpose of the example.

It may be seen that Division B has contributed Rs. 450 thousand; and the respective shares of Project I and Product II in the divisional contribution are

$$49.8\% \quad \boxed{\begin{array}{r} 224 \\ \text{-----} \\ 450 \end{array}} \times 100 \quad \text{and} \quad 50.2\% \quad \boxed{\begin{array}{r} 226 \\ \text{-----} \\ 450 \end{array}} \times 100$$

Variable manufacturing cost of sales (Rs. 413 thousand and Rs. 457 thousand) and variable selling and administrative costs (Rs. 113 thousand and Rs. 67 thousand) are controllable by head of Product I and Product II. Therefore, up to this stage of allocation (stage) section of Product I and section Product II are responsibility centres (cost centres also). Beyond this stage, when fixed costs are controllable by divisional managers only (Rs. 165 thousand and 120 thousand) Division A and Division B responsibility centres. So at stage 2, there are two responsibility centres. Beyond stage 2, they are controllable by only top management of the plant. So at stage three the plant becomes a responsibility centre. Responsibility centres, with reference to Table I are shown by the following chart (Breakdown of Division A has not been made):-

**TABLE –I****Model income Statement of ABC Ltd., by Segments (Areas)**

(Rupees in thousands)

	Plant I of Company	Company Breakdown into two of Division		Break down Divisions 'B' Only		
		Division 'A'	Division 'B'	Not Allowed	Section of Product I	Section of Product II
Net sale	2250	750	1500		750	750
Variable Manufacturing Cost of Sales	1170	300	870		413	457
Manufacturing contribution Margin	1080	450	630		337	293

Variable selling and Administrative Costs	330	150	180		113	67
(1) Contribution Margin	750	300	450		224	226
Fixed costs controllable by division manager (certain advertising sales promotion salaries, research supervisions)	285	165	120	68*	24	28
(2) Contribution controllable by division managers	465	135	350	(68)	200	198
Fixed costs controllable by other (such as depreciation, building tax, insurance and salary of division managers)	105	30	75	33	27	18
(3) Contribution by segments	360	105	255	(98)	173	180
Unallocated cost (could not be allocated to any segment because of lack of agreeable basis)	196					
(4) Income before income taxes	164					

* The cost was clearly identifiable to any of the products

3.6 Types of Responsibility Centres:

There are three types of responsibility centres, viz. (1) Expense Centres/Cost Centres, (2) Financial Performance Centres/Profits Centres and (3) Investment Centres. These Centres are being explained here.

Expense Centre:

It is a unit of an organization which is controlled on the basis of inputs (costs). Inputs are measured in monetary terms for control purposes. These centres do not have outputs. But either output cannot be measured in monetary terms or there is no use of recording the value of output in monetary terms for controlling. If the foreman of a section of a factory is responsible to produce a given quantity of product at the lowest possible cost, his performance will be evaluated on the basis of expense incurred and quantity produced, and not on the basis of the value of production. So there is no use of measuring output in monetary terms. This section will be an expense centre. In the case of Public Relations and image Building Department, it is not possible to measure the output quantitatively, and therefore, in money

terms. Such departments are only expenses centre for control purposes. The performance of such department is measured and controlled, keeping in view the expense incurred by such departments.

According to Jack Gray and K.S. Johnston, in situations where the manager of a segment has no control over investment or revenue but can effectively control the amount of expenses incurred in producing various levels of output, effectiveness of expense control is the yardstick. Thus, in the expense centre, his performance is measured by whether he achieved his planned output within planned levels of expenses". (Accounting and Management action, Mc Graw Hill Book Company, New York 1973, p. 386).

Financial Performance Centre/Profit Centre:

Profit is determined by (a) expense (b) volume, and (c) revenue. Thus may be put in the form of following equation:

$P = (SP \times v) - (VE \times V) - FE$ where P – Profit, SP – Selling Price, V- Volume of Sales, VE – Variable Expenses, and FE- Fixed Expense.

A manager, who has freedom to make decisions for changing SP, V, VE and FE, he should be held responsible for profit. An organization, unit headed by such a manager is called as profit centre. According to Jack Gray and K.S. Johnson, "In the profit centre, a segment manager's performance is measured by how well he achieved his planned profit. Profit is one comparison of output and input: revenue can be defined as a measure of the market value of outputs; and expenses are the cost of input used in producing the output."

According to R.N. Anthony, "If performance in a responsibility centre is measured in terms of both the revenue it earns and the cost it incurs, it is called a profit centre," (Management Accounting Principles 1970, P. 319).

For control purposes (in management accounting) revenue is regarded as the value of the output of the centre; and it is supposed that revenue has been earned if it has not been realized. Thus, a production department, through not selling in the market, may be regarded as a profit centre. For managerial control it would be assumed that production department is selling (Transferring) its output to sales department. Thus a department, being basically a cost centre, may be converted into profit centre, if the intention is to evaluate this performance of the head of such a department on the basis of revenue (output) also. The principles advantages of regarding a cost centre as profit centre as two, viz (i) the supervisor of the department is motivated for better performance as he will feel himself associated with the profitability of the organization as a whole, and if it facilitates decentralization of big organizations, as different divisions work as individual business entities even if they are not earning revenue by realizing it.

R.N. Anthony has used the term Financial Performance Centre for 'profit centre'. Conceptually, there is no difference between a profit centre and a financial performance centre. The reason by Anthony used the term 'Financial Performance Centre in the fact that in a non-profit organization, a profit centre does not exist, while responsibility centre do exist and management control is to be exercised in such organization also. Both 'input' and 'output' are measured in monetary (financial) terms.

Where the 'output' of a segment of organization are not sold in the market, but are transferred to some other segment and become 'input' for transferred segment, the price at which the 'output' of transferor segment is transferred is known as transfer price. The concept of transfer price is of great significance when an expense centre is to be turned into a profit centre. According to R. N. Anthony, "A transfer price is a price used to measure the exchange of products or services between responsibility centres within a company and is different from a market price which measures exchanges between a company and the out side world." A transfer price may be a market-based price (that which prevails in the market) of a cost based price (that which is equal to cost). Generally there are two types of cost-based price : (1) marginal cost and (ii) full cost plus profit. Determination of transfer price is generally a matter of negotiations between buying and selling responsibility centres.

There are some limitations of the concept of profit centre. These limitations must be taken care of while designing and operating a management control system in a organization. These limitations are: (i) Additional cost is incurred for measuring 'output' of a cost centre. Benefits of converting a cost centre into a profit centre by measuring output in monetary terms must be sufficient to meet this additional cost and leave some balance (ii) Certain Services (like internal audit) should be converted into a profit centre; because of difficulties in measuring the output of service responsibility centre, (iii) When the manager of a responsibility centre does not have authority to make decisions about 'output' of his centre converting such a responsibility centre into a profit centre has no practical significance for control purposes and (iv) when competition among profit centres has increased to such an extent that it leads to the erosion of 'goal' congruence' : the use of profit centre technique of management control should be stopped.

Investment Centre:

According to R.N. Anthony, an investment centre is a responsibility centre, "in which the supervisor is responsible not only for profit but also for the assets he uses." The financial measure in an investment centre is profit related to assets employed.

According to Jack Gray and Kenneth S. Johnson, "Investors use a broader measure of performance, the rate of return on

$$\text{Investment} \left(\text{ROI} = \frac{\text{Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}} \right) \text{ if}$$

Two firms produce the same amount of profit but one with a lower investment, the firms with lower investment, the firms with lower investment has achieved better results. In the investment centre, then a manager is judged by how well he achieved his planned return on investment." (p.386).

The concept of an investment centre underlines the following points:-

- (I) The head of an investment centre is responsible for profit.
- (II) The head is responsible for achieving planned profit, using the minimum amount of assets;
- (III) The manager must have control over the revenues and expenses of his responsibility centre.
- (IV) Investment means the amount of assets; and not assets minus liabilities. Because, generally the manager of an investment centre does not have control financing decision.
- (V) Only such assets should constitute of segment 'investment' over which the manager has sufficient control.
- (VI) Problem of measuring the value of 'investment' of an investment centre is not simple. At what values assets should be taken (replacement cost or gross or net book value) is a complicate matter to decide for Valuation problem poses the greatest limitations on using investment centre concept as control technique.

3.7 Controllability:

The central theme of the concept of responsibility centre is controllability. A manager should be made responsible for what he can control. According to R. N. Anthony, some costs are controllable by the head of the responsibility centre, and others are not so controllable at all (Management Accounting Principles, P. 303). According to Charles T. Horngren – Controllability is a matter of degree (a) There are usually few costs that are clearly the sole responsibility of one person and (b) the time period problem is almost impossible to solve for many cost". Cost Accounting: A Marginal Emphasis p. (163). The time period problem refers to the costs i.e. costs which do not change over a period of time span and costs change without reference to time period of fixed costs and variable costs).

If the time period is long, a cost can be controlled. But the same cost cannot be controlled within short period (depreciation).

The concept of responsibility centre distinguishes between controllable and uncontrollable 'inputs' 'outputs' of different types of responsibilities centre. The degree of controllability is dependent upon the level of management authority. This fact is a guiding factor in identifying responsibility centre in an organization. Whether a particular item is controllable or uncontrollable is decided by referring to a level and scope of management authority. For example, insurance cost an machinery may not be controllable by the manager of a production department, but it may be controllable by the manager of the insurance department. Similarly, when a manager is responsible for acquisition and use of a service or an assets is controllable by him.

Since the controllability is diffused throughout the organization, there is need for establishing responsibility centres for control purposes.

Some items (cost) are fully controllable by a particular manager while some are partly controllable by him. In such cases where controllability is shared by more than one manager, the manager having the most decision making power (highest degree of controllability) should be made responsible. For example, take the case of raw materials. The price of raw material, while the raw material usage is most strongly influenced by the production manager. In such a case, the evaluation of performance of responsibility centres should take help of joint variance analysis (for example material cost variance).

So far as the direct costs are concerned (material labour) fixing responsibility and controllability is an easy job. But deciding on controllability and responsibility becomes a complex job when indirect costs are to be assigned to different responsibility centres.

It may be noted since that responsibility centre costs are used for management control purposes, controllable costs should be recorded and reported separately from the non controllable costs.

3.8 Transfer Pricing:

An essential feature of decentralized firms is responsibility centres (e.g. cost –profit-revenue, or investment-centres). The performance of these responsibility centres is evaluated on the basis of various accounting numbers, such as standard cost, divisional profit, or return on investment (as well as on the basis of other non-accounting measures, like market share). One function of the management accounting system therefore is to attach a rupee figure to transactions between different responsibility centres. The transfer price is the price that one division of a company charges another division of the same company for a product transferred between the two divisions. The basic purpose of transfer pricing is to induce optimal decision making in a decentralized organization (i.e. in most cases, to maximize the profit of the organization as a whole).

Reasons of Transfer Pricing:

There are two main reasons for instituting a transfer pricing scheme:

- Generate separate profit figures for each division and thereby evaluate the performance of each division separately.
- Help coordinate production, sales and pricing decisions of the different divisions (via an appropriate choice of transfer prices).
- Transfer prices make managers aware of the value that goods and services have for other segments of the firm.
- Transfer pricing allows the company to generate profit (or cost) figures for each division separately.
- The transfer price will affect not only the reported profit of each center, but will also affect the allocation of an organization's resources.

Mechanics of Transfer Pricing

No money need change hands between the two divisions. The transfer price might only be used for internal record keeping.

- (Transfer price x quantity of goods exchanged) is an expense for the purchasing center and revenue for the selling center.

Accounting for Transfer Pricing

If intra-company transactions are accounted for at prices in excess of cost, appropriate elimination entries should be made for external reporting purposes. Examples of items to be eliminated for consolidated financial statement include:

- Intracompany receivables and payables.
- Intracompany sales and costs of goods sold.
- Intracompany profits in inventories

3.9 Methods of Transfer Pricing:

A Transfer pricing policy defines rules for calculating the transfer price. In addition, a transfer price policy has to specify sourcing rules (i.e. either mandate internal transactions or allow divisions discretion in choosing whether to buy/sell externally). The most common transfer pricing methods are described below:

1. Market –based Transfer Pricing

When the outside market for the good is well-defined, competitive, and stable, firms often use the market price as an upper bound for the transfer price. When the outside market is neither competitive nor stable, internal decision making may be distorted by reliance on market-based transfer prices if competitors are selling at distress prices or are engaged in any of a variety of “special” pricing strategies (e.g. price discrimination, product tie-ins, or entry deterrence). Also, reliance on market prices makes it difficult to protect “infant” segments.

2. Negotiated Transfer Pricing

Here, the firm does not specify rules for the determination of transfer prices. Divisional managers are encouraged to negotiate a mutually agreeable transfer price. Negotiated transfer pricing is typically combined with free sourcing. In some companies, though headquarters reserves the right to mediate the negotiation process and impose an “arbitrated” solution.

3. Cost based Transfer Pricing

In the absence of an established market price many companies base the transfer price on the production cost of the supplying division. The most common methods are:

- Full cost
- Cost – plus
- Variable Cost plus Lump Sum charge
- Variable Cost plus Opportunity cost
- Dual Transfer Prices

Each of these methods is outlined below:

Full Cost

A popular transfer price because of its clarity and convenience and because it is often viewed as a satisfactory approximation of outside market prices.

- (I) Full actual costs can include inefficiencies; thus its usage for transfer pricing often fails to provide an incentive to control such inefficiencies.
- (II) Use of full standard costs may minimize the inefficiencies mentioned above.

Cost – Plus

When transfers are made at full cost, the buying division takes all the gains from trade while the supplying division receives none. To overcome this problem the supplying division is frequently allowed to add a mark-up in order to make a “reasonable” profit. The transfer price may then be viewed as an approximate market price.

Variable Cost Plus a Lump Sum Charge

In order to motivate the buying division to make appropriate purchasing decisions, the transfer price could be set equal to (standard) variable cost plus a lump-sum periodical charge covering the supplying division’s related fixed costs.

Variable cost plus opportunity cost

Also known as the Minimum Transfer Price: $\text{Minimum Transfer Price} = \text{Incremental cost} + \text{Opportunity Cost}$.

For internal decision making purposes, a transfer price should be at least as large as the sum of:

- Cash outflows that are directly associated with the production of the transferred goods; and,
- The contribution margin foregone by the firm as a whole if the goods are transferred internally.

Sub-optimal decisions can result from the natural inclination of the manager of an autonomous buying division to view a mix of variable and fixed costs of a selling division plus, possibly, a mark-up as variable costs of his buying divisions. Dual transfer pricing can address this problem, although it introduces the complexity of using different prices for different managers.

Dual Transfer Prices

To avoid some of the problems associated with the above schemes, some companies adopt a dual transfer pricing system. For example:

- Charge the buyer for the variable cost. The objective is to motivate the manager of the buying division to make optimal (short-term) decisions.
- Credit the seller at a price that allows for a normal profit margin. This facilitates a “fair” evaluation of the selling division’s performance.

Self Assessment

Fill in the blanks:

1. A _____ is a unit within an organization that is responsible for generating revenues.
2. A _____ is part of an organization that does not produce direct profit and adds to the cost of running a company.
3. _____ is a unit within an organisation whose manager not only has profit responsibility but also some influence on capital expenditures.
4. The convention of feasibility emphasizes that the _____, _____ and _____ of analyzing accounting information should be compared vis-à-vis benefit arising out of it.
5. Conventionally, a manager should only be held responsible for those aspects of performance that he or she can _____.

6. Responsibility accounting provides a way to _____ lower level managers and workers.
7. Assigning _____ to lower level managers allows higher level managers to pursue other activities.
8. The accounting system of the company supports preparation of an _____ for each responsibility center.
9. _____ are the amounts charged by one segment of an organization for a product or service that it supplies to another segment of the same organization.
10. The _____ is the outcome of a bargaining process between the selling and the buying divisions.

3.10 Summary:

Responsibility Accounting is a system of control where responsibility is assigned upon different executives of a concern for control of cost or increase of revenue. It is one of the basic components of a good control system. In this system, an executive is held responsible only for those activities for which he has been delegated responsibility.

Prerequisites of Responsibility Accounting are : (i) Activities of an organization are segmented in different Responsibility Centres; (ii) Clear-cut distinction between Controllable and Non-controllable costs is done' (iii) Areas of responsibilities of each Responsibility Centre are clearly defined; (iv) The charge of each Responsibility Centre is given to a manager; and (v) A plan of objective is set up for each Responsibility Centre.

3.11 Glossary:

Cost Center: A cost center is part of an organization that does not produce direct profit and adds to the cost of running a company.

Profit Center: A segment of a business for which costs, revenues, and profits are separately calculated.

Revenue Center: Unit within an organization that is responsible for generating revenues.

Investment Center: A unit within an organization whose manager not only has profit responsibility but also some influence on capital expenditures.

Transfer Prices: Transfer prices are the amounts charged by one segment of an organization for a product or service that it supplies to another segment of the same organization.

3.12 Answers: Self Assessment

1. Revenue centre
2. Cost centre
3. Investment centre
4. Time, labour, cost
5. Control
6. Motivate
7. Responsibility
8. Accounting report
9. Transfer prices
10. Negotiated transfer price

3.13 Terminal Questions:

1. Define Responsibility Accounting. What are its prerequisites?
2. Explain the different assumptions of Responsibility Accounting. What are its benefits?
3. 'Responsibility Accounting is an important device of control'. Discuss.
4. What is meant by responsibility centre? How is it classified? How far are these centres helpful to the management?
5. Write short notes on the following:
 - a) Responsibility Accounting;
 - b) Responsibility Centre;
 - c) Cost Centre;
 - d) Profit Centre;
 - e) Investment centre;
 - f) Controllable cost; and
 - g) Non-controllable cost.

3.14 Suggested readings:

Bhattacharyya, Debarshi, Management Accounting, Pearson Education in India, New Delhi.

Pandey, I.M. Financial Management, Vikas Publishing House Pvt. Ltd., New Delhi.

Monga J.R. Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.

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Lesson – 4

BUDGETING

Structure

- 4.0 Learning Objectives
- 4.1 Introduction
- 4.2 Budgeting
- 4.3 Budgeting Control
- 4.4 Characteristics of Budgeting
- 4.5 Advantages and Purposes of Budgeting
- 4.6 Limitations of Budgeting
- 4.7 Essentials of Budgeting
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- 4.9 Some Important Budgets
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- 4.12 Summary
- 4.13 Glossary
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- 4.15 Terminal Questions
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4.0 Learning Objectives

After studying the lesson, you should be able to understand:

1. Meaning of Budget, Budgeting and Budgeting control
2. Characteristics of Budgeting
3. Advantages and Limitation of Budgeting
4. Essentials of Budgeting
5. Various Types of Budgets
6. Zero-Base Budgeting
7. Performance Budgeting

4.1 Introduction

In the earlier lesson you have seen that accounting for external reporting is mostly concerned with the stewardship of custodial responsibilities of management. This is the usual financial statements attempts of show 'what has been done' rather than 'what will be done. However, management (and many investor and bank loan officer) has become increasingly aware of the merit of formal business plans to guide future operations.

In a modern organization, we are mainly concerned with performance of the management process that comprises a series of decisions aimed at some objectives or set of objectives. According system for

management decision-making and implementation and control, i.e., management accounting is the means for data accumulation, interpretation, and reporting that are tailored to aid management process. One of the more important approaches that has been developed for facilitating effective performance of the management process is comprehensive 'profit planning and control', more comely known in management accounting as 'budgeting' or budgetary control.

4.2 Budgeting

Budgeting is the process of expressing a firm's plans in financial form for a period of time in the future. A budget is, thus, a formal quantitative expression of management plans. In the words of Glenn A. Welsch, 'The budget is a formal statement of management plans and policies for a given period to be used as guide or blueprint in that period,' According to Broad and Carmichal, "An adopted budget is the quantitative and monetary statement of the work to be done by an executive and his subordinates.

Thus, the system of business budget or budgeting indicates in quantitative terms a predetermined detailed plan of action developed and distributed; is a guide; to current operations and as basis for subsequent evaluation of performance. Budgets may be formulated for the organization as a whole or for any sub-unit. The matter summarizes the objectives and plans of all sub-units and phases of an organization sales, production marketing and distribution and finance. It depicts the target for sales, production, and income and cash position. In most cases, as Horngren puts it, the master budget is the best practical approximation to a formal model of the total organization; its objectives, its inputs, and its outputs.

4.3 Budgetary Control

Budgeting as we have observed, is a quantitative plan to activate performance. Budgets are used to evaluate performance and to ensure conformance to 'plan' and 'control'. A control system involves the establishment of targets, of 'standards' of performance, the comparison of actual with the targets and reporting the results of the comparison for managerial action. Budgeting strives to achieve the same objective therefore, includes within its broad scope budgeting as 'profit planning and control' which has been broadly defined as 'a systematic and control responsibilities of management. In simple words, budgetary control is secured through the use of organization where the control is secured through the use of appropriate budgets. It has, therefore, been defined by the Institute of Cost and Works Accountants England (Terminology of Costs Accountancy) as 'the establishment of budgets relating the responsibilities of executives to the requirement of a policy and the continuous comparison of actual with budgeted results either to secure by individual action the objectives of the policy or to provide basis for its revision.

Budgetary control, thus involves (i) the determination of targets (ii) the period in which these are to be achieved, (iii) phases of activities (iv) the measurement of actual performances with the budgeted targets, (v) striking out the deviation or variance (vi) tracing out the causes for it, (vii) reporting of the variance through fixing the responsibility, and (viii) taking the corrective action accordingly. Broadly speaking, therefore it can be said that budget is concerned with planning and policy making while budgetary control results from the implementation of that plan and policy. However, the systems approach requires that both must be taken together as an integrated management accounting system of planning and control. Budgeting should therefore, be studied in its wider all inclusive perspective.

4.4 Characteristics of Budgeting

Budgeting is no longer regarded as merely an accounting procedure, but is recognized essentially a management tool in the hands of management to forecast future income, costs, and control them with definite accuracy. A budget is numerical schedule reducing the policies and plans to concrete targets. It can be distinguished from a 'forecast' insofar as a forecast is a probable event, the statement of a fact likely to occur, while a budget relates to 'planned events' or targets, a statement of the plans and policies to be carried out. In

the language of 'Terminology Cost Accountancy' Institute of Cost and Works Accountants, England, a budget is "a financial and quantitative statement prepared and approved prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective. It may include income expenditure and the employment of capital.' Thus, the major technical work of the budgetary accounting involves expected future data rather than historical data.

Budgets are designed to carryout variety of functions : planning, communication, monvation, coordinating activities, evaluating performance, Implementing plans, controlling operations, and authorizing actions (The last-named role seems to predominate in budgeting in government and non-profit organizations). Effective budgeting system encompasses three basic procedures or activities;

- (I) The development of a realization plan of operations (budget) covering a definite period of time.
- (II) Intelligent and continuous effort to assure attainment of the objectives formally expressed in a plans of operations or budgets.
- (III) The development of a control system based upon performance reports in terms of organizational responsibilities.

4.5 Advantages and purpose of Budgeting:

The advantages of budgeting as a tool of management is varied and many. Some of the important aspect thereof may be enumerated hereunder:

1. Formulation of Planning: - Budgeting, by formulizing their responsibilities for planning, compels managers to think forward and 'plan ahead'. That is, they are forced to anticipate and prepare for changing conditions. There is also a major philosophical aspect of budgeting: the process of preparing the budgets-advance planning –forces executives to become better administrators. Budgeting puts planning where it belongs-in the forefront of a manager's mind. Horngren thinks that "this forced planning is by far the greatest contribution of budgeting to management."
2. An Instrument of control:- Budgeting provides definite expectations that are best framework for judging subsequent performance. Budgets provide standards or 'yardsticks' of performance which are profitably used for comparing and evaluating actual performance. Budgeting is, thus, one of the most important instrument of control in the hands of management. Past performance may not be a good basis for comparison mainly due to dynamism of business environment and the likelihood of intervening changes; moreover, inefficiencies may also be buried in past performance.
3. Coordination and communication:- Budgeting helps managers in coordinating their efforts, so that the objectives of the organization as a whole harmonize with the objectives of its parts. It compels the departmental managers to plan in harmony with the plans of other departments and of the entire organization. Also, it is a means of communicating over all objectives and targets, and for lending the objectives of the departments. Budgets help to search out weakness in the organizational structure by isolating problems of communication of fixing responsibility, and of working relationship. As the existence of a well laid out plan (budgeting) is the major step toward achieving coordination, executives are forced to think of the relationship of individual operations, and the company as a whole. Budgeting through communication and coordination ensures goal congruence, so till the interests of the individual managers are subordinated for the benefit of the business as a whole. This also results in 'synergic' advantage, where the joint effect is more than the sum total of the performance of its parts.
4. Delegation of authority:- Koontz and O' Donnell also view budgeting as an instrument of delegation, as through it authority is delegated downward without authority is delegated downward without the

loss of control. Thus, it frees executives from many, day-to-day problems and provides them more time for planning.

5. **Motivation:-** Budgeting involves the participation of all members of management from the top down and ensures their identification with the established goals and plans. It is a step towards 'management by objectives' with all its motivational overtones. "Motivation' is the need to achieve some selected goals and the resulting drive that influences action towards the chosen goal. Moreover, participation itself is likely to have a favorable motivational impact, in the process of fulfillment of targets.
6. **Others:-** Among many other advantages of budgeting, there are some which may be mentioned. Budgeting reduces ambiguity, plattudes the misunderstanding about organization goals by putting them down in cold figures and concrete terms. It compels management for the most economical use of labour material, facilities and capital. It pinpoint efficiency and inefficiency. It forces the management to give time and adequate attention to the effect of the expected trend of general business conditions, and government policies. It also aids in obtaining bank credit. Last, but not the least, it develops in manager "time consciousness' and 'cost consciousness'.

4.6 Limitations of Budgeting

The emphasis on the potentials and merits on budgeting should not make you believe that it is a foolproof system or entirely free from problems. Apart from the problems associated with developing the budgetary system itself, it is subject to certain limitations.

Budgets are based on estimates:- They are as good or as accurate as the estimates would make them. The estimates must therefore, be based on all available facts and good managerial judgment. For this reason, flexibility is essential in interpreting and utilizing the results.

Since budgeting attempts to reduce all relevant facts into numerical data, it always involves the danger of rigidity and finality. In a dynamic and changing business environment, no budget can be final words. Rigidity of budgetary figures is most likely to affect much of their usefulness. A budgetary programme must, therefore, be continually adopted to fit changing circumstances.

Impersonal approach is another danger of comprehensive budgeting system. Simply introduction of the programme is not likely to ensure its success as its execution will not occur automatically. Budgeting will be effective only occur automatically. Budgeting will be effective only when all responsible executives will not occur automatically. Budgeting will be effective only when all responsible executives get behind it and exert continuous and aggressive efforts towards its accomplishment. Involvement of all the managers coupled with the support of the top management, implying a continuous "budget consciousness" throughout the organization, is a pre-requisite for the successful implementation of the budgeting plans.

Budgeting involves costs. Often super-structure of the budgeting system become to heavy and costly to justify its usefulness. It must not be forgotten than budgeting is not an end in it-self, it means to achieve certain ends. The budgeting system should, therefore, be tailored to the requirement of management depending upon the size and nature of the activities of individual organization.

Lastly, the budgeting system cannot take the place of management and administration. It is a tool, and perhaps one of the best tools yet devised for advancing the affairs of an organization that can aid performing the management process in relevant ways. Budgeting is never perfect; it cannot replace management action. Its benefits may be derived only by its intelligent use by management. Moreover, a budget must be followed up by effective control action. If it is lacking in any organization, it may defeat the very purpose of budgeting.

4.7 Essentials of Budgeting

Budgeting is not merely an accounting exercise. Modern budgeting, properly viewed, is a comprehensive and integrated system whereby all aspects of the management process may be brought together into a coordinated whole, where the loose ends of management action and operations may be carefully tied together. There are certain common ingredients and basic distinction that are crucial to sophisticated understanding and application of the concept of budgeting. These may be taken as essentials, or fundamental principles of effective budgeting. There are three aspects thereof. Weisch (Budgeting Profit planning and Control), while making careful distinction between them for the study and application of budgeting, describes them as under:

1. The mechanics of budgeting:- Mechanics have to do with such matters as design of budget schedules, clerical or accounting methods of completing such schedules, and routine computations. It is the routine, clerical process of preparing budget schedules.
2. The techniques of budgeting:- Technique have to do with special approaches and methods of developing data for managerial use in the decision making process. The techniques are many, varying from the simple to sophisticated. Some of the more commonly used techniques, for instance, are : methods of projecting sales volume (sales forecasting); approaches in resolving inventory volume (including application of operations research); break-even analyses: resource determinations (including discounted cash-flow approach); cash flow analyses; and variable flexible budgeting procedures.
3. The fundamentals of budgeting :- The fundamentals are concerned directly with effective implementation of budget plans as the management process. The fundamanentals tend to represent desirable management orientations, activities and approaches that are basically necessary conditions for proficient, sophisticated and effective application of the concept of budgeting. These are environmental conditions that need to be established on a sound foundation of managerial commitment. The more important fundamentals, some of which have been referred to earlier may be enumerated thus:
 - (I) Managerial involvement and participation, including top management support.
 - (II) Organizational adaptation to ensure sound and clearly defined organizational structure with a clear-cut designation of lines of authorities and responsibilities.
 - (III) Responsibility accounting system, tailored first and foremost to the organizational responsibilities.
 - (IV) Goal orientation entailing the acceptance on the part of management of the concept of management by objectives (MBO).
 - (V) Full communication, ensuring full and clear understanding, by the executive and subordinates alike, of responsibilities and goals as well as full and open reporting in performance reports.
 - (VI) Realistic expectations by avoiding both under conservation and irrational over optimism.
 - (VII) Timeliness, that is a definite time schedule for formal planning, performance reports, and certain other related activities.
 - (VIII) Flexible application, to avoid rigidity and "strait jackets" so that budgets do not act as severe constraint on the decision-making freedom of managers and supervisors.
 - (IX) Individual and group recognition, identifying and recognizing in the management process individual accomplishment, both outstanding and sub standard performance. The system of individual evaluation must be fair, understandable and accurate.
 - (X) Follow up. This fundamental holds that both good and substandard performance should be carefully investigated the purpose being three-fold ; (i) in the case of substandard

performance, to lead in a constrictive manner to immediate corrective action' (ii) in the case of outstanding performance, to recognize it and perhaps provide for transfer of knowledge to similar operations; and (iii) to provide a basis for better planning and control in the future.

Moreover, in order to sustain the interest those who shoulder the responsibility of budget implementation, as also to improve upon their knowledge and capabilities, a continuous budget education is often essential for the success of the budgeting in an organization.

4.8 Types of Budgets

As budgets serve different purposes, different types of budgets have been developed. The following are the different classification of budgets developed on the basis of time, functions, and flexibility or capacity.

- (A) Classification on the basis of Time:
1. Long-Term Budgets
 2. Short-Term Budgets
 3. Current Budgets
- (B) Classification according to Functions:
1. Functional or Subsidiary Budgets
 2. Master Budgets
- (C) Classification on the basis of Capacity :
1. Fixed Budgets
 2. Flexible Budgets

The following chart can explain this more:

Types of Budgets

On the basis of Time:

Long-Term Budget

Short-Term Budget

On the basis of Function:

Current
Budget

Functional
Budget

Master
Budget

On the basis of Capacity

Fixed
Budget

Flexible
Budget

(A) Classification on the Basis of Time

1. **Long-Term Budgets:** Long-term budgets are prepared for a longer period varies between five to ten years. It is usually developed by the top level management. These budgets summarise the general plan of operations and its expected consequences. Long-Term Budgets are prepared for important activities like composition of its capital expenditure, new product development and research, long-term finance etc.
2. **Short-Term Budgets:** These budgets are usually prepared for a period of one year. Sometimes they may be prepared for shorter period as for quarterly or half yearly. The scope of budgeting activity may vary considerably among different organization.

3. **Current Budgets:** Current budgets are prepared for the current operations of the business. The planning period of a budget generally in months or weeks. As per ICMA London, "Current budget is a budget which is established for use over a short period of time and related to current conditions."

(B) Classification on the Basis of Function

1. **Functional Budget:** The functional budget is one which relates to any of the functions of an organization. The numbers of functional budgets depend upon the size and nature of business. The following are the commonly used:
 - (1) Sales Budget
 - (2) Purchase Budget
 - (3) Production Budget
 - (4) Selling and Distribution Cost Budget
 - (5) Labour Cost Budget
 - (6) Cash Budget
 - (7) Capital Expenditure Budget

2. Master Budget: The Master Budget is a summary budget. This budget encompasses all the functional activities into one harmonious unit. The ICMA England defines a Master Budget as the summary budget incorporating its functional budgets, which is finally approved, adopted and employed.

(C) Classification on the Basis of Capacity

1. **Fixed Budget:** A fixed budget is designed to remain unchanged irrespective of the level of activity actually attained.
2. **Flexible Budget:** A flexible budget is a budget which is designed to change in accordance with the various level of activity actually attained. The flexible budget also called as Variable Budget or Sliding Scale Budget, takes both fixed, variable and semi fixed manufacturing costs into account.

4.9 SOME IMPORTANT BUDGETS

4.9(1) Master Budget

When the functional budgets have been completed, the budget committee will prepare a Master Budget for the target of the concern. Accordingly a budget which is prepared incorporating the summaries of all functional budgets. It comprises of budgeted profit and loss account, budgeted balance sheet, budgeted production, sales and costs. The ICMA England defines a Master Budget as "the summary budget incorporating its functional budgets, which is finally approved, adopted and employed." The Master Budget represents the activities of a business during a profit plan. This budget is also helpful in co-ordinating activities of various functional departments

4.9(2) Cash Budget

This budget represents the anticipated receipts and payment of cash during the budget period. The cash budget also called as Functional Budget. Cash budget is the most important of the entire functional budget because; cash is required for the purpose to meeting its current cash obligations. If at any time, a concern fails to meet its obligations, it will be technically insolvent. Therefore, this budget is prepared on the basis of detailed cash receipts and cash payments. The estimated Cash Receipts include:

- (1) Cash Sales
- (2) Credit Sales
- (3) Collection from Sundry Debtors

- (4) Bills Receivable
- (5) Interest Received
- (6) Income from Sale of Investment
- (7) Commission Received
- (8) Dividend Received
- (9) Income from Non-Trading Operations etc.

The estimated Cash Payments include the following:

- (1) Cash Purchase
- (2) Payment to Creditors
- (3) Payment of Wages
- (4) Payments relate to Production Expenses
- (5) Payments relate to Office and Administrative Expenses
- (6) Payments relate to Selling and Distribution Expenses
- (7) Any other payments relate to Revenue and Capital Expenditure
- (8) Income Tax Payable, Dividend Payable etc.

Illustration:

A company is expecting to have Rs. 25,000 cash in hand on 1st April 2003 and it requires you to prepare an estimate of cash position in respect of three months from April to June 2003, from the information given below :

	Sales Rs.	Purchase Rs.	Wages Rs.	Expenses Rs.
February	70,000	40,000	8,000	6,000
March	80,000	50,000	8,000	7,000
April	92,000	52,000	9,000	7,000
May	1,00,000	60,000	10,000	8,000
June	1,20,000	55,000	12,000	9,000

Additional Information : (a) Period of credit allowed by suppliers - two months. (b) 25 % of sale is for cash and the period of credit allowed to customer for credit sale one month. (c) Delay in payment of wages and expenses one month. (d) Income Tax Rs. 25,000 is to be paid in June 2003.

Solution:

Cash Budget

Particulars.	April Rs.	May Rs.	June Rs.	Total Rs.
Opening balance of cash	25,000	53,000	81,000	1,59,000
Cash Receipts :				
Cash Sales	23,000	25,000	30,000	78,000

Debtors	60,000	69,000	75,000	2,04,000
Total Cash Receipts - (1)				
Cash Payments :	1,08,000	1,47,000	1,86,000	4,41,000
Creditors				
Wages	40,000	50,000	52,000	1,42,000
Expenses	8,000	9,000	10,000	27,000
Income tax	7,000	7,000	8,000	22,000
Total Payment - (2)	---	---	25,000	25,000
Closing Balance of Cash (1-2)	55,000	66,000	95,000	2,16,000
	53,000	81,000	91,000	2,25,000

4.9(3) Fixed Budget and Flexible Budget

Based on Capacity, there are two types of budget that can be prepared, they are fixed and flexible budget. Fixed Budget is a budget that remains constant, irrespective of the levels of activity while a Flexible Budget, changes with the change in the activity level. Both of them are completely opposite to each other. If you are looking for the difference between fixed budget and flexible budget, then you are at the right place. You can find all the important differences below.

Fixed Budget

A budget is drawn for a particular level of activity is called fixed budget. According to ICWA London "Fixed budget is a budget which is designed to remain unchanged irrespective of the level of activity actually attained." Fixed budget is usually prepared before the beginning of the financial year. This type of budget is not going to highlight the cost variances due to the difference in the levels of activity. Fixed Budgets are suitable under static conditions.

Flexible Budget

Flexible Budget is also called Variable or Sliding Scale budget, "takes both the fixed and manufacturing costs into account. Flexible budget is the opposite of static budget showing the expected cost at a single level of activity. According to IEMA, England defined Flexible Budget is a budget which is designed to change in accordance with the level of activity actually attained." According to the principles that guide the preparation of the flexible budget a series of fixed budgets are drawn for different levels of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come into use for solving the problems caused by the application of the fixed budget.

Advantages of Flexible Budget

- (1) In flexible budget, all possible volume of output or level of activity can be covered.
- (2) Overhead costs are analysed into fixed variable and semi-variable costs.
- (3) Expenditure can be forecasted at different levels of activity.
- (4) It facilitates at all times related factor can be compared. which are essential for intelligent decision making.
- (5) A flexible budget can be prepared with standard costing or without standard costing depending upon What the Company opts for.

- (6) Flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and Quotations.
- (7) It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business.

Method of Preparing Flexible Budget

The following methods are used in preparing a flexible budget:

- (1) Multi-Activity Method.
 - (2) Ratio Method.
 - (3) Charting Method.
- (1) Multi-Activity Method: This method involves preparing a budget in response to different level of activity. The different level of activity or capacity levels are shown in Horizontal Columns, and the budgeted figures against such levels are placed in the Vertical Columns. The expenses involved in production as per budget are grouped as fixed, variable and semi variable.
 - (2) Ratio Method: According to this method, the budget is prepared first showing the expected normal level of activity and the estimated variable cost per unit at the side expected level of activity in addition to the fixed cost as estimated. Therefore, the expenses as per budget, allowed for a particular level of activity attained, will be calculated on the basis of the following formula :
Budgeted fixed cost + (Variable cost per unit of activity x Actual unit of activity)
 - (3) Charting Method: Under this method total expenses required for any level of activity, are estimated having classified into three categories, viz., Variable. Semi Variable and Fixed. These figures are plotted on a graph. The expenses are plotted on the Y-axis and the level of activity is plotted on X-axis. The graphs will thus, help in ascertaining the quantum of budgeted expenses corresponding to the level of activity attained with the help of this chart.

Illustration:

The expenses budgeted for production of 10,000 units in a factory is furnished below:

	Per unit Rs.
Materials	70
Labour	25
Variable factory overheads	20
Fixed factory overhead (Rs. 1,00,000)	10
Variable expenses (Direct)	5
Selling expenses (10 % Fixed)	13
Distribution expenses (20 % Fixed)	7
Administrative expenses (Rs. 50,000)	5
Total cost of sale per unit	155

You are required to prepare a budget for the production of 8,000 units.

Solution:

Flexible Budget

Particulars	Output 10,000 units		Output 8,000 units	
	Per unit	Amount	Per unit	Amount
Variable Expenses:				
Material cost	70	7,00,000	70	5,60,000
Labour cost	25	2,50,000	25	2,00,000
Direct expenses (variable)	5	50,000	5	40,000
Prime Cost	100	10,00,000	100	8,00,000
Add: Factory overheads :				
	20	2,00,000	20	1,60,000
Variable overheads	10	1,00,000	12.50	1,00,000
Fixed overheads	130	13,00,000	132.50	10,60,000
Works cost				
Add: Administrative expenses	5	50,000	6.25	50,000
Fixed (Assumed)	135	13,50,000	138.75	11,10,000
Cost of production	1.30	13,000	1.63	13,000
Add: Selling Expenses	11.70	1,17,000	11.70	93,600
Fixed - 10 % of Rs. 13				
Variable - 90 % of Rs. 13				
Add: Distribution Expenses:	1.40	14,000	1.75	14,000
	5.60	56,000	5.60	44,800
Fixed - 20 % of Rs.7	155	15,50,000	159.43	12,75,400
Variable - 80 % of Rs.7				
Total Cost of Sales				

Differences between fixed budget and flexible budget:

1. The budget, which remains constant, regardless of the actual output levels is known as Fixed Budget. Flexible budget, is a budget which can be easily adjusted according to the output levels.
2. Fixed Budget is static in nature while Flexible Budget is dynamic.
3. Fixed Budget operates in only one activity level, but Flexible Budget can be operated on multiple levels of output.
4. Fixed Budget is based on the assumption, whereas Flexible Budget is realistic.
5. Fixed Budget is inelastic, as it cannot be re-casted as per the actual output. Conversely, Flexible budget is elastic because it can be easily adjusted according to the volume of output.

6. Flexible Budget proves more accurate to evaluate the performance, capacity and efficiency of the activity level compared to Fixed Budget.

4.10 Zero –based budgeting

Zero-based budgeting is an approach to planning and decision-making which reverses the working process of traditional budgeting. The term “zero-sum budgeting”, the practice of budgeting every unit of income received, and then adjusting some part of the budget downward for every other part that needs to be adjusted upward. Zero based budgeting also refers to the identification of a task or tasks and then funding resources to complete the task independent of current resourcing.

Zero Base Budgeting (ZBB) in the public sector and the private sector are very different processes, and this must be understood when implementing a ZBB process in the public sector.” The use of ZBB in the private sector has been limited primarily to administrative overhead activities (i.e. administrative expenses needed to maintain the organization...).” Thomas D. Lynch, *Public Budgeting in America* (Prentice Hall, 3rd Edition, 1990), For example, Peter Phyrre used ZBB successfully at Texas Instruments in the 1960s and authored an influential 1970 article in *Harvard Business Review*. In 1973, President Jimmy Carter, while governor of Georgia, contracted with Phyrre to implement a ZBB system for the State of Georgia executive budget process.

Definitions of Zero Base Budgeting:

“ZBB means “different things to different people.” Some definitions are implying that zero-base budgeting is the act of starting budgets from scratch or requiring each program or activity to be justified from the ground.

According to Sarant, “ZBB is a technique which complements and links to existing planning, budgeting and review processes. It identifies alternative and efficient methods of utilizing limited resources. It is a flexible management approach which provides a credible rationale for reallocating resources by focusing on a systematic review and justification of the funding and performance levels of current programs.”

A method of budgeting in which all expenses must be justified for each new period. A zero-based budgeting start from a “zero base” and every function within an organization is analyzed for its needs and costs. Budgets are then built around what is needed for the upcoming period, regardless of whether the budget is higher or lower than the previous one.

ZBB allows top-level strategic goals to be implemented into the budgeting process by tying them to specific functional areas of the organization, where costs can be first grouped, then measured against previous results and current expectations.

The Difference between Zero Based Budgeting and Incremental

- A budget is a plan of operations and activities for the next period, like a month, quarter or year, expressed in quantitative terms. Zero-based budgeting is a method of budgeting which requires you to specifically justify each cost element, as if the activities were being undertaken for the first time. Incremental budgeting is an approach to budget creation that assumes there will be little change in activity for next year compared with the current year.
- In principle, zero-based budgeting requires you prepare the budget starting at zero budget levels every quarter or year. You don't have to start from zero, but can instead start from the current level of expenditure and work downwards. While doing this, consider what would happen if any particular aspect of current expenditure and operations were removed from the budget. Incremental budgeting requires you to only add or subtract from the previous cost levels. You start with the previous period's budget and add or subtract from it according to the expected needs.

- In zero-based budgeting, you are required to justify every rupee of costs from a zero base, as if the programs involved were being initiated for the first time. In contrast, incremental budgeting requires you to justify only additions to or subtractions from the previous cost levels.
- Incremental budgeting encourages wasteful spending to creep into budgets. This is because by using this system, you will be perpetuating past inefficiencies, since cost levels are rarely subjected to close scrutiny. In zero-based budgeting, every aspect of the budget is examined in terms of its cost and its benefits, thus eliminating wasteful and inefficient operations.
- In zero-based budgeting, each organizational activity, or decision package, is evaluated. Activities which are vital to the very existence of the organization, such as employees, are given the highest priority. Resources are then allocated in the budget, according to the funds available. In incremental budgeting, the previous year's funds allocated to an activity are simply adjusted for inflation, regardless of the ranking of the activity.
- Owing to the huge amount of managerial time needed to draw them up, zero-based budgets are prepared every five or so years. Incremental budgeting is carried every year, since the previous year's budget must be incorporated when preparing it.

Process of ZBB:

The following steps are involved in Zero Base Budgeting:

1. Determinations of the objectives of budgeting.
2. Determination of the extent to which zero base budgeting is to be introduced.
3. Development of decision units.
4. Development of decision packages.
5. Review and ranking of decision packages.
6. Selecting, approving and finalizing the budgets.

Advantages:

- Efficient allocation of resources, as it is based on needs and benefits rather than history.
- Drives managers to find cost effective ways to improve operations.
- Detects inflated budgets.
- Increases staff motivation by providing greater initiative and responsibility in decision-making.
- Increases communication and coordination within the organization.
- Identifies and eliminates wasteful and obsolete operations. Identifies opportunities for outsourcing.
- Forces cost centres to identify their mission and their relationship to overall goals.
- Helps in identifying areas of wasteful expenditure, and if desired, can also be used for suggesting alternative courses of action.

Disadvantages

1. More time-consuming than incremental budgeting.
2. Justifying every line item can be problematic for departments with intangible outputs.
3. Requires specific training, due to increased complexity vs. incremental budgeting.
4. In a large organization, the amount of information backing up the budgeting process may be overwhelming.

4.11 Performance budgeting

Performance-based budgeting is the practice of developing budgets based on the relationship between program funding levels and expected results from the program. The performance – based budgeting process is a tool that program administrators can use to manage more cost-efficient and effective budgeting outlays.

Today, when the management of money is more important than ever for public and private entities, budgeting plays an enormous role in controlling operations efficiently and effectively. Budgeting in itself is a familiar process to even the smallest economic unit-the household –but it needs to be divided into two different classes:

Budgeting for public entities

Budgeting for private entities

This differentiation is important because public bodies need to go through many processes before moving into the budget execution phase and post-execution analyses; furthermore, the entire process involves the collaboration of different bodies throughout the government. This collaboration is not only for budget preparation, negotiation and approval processes, but also for the spending approval after the whole budget allocation is finalized. Compared to private sector, it is cumbersome.

According to this new budgeting methodology, traditional methods of analyzing and utilizing budget figures are insufficient. In traditional terms, organizations start building up their long-term plans and break those plans into annual budgets that are formed as forecasts. At the end of the year, budget figures are compared with actual results and a simple actual-budget variance comparison is calculated. Since the analysis is simple, this analysis lacks any sophistication in terms of adjusting similar budget items for forthcoming periods by increasing or decreasing the expenditure estimates. Basically, variance results are generally used for revising monetary amounts for the next planning and budgeting cycle, and also for very simple departmental performance tracking.

This new approach to budget analysis and utilization is many steps ahead of traditional methods.

As explained by Carter “Performance budgets use statements of mission, goals and objectives to explain why the money is being spent. It is a way to allocate resources to achieve specific objectives based on program goals and measured results.” The key to understanding performance-based budgeting lies beneath the word “result”. In this method, the entire planning and budgeting framework is result oriented. There are objectives and activities to achieve these objectives and these form the foundation of the overall evaluation.

According to the more comprehensive definition of Segal and Summers-performance budgeting comprising three elements:

- The result (final outcome)
- The strategy (different ways to achieve the final outcome)
- Activity/output (what is actually done to achieve the final outcome)

Performance – Based Budgeting is a way to allocate resources for achieving certain objectives.

Harrison elaborates: “PBB sets a goal, or a set of goals, to which monies are “connected” (i.e. allocated). From these goals, specific objectives are delineated and funds are then subdivided among them.”

Performance budgeting involves:

- i. Development of performance criteria for various programmes
- ii. Assessment of performance of each programme through each responsibility centers
- iii. Comparison of actual performance with budgeted programme
- iv. Review of the programme with a view to make modifications

Budgetary Control Applied Under Conditions of Uncertainty

Budgeting is essential for all types of business, whether large or small and in the public as well as private sectors. Particularly, in view of constraints like risks, uncertainties as well as availability of resources, budgeting is all the more necessary. In general, it shall be helpful (a) as a tool for management control, (b) as an instrument delegation and accountability, (c) as a means of communication, and (d) as an effective weapon for evaluating the overall performance of an enterprises. But since the risk and uncertainty as to price and consumer behaviour etc., are serious handicaps, the flexible budgeting approach or the technique of preparing alternative forecasts may be usefully adopted. On account of such factors, the budget period will naturally vary. A long – term budget combined with annual budgets further broken up into quarterly, monthly weekly or even daily estimates may be considered suitable under such conditions. Revision of budgets frequently may have be resorted to.

The budget should not be imposed from above, i.e. the top management. For successful programming, it is essential that the urge for their implementation comes from within and for that participation of all concerned is a must. Budgeting should emerge from the middle management, it should roll upwards and downwards and then finalized by the top management in the light of suggestions and criticisms received. In view of the rapidly changing circumstances, it is imperative that the budgets are reviewed regularly by the Budget Committee and necessary amendments incorporated continuously on the basis of altered conditions.

Control Ratios

Three important ratios are commonly used by the management to find out whether the deviations of actual from budgeted results are favourable or otherwise. These ratios are expressed in terms of percentages. If the ratio is 100% or more, the trend is taken as favourable. The indication is taken as unfavourable if the ratio is less than 100.

Activity Ratio: It is a measure of the level of activity attained over a period. It is obtained when the number of standard hours equivalent to the work produced are expressed at a percentage of the budgeted hours.

$$\text{Activity Ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

Capacity Ratio: This ratio indicates whether and to what extent budgeted hours of activity are actually utilized. It is the relationship between the actual number of working hours and the maximum possible number of working hours in a budget period.

$$\text{Capacity Ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

Efficiency Ratio: The ratio indicates the degree of efficiency attained in production. It is obtained when the standard hours equivalent to the work produced are expressed as a percentage of the actual hours spent in producing that work.

$$\text{Efficiency Ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

Illustration: A factory produces 2 units of commodity in one standard hour. Actual production during a particular year is 17,000 units and the budgeted productions for the year is fixed at 20,000 units Actual hours operated are 8,000. Calculate the efficiency and activity ratios.

Solution: 2 units are produced in one standard hour

Therefore for actual production of 17,000 units standard hours will be

$$\frac{17,000}{2} \quad \text{i.e. } 8,500$$

For budgeted production of 20,000 units budgeted hours will be:

$$\frac{20,000}{2} = 10,000$$

$$\text{Efficiency Ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$= \frac{8,500}{8,000} \times 100 = 106\%$$

$$\text{Activity Ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{8,500}{10,000} \times 100 = 85\%$$

Illustration: A factory manufactures two types of articles – x and y. article X takes 10 hours to make and article Y requires 20 hours. In a month (25 day of 8 hours each) 500 units of x and 300 units of y are produced. The budgeted hours are 8,500 per month. The factory employs 60 men in the department concerned. Compute Activity Ratio, Capacity Ratio and Efficiency Ratio.

Solution:	Standard hours for actual production	hrs.
	X : 500 units x 10	5,000
	Z : 300 units x 20	6,000

		11,000

	Budgeted Hours	8,500
	Actual Hours worked	60 x 8 x 25 = 12,000

$$\text{Activity Ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{11,000}{8,500} \times 100 = 129\%$$

$$\text{Capacity Ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$12,000$$

$$= \frac{\text{-----}}{8,500} \times 100 = 141\%$$

$$\text{Efficiency Ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

$$= \frac{11,000}{12,000} \times 100 = 92\%$$

Self Assessment

Fill in the blanks:

1. _____ means the process of preparing budgets.
2. Preparation of budgets involves study of business situations and understanding of _____ as also the capacity of the organisation.
3. The preparation of the production budget is mainly dependent on the _____ budget.
4. _____ budget takes place only after identifying the number of finished products expected to produce to the tune of production budget.
5. Fixed budget is a budget known as _____ budget.
6. _____ budget is prepared for any level of production as an estimate of statement of all expenses.
7. _____ is a system which uses budgets as a means of planning and controlling all aspects of producing and/or selling commodities and services.
8. Budget is a statement of _____.
9. _____ contains two different processes one is the preparation of the budget and another one is the control of the prepared budget.
10. Budget is an estimate prepared for definite _____ period.
11. Budgetary control facilitates centralised control with _____ authority and responsibility.
12. The budget is usually expressed in terms of _____.
13. The _____ considers the current year as a new year for the preparation of the budget.
14. The very first step is to prepare the Zero-base Budgeting is to enlist the _____.
15. _____ budgeting is the practice of developing budgets based on the relationship between program funding levels and expected results from the program.

4.12 Summary

Every business enterprises need the use of control techniques for surviving in the highly competitive and changing economic world. There are various control devices in use. Budgets are the most important tool of profit planning and control. Budgeting control helps in the management of controlling costs and maximizing and policies of the business at operating and realistic level. It helps the management in removing deviations of actual performance from budgeted performance.

In modern times, much emphasis is laid on performance oriented budgets and zero-base budgeting. In conventional budgeting, physical performance is not related to cost, but it is done so in performance budgeting. In conventional budgeting figures of last year are taken as base whereas in zero –base budgeting budget is prepared by not considering the figures of last year and by assuming zero-base.

4.13 Glossary:

Budget: A financial statement prepared for specified activity for future periods.

Budgeting: Activity of preparing the budget is known as budgeting.

Budget Control: Quantitative controlling technique to assess the performance of the organization.

Cash Budget: It is a statement prepared by the organization to identify the future needs and receipts of cash from the yester activities.

Flexible Budget: It is a financial statement prepared on the basis of principle of flexibility to identify the cost of the unknown level of production from the existing level of operational capacity.

Zero-based budgeting: Zero-based budgeting (ZBB) is a method of budgeting in which all expenses must be justified for each new period. The process of zero-based budgeting starts from a "zero base," and every function within an organization is analyzed for its needs and costs.

Performance-based budgeting: Performance-based budgeting is the practice of developing budgets based on the relationship between program funding levels and expected results from that program. The performance-based budgeting process is a tool that program administrators can use to manage more cost-efficient and effective budgeting outlays.

4.14 Answers: Self Assessment

1. Budgeting
2. Management goals
3. Sales
4. Materials/Purchase
5. Constant
6. Flexible
7. Budgetary control
8. Quantitative
9. Budgetary control
10. Future
11. Delegated
12. Total volume
13. Zero-base budgeting
14. Objectives
15. Performance

4.15 Terminal Questions

1. Explain the following terms which has been used in this lesson:
 - (I) Budgeting

- (II) Budgetary control
 - (III) Master Budget
 - (IV) Capacity Budget
 - (V) Performance Reports
 - (VI) Financial Budget
2. Explain the advantages and purpose of budgeting
 3. Give the basic steps in preparing a master budget
 4. Discuss zero base Budgeting
 5. What do you understand by performance budget

4.16 Suggested Readings

1. Charles T. Horngren, Cost Accounting – A Managerial Emphasis, Prentice Hall of India, New Delhi 1973.
2. Man Mohan and S. N. Goyal, Principles of Management Accounting, Sahitya Bhawan Agra.
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Lesson- 5

CAPITAL BUDGETING

Structure

- 5.0 Learning Objectives
- 5.1 Introduction
- 5.2 Meaning of Capital Budgeting
- 5.3 Characteristics of Capital budgeting Decisions
- 5.4 Types of Investment Projects
- 5.5 Capital Budgeting
- 5.6 Factors Influencing Capital Budgeting Decisions
- 5.7 Steps in Capital Budgeting
 - 5.7.1 Estimating Cash Flows
 - 5.7.2 Determining Required Rate of Return
 - 5.7.3 Application of Rules
- 5.8 Summary
- 5.9 Glossary
- 5.10 Answers: Self Assessment
- 5.11 Terminal Questions
- 5.12 Suggested Readings

5.0 Learning Objectives:

After reading this lesson you should be able to

1. Understand the meaning of Capital budgeting
2. Understand the need for capital investment
3. Highlight the importance of capital budgeting
4. Understand the different types of investment projects
5. Describe the capital budgeting process
6. Spell out the factors influencing investment decisions

5.1 Introduction

Every now and then almost all business organizations make new investments. Thus, efficient allocation of capital is one of the most important functions of financial management in modern time. This function involves the firm's decision to commit its funds in long-term assets and other profitable activities. Such investment decisions of the firm have considerable significances as they influence its wealth, determine its size, set the pace and direction of its growth and affect its business risk. These are problems in which the proposal is to invest funds, that is capital at the present time in the expectation of earning a return on this money over some future period. Such problems are called capital investment decisions.

5.2 Meaning of Capital Budgeting

Capital investment decisions also known as capital budgeting (CB) decisions pertain to long-term assets. These are the decisions, which involve investment of current funds in long-term assets in the most efficient manner in return for an anticipated flow of future benefits over a period of time. These benefits may be either in the form of increased revenue or reduced costs. Expansion of present operations or additions of new product line are expected to bring in additional revenue. On the other hand, replacement proposals when an asset wears off or becomes outdated or some new asset involves low operating cost, may result in reduction of cost, thus, adding to the total earnings of the firm. Capital budgeting aims to evaluate all such investment decisions.

It is important to note that investment decisions affect the firm's value. The firm's value will increase if investments are profitable and add to the shareholder's wealth. This will be achieved if investment results in benefits in excess of the minimum required benefits as per the opportunity cost of capital. Thus, investment should be evaluated on the basis of a criterion which is compatible with the objective of maximization of the shareholders' wealth.

The term capital budgeting consist of two words, capital and budgeting, capital refers to the scarce resources of the organization, which can be put to alternative uses. Budgeting refers to the process of systematic business planning so as to fulfill the objective of value maximization. Thus, capital budgeting can be described as the process of deployment of scarce resources of the organization in the acquisition of fixed assets with the objective of maximizing its value in the long run.

According to "Charles T. Horngren Capital Budgeting is long-term planning for making and financing proposed capital outlay".

According to Richards & Greenlaw the "Capital Budgeting generally refers to acquiring inputs with long-term returns".

According to Milton H. Spencer "Capital budgeting involves the planning of expenditure for assets, the returns from which will be realized in future time period".

Capital budgeting involves long-term decisions making on the expenditure of capital. According to Weston and Brigham Capital budgeting is defined as "planning the deployment of available capital (the relatively scarce, non-human resources of productive enterprise) for the purpose of maximizing the long term profitability of the firm." Capital budgeting includes the process of planning the expenditures whose returns are expected to extend beyond one year. In other words, capital budget includes such expenditures the benefits of which are expected to be received over several accounting years.

5.3 Characteristics of Capital Budgeting Decisions

1. Long term results:

The benefits/losses associated with such decisions arise in future due to high set up or initial cost and long gestation period involved. Due to high costs involved, in case of losses such firms face serious long-term impacts which affect its profitability. Profitability will be reduced by all such costs and losses incurred.

2. Initial investment in Capital Budgeting decisions are large:

The funds are invested into projects whose nature is such that large investments are required like purchase of fixed asset, Branch expansion, replacement, acquisition etc.

3. Usually Capital Budgeting decisions are irreversible decisions:

There are various reasons to support this view

- Resale value of an input/purchases done as a part of Capital Budgeting decisions is very low.
- The initial costs involved in setting up costs cannot be recovered if the project generates losses. As large time periods are involved in setting up the project and finally implementing it, the value of money

with time changes drastically. Future value of same money increases as time passes by and so expected returns are also high. In case of low profits/zero profits cost of project increases manifold with time.

4. Capital investment of any form reveals its growth potential:

The long-term investments are made to generate future revenues/ profits which add to the value of the firm. Thus investments grow with time if profitable investment plans are implemented.

“We know that growth of any company is measured by the expected return multiplied by the amount of funds invested by the firm, i.e., $g = b \times r$.”

Where: g is growth of firm

b is the funds retained by the firm only for investment purpose

r is required/ expected rate of return and $r > k$ (cost of capital).

When b is high i.e. funds invested by the firm are large then g will also be large even if r remains constant. Hence once the company decides to go for profitable investment the company will grow. Provided that $r > k$ (cost capital).

Limitations of Capital Budgeting decisions

1. Huge investment costs involved in capital budgeting decisions. Capital budgeting decisions involve large investment due to the nature of investment plans, like purchasing of nay fixed assets, launching a new product, product line, product improvisation, branch expansion etc.
2. If fund availability is certain and uncertain then effectiveness of C.B. is hampered. We know that C.B. decisions required huge outlay hence funds are required in large amount. If these funds are not available freely and at low cost, then C.B. decisions lose their importance. The growth of the firm is delayed and slowed down.
3. Due to long term investment nature C.B. decisions are very rigid. They do not have the component of flexibility. Everything from zero to final result is decided beforehand, thus leaving no scope for contingencies.
4. Investment for a long time period is usually based on forecasting of opportunities, cost involved and future benefits arising. Inaccurate forecasting, may lead to unbalanced investment in Fixed Assets. All related decisions like financing decision, timing of financing and implementation, benefit/loss arising etc. may all deviate from their actual figures and thus even a bad investment may be taken up as a good investment decisions and finally the firm would face a failure after putting in lots of efforts, time and cost.
5. Long term serious implications of a wrong C.B. decisions are very detrimental for any firm like its
 - Liquidity
 - Profitability
 - Risk structure
 - Competitive and technological edge
 - Manufacturing capacity
 - Existing and potential customers etc.

Thus any firm can be badly affected by a wrong and a non-profitable investment decision.

5.4 Types of Investment Projects

Classifications of capital investment projects in groups help the evaluation of projects. Also, classification helps in understanding the interdependent relationships between and among the projects. These relationships affect the success of capital budgeting. For example, if a machine to produce goods has been purchased, there must be space to operate that machine, and there must be needed transport vehicle to transfer the goods to different places. Thus, there are interdependent (supplementary) relationships among capital expenditure on machine-land-truck system. These relationships help to determine the size and timing of capital expenditures.

Classification of projects also helps in choosing the suitable techniques for evaluation of projects. Classification helps in proper rationing of scarce funds/capital.

Various approaches may be adopted to classification of the project. The more common approaches are three as given in Chart No. 1.

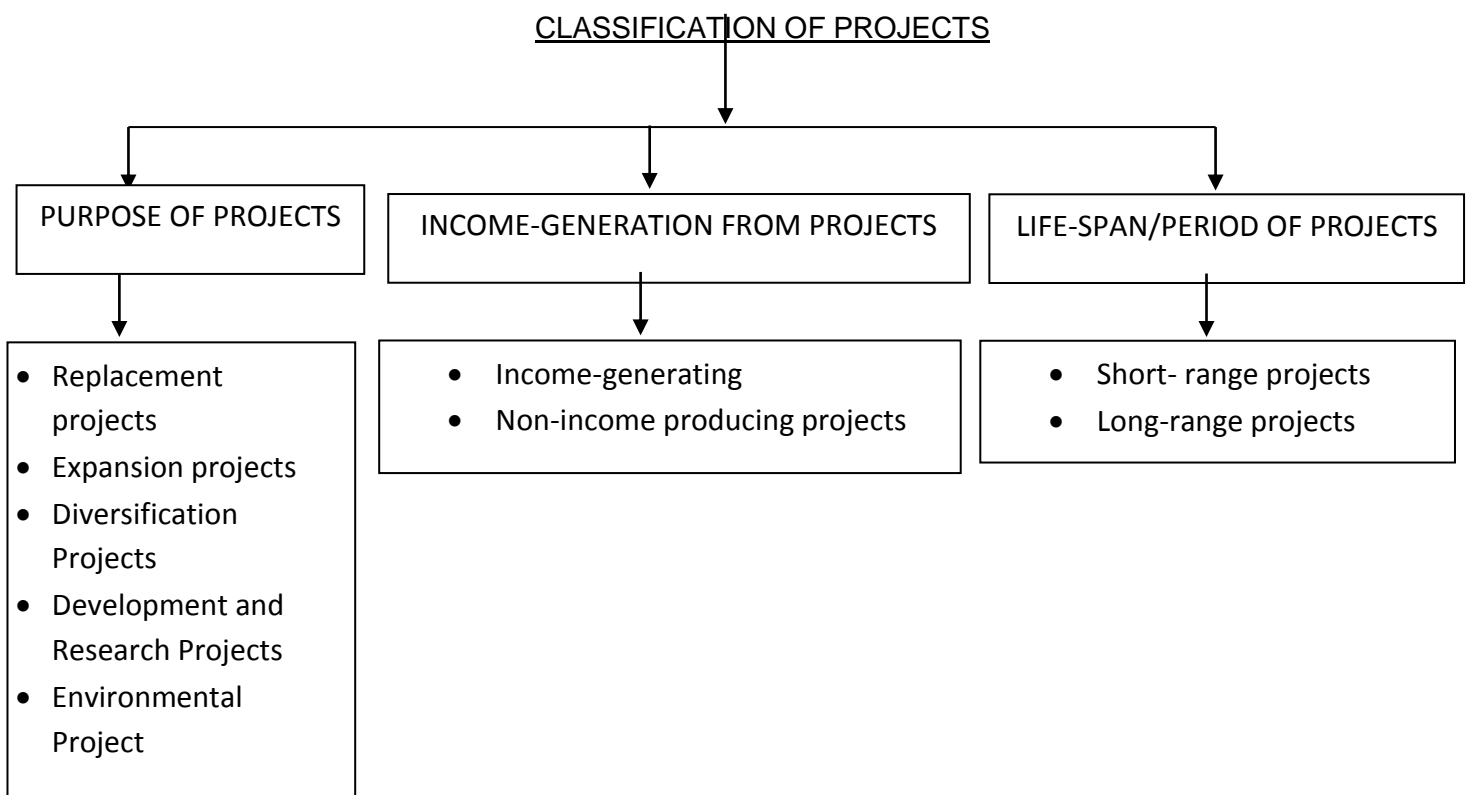


Chart No. 1.

a) Replacement Projects

Replacement of worn-put or obsolete/old machine by a new modern machine for the same work.

b) Expansion projects

To increase the production capacity for production, purchase of additional machines. These projects add to the existing capacity

c) Diversification Projects

Firms may decide to produce more than one line of products or to sell in more than one market with the purpose of reducing risk or earning high contribution, and sustained growth. These decisions are known as diversification decisions. For implementing diversification decisions, the firms acquire and establish new

machinery and facilities, including operating offices and divisions. Capital projects for diversifications are grouped as diversification projects.

d) Development and Research Projects

In some industries, technology changes rapidly, in other industries, the change in technology takes some time. But changes in technology are bound to take place. In order to meet the requirements of change in technologies, the firms plan to invest in research and developments projects which are of long-term. Also, such investments are generally large in amount. If amount of investment in new machines and facilities for research and development purposes is large, then such investment is included in the capital budget.

e) Environmental Projects

These projects help in improving working conditions, pollution control, provision of safety. Such projects often require large investments, and provide benefit for long-periods. Though such projects do not directly help in earning profit or achieving other profit oriented goals, these become desirable for their long-term impact on growth and image of the firm.

f) Income-generating Projects

Projects for replacements, expansion, and diversification are income producing projects. The results of such projects can be conveniently measured for evaluation.

g) Non-Income producing Projects

Projects for development, research, improvement in environment help earning income. However, direct measurement of benefits from these projects is difficult. In the short-run the results of these projects cannot be measured in monetary terms with sufficient reliability. Therefore, such projects are classified as non-income producing projects.

h) Short-range Projects

The projects whose entire expenditure is incurred within one accounting year/period are short-range projects. Capital budget of the current year must provide for total costs of such projects. Replacement projects generally are put into this class. These projects have short gestation periods. These projects start producing income in relatively short period of time.

i) Long-range Projects

Such projects have long gestation periods. The expenditures on these projects generally extend over more than one accounting year/period. Generally, a part of these projects is included in the current year's capital budget. These projects are generally the responsibility of top management. Examples of such projects are: projects for expanding facilities, adding new products, disposal of affluent, etc.

All the above mentioned projects are reclassified for the point of view of problems involved in selecting the projects form a variety of alternative projects. Such reclassification is given in the following chart No. 2.

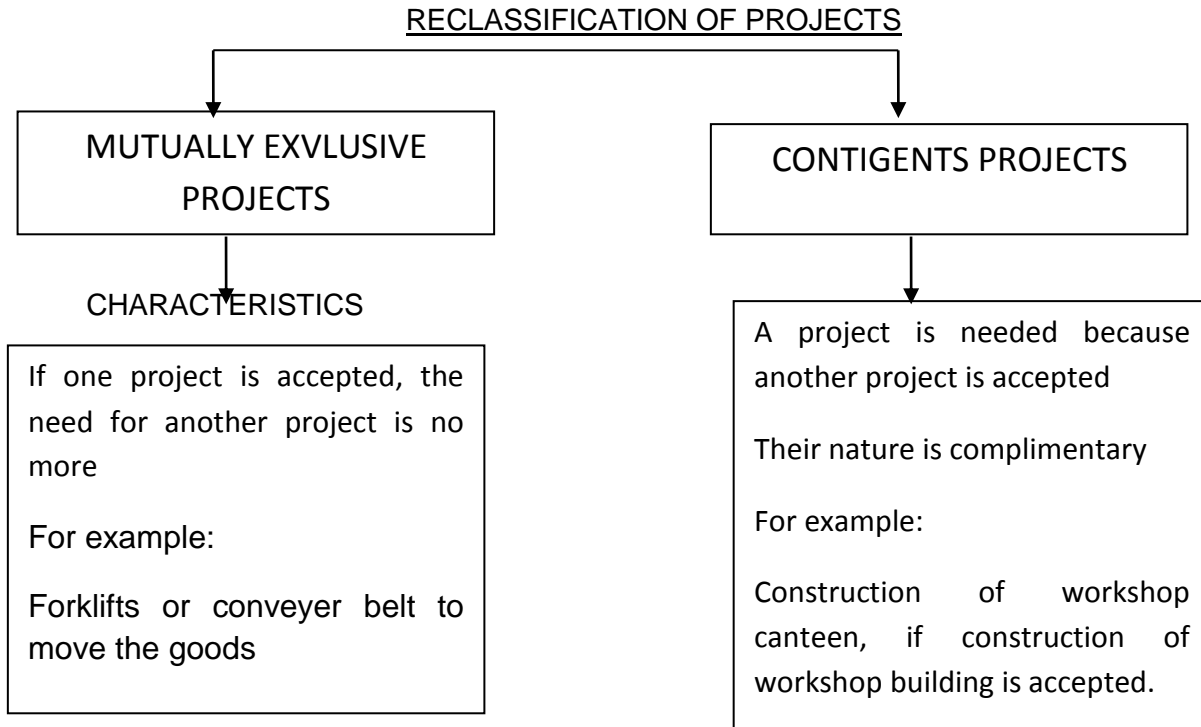


Chart No. 2.

5.5 Capital Budgeting Process

The important steps which are required for taking capital investment decision had been explained by I.M. Pandey in this book on Financial Management.

Chart No. 3 explains that capital budgeting process involved four steps i.e. (i) Project Generation, (ii) Project Evaluation, (iii) Project Selection and (iv) Project Execution. The nature of the formal system for the capital budgeting process will depend on the size of the firm and nature of projects, and their number complexity and diversity. At the time of establishing such a system, it should be remembered that its cost does not exceed the benefits to be derived. As the expenditure involved is very large the substantial part of this process should be continued to the top management. In this process we assume that the required rate is known and the investment proposals do not suffer from uncertainty.

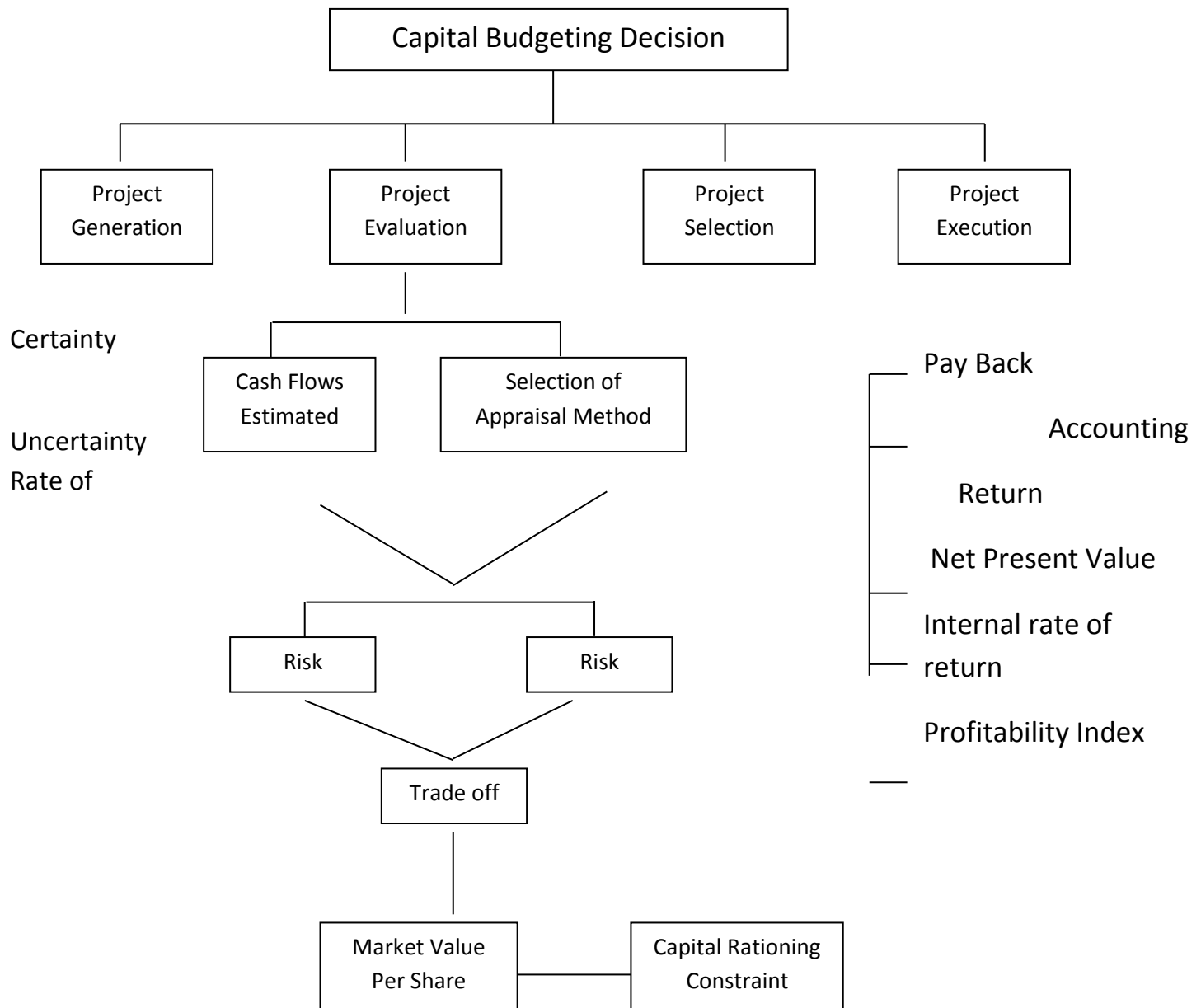


Chart No. 3

(a) Project Generation:

Investment proposals of various nature may originate at different levels within the organization at different times and may relate to one of the following categories:-

- A.
 - (i) Proposal to add new produce to the product line.
 - (i) Proposals to expand capacity in existing product lines.
- B. Proposals for reduction in existing product lines.

Any type of investment proposals can originate at any level, from the top management level to the level, of workers. The proposals can originate systematically or haphazardly. If the company wants to introduce a new product in the market, it may emanate from the marketing department or from the plant manager who thinks of a better way of utilizing idle capacity. Similarly, factory level can give suggestions for replacing an old machine or improving the production techniques. So, there should be a systematic procedure for generating proposals and the efficiently utilization of resources.

(b) Project Evaluation:

It involves two steps (a) estimation of benefits and cost; the benefits and costs are measures in terms of each flows and (b) selection an appropriate criterion to judge the desirability of the project. Because the future is uncertain, so it is very difficult to estimate cash flows. The risk involve in the process should also taken into consideration for taking the decisions.

(c) Project Selection:

For approving the investment proposal no standard administrative procedure can be laid down as it differs from firm to firm. Though the capital investment decision is top management decision is top management decision but, however, projects are screened at multiple levels, sometimes top management delegate, the authority by limiting the amount of cash outlays, prescribing the selection criteria and holding the lower level management accountable for the results.

(d) Project Execution:

After the final selection of the investment proposals, the funds are appropriated for capital expenditure. The formal plan for the appropriation of funds is called the capital budget and the project execution committee must ensure that funds are spent in accordance with budget. Now funds for the purpose of project execution should be spent only after seeking formal permission from the controller. After this systematic procedures should be developed to review the performance of project during their lifetime and after completion.

5.6 Factors Influencing Capital Budgeting Decisions:

The main factors which, influencing capital investment are:

1. Cash flows:

Every firm makes a cash flow budget. Its analysis influences capital investment decision. With its help the firm plans the funds for acquiring the capital asset. The budget also shows the timing of availability of cash flows for alternative investment proposals, thereby helping the management in selecting the desired project.

2. Type of management:

Whether capital investment would be encouraged or not depends, to a large extent, on the viewpoints of the management. If the management is modern and progressive in its outlook, the innovations will be encouraged, whereas a conservative management discourages innovation the fresh investments.

3. Competitors' Strategy:

Many a time an investment is taken to maintain the competitive strength of the firm; if the competitors are installing new equipment to expand output or to improve quality of their products, the firm under consideration will have no alternative but to follow suit; else it will perish. It is, therefore, often found that the competitors' strategy regarding capital investment plays a very significant role in forcing capital decisions on a firm.

4. Technological Change:

In modern times, one often finds fast obsolescence of technology. New technology, which is relatively more efficient, takes the place of old technology; the latter getting downgraded to some less important applications. However, in taking a decision of this type, the management has to consider the cost of new equipment vis-à-vis the productive efficiencies of the new as well as the old equipments. However, while evaluating the cost of new equipment, the management should not-take into, account its full accounting cost (as the equipment lasts for years) but it incremental cost. Also, the cost of new equipment is often partly offset by the salvage value of the replaced equipment.

5. Return expected from the investment:

In most of the cases, investment decisions are made in anticipation of increased return in future. While evaluating investment proposals, it is therefore essential for the firm to estimate future returns or benefits accruing from the investment.

6. Demand forecast:

The long-run forecast of demand is one of the determinants of investment decision. If it is found that there is a market potential for the product in the long run, the dynamic firm will have to take decisions for capital expansion.

7. Fiscal Policy:

Various tax policies of the government (like tax concessions on investment income, rebate on new investment, method of allowing depreciation deduction allowance) also have favorable or unfavorable influence on capital investment.

5.7 Steps in Capital Budgeting

Capital budgeting decisions involve three steps, that is:

1. Estimating cash flows,
2. Determining the required rate of return
3. Applying acceptance/rejection rule for selecting a project.

5.7.1 Estimating cash Flows:

To evaluate any capital investment proposal, it is important to estimate the future benefits which are expected to accrue from the investment proposal. The future benefits can be measured either in terms of accounting profit based on actual concept or alternatively, in terms of cash flows from the project. The cash flow criteria to measure future benefits are considered better than accounting profit criteria.

Incremental cash flows

For each investment proposal, we need to provide information about expected future cash flows on an after-tax basis. This information must be provided on an incremental basis, so that only the difference between the cash flows of the firm with and without project is analyzed. For example, if a firm wants to introduce a new product which is likely to compete with existing products, it is not appropriate to express cash flows in terms of the estimated sales of the new product. Rather some probable sales of existing products should also be considered and the situation should be analyzed with or without the new investment. In this regard, sunk costs must be ignored. It is the incremental costs and benefits which are relevant and not the recovery of past cost.

Depreciation involves only an accounting entry and does not involve any cash outflow. It is, however, a deductible expense for computing taxes and thus, reduces the firm's tax liability. The savings in tax resulting from depreciation is known as depreciation tax shield.

Net cash flows are the difference between cash receipts and cash payments including taxes. Thus,

$$I = C - P - T$$

Where I stands for net cash flows, C for cash receipts, P for cash payments and T for taxes.

Example 1

Suppose that a project requires an initial cash outlay of Rs. 4,00,000. The project is expected to generate annual cash sales of Rs. 2,00,000 and incur total annual cash expenses of Rs. 80,000 over the life of the project. The life of the project is estimated at 10 years and depreciation is to be charged on straight line basis. The tax rate may be assumed at 40 per cent. Determine net cash flows from the project.

Solution:

For determining the tax liability, we need to ascertain profit generated by this project as per profit & Loss Statement:

Statement of Profit & Loss

Revenue	2,00,000
Less Expenses (Cash)	80,000
Earnings before depreciation & Tax	1,20,000
Less Depreciation @ 10% p.a.	40,000
Earnings before Tax	80,000
Less Tax @ 40%	32,000
	48,000

Thus, net cash flows would be equal to:

$$I = 2,00,000 - 80,000 - 32,000 = \text{Rs. } 88,000$$

Net cash flows can also be calculated in the following manner—

$$I = \text{EBT} - T + D$$

Where EBT stands for earnings before tax. Thus,

$$I = 80,000 - 32,000 + 40,000 = \text{Rs. } 88,000$$

It may be noted here that depreciation has provided a tax shield equal to tax rate multiplied by the amount of depreciation.

$$Ds = T \times D$$

Where Ds stands for depreciation tax shield. Thus, in above example.

$$Ds = 40,000 \times 4.0 = \text{Rs. } 16,000$$

If depreciation was not tax deductible, net cash flows would have been only Rs. 72,000 which go increased by Rs. 16,000 due to tax shield provided by depreciation.

Terminal Cash Flows

The last year of an investment project may generate some additional cash inflows, which are generally in the form of salvage value of the asset. In case of a replacement decision, in addition to the salvage value of the new investment at the end of its life, the following two other salvage values will also have to considered:

- a) The salvage value of the existing asset at the time of replacement decision.
- b) The salvage value of the existing asset at the end of its life, if it were not replaced.

Besides salvage value, the terminal cash flows may also include release of net working capital. The funds initially tied up in net working capital at the time when project was undertaken would be released in the last year when the project is terminated.

Calculation of Present Value of Cash Inflows:

All investment projects involve cash outflows (investments and related expenses) and cash inflows (cash income received as a result of investments). For evaluating the investment projects, some techniques use present value of cash inflows, which will occur in future as a result of investments in projects.

Due to inflation and earning capacity of money, an amount to be received in future will have less value at present. This is the time value concept of money (cash). For example, if a sum of Rs. 100 is invested at 6% interest p.a. for 5 years, it will become Rs. 133.80 after five years. The present value of Rs. 133.80 is Rs. 100.

Present value concept is opposite to the concept of compound sum.

Compound sum of an amount is computed by the following method:

$$S = P (1+I)^n$$

S = compound amount:

P = Principal money invested or present value of investment

I = Interest rate on principal money

N = number of periods/years

For computing the present value, the above formula is rewritten:

$$P = S \frac{1}{(1+I)^n}$$

The expression $1/(1 + I)^n$ is a present value factor by which S must be multiplied to compute the present value. S is the cash flow, which will be received in future.

The present value factors for different rates of interest and time-periods can be computed through the use of logarithms. But computed present value factors are readily available. The present value factors are for Rs. 1. To know the present value of any amount, the factors for Rs. 1 are multiple with the amount. The product is the present value:

$$P = S \times \text{p.v. factor for Rs. 1}$$

Where P is the present value

S is the amount

p.v. factor may also be called as discount factor, i.e. d.f.

Example 2:

A firm has a choice of receiving Rs. 2500 today or Rs. 6000 after 10 years. The interest rate (discount rate) is 8%. Find the present value of Rs. 6000. Which should the firm choose? What, if the discount rate is 10%

Solution:

$$P = S \times \text{p.v. factor for Rs. 1}$$

The d.f. with 8% after years for Rs. 1 is 0.463.

With 8% for Rs. 6000 to be received after 10 year:

$$\begin{aligned} P &= 6000 \times 0.463 \\ &= \text{Rs. } 2778 \end{aligned}$$

With 10% for Rs. 6000 to be received after 10 year:

$$\begin{aligned} P &= 6000 \times 0.386 \\ &= \text{Rs. } 2316 \end{aligned}$$

Comment:

- (i) The present value Rs. 2778 > Rs. 2500 to be received now. The firm should choose to receive Rs. 6000 after 10 years if interest is rate 8%.

- (ii) The present value Rs. 2316 > Rs. 2500 to be received now. The firm should choose to receive Rs. 2500 now than to receive Rs. 6000 after 10 years if interest rate is 10%

The higher the interest rate, other things remaining the same, the lower the present value of the sum to be received in future. This is because of the time value of money.

Present Value of an Annuity

Annuity means receipt or inflow of a certain sum every year, for a period of time. For example, if Rs. 1,00,000 is the inflow every year for 5 years in future, then the annuity is Rs. 1,00,000.

Example 3:

A machine costing Rs. 18,000 will save a firm Rs. 3,000 a year for the next 10 years. If a discount rate of 10% is used, is the purchase of the equipment advisable?

Solution:

The amount of annuity is Rs. 3,000

P.V. of Rs. 3000 = 3000×6.145

= Rs. 18,435

Since the P.V. of annuity is greater than the investment, the purchase of the machine is advisable.

Interest Rate for an Annuity

When, Period of annuity, amount of annuity and amount of investment is given, the interest rate (yield) can be found out.

The interest rate so found will equate total annuity receipts with the initial amount of the investment or the present value of investment.

There are two steps in calculation:

Step 1: Divide the investment by annuity to find the value.

Step 2: Locate the value nearest to the computed value in step 1 for the given period, looking at the table for annuity. The interest of the closest value is the answer.

Example 4:

An investment of Rs. 2,400 will give inflows (returns) of Rs. 400 per year for the next 10 year. What is the interest (yield) on investment?

Solution:

(i) The value = $2400/4 = 6$

(ii) The closest value for 10 years period in the table is 6.145/

The interest rate for 6.145 is 10%. Therefore, approximate yield on investment is 10%.

Present Value of a Deferred Annuity

When the annuity is not received from the very beginning year of the investment, but after a few years, it is called deferred annuity. If an investment gives deferred annuity, the p.v. of deferred annuity is computed.

5.7.2 Estimating required rate of return

Generally, present receipt of cash is preferred to the future receipt of cash due to availability of investment opportunities to which it can be employed to earn additional cash, that is, an individual shall prefer Rs. 100 today than to have the same Rs. 100 after one year if he can earn an interest of say, Rs. 10 by putting it in the

fixed deposit in a bank for one year. His total cash after one year will increase to Rs. 110. Thus, the justification for time value of money lies in the availability of investment opportunity.

The time value of money is generally expressed by an interest rate. One component of it is risk-free rate, for example, an investor can forego the opportunity of receiving Rs. 100 if he is offered Rs. 110 after one year. Thus, an individual may be considered indifferent between Rs. 100 and Rs. 110 a year from today as he considers these two amounts equivalent in value. In reality, an investor may be exposed to some degree of risk. Therefore, he would also expect a rate of return from the investment, which compensates him both for time and risk. Consequently, his required rate of return will be risk free rate plus premium for risk he is bearing.

This required rate of return is used for evaluating the various alternative investment projects. Any project must earn this minimum required rate of return to justify its acceptance and execution. Various cash flows being generated from projects at different times are discounted at this rate to convert them into the amounts of equivalent value at the present (called present value). This minimum required rate of return, therefore, is known as discount rate, that is, a rate at which future cash flows are discounted to determine the worthiness of any project. Since an investor can invest his money in other securities involving equivalent risk, this rate, therefore, is also known as the opportunity cost of capital.

5.7.3 Applying acceptance/rejection rule for selecting a project

The various available projects are to be evaluated in the light of certain decision rules so that only worth projects figure in the list of selected ones and a ranking among them could be worked out in order of preference for each of them. For this purpose, certain evaluation techniques can be used to measure the economic worth of an investment project. The various evaluation techniques will be discussed in the next lesson.

Self Assessment:

Fill in the blanks:

1. _____ describes the firm's formal planning process for the acquisition and investment of capital.
2. Capital investment decisions once made, are not easily _____ without much financial loss to the firm.
3. A capital budgeting decision is a _____ process.
4. It is important to include all _____ effects on the remainder of the business.
5. Projects for replacements, expansion, and diversification are _____ projects.

5.8 Summary

Capital budgeting is budgeting for capital projects. It is significant because it deals with right kind of evaluation of projects. The exercise involves ascertaining/estimating cash inflows and outflows, matching the cash inflows with the outflows appropriately and evaluation of desirability of the project. It is a managerial technique of meeting capital expenditure with the overall objectives of the firm.

Capital budgeting provides useful tool with the help of which the management can reach prudent investment decision. Capital projects involve huge outlay and last for many years. The Important factors influencing investment decisions include Technological change, competitors' strategy, demand forecast, type of management, fiscal policy, cash flows and return expected from the investment.

The overall objective of capital budgeting is to maximize the profitability of a firm or the return on investment. This objective can be achieved either by increasing the revenues or by reducing costs. Thus, capital budgeting decisions can be broadly classified into two categories: a) those, which increase revenue, and b) those, which reduce costs.

5.9 Glossary

Short Term Investment: Where funds are invested for a short time period usually for a year or less.

Capital Budget: It is a list of all investment proposals to be undertaken for final evaluation by the firm.

Cash flows: It is the difference between the rupee received and rupee paid.

Opportunity Cost: It is the cost associated with the next best alternative foregone to undertake present alternative.

Net Cash flow: Total cash inflows total cash outflows.

5.10 Answers: Self Assessment:

1. Capital budgeting
2. Reversible
3. two-sided
4. Incidental
5. Income producing

5.11 Terminal Questions:

1. What is capital budgeting explain the nature and features of capital budgeting.
2. What are the various kinds of capital budgeting decisions? Discuss the capital budgeting process?
3. Describe the Factors Influencing Investment Decisions and need for investment decisions.

5.12 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGrew Hill, New Delhi.

Lesson 6

MEHODS OF VALUATION OF CAPITAL BUDGETING

Structure

- 6.0 Learning Objectives
- 6.1 Introduction
- 6.2 Investment evaluation criteria and features
- 6.3 Methods of Evaluation of Capital Investments
 - 6.3.1 Pay Back Method
 - 6.3.2 Average Rae of Return
 - 6.3.3 Net Present Value Method
 - 6.3.4 Internal Rate of Return
 - 6.3.5 Profitability Index
- 6.4 Practical Problems
- 6.5 Summary
- 6.6 Glossary
- 6.7 Answers: self Assessment
- 6.8 Terminal Questions
- 6.9 Suggested Readings

6.0 Learning Objectives

After reading this lesson you should be able to:

- Understand different criteria and features for evaluation of projects.
- To analyze techniques of investment appraisal methods.
- To make a decision which method is to be used.
- To make a comparison between NPV & IRR

6.1 Introduction

In the previous lesson we have already learnt what capital budgeting is all about? And we have also learnt how to estimate and determine the relevant cash flows necessary to take capital budgeting decisions? Briefly we can summarize that “capital budgeting is the process of identifying, analyzing and selecting investment projects which will generate future cash flow over a long period of time”. The various investment project proposals for the business enterprise have to be profitable. And out of these proposals the feasible projects and value generating plans are to be selected. In this lesson we will study the various techniques used in appraisal, valuation, and selection of the projects.

6.2 Investment Evaluation Criteria & Features

The capital budgeting process begins with assembling of investment proposals of different departments of a firm. He has to select the best alternative from among the conflicting proposals. This selection is made after estimating return on the projects and comparing the same with the cost of capital. Investment proposal which gives the highest net marginal return will be chosen. Following are the steps involved in the evaluation of an investment:

- 1) Estimation of cash flows
- 2) Estimation of the required rate of return
- 3) Application of a decision rule for making the choice

A sound appraisal technique should be used to measure the economic worth of an investment project, Porterfield, J.T.S. in his book, Investment Decisions and Capital Costs, has outlined some of the features that must be had by a sound investment evaluation criteria.

- It should consider all cash flows to determine the true profitability of the project.
- It should provide for an objective and unambiguous way of separating good projects from bad projects.
- It should help ranking of projects according to their true profitability.
- It should recognize the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferable to later ones.
- It should help to choose among mutually exclusive projects that project that project which maximize the shareholders' wealth.
- It should be a criterion which is applicable to any conceivable investment project independent of others.

6.3 Methods of Evaluation of Capital Investments

A management accountant faces a number of alternative capital expenditure proposals which compete for allocation of funds. Each capital expenditure project is ranked in terms of its profitability.

There are various methods which can be used for ascertaining the profitability of a capital expenditure project and different firms may use different methods it will depend upon circumstances of the firm that which method is more appropriate. A large company may use more than one technique to appraise each of its investment projects, while small firms by contend with using only one technique which involves minimum funds and time. However, to avoid confusion, some methods should be used uniformly for ever object throughout the firm. Though these appraised techniques will help management in making decisions objectively, still the management must exercise their common sense and management in making the decisions.

The following are the basic methods for evaluation of investment opportunities.

There are:

- (A) Traditional Methods of Non-Discounted Cash flow method
 - (i) Pay Back Period
 - (ii) Average rate of return (ARR)
- (B) Modern Methods or Discounted Cash flow method
 - (i) Net Present Value (NPV)
 - (ii) Internal Rate of Return (IRR)
 - (iii) Profitability Index (IP)

Now let us discuss all these methods

6.3.1 Pay Back Method

This is also known as pay off or payout method. This method is employed to determine the number of years in which the capital expenditure incurred is expected "to pay for itself". This deals with the comparison of the capital expenditure with the flow of income generated there form. It is defined as the number of years required to recover the original cash outlay invested in a project. The payback period is number of years during which the income is expected, when the total earnings from investments equals to the total outlay, that period is the back period of capital investment.

			(years)		(Rs)		(years)
1	1000	1000		1	400	400	
2	800	1800		2	400	800	
3	800	2600	3 rd year	3	400	1200	
				4	1200	2400	4 th year
				5	1200	3600	

In first two years, the amount recovered = Rs. 1800

In the third year, the amount to be recovered:

= Initial investment – Recovered in first two years

= Rs. 2200 – 1800 = Rs. 400

Payback period is $2\frac{1}{2}$ years.

(ii) Investment B

Full recovery of initial investment requires 3 years and a part of the 4th year.

Payback period = 3 years + 1000/1200 years

+ 3 years + 5/6 year = 3 5/6 years.

Comment:

Investment A returns the initial investment earlier, hence it is better.

Weaknesses of Payback Method

Since the decision criterion is crude, the investment decision on the basis of payback is generally poor. This method has the following shortcomings:

(a) Cash inflows beyond the payback period is ignored:

In the example, cash inflows of Rs. 400 Project A and Rs. 1400 i.e. 1200 + 200 for Project B are ignored. If these cash flows are also considered, perhaps Investment B will be the better choice.

No consideration of inflows after payback period is an inferior policy, where strategic long-range planning for entry into new markets is being adopted.

Therefore, the payback method should be used for ranking such projects which give cash inflows for a short period, say 3 to 4 years or even shorter periods.

(b) No consideration of time Value of money:

Two investment proposals having the same payback periods are considered equal by payback method. But, this may not be correct assessment. The reason is difference in pattern of cash flows of the two projects. If the present value concept is used for comparing the cash flows of such projects, the ranking may differ substantially. The other method is used i.e. Discount payback method to overcome this drawback.

Example 2: Rank the following projects using payback method as well as discounted value concept of cash inflows. Use a 10% discount rate.

	Investment X	Investment Y
Initial Investment	Rs. 10100	Rs. 10100
Cash inflows		
Years	Rs.	Rs.

1	9500	200
2	200	200
3	200	200
4	200	9500
5 to 10 years	800	800

Solution:

(i) Payback method. It is important to note the patterns of cash flows of the investments differ significantly.

Payback for X

Years	Flows	Cumulative Flows
1	9500	9500
2	200	9700
3	200	9900
4	200	10100

Payback period for X = 4 years

Similarly, Payback period for Y = 4 years

Ans. Both the projects are equal

(ii) Present value of cash flows using a 10% discount rate (d.f.)

Year	Cash flows	d.f.	P.V.	Year	Cash flows	d.f.	P.V.
1	9500	909	8560	1	200	909	182
2	200	826	165	2	200	826	165
3	200	751	150	3	200	751	150
4	200	683	137	4	9500	683	6489

The p.v. of cash flows of the two projects are significantly different. This is because the patterns of cash flows differ.

Ans. If p.v. concept is used, the two suitable to evaluate projects with different economic lives. So Project X is accepted.

(c) Payback period method is not suitable to evaluate projects with different economic lives.

Merits of Payback Method

A number of arguments are given in favour of this method:

- It is easy to understand.
- It is suitable when liquidity is given higher importance than that given to profitability.
- It gives a reasonable approximation to the possible result which can be had by using advanced techniques like Internal Rate of Return.

6.3.2 Average Rate of Return Method

It is also an important method. This method is known as Accounting Rate of Return Method/Financial Statement Method/Unadjusted Rate of Return Method also. According to this method, capital projects are ranked in order of earnings. Projects which yield the highest earnings are selected and others are ruled out. The return on investment method can be expressed in several ways as follows:

(i) Average Rate of Return Method: Under this method we calculate the average annual profit and then we divide it by the total outlay of capital project. Thus, this method established the ratio between the average annual profits and total outlay of the projects.

$$\text{Rate of Return} = \frac{\text{Average Annual Profits}}{\text{Outlay of the Project}} \times 100$$

Thus, the average rate of return method considers whole earnings over the entire economic life of an asset. Higher the percentage of return, the project will be acceptable.

(ii) Return on Average Amount of Investments Method: Under this method the percentage return on average amount of investment is calculated. To calculate the average investment the outlay of the projects is divided by two. As per formula:

$$\text{Average Investment} = \frac{\text{Initial Investment} + \text{scrap value}}{2}$$

$$\text{Rate of Return} = \frac{\text{Average Annual Net Income (Sayings)}}{\text{Average Investment}} \times 100$$

Here:

Average Annual Net Income = Average Annual Cash-inflow – Depreciation

Thus, we see that the rate of return approach can be applied various ways. But, however, in our opinion the third approach can be applied in various ways. But, however, in our opinion the third approach is more reasonable and consistent.

Accounting Rate of Return Method – Merits

This approach has the following merits of its own:

- 1) Like payback method it is also simple and easy to understand.
- 2) It takes into consideration the total earnings from the project during its entire economic life.
- 3) This approach gives due weight to the profitability of the project.
- 4) In investment with extremely long lives, the simple rate of return will be fairly close to the true rate of return. It is often used by financial analysis to measure current performance of a firm.

Accounting Rate of Return Method—Demerits

- 1) One apparent disadvantage of this approach is that its results by different methods are inconsistent.
- 2) It is simply an averaging technique which does not take into account the various impacts of external factors on overall profits of the firm.
- 3) This method also ignores the time factor which is very crucial in business decision.
- 4) This method does not determine the fair rate of return on investments. It is left to the discretion of the management.

Example 3: A project requires an investment of Rs. 5,00,000 and has a scrap value of Rs. 20,000 after five years. It is expected to yield after depreciation and taxes during the five years amounting to Rs. 40,000, Rs. 60,000, Rs. 70,000, Rs. 50,000 and Rs. 20,000.

Calculate: (i) Average Rate of Return (ii) Return per unit of investment (iii) Return on average investment (iv) Average return on average investment

Solution:

$$\text{Total Profit} = \text{Rs. } 40,000 + \text{Rs. } 60,000 + \text{Rs. } 70,000 + \text{Rs. } 50,000 + \text{Rs. } 20,000 = \text{Rs. } 2,40,000$$

$$\text{Average Profit} = \frac{\text{Rs. } 2,40,000}{5} = \text{Rs. } 48,000$$

$$\text{Average Investment} = \frac{\text{Total Investment}}{2} = \frac{5,00,000 - 20,000 (\text{Scrap})}{2}$$

$$(i) \quad \text{ARR} = \frac{\text{Average Annual Profit}}{\text{Net Investment}} = \frac{48,000}{4,80,000} \times 100 = 10\%$$

$$(ii) \quad \text{Return Per Unit of investment} = \frac{\text{Total Profit}}{\text{Net investment}} = \frac{2,40,000}{4,80,000} \times 100 = 50\%$$

$$(iii) \quad \text{Return on average investment} = \frac{\text{Total Profit}}{\text{Net investment}} = \frac{2,40,000}{2,40,000} \times 100 = 100\%$$

(iv) Average Return on average Investment =

$$\frac{\text{Average Profit}}{\text{Average Investment}} \times 100 = \frac{48,000}{2,40,000} \times 100 = 20\%$$

6.3.3 Net Present Value Method

Another method of computing expected rates of return is the present value method. The method is popularly known as Discounted Cash flow Method also. This method involves calculating the present value of the cash benefits discounted at a rate equal to the firm's cost of capital.

The financial executive compares the present values with the cost of the proposal. If the present value is greater than the net investment, the proposal should be accepted. Conversely, if the present value is smaller than the net investment, the return is less than the cost of financing. Making the investment in this case will cause a financial loss to the firm.

NPV method is also known as Excess Present Value or Net Gain Method. To implement this approach, we simply find the present value of the expected net cash inflows (Profit before depreciation and after tax) of an investment discounted at the cost of capital and subtract from it the initial cost outlay of the project. If the net present value is positive, the project should be accepted: if negative, it should be rejected.

NVP = Total Present value of cash inflows – Net investment

If the two projects are mutually exclusive the one with higher net present value should be chosen. The following example will illustrate the process:

Assumed that the cost of capital after taxes of a firm is 6%. Assume further, that the net cash-inflow (after taxes) on a Rs. 5,000 investment are forecasted as being Rs. 2,800 per annum for 2 years. The present value of this stream of net cash-inflow discounted at 6% comes to Rs. 5,272 (1,81 X Rs. 2800).

Therefore, the present value of the cash inflow	= Rs. 5,272
Less present value of net investment	= Rs. 5,000
Net present value	= Rs. 272

The NVP method involves finding the total of the present value of future cash inflows discounted at a given (assumed) rate of return or the cost of capital (K) minus the cost of project.

Symbolically:

$$NVP = (A_1/(1+K)^1 + A_2/(1+K)^2 + \dots + A_n/(1+K)^n) - C$$

Where: A_1, A_2, \dots, A_n are cash inflows in different years of the economic life of the project

K = Cost of capital/desired or assumed rate of return.

O = Cost of the project/investment in the project. Since most of the times, investment takes place in the beginning of the life of the project; the present value of the investment is the same. However, if investments are in installments/in phased manner, then present value of investments in the subsequent years will be calculated. This will be needed to know the p.v. of all cash outflows.

Example 4:

A company has two investment opportunities, each costing Rs. One lakh and each having the expected cash inflows as shown below:

Expected cash inflows

Year	Project A (Rs.)	Project B (Rs.)
1	50000	20000
2	40000	40000
3	30000	50000
4	10000	60000

After giving due consideration to the risk criterion in each project, the management has decided that project A should be evaluated at a 10% cost of capital and project B, a risky project with a 15% cost of capital. Compare the NPVs and Suggest the course of action for the management, if

- Both the project are independent ; and
- Both are mutually exclusive.

Solution:

Project A				Project B			
Year	Expected Cash inflows Rs.	PV factor at 10%	Present value	Year	Expected Cash inflows Rs.	PV factor at 10%	Present value
1	50,000	.90909	45,455	1	20,000	.86957	17,391
2	40,000	.82645	33,058	2	40,000	.75614	30,246
3	30,000	.75131	22,539	3	50,000	.75752	32,876

4	10,000	.68301	6,830	4	60,000	.57175	34,305
Total P.V. of cash inflow			1,07,882	Total P.V. of cash inflow			1,14,818
Investment			<u>1,00,000</u>	NPV			<u>1,00,000</u>
NPV(+)			<u>7,882</u>				<u>14,818</u>

- 1) If both the projects are independent, accept both the projects, as NPV of both is positive.
- 2) If both projects are mutually exclusive accept B as its NPV is higher than that of A.

6.3.4 Internal Rate of Return Method

It is a method that arrives at the expected rate of return on investment after taking into account the time value of money. Discount rate is the interest rate at which the present value of the future cash receipts from an investment is just equal to the present value of the cash outlays for it. In order to judge the profitability of a project, the discount rate is compared with the required rate of return known also as the cut of hurdle rate. In case of alternative projects the one yielding the highest discount rate will be selected.

Now question arises as to how we arrive at the discounted rate of return? The answer is, by trial and error method. The rate is not known before hand hence the discounting has to be done with different rates of interest till the present value of cash inflow is equal to the present value of cash outflows, keeping in mind the fact that higher the interest rate and longer the period of time, lower will be the present value and vice-versa.

In this method one of the following two techniques may be used:

(i) If net annual flows over the life of asset are equal

First, find out present value Factor by dividing initial cost by net annual cash flow:

Then, consult present value annuity table (2) with the number of years equal to life of the asset and find out the rate at which calculated present value factor is equal to given present value of the table.

Example:

Initial Cost	=	Rs. 20,000
Life is Asset	=	5 year
Expected Net Annual Cash Flow	=	Rs. 5,000

Solution:

Present Value Factor = $20,000/5,000 = 4.00$

Consulting Annuity Table (2) of Present Values for 5 years with P.V. Factor =4.00

Discounted Cash Flow Rate of Return = 8% approx.

(ii) If Annual Cash Flows are unequal

When expected net annual cash flows are unequal, calculation of internal rate of return cannot be made according to the above method. In such cases rate of return is calculated by trial and error method. That is, starting with an assumed rate, total present value of annual flows is found out by consulting present value table. The rate at which total present value of annual cash flows becomes equal to initial Investment is the internal rate of return. Sometimes the process of discounting might have to be carried many times before exact rate of return is found out. As guideline, if the total present value of annual cash flows exceeds the initial cost, a higher rate must be tried and if it is less than the initial cost a lower rate is indicated.

6.3.5 Profitability Index Method:

NPV cannot be taken as a reliable evaluation technique in case of project, requiring different initial investments, due to the fact that it is an absolute measure. Profitability index is a better yardstick to evaluate projects in such a situation because it is a relative measure.

The profitability index is the ratio of the present value of future cash inflows to the initial cash outlay.

PV of future cash flows

Initial cash outlay

Acceptable Criteria

As long as the profitability index is 1.00 or greater, the investment proposal is acceptable. Amongst various projects, the projects with highest profitability index shall be ranked number one followed by others in the descending order.

Profitability index is computed on the basis of net rather than aggregate index. The aggregate index is simply the present value of cash inflows over the present value of cash outflows. Net index is used to differentiate the initial cash outlay from subsequent cash outlays. The initial cash outlay is discretionary because the firm can either commit funds to the project or employ them elsewhere. Subsequent cash outflows are not discretionary in this sense, these are embodied in the system. The aggregate index does not differentiate between the cash outlay the firm has to put up initially and subsequent cash outlays. Due to this reason, the net profitability index is a more rational measure of profitability than the aggregate index.

Evaluation of profitability index

Like other time adjusted techniques, the profitability index also takes into consideration the time value of money. Conceptually, it is a sound investment criterion of capital budgeting. It is a better evaluation technique than NPV in a situation of capital rationing since it evaluates the worth of projects in terms of their relative rather than absolute magnitudes. However, with regard to projects of mutually exclusive nature, the NPV method would be superior to be profitability index method.

Net present value method versus internal rate of return

Both the net present value and internal rate of return methods lead to the same acceptance or rejection decision in case of projects which are conventional and independent in nature. A conventional project is one whose cash flows pattern is such that an initial cash outlay is flowed by cash inflows. Cash outflows are restricted to the initial period in case of such investments. Independent project is one of the acceptance of which does not preclude the acceptance of others so that all profitable proposal can be accepted without any constraint. The reason why both methods give similar results, is obvious. As explained earlier, all projects with positive net present value would be accepted under NPV method is the one which has zero net present value. This project would also have internal rate of return equal to the required rate of return. The projects which have positive net present values will also have an IRR higher than the required rate of return.

Terminal Value Method

This approach separates the timing of the cash-inflows and outflows more distinctly. Behind this approach is the assumption that cash-inflow is re-invested in another assets at the certain rate of return from the moment it is received until the termination of the project. Then the present value of the total compounded sum is calculated and it is compared with the initial cash-outflow. The decision rule is that if present value of the sum total of the compounded re-invested cash-inflows is greater than the present value of cash-outflows, the proposed project is accepted otherwise not. The firm would be different if both the values are equal.

This method has a number of advantages. It incorporates the advantage of re-investment of cash-inflows by compounding and then discounting it. Further, it is best suited to cash budgeting requirements. The major

practical problem of this method lies in projecting the future rates of interest at which the intermediate cash inflows received will be re-invested.

6.4 Practical problems

A company is considering an investment proposal to purchase a machine costing Rs. 2, 50,000. The machine has a life expectancy of 5 years and no salvage value. The company's tax rate is 40%. The firm uses straight line method for providing depreciation. The estimated cash flows before tax (CFBT) from the machine are as follows:

Year	CFBT (Rs.)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

Calculate:

- Payback period
- Average Rate of Return
- Net Present Value and Profitability Index at 10% discount rate
- Internal Rate of Return.

Solution:

Year	CFBT (Rs.)	Depreciation (Rs.)	Net Profit Before Tax (Rs.)	Tax (Rs.)	Net Profit After Tax (Rs.)	CFAT (Rs.)
1	60000	50000	10000	4000	6000	56000
2	70000	50000	20000	8000	12000	62000
3	90000	50000	40000	16000	24000	74000
4	100000	50000	50000	20000	30000	80000
5	150000	50000	100000	40000	<u>60000</u>	110000
					132000	

a) **Payback period**

Cumulative cash flows after Tax

Year	CFAT (Rs.)	Cumulative CFAT(Rs.)
1	56000	56000
2	62000	118000
3	74000	192000
4	80000	272000
5	110000	382000

Thus the full investment is recovered within a period of 3 and 4 years.

Payback period = 3 year = 58000/80000 = 3 years 8.7 months

b) Average rate of return

$$\text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}} \times 100$$

$$\text{Average Income} = \frac{\text{Rs. 132000}}{5}$$

$$= \text{Rs. 62400}$$

$$\text{Average Investment} = \frac{\text{Rs. 250000}}{2}$$

$$= \text{Rs. 1, 25,000}$$

$$\text{ARR} = \frac{\text{Rs. 62400}}{\text{Rs. 125000}} \times 100$$

$$= 21.12\%$$

c) Net Present Value

Year	CFAT	PV Factor at 10%	Present Value of Cash Flows
1	56000	0.909	50904
2	62000	0.826	51212
3	74000	0.751	55574
4	80000	0.683	54640
5	110000	0.621	<u>68310</u>
			280640

NPV = PV of cash Inflows – Initial Investment

$$= \text{Rs. 280640} - \text{Rs. 250000}$$

$$= \text{Rs. 30640}$$

Profitability Index =

$$\text{Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Initial Investment}}$$

$$= \frac{2, 80,640}{2,50,000} = 1.12$$

d) Internal Rate of Return

Substituting the value in the question, we get

$$-\frac{250000}{(1+r)^0} + \frac{56000}{(1+r)^1} + \frac{62000}{(1+r)^2} + \frac{74000}{(1+r)^3} + \frac{80000}{(1+r)^4} + \frac{110000}{(1+r)^5} = 0$$

To solve this equation we will have to follow trial and error approach. As is clear from the following table, the value of IRR lies between 14 percent and 15 percent:

Year	CRAT (Rs.)	PV Factor at 14%	PV of cash flows	PV factor at 15% Rs.	PV of Cash flows
1	56000	0.877	49112	0.870	48720
2	62000	0.769	49216	0.756	48384
3	74000	0.675	49950	0.658	48692
4	80000	0.592	47360	0.572	45760
5	110000	0.519	<u>57090</u>	0.497	<u>54670</u>
			<u>252728</u>		<u>246226</u>

$$\text{IRR} = 14 + \frac{2,52,728 - 2,50,000}{2,52,728 - 2,46,226} \times 1 = 14.42\%$$

Example:

XYZ Ltd. has got Rs. 20,000 to invest. The following proposals are under consideration:

Project	Initial Outlay	Annual Cash inflows	Life (in years)
A	10000	2500	5
B	8000	2600	7
C	4000	1000	15
D	10000	2400	20
E	5000	1125	5
F	6000	2400	6
G	2000	1000	2

- Rank these projects in order of their desirability under the Payback Period Method.
- Rank these projects under the net present value index assuming the cost of capital to be 10%

Solution:

a) Ranking under Payback Period Method

Project (1)	Initial Outlay (2)	Annual Cash inflow (Rs.) (3)	Payback Period (Years.) (2+3) (4)	Rank (5)
A	10000	2500	4.00	IV
B	8000	2600	3.08	III
C	4000	1000	4.00	IV
D	10000	2400	4.17	V

E	5000	1125	4.45	VI
F	6000	2400	2.50	II
G	2000	1000	2.00	I

b) Ranking under Net Present Value Method

Project	Initial Outlay Rs.	Life (yrs)	PVA Factor at 10%	Annual Cash flow Rs.	P.V. of Total Cash Inflow (Rs.)	NPV	Rank
A	10000	5	3.791	2500	9,478	(-) 522	Rejected
B	80200	7	4.868	2600	12,657	4657	II
C	4000	15	7.606	1000	7,606	3,606	IV
D	10000	20	8.514	2400	20,434	10,434	I
E	5000	5	7.606	1125	8,557	3,557	V
F	6000	6	4.355	2400	10,452	4,452	III
G	2000	2	1.736	1000	1,736	(-)264	Rejected

Comments: From the above table we can conclude that projects A and G result in loss and therefore should be rejected out rightly without further consideration.

Self Assessment:

Fill in the blanks:

- Under Net Present Value (NPV) method, all cash inflows and outflow are discounted at a _____ acceptable rate of return, usually the firm's cost of capital.
- _____ is the ratio of the present value of cash inflows to the present value of the cash outflows.
- _____ is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows.
- Profitability Index will be less than I when the investment proposal has a _____ net present value under the NPV method.
- 'The process of selecting the more desirable projects among many profitable investments is called _____.
- The net cash outlay is the different amount of money that will be spent when the investment is made in year _____.
- The cost of capital is an important element as basic input information in _____ Decisions.

6.5 Summary

Capital budgeting is a double-edge tool that analysis investment opportunities and cost of capital simultaneously while evaluating worthwhile ness of a project. A wide range of criteria has been suggested to judge the worth whileness of investment projects. Capital projects need to be thoroughly evaluated as to costs and benefits. The capital budgeting process begins with assembling of investment proposals of different departments of a firm. The departmental head will have innumerable alternative projects available to meet his

requirements. He has to select the best alternative from among the conflicting proposals. This selection is made after estimating return on the projects and comparing the same with the cost of capital. Investment proposal which gives the highest net marginal return will be chosen. Following are the steps involved in the evaluation of an investment: 1) Estimation of cash flows, 2) Estimation of required rate of return and 3) Application of a decision rule for making the choice. A sound appraisal technique should be used to measure the economic worth of an investment project. The various techniques of investment appraisal methods include: Discounted Cash Flow (DCF) Criteria i) Net present value (NPV), ii) Internal rate of return (IRR) and iii) Profitability index (PI). Non-discounted Cash Flow Criteria i) Pay-back period, ii) Discounted payback period and iii) Accounting rate of return (ARR).

6.6 Glossary

Payback period: A method of evaluating investment proposal which determine the time a project's cash inflows will take to repay the original investments of the project.

Average rate of return: Also known as the accounting rate of return (ARR) < return on investment (ROI) or return on assets (ROA), is obtained by dividing average annual post-tax profit by the average investment.

Discount rate: The rate at which cash flows are discounted. This rate may be taken as the required rate of return on capital, or the cost of capital.

Internal rate of return: The IRR is a method of evaluating investment proposals. It is that rate of discount (or interest rate) that equals the present value of outflows to the present value of inflows, thus making $NPV=0$.

Mutually exclusive projects: A situation in which the acceptance of one investment proposal leaves out the acceptance of another proposal.

Net present value: A method of evaluation consisting of comparing the present value of all net cash flows (discounted by cost of capital as the interest rate) to the initial investment cost.

6.7 Answers: Self Assessment:

1. Minimum
2. Profitability index
3. Internal rate of return
4. Negative
5. Capital rationing
6. Zero
7. Capital investment

6.8 Terminal Questions

1. What are the mutually exclusive projects? Explain the conditions when conflicting ranking would be given by the internal rate of return and net present value methods to such projects.
2. Explain the investment criteria. Discuss the various methods of appraisal of investment proposals.
3. (a) Differential between NPV and IRR method
(b) Do the NPV and Profitability index always lead to the same investment decision? Discuss.
4. Company is considering an investment proposal to purchase a machine costing Rs. 2, 50,000. The machine has a life expectancy of 5 years and no salvage value. The company's tax rate is 40%. The

firm uses straight line method for providing depreciation. The estimated cash flows before tax (CFBT) from the machine are as follows.

Year	CFBT (Rs.)
1	60,000
2	70,000
3	90,000
4	1,00,000
5	1,50,000

6.9 Suggested Readings:

1. I.M. Pandey, Financial Management, Vikas Publishing New Delhi.
2. James C. Van Horne Financial Management and Policy Prentice Hall, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra, Financial Management, Tata McGraw Hill, New Delhi.

Lesson -7

MARGINAL COSTING

Structures

- 7.0 Learning Objectives
- 7.1 Introduction
- 7.2 Meaning of Marginal Cost and Marginal Costing
- 7.3 Ascertainment of Marginal Cost
- 7.4 Application of Marginal Costing
- 7.5 Limitations of Marginal Costing
- 7.6 Summary
- 7.7 Glossary
- 7.8 Answers: Self Assessment
- 7.9 Terminal Questions
- 7.10 Suggested Reading
- 7.0 Learning Objectives**

After studying the lesson, you should be able to understand:-

1. The concept of Marginal Cost and Marginal Costing
2. Ascertainment of P/V Ratio, margin of safety and breakeven point. Etc.
3. Application of Marginal Costing

7.1 Introduction

We have already learnt that total costs can be divided into fixed, semi variable according to the variable classification of costs. Semi variable costs again can be segregated into fixed and variable portions. Thus the two broad divisions of costs will be fixed and variable costs. Total costs of a product will decrease with the increase in units of production and will decrease with the decrease in the units of production. This is because of the fact that variable cost per unit remains the same whereas fixed cost per unit increases with the decreases in the units of production and decreases with the increase in the units of production. Thus when taken together total costs will increase with the increase in units of production and decrease with the increase in the units of production. The changes in total costs will not provide the management the comparable data on the basis of which the decisions may be taken by the management. Thus management thought of excluding the fixed cost from the total cost in order o have variable costs only which remains the same per unit of production. This provided the management comparable data which helps the management to take various type of decisions. This lead to the invention of a new technique known as marginal costing. In U.S.A variable costing is used for marginal costing (which is used in U.K)

7.2 MEANING OF MARGINAL COST AND MARGINAL COSTING

There are two terms which confuse the students generally. These are marginal cost and marginal costing. Marginal cost is the change in the aggregate costs with the increase or decrease one unit of production. If 1000 units are produced and the marginal cost is Rs. 3 per unit hen the total cost will be Rs. 3,000. If the production is increased to 1001 unit of production then the total cost will be Rs.3,003. The change in the aggregate cost is Rs.3 and is the marginal cost. In the context a unit may be single, a batch of articles, an order, a stage of production capacity or a department. It relates o he change in output in the particular circumstances under consideration.

Marginal costing is the ascertainment of marginal costs by differentiating between fixed costs and variable costs and to see the effects of profit of changes in volume or type of output. Thus marginal costing includes two things i.e. (i) the ascertainment marginal cost and (ii) The cost volume profit relationship.

7.3 ASCERTAINMENT OF MARINAL COST

We have already seen how cost is presented in the cost sheet with various divisions of costs. This presentation is made under the method of absorption or total cost method. Under this method the total cost is absorbed in the units of production. But presentation under marginal cost is different from the absorption costing. Under marginal costing the cost is ascertained as under :

Sales	Rs.
Less Marginal Cost	xxxxxx
Direct Material	xxxxx
Direct Wages	xxxxxx
Direct Expenses	xxxxxx
Variable Overheads	xxxxxx
Contribution	xxxxxx

Less fixed Costs	xxxxxx
Profit or loss)	xxxxxx

Thus, we find that out of sales, marginal cost is deducted in order to calculate the gross margin or contribution. The contribution of a product will create a fund out of which fixed costs of the concern as a whole is deducted to have profit or loss.

It is only in presentation that total cost method is different from the marginal cost. The same transaction which are included in the cost sheet are taken for the purpose of marginal costing but with the difference that in case of marginal costing we take first of all the marginal cost and then fixed costs in order to calculate the profit or loss. Generally it is expected that the profits or loss as per total cost and marginal cost must be the same but it may be different because of the following reason:-

(i) Difference in stock Valuation

In total cost method the stock (opening and closing) is valued at total cost basis whereas in marginal costing such stock is valued at marginal cost basis. Thus the valuation under marginal costing will be less as compared to total cost method and hence there will be difference in profits calculated under two methods. If the closing stock is more than the opening stock or production exceeds sales there will be more profit in absorption costing. But if closing stock is less than the opening stock i.e. sales exceed production there will be higher profit in marginal costing.

(ii) Over or under absorption of overheads

In absorption costing there is every possibility of under or over absorption of overheads because of difficulty in forecasting cost and volume of output. Thus there will not be hundred percent absorption of fixed costs. But in marginal costing, fixed costs are not taken into consideration and directly charged to Costing Profit and Loss Account treating it as fixed costs. Thus due to under or over-absorption of overheads there will be difference in profits as calculated under absorption costing and marginal costing.

After ascertaining the marginal cost it becomes necessary for us to see the other aspect of marginal costing i.e. cost volume profit relationship. It is a known fact that if volume of a product is increased, the cost will decrease and profit will increase and vice-versa will be true if volume is decreased.

In order to understand the relationship of cost volume profit relationship it becomes necessary to understand the following terms:

1. Contribution
2. P/V Ratio
3. Break Even Point
4. Margin of Safety

These will be discussed now one by one.

1. **Contribution:-** Contribution is the difference between the sales and variable cost of sales. It contributes to the 'fund' out of which fixed expenses are deducted to calculate profit or loss. Thus if the selling price is Rs. 10 and the variable cost is 6 per unit then contribution will be Rs. 4 per unit. Suppose the concern is producing 1000 units then Rs. 4000 will be total contribution. If the total fixed expenses are Rs. 2000, then the profit will be Rs. 2,000. If the fixed expenses are Rs. 7000 then there will be loss of Rs. 3,000. It can be represented as:

$$\text{Contribution} = \text{Selling} - \text{Marginal Cost}$$

$$\text{Or Contribution} = \text{Fixed} + \text{Profit/Loss}$$

Or Contribution-Fixed Expenses=Profit/loss

Contribution is very important in marginal costing as it helps to determine the profitability of various products, departments in profit planning, in selecting a better product mix and other decision making task of the management. Contribution per unit will also help to determine the breakeven point. In general we can say that product or department which gives maximum contribution is the best as compared to other product or departments.

Marginal Cost Equation

The above relationship can also be put in the form of marginal equation:

Sales=Variable Cost+ Fixed Expenses +Profit/Loss

Or Sales-Variable Cost=Fixed Cost= Fixed Expenses +Profit/Loss

Or $S-V=F+P$ (where S stand for sales, V for variable costs, F for fixed expenses, +P for profit and -P for loss)

Or $S-V=C$ (as $F+P$ i.e. fixed expenses + Profit=Contribution)

From his equation we can calculate the value of four factors i.e. S, V, E, P, if any of these factors are known.

Illustration: Determine the amount of fixed expenses from the following particulars:

	Rs.
Sales	10, 00,000
Direct Materials	3, 00,000
Direct labour	2, 00,000
Variable overheads	1, 50,000
Profit	1, 0,000

Solution:

Sales –Variable Cost=Fixed Cost +1, 0,000 or Fixed Cost +Rs. 2, 00,000.

2. **P/V Ratio.** Profit Volume or Contribution Sales ratio is the ratio of contribution to sales and is calculated by the following formula:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{Or} = \frac{\text{Fixed Expenses} + \text{Profit}}{\text{Sales}}$$

$$\text{Or} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}}$$

$$\text{Or} = \frac{\text{Changes in Profits or contribution}}{\text{Changes in sales}}$$

The ratio is multiplied by 100 then P/V ratio can be expressed in the form of percentage.

Suppose the sale price of a unit is Rs. 10 and the variable cost per unit is Rs. 6 then the contribution will be Rs. 4 per unit P/V Ratio will be $\frac{4}{10} \times 100 = 40\%$.

The P/V ratio is a very important ratio studying the profitability of operations of a business and established relationship between the contribution and sales. In order to find out which product is most profitable, we have to calculate the profit-volume ratio of the different products. The product which gives the maximum P/V ratio is the most profitable. Every concern tries to maximise P/V ratio, as higher P/V ratio gives an indication of more profit. It can be increased by:

Increasing the selling price of the product.

- (i) Decreasing the variable cost of the product and
- (ii) Shifting to the production of those products which are more profitable or having more P/V ratio

With the help of this ratio variable costs can also be calculated by the following:

$$\text{Variable costs} = \text{Sales} (1 - \text{P/V ratio})$$

Breakeven point (as will be discussed later on) can also be calculated with the help of this ratio by the following rule

$$\text{Break Even Point} = \frac{\text{Fixed cost}}{\text{P/V Ratio}}$$

Illustration

Assuming that the cost structure and selling price remain the same in Periods I and II find out P/V ratio and fixed expenses.

Period	Sales	Profit
I	Rs. 1,20,000	Rs. 9,000
II	Rs. 1,40,000	Rs. 13,000

Solution

P/V ratio =

$$\frac{\text{Change in Profits}}{\text{Change in sales}} = \frac{4,000}{20,000} \times 100 = 20\%$$

For calculating the fixed cost, contribution will be calculated by multiplying the P/V ratio with the sales of one period and then profit of the same period will be deducted to find out the fixed costs.

Fixed Costs = (P/V ratio * sales) - Profit

$$= (20\% \times 1,20,000) - 9,000$$

$$= 24,000 - 9,000 = \text{Rs. } 15,000$$

3. Break Even Point

Break Even Point is that where the total costs are equal to the total sales and there is no profit or loss. Contribution will be equal to the fixed costs at this point. Break Even Point can be calculated either in units or value. Breakeven Point can be calculated either in units or value. Break Even Point in units can be calculated by the following formula

Break Even Point (in units) =

$$\frac{\text{Total Fixed Expenses}}{\text{Selling price per unit} - \text{Marginal cost per unit}}$$

Breakeven point in sales can be calculated by multiplying the units with the sales price.

Break Even Point can also be calculated with the help of the P/V ratio as already given previously.

Calculation of Profit when sales are given:

Sometimes it is required to calculate the amount of profit when sales are given. First of all sales are to be multiplied with the P/V ratio in order to calculate the contribution. Out of contribution fixed expenses are to be deducted in order to calculate the profit.

Calculation of sales when it is desired to earn a certain amount of profit

If it is desired to earn a certain amount of profit then the desired amount of profit should be added to the fixed expenses in order to calculate the desired contribution which should be divided by the P/V ratio in order to calculate the amount of sales.

Illustration. From the following data find out (i) PV Ratio (ii) Break Even Point (iii) Sales required to earn a profit of Rs. 1, 60,000 and (iv) Profit when sales are 2,00,000

Selling Price per unit	Rs40
Variable cost per unit:	
Direct Materials	Rs.10
Direct Labour	Rs.7
Variable Overheads-100 on direct labour cost	
Fixed Expenses	Rs.64, 000

Solution:

Selling Price		Rs.40
Less Marginal Cost:		
Direct Materials	Rs.10	
Direct Labour	Rs.7	
Variable overheads	Rs. 7	Rs.24

Contribution		Rs.16

$$(i) \quad P/V \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} * 100 = \frac{16}{40} * 100 = 40\%$$

$$(ii) \quad \text{Break Even Point} = \frac{\text{Fixed Costs}}{\frac{P}{V} \text{ Ratio}}$$

$$\frac{64,000}{40\%} = \text{Rs. } 1,60,000$$

$$(iii) \quad \text{Sales required to earn a profit of Rs. } 1,60,000$$

$$\frac{\text{Fixed expenses} + \text{Desired profit}}{\frac{P}{V} \text{ Ratio}}$$

$$\frac{64,000 + 1,60,000}{40\%}$$

=Rs.5, 60,000

(iv) Profit when sales are Rs.2,00,000

Profit =Contribution-fixed expenses

=(P/V Ratio x Sales)-Fixed Expenses

= 40% x 2,00,000)-Rs. 6400

= Rs.80,000-Rs. 64,000=Rs.16,000

4. Margin of Safety

Margin of safety is the difference between the actual sales and sales at break even point. At break even point we have seen there is no profit or loss. It is only after the break even point that the profit starts. The more the actual sales are from the break even point the more margin of safety will be. Thus margin of safety can be calculated by the following formula:

Margin of Safety =Present Sales-Break Even Sales

Margin of Safety can also be calculated with the following formula:

Marin of Safety=

$$\frac{\text{Profit}}{\frac{P}{V} \text{Ratio}}$$

Margin of safety indicates the strength of the business. If the production or sales are increased from the break even point the margin of safety will increase. More the margin of safety it will be more beneficial for the business. Every concern tries to increase the margin of safety in order to increase the strength of the business. Margin of safety can be increased by the following steps:

- (a) Increase the level of production
- (b) Increase the selling price
- (c) Reduce the fixed costs or variable costs or both
- (d) Substitute the existing product y more profitable products.

Illustration.

The sales turnover and profit during two years were as follow:-

Year	Sales Rs.	Profit Rs.
I	3, 00,000	40,000
II	3, 40,000	50,000

You are required to calculate:

- (i) P/V Ratio
- (ii) Fixed Costs
- (iii) Break Even Point
- (iv) The sales required to earn a profit of Rs. 0,000
- (v) The profit when sales are Rs. 5,00,000

- (vi) Margin of safety at a point of Rs. 1,00,000.
 (vii) Variable costs of the two periods.

Solution.

$$(i) \quad P/V \text{ Ratio} = \frac{\text{Change in profits}}{\text{Change in sales}} = \frac{10,000}{40,000} = \frac{1}{4} \text{ or } 25\%$$

$$(ii) \quad \begin{aligned} \text{Fixed Expenses} &= \text{Contribution} - \text{Profit} \\ &= (\text{P/V Ratio} \times \text{Sales}) - \text{Profit} \\ &= (1/4 \times 3,00,000) - 40,000 \\ &= \text{Rs. } 75,000 - \text{Rs. } 40,000 \\ &= \text{Rs. } 35,000 \end{aligned}$$

$$(iii) \quad \text{Break Even Point} = \frac{\text{Fixed Costs}}{\frac{P}{V} \text{ Ratio}} = \frac{35,000}{\frac{1}{4}} = \text{Rs. } 1,50,000$$

$$(iv) \quad \text{Sales required to earn a profit of Rs. } 80,000$$

$$\begin{aligned}
 &= \frac{35000 + 80,000}{1} = 1,15,000 \times \frac{4}{1} \\
 &= \text{Rs. } 4,60,000
 \end{aligned}$$

(v) The profit when sales are Rs5,00,000

$$\begin{aligned}
 \text{Profit} &= (\text{P/V Ratio} \times \text{Sales}) - \text{Fixed Expenses} \\
 &= (1/4 \times 500,000) - \text{Rs. } 35,000 \\
 &= \text{Rs. } 1,25,000 - \text{Rs. } 35,000 = \text{Rs. } 90,000
 \end{aligned}$$

(vi) Margin of safety of a profit of Rs. 1,00,000

Margin of Safety

$$\frac{\text{Profit}}{\text{P/V Ratio}} = \frac{1,00,000}{1/4} = \text{Rs. } 4,00,000$$

(vii) Variable Cost= (100-P/V Ratio) or

100-2%=7% of sales

Variable cost of year 1= % of 3,00,000=Rs. 2,2,000

Variable cost of Year II= Of 3,40,000+Rs. 2,000

SOLVED TYPICAL PROBLEMS ON MARGINAL COSTING

Illustration: A company is considering expansion. Fixed costs amount to Rs. 4,20,000 and are expected to increase by Rs. 1,25,000 when plant expansions completed. The present plant capacity is 80,000 units a year. Capacity will increase by 0 percent with the expansion. Variable costs are currently Rs. 6.0 per unit and are expected to go down by Rs.0.40 per unit with the expansion. The current selling price is Rs. 16 per unit and is expected to remain under either alternative. What are the break even points? Which alternative is better and why?

Solution:

	Present Position	After Expansion
	Rs.	Rs.
Fixed Costs	4,20,000	5,45,000
Capacity	80,000 units	1,20,000 units
Selling price per unit	Rs.16.00	Rs.16.00
Less Variable costs	Rs.6.80	Rs.6.40
Contribution per unit	9.20	9.60
Break Even Point:	$\frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{4,20,000}{9.20}$	$\frac{5,45,000}{9.60}$
	=45,652 units	=56.771

Assuming that production up to plant capacity can be sold, profit under the two alternative will be as follows:

	Present capacity Rs.	Capacity after expansion Rs.
Sale: 80,000 units Rs16 1,20,000 units Rs.16	12,80,000	19,20,000
Less variable cost		
80,000 units Rs. 6.80 1,20,000 units Rs.6.40	5,44,000	7,68,000
contribution	7,36,000	11,52,000
Less fixed costs	4,20,000	5,45,000
profit	3,16,000	6,07,000

From the above it is clear that profit it is nearly twice of the present profit after the expansion so alternative of expansion. So alternative of expansion is better than the present.

Solution.

At 100% capacity:

	Plant 1 Rs. (lakhs)	Plant II Rs. (lakhs)	Merged plan Rs.(lakhs)
sales	300	$\frac{120}{200}(\frac{60}{60} * 100)500$	500
Variable cost	220	$\frac{90}{150}(\frac{60}{60} * 100)370$	
Variable cost	220	$\frac{90}{150}(\frac{60}{60} * 100)370$	
contribution	80	50	130
Fixed costs	40	20	60
profit	40	30	70

fixed cost

(1) Break even sale of Merged plant = $\frac{\text{fixed cost}}{\text{sale} - \text{variable cost}}$

$$= \frac{60 * 500}{130} * 100 = 46.15\%$$

(II) At 75% capacity working contribution = $\frac{130 * 75}{100}$ =Rs. 97.5 lakhs.

Profit=(Rs.97.5 lakhs –Rs. 60 lakhs fixed cost)=Rs.37.5 lakhs.

Illustration: The following figures have been extracted from the accounts of a manufacturing undertaking, which produces a single product for the previous (base)

units produce and sold	10,000
	Rs.
	20,000
Variable cost per units :	
Labour	4
Material	2
Overheads	0.80
Selling price per unit	10

In preparing the Budget for the current (budget) year the undernoted changes have been envisaged:

Units to be produced and sold	15,000
Fixed overheads increased by	Rs.3,000
Fall in labour efficiency	20%
Special additional discount for bulk Purchase of material	
Variable overhead per unit educed	
Fall per unit in selling price	10%

Calculate:

- (i) The number of units which must be sold to break even in each of the two years.
- (ii) The number of units which would have had to be sold to double the profit in the base year under base year conditions.
- (iii) Te number of units which would have to be sold in the budget year to maintain the profit level of the preceding year.

Solution:

Summary of Costs

	Base Year		Current Year	
	Rs./units	Total Amount	Rs./Units	Total Amount
Units produced And sold	10,000		15,000	
1. Sales	10.0	1,00,000	9.00	1,35,000
2. Variable Costs:				
Direct Wages	4.0	40,000	5 .00	75,000
Direct materials	2.0	20,000	1.95	29,250

Variable overheads	<u>0.80</u>	<u>8,000</u>	<u>.79</u>	<u>11,850</u>
Total variable cost	<u>6.80</u>	<u>68,000</u>	<u>7.74</u>	<u>1,16,100</u>
Contribution (1-2)	3.20	32,000	1.26	1,900
Fixed overheads		<u>20,000</u>		<u>25,000</u>
Net profit/ (Loss)		<u>12,000</u>		<u>61,00</u>

(i) Units to sell for breaking even

= Fixed overhead/ Contribution per unit

= Rs. 20,000/ Rs. 3.20 Rs. 25,000 / Rs. 1.26

= 6,20 units = 19,841 units.

(ii) Units to sell for doubling profit in Base year

$$\frac{(\text{Profit } \times 2) + \text{Fixed Overhead}}{\text{Contributed per unit}}$$

$$\frac{(\text{Rs. } 12,000 \times 2 + 20,000)}{\text{Rs. } 3.20}$$

$$\frac{44,000}{\text{Rs. } 3.20} = 13,750 \text{ units}$$

(iii) Units to sell in current year for maintenance of profit of the base year

$$= \frac{\text{Profit of base year} + \text{Fixed overhead of current year}}{\text{Rs. } 1.26}$$

$$\frac{\text{Rs. } 12,000 + \text{Rs. } 25,000}{\text{Rs. } 1.26} = \frac{\text{Rs. } 35,000}{\text{Rs. } 1.26}$$

=2,365 unit

Working notes:

Changes of data to current year from the base year.

(i) Total fixed overhead = Rs. 20,000+Rs. 5,000= Rs.25,000

(ii) Labour cost per units:

(Fall in labour efficiency by 20% implies that 20 less output is now produced by labour in the same working hours).

	Out put	Wages
Base year	1 unit	Rs. 4.00
Current year with 20% lower efficiency	0.8 unit	Rs.4.00
Hence in current year labour cost		
Per unit	Rs. 4/0.8	Rs.5

(iii) Material cost per unit:

Base year= Rs. 2 less discount is current year 21/2 % = Rs.1.9.

(iv) Variable overheads per units:

Base year=Rs. 0.80 less reduction by 1% in current year
 $=0.80 \times 0.99 = 0.792$. There, variable overheads per unit in current period=0.9

(v) Selling price per unit

Base year=Rs. 10 less 10 falling current year = Rs.9.00

7.4 Application of Marginal Costing

The marginal costing technique is very useful to the management in taking many valuable policy decisions. Such decisions, if taken by the management with the help of absorption costing method will lead to wrong conclusions. The following are some of the managerial problems which can be solved with the help of marginal cost technique.

1. Fixation of Selling Price.

Fixation of selling price is one of the important functions of management and is to be performed under the normal circumstance in times of completion of trade depression, accepting additional orders for utilizing idle capacity and in exploring and exporting new markets

In normal circumstance the price must be fixed by the forces of demand and supply and must cover the total cost plus a reasonable margin of profit. It can also be fixed on the marginal costing basis provided the contribution must be able to cover the fixed cost and a reasonable margin of profit. The real test of management will be when prices are to be fixed in cut throat competition or depression or additional capacity is to be utilised or new markets are to be explored or goods are to be exported. In such cases, the price can be below total cost but must be above the marginal cost i.e., marginal cost plus some contribution towards the fixed expenses. The more the contribution is towards the fixed expenses the more the beneficial the price will be in the interest of the concern.

In times of depression in order to clear the stocks of the concern, the concern may adopt the price which is just covering the marginal cost. This policy may be good for short period to tide the period of difficulty but this policy will not be good in the long term.

Sometimes the concern is required to reduce the price below cost in order to tide over the short period difficulties. This policy may be good for short term but cannot be adopted in the long period. Such policy becomes necessary:

- (i) When the concern is required to introduce a new product in the market.
- (ii) When foreign market is to be explored to earn foreign exchange.
- (iii) When the concern has purchased a large quantity of material and the materials become obsolete. In order to reduce the loss, it becomes necessary to produce and sell it below marginal cost.
- (iv) When the closure of business may mean breaking up the connections with the existing purchasers and in order to regain much expenditure is to be done for advertisement and sales promotion.
- (v) The sale of one product may push up the sale of another product and it becomes necessary to produce such product and sell it below marginal cost.
- (vi) When on the closure of business heavy compensations are required to be paid to the workers on retrenchment.
- (vii) When competitors are to be eliminated from the market.
- (viii) When goods are of perishable nature.

Sometimes a concern may get a foreign order but the price which is to be received may be less than the home price. Under such circumstances it is to be seen whether the order should be accepted or not. If the home price is compensating the loss which the concern is required to bear and the concern may get some direct or indirect benefits such as prestige of exporting, import entitlements, subsidies or any other special favours from the government than the foreign order can be accepted provided the concern has idle capacity and can manufacture that quantity without increasing any fixed expenses. But if the concern is not having any idle capacity then the cost must be increased reasonably in order to adjust the charges which the concern is required to incur because of fixed additional facilities. This will be more clear from the following illustrations.

Illustration:

The cost sheet of a product is given as under:

		Rs.
Direct Materials		10.00
Direct wages		6.00
Factory Overheads		
Fixed	Re.1.00	
Variable	Re.1.00	2.00
Administration Expenses		
Selling and Distribution		
Overheads:		
Fixed	Re.0.50	
Variable	<u>Re. 1.00</u>	<u>1.50</u>
		<u>21.00</u>

The selling price is Rs.24

The above figures are for an output of 1, 00,000 units. The capacity of the firm is 1,0,000. A foreign customer is desirous of buying 30,000. Units at a price of Rs. 20.00 per unit. Advise the manufacturer whether the order should be accepted. What will be your advice if the orders were from local merchant?

Solution:

Marginal cost or additional cost of addition 30,000 units

	Per unit	For 30,000 units
	Rs.	Rs.
Direct Materials	10.00	3, 00,000
Direct Wages	<u>6.00</u>	<u>1, 80,000</u>
Prime cost	16.00	4, 80,000
Variable Overheads:		
Factory	1.00	30,000
Selling and Distribution	<u>1.00</u>	<u>30,000</u>
	18.00	5,40,000
Sales	<u>20.00</u>	<u>6,00,000</u>

Contribution	<u>2.00</u>	<u>60,000</u>
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The order from the foreign customer will give an additional contribution of Rs. 60,000. Hence, the order should be accepted because additional contribution of Rs. 60,000 will increase the profit by this amount because fixed expenses have already been met from the internal market.

The order from the local merchant should not be accepted at a price of Rs. 20. This price will affect relationship with other customers and there will be general tendency of reduction in the price.

Illustration:

Asha Ltd has been working well below normal capacity due to recession. The directors of Asha Ltd have been approached by a company with an enquiry for special purpose job. The costing department estimated the following in respect of the job:

Direct Materials Rs. 20,000 Direct Labours 1,000 hours @ Rs. 4 per hour; Overhead Costs: (Normal recovery rates):

Variable	Rs. 1.00 per hour
Fixed	Rs. 2.00 per hour

The directors ask you to advise them on the maximum price to be charged. Assume that there are no production difficulties regarding the job.

Solution:

Statement showing the minimum price to be charged.

	Rs.
Direct Material	20,000
Direct labour 1,000 hours Rs. 4 per hour	4,000
Variable Overheads	<u>1,000</u>
Marginal Cost	<u>25,000</u>

Hence the absolute minimum price Rs. 25,000 i.e., total of marginal costs. As this will not make any contribution a proportion of fixed costs of Rs. 2,000 may be added to make the job worthwhile. The amount to be added will depend upon the circumstances of the case.

2. Make or Buy Decisions.

A concern may have idle capacity which may be utilized in manufacturing components parts or similar items instead of buying them from market. While making such decisions, the marginal cost of manufacturing the components should be compared with the price quoted by the supplier. If the marginal cost is less it is better to purchase from the market but on the other hand if the marginal cost is more than the purchase price it is desirable to purchase the same from the market. Fixed cost are entirely ignored on the assumption that such cost will not be increased with the manufacturing of components. But if the manufacturing of the components increase the fixed cost then it becomes necessary to find out the minimum volume which would justify making instead of buying. This volume is determined as follows:

Increase in fixed costs

Contribution (i.e. price less variable cost of production) per unit.

While doing this if there is any impugnant factor (discussed afterwards in the lesson) it should be taken into consideration

Illustration:

A firm can purchase a spare part from an outside source a Rs. 6 per unit. There is a proposal that the spare part be produced in the factory itself. For the purpose a machine costing Rs. 1,00,000 with an annual capacity of 20,000 units and a life of 10 years, will be required. A foreman with a monthly salary of Rs. 800 p.m. will have to be engaged. Materials required will be Rs. 1.75 per unit and wages 90 paise per unit. Variable overheads are 150% of direct labour. The firm can easily raise funds at 7%. Advise the firm whether the proposal should be accepted.

Solutions:

The variable cost is compared as under:

	Rs.
Materials	1.75
Wages	0.90
Able overheads	<u>1.35</u>
Marginal cost	<u>4.00</u>

In order to decide whether spare part should be manufactured or not, marginal cost is compared with the purchase price in order to find out the contribution. In this case the contribution is Rs. 2/- (Rs.6-Rs.4). But in order to find out the volume at which it will be economical, we must divide the fixed cost by the contribution. Fixed costs in this case will be as under:

	Rs.
Depreciation (annual)	10,000
Salary of the foreman (annual)	9600
Interest on Rs. 1,00,000 7% p.a.	<u>7,000</u>
Increase in total fixed cost	<u>26,600</u>

In order to accept the proposal it is essential that the volume should be at least 13,300 as calculated here:

$$\frac{\text{Increase in fixed costs}}{\text{Contribution per unit}} = \frac{26,600}{\text{Rs. } 2} = 13,300$$

If there is no idle capacity and making of the component in the factory involves putting aside other work, then the loss from displaced work should also be taken into consideration along with the marginal cost of production. It will be more profitable to manufacture if the purchase price is more than the marginal cost plus traceable fixed cost plus the loss of contribution. The loss of contribution is to be found with reference to the key factor.

Illustration:

K. Ltd. produces a variety of products each having a number of component parts. Product B takes 5 hours to process on a machine working to full capacity. B has a selling price of Rs. 50 and a marginal cost of Rs.30 per unit. A-10 a component part used for product. A could be made on the same machine in 2 hours for a marginal cost of Rs. 5 per unit. This supplier's price is Rs. 12.50 per unit. Should one make or buy A-10? Assume the machine hours is the limiting factor.

Solution

Contribution of B=Selling price-Marginal Cost

$$=\text{Rs. } 50-\text{Rs. } 30=\text{Rs. } 20$$

Contribution of B per hour=Rs. 20 ours=Rs.4 per our

Loss of contribution for 2 hours= Rs. 4x2=Rs.8 per hour

For deciding whether to manufacture the component or to purchase it from outside, marginal cost plus loss of contribution must be compared with the purchase price. In this case the marginal cost is Rs. 5 and loss of contribution is Rs.8. The total cost i.e. Rs.13 when compared with the purchase of Rs.12.0 it will be concluded that outside purchase is preferable.

3. Key or Limiting Factor:

A key factor is that factor whose influence must be taken into consideration before making any programme of production or sales. In general, sales are the limiting factor as a concern is not able to sell as much as it can produce. But Sometimes a concern can sell all what it can produce but production is affected by some limiting factor. It may be material, labour machine capacity or capital act. In such cases it becomes necessary to see the profitability of the product with reference to limiting factor. This can be determined by dividing the contribution of a product by the limiting factor in order to calculate the profitability per limiting factor. Only then decision can be taken by the management as to which product is more profitable.

Illustration.

From the following data, which product would you recommend to be manufactured in a factory, time being he key factor

	Per unit of Product A	Per unit of Product B
Direct Material	24	14
Direct Labour at Re. 1 per hour	2	3
Variable Overhead at Rs.2 per hour	4	6
Selling price	100	110
Standard time to produce	2 hours	3 hours
Contribution per hour	Rs.35	Rs. 29

From the above it is clear at contribution per hour of product A is more than that of product B Rs.6. Therefore product A is more profitable and is recommended to be manufactured.

4. Effect of Changes in Sale price

Because of competition, or expansion programme or government regulations, the management is required to reduce the price. The effect of reduction in price will be reduction in contribution per unit. This aspect has to be studied thoroughly by the management in order to see the justification of reduction in price or the product.

Illustration:

The directors of a company are considering the results of treading during the last year. The Profit and Loss Statement of the company appeared as follows:

	Rs.	Rs.
Sales		7,50,000

Direct materials	2,25,000	
Direct wages	1,50,000	
Variable overheads	60,000	
Fixed, overheads	<u>2,20,000</u>	<u>6,55,000</u>
Profit		<u>95,000</u>

The budgeted capacity of the company is Rs. 10,00,000 but the key factor is sales demand. The sales manager is proposing that in order to utilise the existing capacity, the selling price of the only product manufactured by the company should be reduced by 5%.

You are required to prepare to forecast statement which should show the effect of the proposed reduction in selling price and to indicate any changes in costs expected during the coming year. The following additional information is given:

Sales forecast : Rs.9,50,000

Direct material prices are expected to increase 2%

Direct wages rates are expected to increase by 5% per unit.

Variable overhead cost expected to increase by % per unit.

Fixed overheads will increase by Rs. 10,000

Solution;

Statement showing the effect of Change in selling

	Rs.	Rs.
Sales		9,50,000
Less marginal cost:		
Direct Materials	3,06,000	
Direct wages	2,10,000	
Variable overheads	<u>84,000</u>	<u>6,00,000</u>
3,50,000		Contribution
Fixed overheads		<u>2,30,000</u>
Profit		<u>1,20,000</u>

The above statement will show that although costs have increased and selling price has been reduced, the profit forecast for coming year is still more than achieved last year. This is because increased volume of sales at reduced sales price has resulted in increased contribution more than sufficient to cover increase in costs, variable and fixed.

Working Notes:

Rs.

(a) Sales (after 5% price reduction)	9,50,000
Add reduction in selling price	
5/95 X 9, 50,000	<u>50,000</u>

Sales before price reduction	10, 00,000
Less: Sales last year	<u>7,50,000</u>
Increase in sales	2,50,000

or $2,50,000/7,50,000 \times 100$
 $=33\frac{1}{3}\%$

This is to be taken into account in adjusting increase in cost.

Thus

	Rs.
(b) Direct materials:	
Last year's figures	2, 25,000
1	
Add 33 X ----- due to increase In volume	75,000
3	

	3, 00,000
Add: 2% increase in price	<u>6,000</u>
	<u>3, 06,000</u>
(c) Direct wages	
Last year's FIGURE	1, 50,000
1	
Add 33 X -----	50,000
3	

	2, 00,000
Add:5 % increase in rate	10,000

	2, 10,000
(d) Variable overheads:	60,000
Last year's figure	
1	
Add 33 X ----- %	20,000
3	

	80,000
Add: 5% increase in rate	<u>4,000</u>

84,000**5. Maintaining a desired level of profits.**

A management may be interested to have a desired level of profit. For this necessary volume of sales can be ascertained with the help of marginal costing. This will be more clear from the following illustration.

Illustration:

A company produces and markets industrial containers and packing cases. Due o increase in competition the company proposes to reduce the selling price. If the present level of profit is o be maintained indicate the number of units to be sold if he proposed reduction in selling price is:

(a) 5% (b) 10% (c) 15%

The following additional information is available

		Rs
Present sales Turnover		6,00,000
(60,000 units)		
Variable costs		
(60,000 units)	3,60,000	
Fixed costs	<u>1,40,000</u>	<u>5,00,000</u>
Net profit		<u>1,00,000</u>

Solution:

	5%	10%	15%
	Rs.	Rs.	Rs.
Selling price after reduction	9.50	9.00	8.50
Less variable cost	6.00	6.00	6.00
Contribution per unit	3.50	3.00	2.50

Thus the total contribution required to maintain the present level of profit is as follows:

Fixed Expenses	Rs. 1,40,000
Profit as per statement above	<u>Rs. 1,00,000</u>
	<u>Rs. 2,40,000</u>

Units to be sold to earn the total contribution of Rs. 2, 40,000 to maintain the present level of profit.

(a) At a price reduced by 5% = $\text{Rs. } 2, 40,000 / 3.50 = 68,571$ units.

(b) At a price reduced by 10% = $2, 40,000 / 3.00 = 80,000$ units.

(c) At a price reduced by 15% = $2, 40,000 / 2.50 = 96,000$ units.

6. Selection of a suitable mix: When a factory is producing more than one product then the problems faced by the management is the determination of suitable mix i.e. the proportion in which the concern should produce and sell the products. The best product mix will be that which gives the maximum contribution. The products

which are giving maximum contribution their production and sales are to be increased whereas those products where contribution is comparatively less their production should be reduced or closed down altogether.

7. Alternative Methods of Production: Marginal costing is helpful in selecting the best method of production i.e., whether the production is to be done by hand or by machine. That method of production which gives the maximum contribution will be the best.

Illustration:

Product X can be produced either by machine A or machine B. Machine A can produce 100 units of X per hour and Machine B 150 units per hour. Total machine hour available during the year are 2,500. Taking into account the following data determine the profitable method of manufacture:

	Per unit of Product	
	Machine A	Machine B
Marginal cost	10	12
Selling price	18	18
Fixed cost	4	4

Solution:

Profitability Statement

	Machine A	Machine B
Selling price per unit	18	18
Less marginal cost	10	12
Contribution per unit	8	6
Output per hour	100	100
Contribution per hour	800	900
Machine hour per year	2,500	2,500
Annual Contribution	20,00,000	22,50,000

Hence production by machine B is more profitable.

- 8. Diversification of Products:** Sometimes a new product is to added to the existing product or products to utilize the capacity of the concern to capture a new market or for any other purpose. Whether the new product should be added or not it will depend on the profitability of the product. The new product may be manufactured if it is capable of giving some contribution after meeting its variable cost. This is on the assumption that the concern will not require incurring any thing on fixed expenses and the new product can be manufactured with the help of existing resources and manpower etc. Marginal costing will definitely help in this respect.
- 9. Level of Activity:** Marginal costing is also helpful to the management in deciding the level of activity. While deciding it has to be seen that the level of activity is the best where the contribution is the maximum. This is true up to 100% capacity.
- 10. Closing down or suspending activities:** Sometimes management is required to take decision whether to close the business or continue its operation. Marginal costing helps to make decisions in this context. Till the products are giving contribution i.e., marginal cost is less than the price available it is desirable for the concern to continue its operations.

11. **Alternative course of action:** Management is confronted in most cases with the problem of taking decisions as to the effect of alternative course of action. This problem can be tackled with the help of marginal costing technique. That course of action will be more profitable which gives the maximum contribution to the concern.

7.5 Limitations of Marginal Costing:

- a) It is very difficult to separate all costs into fixed and variable costs clearly, since all costs are variable in the long run. Hence such classification sometimes may give misleading results. Furthermore, in a firm with many different kinds of products, marginal costing can prove less useful.
- b) Since the closing stock consists only of variable costs and ignores fixed costs, this gives a distorted picture of profits to shareholders.
- c) Semi-variable costs are either excluded or incorrectly analyzed, leading to distortions.
- d) With marginal costing, there is often the problem of under or over-recovery of overheads, since variable costs are apportioned on an estimated basis and not on actual value.
- e) Marginal costing *cannot* be used in external reports, which must have a complete view of all indirect and overhead costs.
- f) Since it is based on historical data, marginal costing can give an inaccurate picture in the presence of increasing costs or increasing production.

Self Assessment

Fill in the blanks:

1. Absorption costing technique is also known by other names as "Full costing" or _____.
2. _____ is the cost nothing but a change occurred in the total cost due to changes taken place on the level of production.
3. The _____ is the cost involved in the procurement of indirect materials, indirect labour and indirect expenses.
4. The initial absorption of _____ led the marginal cost to become as variable cost.
5. Profit depends upon a large number of factors, the most important of which are the costs of the manufacturer and the _____ effected.
6. The Cost-Volume-Profit (CVP) analysis helps management in finding out the relationship of _____ to profit.
7. Cost-volume-profit analysis furnishes a picture of the _____ at various levels of activity.
8. The ratio or percentage of contribution margin to sales is known as _____
9. Marginal cost helps management to make decision involving consideration of _____.
10. A decision involves the act of choice and the _____ chosen out of the available alternatives.
11. Marginal costing furnishes information regarding _____ to be incurred if an additional activity is to be taken up or the saving in costs which may be expected if an activity is given up.
12. _____ is the ratio of contribution to sales.
13. A _____ decision is possible when the various factors, and relationships between them, are measurable.

14. A _____ involves the act of choice and the alternative chosen out of the available alternatives.
15. _____ describes the process by which a course of action is selected as the way to deal with a specific problem.

7.6 Summary:

The technique of marginal costing is very simple to operate and easy to understand. Marginal costing removes the complexities of under-absorption of overheads. It helps the management in production planning, facilitates the calculation of breakeven point etc. Marginal costing also helps in calculating other factors such as, effect on profit due to changes of raw material prices, increased wages and changes on sales mixture etc.

7.7 Glossary:

Variable Cost: It varies along with the level of production.

Contribution: It is an amount of balance available after the deduction of variable cost from the sales.

Fixed Cost: It is a cost which is fixed or remains the same for irrespective level of production.

Marginal Cost: Change occurred in the cost of operations due to change in the level of production.

BEP (Units): It is the level of units at which the firm neither incurs a loss nor earns profit t.

BEP (Volume): It is the level of sales in Rupees at which the firm neither incurs a loss nor earns profit t.

PV Ratio: Profit volume ratio which is nothing but the ratio in between the contribution and sales.

Decision-making: Decision-making describes the process by which a course of action is selected as the way to deal with a specific problem.

Desired Profit: It is a profit level desired by the firm to earn at the given level of sales volume.

Key Factor: Factor of influence on the component of contribution.

7.8 Answers: Self Assessment

1. Traditional costing
2. Marginal cost
3. Variable overhead
4. fixed overhead
5. Volume of sales
6. Costs and revenues
7. profit
8. P/V ratio
9. Cost and revenue
10. Alternative
11. Additional costs
12. Profit-Volume (P/V) Ratio
13. Quantitative
14. Decision
15. Decision-making

7.9 Terminal Questions:

1. Write a note on marginal costing.
2. Discuss the following:
 - a) P/V Ratio
 - b) Margin of Safety
 - c) Angle of incidence
3. From the following data, calculate:
 - (1) P/V Ratio.
 - (2) Profit when sales are Rs.20,000 and
 - (3) New Break Even Point if selling price is reduced by 20%

Fixed Expenses	Rs. 4,000
Break Even Point	Rs.10,000

7.10 Suggested Readings:

- 1 Pandey, I.M. Financial Management, Vikas Publishing House Pvt. Ltd., New Delhi.
- 2 Monga J.R. Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.
- 3 Lall, B.M. Jain, I.C. Cost Accounting: Principles and Practice, Prentice Hall, Delhi.
- 4 Man Mohan and S. N. Goyal, Principles of Management Accounting, Sahitya Bhawan Agra
- 5 Bhattacharyya, Debarshi. Management Accounting, Pearson Education in India, New Delhi

Lesson – 8

BREAK EVEN ANALYSIS

Structure

- 8.0 Learning Objectives
- 8.1 Introduction
- 8.2 Break Even Analysis
- 8.3 Calculation of Break Even Point
- 8.4 Related Terms and Techniques
- 8.5 Break Even Charts
- 8.6 Assumption and Limitation of Break Even Chart
- 8.7 Summary
- 8.8 Glossary
- 8.9 Answers: Self Assessment
- 8.10 Terminal Questions
- 8.11 Suggested Readings

8.0 Learning Objectives:-

After studying the lesson, you should be able to understand:-

1. The concept of Break Even Analysis
2. Calculation of Break Even Point through various ways
3. Construction of different Break Even Charts
4. Assumption and limitations of Break Even Chart.

8.1 Introduction

Some industries today are encountering the problems raised by expansion through increased sales and the introduction of new products. Many on the other hand, are facing problems of contraction due to the introduction of substitute materials or products, or reduced demand for their product. Whichever is the case, it is vitally important that management should be in a clear position to plan for these changing levels of activity. Information must be available showing the forecasted sales, fixed and variable costs for the period so that a general picture can emerge of the company have expected position. Profit planning has been simplified by the introduction of several new techniques. One of the most important is the preparation and analysis of profit graphs.

8.2 Break Even Analysis:-

The term Break even analysis may be interpreted in two ways. In its narrow sense, it can be termed as a system of determining that level of operations where total revenue equals total expenses i.e. where there is neither any profit nor loss. When interpreted in the broader sense, it refers to a system of analysis that can be used to determine the profit at any level of operations. Break-even analysis is very much an extension or even a part of marginal costing. Basically it is concerned with finding the point at which revenues and costs agree exactly-hence the term “breakeven”. The breakeven point is, therefore, the volume of output at which neither a profit is made nor a loss is incurred.

As a result of calculating break-even points accountants have come to realize that many valuable facts, all essential for operating a business enterprise, can emerge from the exercise. Typical problems which may be solved with the help of break even analysis are as follows:

- (1) What volume of sales will be necessary to cover:
 - (a) A reasonable return on capital employed.
 - (b) Preference dividends.
 - (c) Ordinary dividends
- (2) To compare a number of companies by arranging probable earnings from each in order of magnitude.
- (3) Determination of the price of a product which will give the desired breakeven point and profit.
- (4) Calculation of costs and revenues for all possible volumes of output thereby aiding in fixing budgeted sales.
- (5) Variable cost per unit can be quite easily calculated from a breakdown chart.
- (6) The cash involved in calculating a particular volume of output.

8.3 Calculation of the Break even point:

The point at which the total cost line intersects the turn-over line, that point is known as break even point. The spread to the right of this point between the two lines represent the profit potential while the spread to the left would represent the losses. The break even point may be found by the use of the following formula:

$$\text{Break even point} = \frac{F}{1 - \frac{V}{P}}$$

Where F = Fixed cost

I = A whole number (ONE)

V=Variable cost per unit (or total variable cost)

P= Selling price per unit (or total sales value may be substituted, symbol "S")

Unit variable cost and selling price should be used together in the formula. Alternatively, these may be substituted by total variable cost and sales values.

Example, we are given that:

Fixed Costs	=	Rs. 4, 00,000
Variable costs	=	Rs. 20 per unit
Selling price	=	Rs. 100 per unit
Total Sales value	=	Rs. 10, 00,000

Now using for formula the breakdown point is:

$$\frac{\text{Rs. 4, 00,000}}{20} = \frac{\text{Rs. 4, 00,000}}{1 - \frac{20}{100}}$$

$$\begin{aligned} &= \frac{\text{Rs. 4, 00,000}}{4} \\ &= \frac{\text{Rs. 4, 00,000}}{4} \times 5 \\ &= \text{Rs. 5, 00,000} \end{aligned}$$

This calculation may be checked as follows:

Fixed costs	=	Rs. 4, 00,000
Variable costs	=	Rs. 1.00,000

		Rs. 5, 00,000

Break even point	=	Rs. 5, 00,000

An alternative formula is:

$$\frac{F}{P-V} = \text{Units needed to breakdown}$$

When F = Fixed costs

P = Selling price

V = Variable cost per unit

Using the same facts, the new formula will give:

$$\frac{4,00,000}{100-20} = \frac{4,00,000}{80} = 5000 \text{ units}$$

5000 units @ Rs. 100 = Rs. 5, 00,000 Break even point.

The other alternative formula for calculating Break even point may be noted:

$$\text{Break even Point} = \frac{\text{Fixed Costs} \times \text{Sales}}{\text{Sales} - \text{Variable Cost}}$$

Calculation of turnover for Desired Profit: Once the profit target has been fixed it will be desirable to fix the turnover necessary to earn that profit. Thus may be done by using following formula:

$$\text{Turn-over for Stated Profit} = F + \frac{PT}{1} - \frac{V}{P}$$

When F = Fixed costs

P = Profit

I = One unit

U = Variable cost per unit

P = Selling price

This formula, therefore, is the break even point formula given earlier with the addition or desired profit. If a profit target of Rs. 3, 00,000 is budgeted then using the facts of our example, the turnover required is :

$$\begin{aligned}
 &= \frac{\text{Rs. 4, 00,000} - \text{Rs. 3, 00,000}}{1 - \frac{20}{100}} \\
 &= \frac{\text{Rs. 7, 00,000}}{1-0.2} \\
 &= \frac{\text{Rs. 7, 00,000}}{0.8} = \text{Rs. 8, 75,000}
 \end{aligned}$$

8.4 Related Terms and Techniques:

Many terms and techniques have been developed which now form part of Break-even analysis. Before going to explain breakeven charts the most important of these terms are explained:

Additional Calculation: Calculation, which are additional to those given above for the breakeven point are also a part of the breakeven analysis:

Calculation of Profit for Different turnovers: When it is found that Rs. 8, 00,000 will be the likely sales turnover for the next budget period and the costs and selling price remain the same then estimated contribution and profit can be calculation by the following formula:

$$\text{Contribution} = S \left(1 - \frac{V}{P} \right)$$

When S = Sales turnover of total sales.

I = one unit

V = Variable cost per unit

P= Selling price per unit

Profit = C-F

Where C = Contribution

And F = Fixed Cost

In the present example, therefore, necessary calculations are:

$$\begin{aligned}
 \text{Contribution} &= \text{Rs. 8,00,000} \left[1 - \frac{20}{100} \right] \\
 &= \text{Rs. 8,90,000} (1-0.2) \\
 &= \text{Rs. 8,00,000} \times 0.8 \\
 &= \text{Rs. 6,40,000} \\
 \text{Profit} &= 6,40,000 - \text{Rs. 4,00,000} \\
 &= \text{Rs. 2,40,000}
 \end{aligned}$$

Contribution theory: The contribution theory is the term used to describe the relationship between variable cost and selling price. The use of the word theory may be regarded by many accountants as rather a grandiose description to give to the rules and procedures involved. In summary these are:

1. The difference between selling price and variable cost per unit is the contribution
2. If nothing is produced the loss involved will be the total fixed costs.
3. Variable cost per unit remains the same for different levels of outputs (liner relationship).

Margin of safety: "Margin of Safety" is the difference between the total sales and the sales figure at the breakeven point. This represents the amount by which volume of sales exceeds the breakeven point. It may be expressed in monetary terms or as a percentage- the margin of safety in relation to total sales.

It is important that there should be a reasonable margin of safety, otherwise, a reduced level of activity may prove disastrous. A low margin usually indicates high fixed overheads so that profits are not made until there is a high level of activity to absorb the fixed costs. The margin of safety is important, particularly, in times of depression when sales are receding. The greater the margin of safety, the further sales can fall before the break-even point is reached. Of course, this point is passed, a loss will result. If the margin of safety is unsatisfactory, some of the possible steps to rectify the matter are:

1. Increase the selling price where company is in a strong favorable position and the demand is inelastic.
2. Reduce fixed costs.
3. Reduce variable costs.
4. Substitution of existing product or products by more profitable lines.
5. Increase the volume of output.

How the margin of safety is calculated is shown below:

	Company A	Company B
	Rs.	Rs.
Total Sales	10, 00,000	6, 00,000
Break even point	5, 00,000	5,00,000
	-----	-----
Margin of Safety	5, 00,000	1, 00,000
	-----	-----
Margin of Safety As a percentage	50%	16.67%

If the rate of profit earned on sales above the break-even point is the same for both companies then it is clear that company A is in a much stronger position than the other company. At break-even point the following applies:-

$$\text{Fixed costs} + \text{Variable Cost} = \text{Sales Value}$$

Both sides of equation agree exactly so that there is neither a profit nor a loss. The fixed costs are covered so it follows that once the break-even point is reached, only variable cost have to be deducted from all sales above that level (the margin of safety).

The following formula may be used for calculating margin of safety:

$$\frac{\text{Profit + Sales}}{\text{Sales - Variable Costs}}$$

Angle of incidence: This is the angle at which the sales line cuts the total cost line. The Management's aim will be to have as large an angle as possible, because this indicated a high rate of profit once the fixed overheads are absorbed. A narrow angle would show that even when fixed overheads are absorbed profit accrues at a relatively low rate of return, indicating that variable costs form a large part of cost of sales. This angle of incidence is important in boom times when sales are expanding. Once break even point is reached, additional sales show a good profit return.

Profit Volume Ratio: The Profit/Volume (P/V) ratio often expressed as a percentage is a guide to the profitability of the business. This ratio shows the relationship between the contribution and volume of sales. A more appropriate term might be the "Contribution/Sales Ratio".

A formula for determining the Profit/Volume ratio is as follows:

$$\begin{aligned} &= \frac{S-V}{S} \times \frac{100}{1} \text{ which when simplified becomes} \\ &= \frac{C}{S} \times \frac{100}{1} \end{aligned}$$

Where S = Sales Value
C = Contribution
V = Variable costs (Total)

For example, when contribution is Rs. 8, 00,000 and total sales are Rs. 10, 00,000 then.

$$\text{P/V ratio} = \frac{8,00,000 \times 100}{10,00,000} = 80\%$$

As with other marginal costing techniques, there is an assumption that costs can be separated into two definite groups-variable (marginal) costs and fixed costs. Moreover, so far as variable costs are concerned, a linear relationship is assumed.

It is interesting to note that although 'Volume' appears in the terms; the actual volume of output or sales is not indicated in the ratio. In fact it is possible to calculate the P/V ratio by comparing the contribution is Rs. 80 and selling price Rs. 100 then P/V is 80% as in the above example. Obviously, if in one period sales are Rs. 5,00,000 and in other Rs. 10,00,000 with no change in the P/V ratio, then the positions cannot be said to be equal. Therefore, other relevant information must also be considered along with P/V ratio.

Some of the uses to which P/V ratio can be put are:

1. Determination of variable costs for any volume sales.

It is arrived at by deducting the P/V ratio from 100 percent and then, using the percentage, arriving at the total variable cost.

Example: If P/V ratio = 20%

Company A turnover = Rs. 6, 00,000

Company B turnover = Rs. 10, 00,000

Then variable costs for each company will be:

Company A

$$100\% - 20\% = 80\%$$

80% of Rs. 6, 00,000 = Rs. 4, 80,000 variable cost.

Company B

$$80\% \text{ of Rs. } 10, 00,000 = 8, 00,000 \text{ variable cost.}$$

2. Comparison can be made by calculating the P/V ratio for each factor to be compared; viz.

- (a) Line of product.
- (b) Sales area
- (c) Method of sale: e.g. sale through wholesalers or retailers.
- (d) Individual factories
- (e) Separate companies

Example: Line of Products.

The following products are made by a company. Variable costs and prices are shown alongside.

Product	Prices	Variable Cost
X	Rs. 10	Rs. 5
Y	Rs. 20	Rs. 15
Z	Rs. 40	Rs. 25

Then P/V ratio for each line will be:

C	Product	C/S x 100/1	P/V Ratio
10-5-5	X	$\frac{5 \times 100}{10}$	50%
20-15-5	Y	$\frac{15 \times 100}{20}$	25%
40-25-15	Z	$\frac{25 \times 100}{40}$	37%

3. Calculation of desired volume of output, profit or other essential facts.

Management has to aim at increasing the P/V ratio. This may be done by reducing variable costs or by raising prices. If a composite P/V ratio (average ratio for a number of products) is being considered an effort should be made to improve the sales mixture by increasing the volume of products with a high P/V ratio and reducing the volume of those products with a low P/V ratio. However, it may be pointed out again that just like the margin of safety, P/V ratio is not to be considered in isolation, rather the margin of safety P/V ratio, the volume of sales, and fixed costs all are to be studied together.

The principal budget factors or limiting factors or limiting factors or key factors, like shortage of labour, raw material, plant capacity available, cash available etc. may also be very important when considering which product have the highest P/V ratio. The object of assessing principal budget factor is to “weight” the P/V ratios, thereby giving due recognition to special circumstances. For example, consider the following case where direct labour acts as principal budgeting factor.

	Product X	Product Y
Selling price	Rs. 15	Rs. 25
Variable Cost	<u>Rs. 10</u>	<u>Rs. 10</u>
Contribution	<u>Rs. 5</u>	<u>Rs. 10</u>
P/V	33 ½	60%

There is shortage of skilled labour necessary for producing both products. Products X takes 1 hour to produce, whereas product Y involves 4 hours.

If we gave due weight to the fact that the hours involved for the products are different then the position may be as follows:

	Product X	Product Y
Amended P/V ratio	33%	15%
Contribution per direct Labour hour	Rs. 5	Rs. 3/75

According to these attended figures Products X is more desirable than product Y. the significant fact is the contribution per direct labour hour.

8.5 The Break-Even Charts:

Break even chart is a very useful device for presenting management with information showing the effect of costs and revenue at varying levels of output. It is an elementary form of profit graph and has the advantage of being easily prepared and more easily understood. This chart shows quite clearly the break even point of the business, hence the name. no doubt, it has certain limitations, but is nevertheless an important aid to profit planning. A break even chart is then a chart or graph which partly says-

1. Likely profits or losses at different levels of output.
2. The relationship between marginal (variable) costs and fixed costs.
3. The margin or safety.
4. The rate of growth of profit earning for a suitable multiple of output.
5. The break even point i.e. the point at which total cost line and sales revenue line intersect, thereby, indicating the state of no profit, no loss.
6. On an appropriately designed chart, the contribution and the P/V ratio may be shown.

Construction of Breakeven Charts:

1. Select a scale for sales on horizontal axis.
2. Select a scale for costs and revenue on the vertical axis.
3. Draw the fixed cost line parallel to the horizontal axis.
4. Draw the variable cost line, starting from the point on the vertical axis which represent fixed costs.
5. Draw the sales line, starting from the point of origin (zero) and finishing at a point of maximum sales.

Example:

Fixed Cost = Rs. 3,00,000

Variable Cost Per Unit = Rs. 25

Selling Price Per Unit = Rs. 40

Now, the break even point will be calculated. The contribution per unit is Rs. 15 (i.e. Rs. 40-25). Therefore the BEP= Rs. 3,00,000 ÷ 15 = 20,000 units with the help of this calculations are shown in the table below and a break even chart prepared.

No. of Units	Fixed Cost	Variable Cost	Total Cost	Sale Proceeds	Profits/Loss
0	3,00,000	0	3,00,000	-	-
10,000	3,00,000	2,50,000	5,50,000	4,00,000 (-)	1,50,000
20,000	3,00,000	5,00,000	8,00,000	8,00,000	B.E.P
30,000	3,00,000	7,50,000	10,50,000	12,00,000 (+)	1,50,000

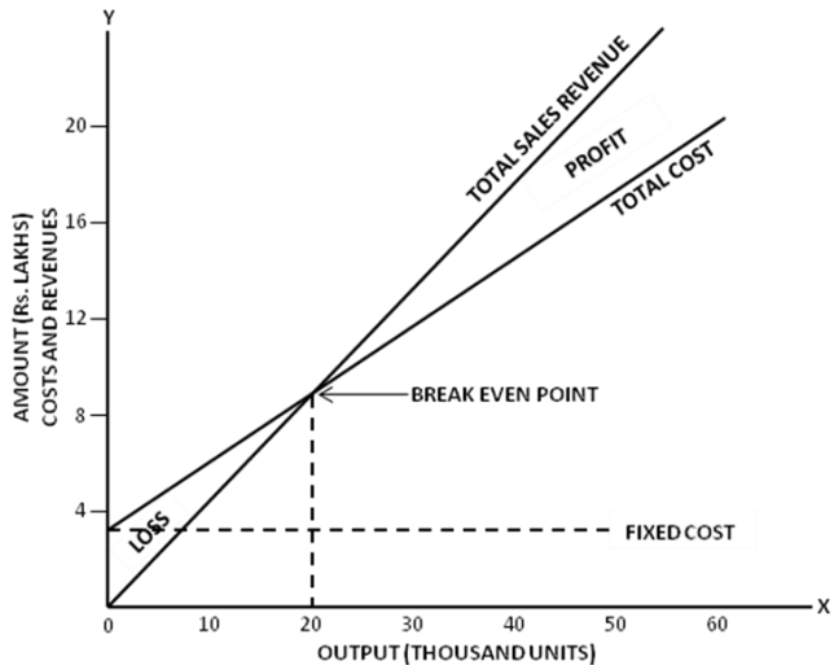


Fig. 1 Break Even Chart

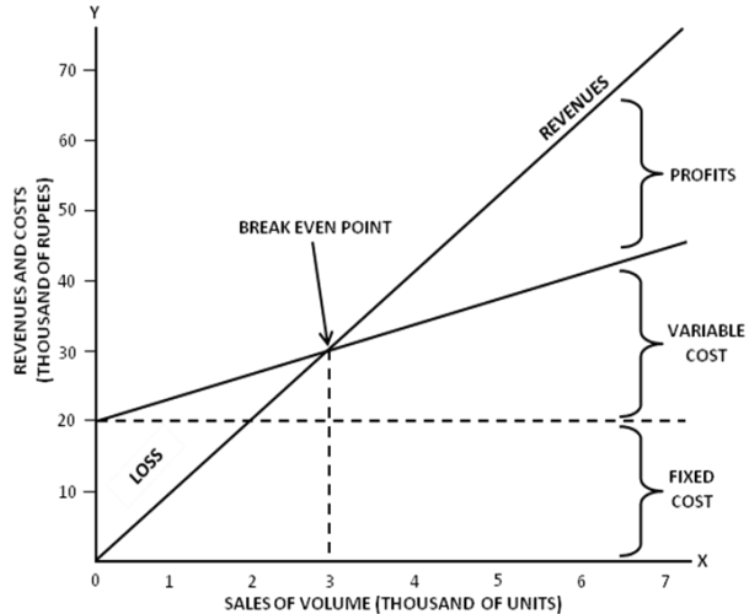


Fig. 2

In the diagram, the output and sales have been plotted on X-axis and Revenue and costs on Y-axis. Fixed costs remaining constant are shown by means of a line across the face of the graph parallel to horizontal axis. The line representing variable costs has been plotted from the point where fixed costs have finished and rises steadily as to give the total cost curve, Break-even point is calculated where lines representing total cost and sales intersect.

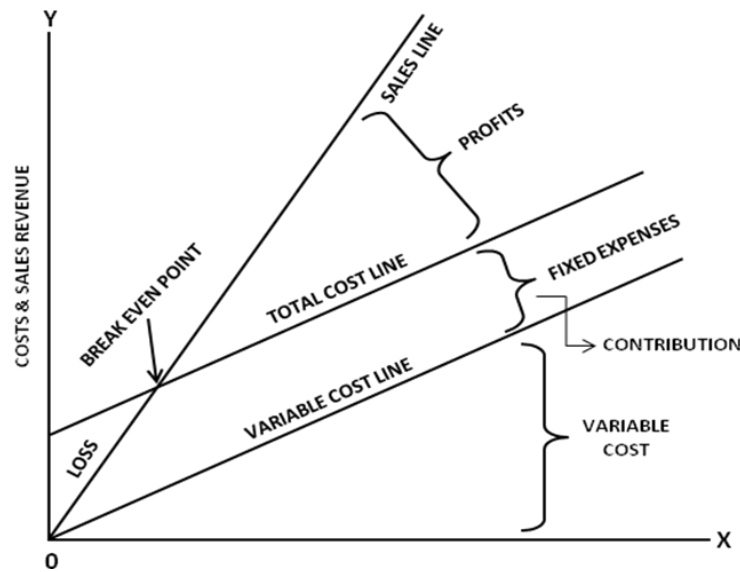


Fig. 3 Contribution Break Even Chart

A variation of first method is that fixed costs are shown above variable costs. This is also known as contribution Breakeven chart as contribution at different levels of activity are seen quite easily from the chart.

This method has the advantage of indicating the recovery of fixed costs at various levels of production before profits are realized. Therefore, contributions at various levels of production are automatically depicted in the chart as in following figure.

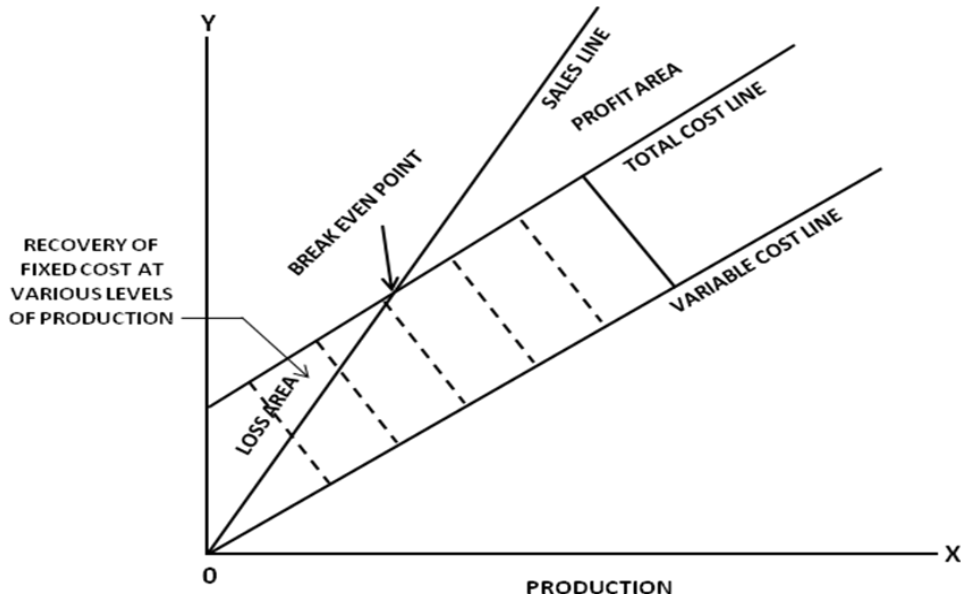


Fig. 4

Another method is of showing the variable costs in a particular sequence, for instance, in the order of profit and fixed costs are plotted for corresponding sales volume and the points major cost classifications, such as direct material cost, direct labour cost, fixed factory overheads etc. This is known as Analysis Breakeven chart.

Profit Volume graph: Developed from simple break even chart presented in conventional style, profit volume graph is the graphical representation of the relationship between profit and volume. It is based on the same information as is required for the traditional Break-even chart and is characterized by the same limitations.

Steps:

- (1) Profit and fixed costs are represented on the vertical axis.
- (2) Sales are shown on the horizontal axis.
- (3) Fixed costs are represented on the vertical axis below the sale line and profit on the same axis above sales line are joined by a line which is profit line.
- (4) Profit and fixed costs are plotted for corresponding sales volume and the points are joined by a line which is profit line.

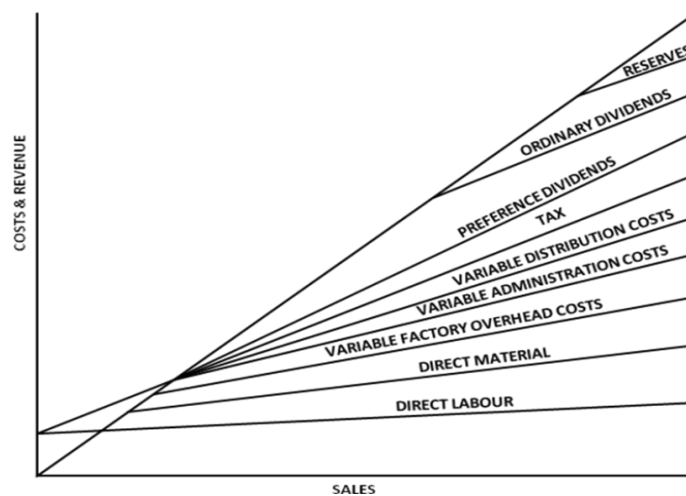


Fig. 5. Analysis Break Even Charts

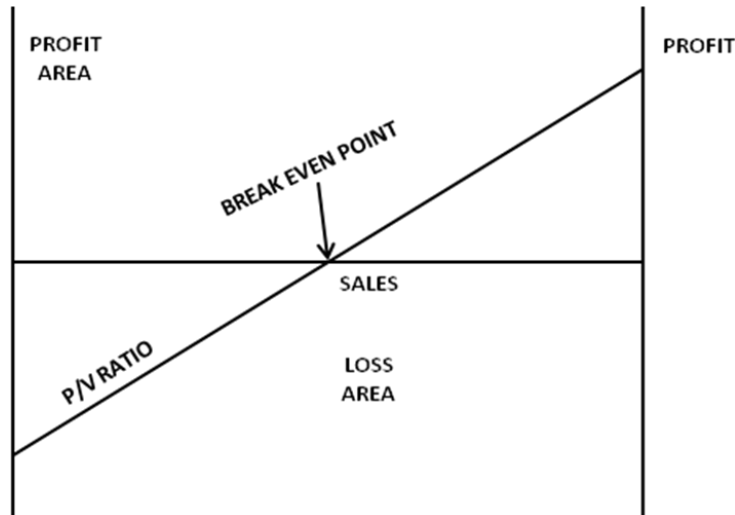


Fig. 6

Cash Break –even Charts: The cash break even chart follows the conventional form except that fixed costs are divided into two groups:

- (1) Fixed costs requiring immediate cash viz, rent, rates insurance salaries, “Immediate”, means during the course of the period covered by the chart.
- (2) Fixed costs not requiring immediate cash:

Some Other types of Breakeven Chart: Break even chart (showing profit appropriations). The Break-even chart which shows profit appropriations is the orthodox type with the additional information relating to how profit is to be divided.

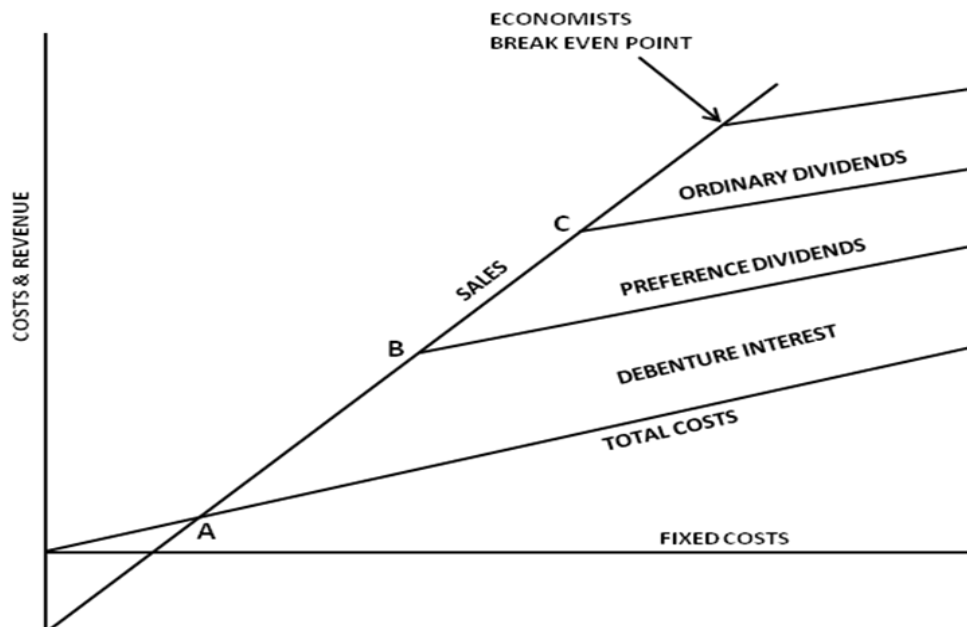


Fig. 7. Breakeven Chart (showing profit appropriations)

e.g. depreciation and other deferred expenses such as advertising and research and development expenditures, which have already been incurred and which refer to a number of years; also where a national cost, such as reasonable rent when an asset is fully depreciated, is included in the annual fixed costs.

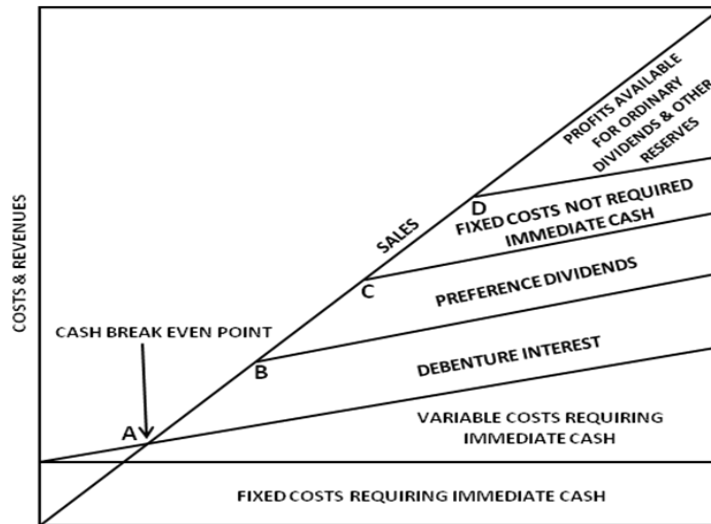


Fig. 8 Cash Break-even Chart

The former (1) is shown at the base of the Break even Chart. On the other hand, the fixed costs not requiring immediate cash shown last. In this way it is possible to see what cash be required to break-even (point "A") to pay Debenture interest ("B") and to pay preference dividends ("C"). The fixed costs already paid are left until the end. Later, when fixed assets are to be replaced, it will be necessary to increase the fixed costs requiring immediate cash. Therefore, fixed costs in the sense meant in this context will vary in total depending upon the cash to be spent within the period.

The variable costs are assumed to be payable in cash. If credit transactions are involved then their effect should be measured and the cash payment adjusted.

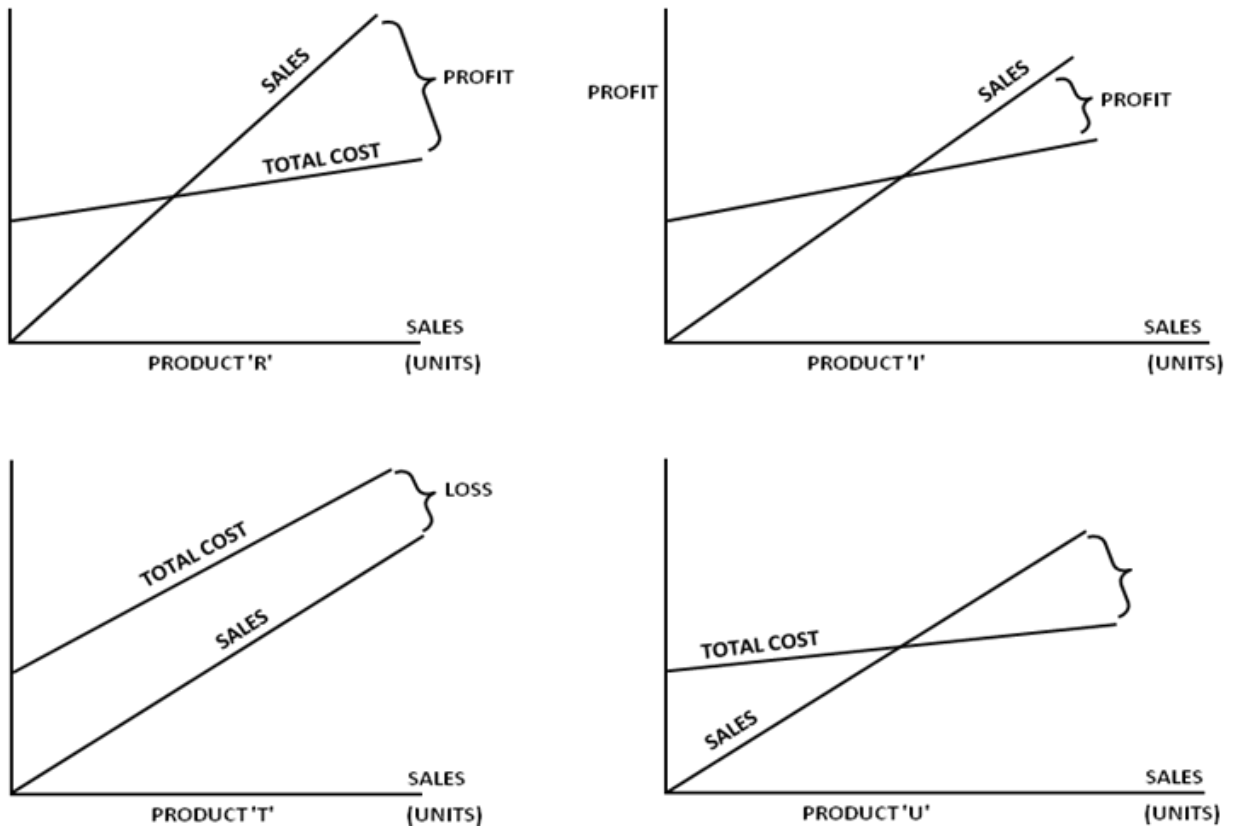


Fig. 9 & 10 Break even chart (for comparing product profitability)

Control Break Even Charts: The control Break Even chart is extremely useful for comparing budgeted and actual profits, break-even point and sales.

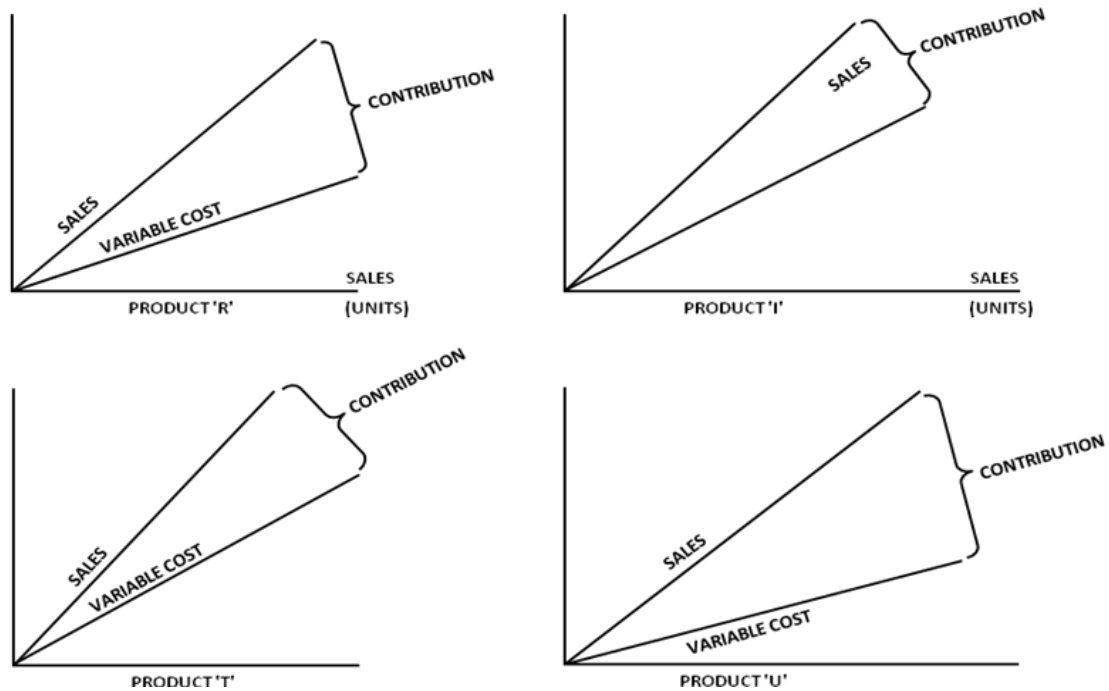


Fig. 11 Break Even Chart (for comparing product contribution)

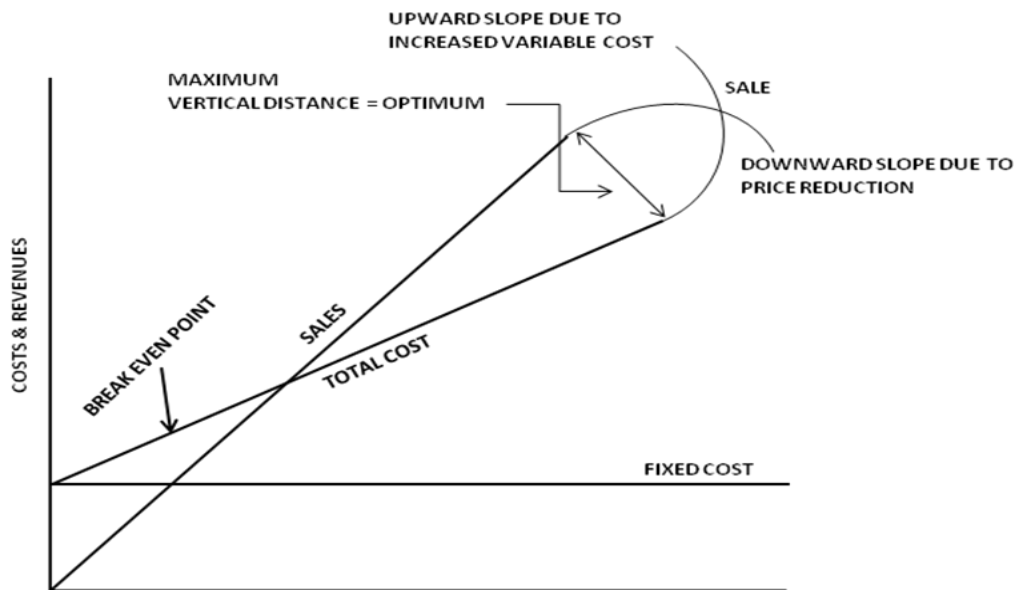


Fig. 12 Break Even chart (showing optimum output)

Breakeven Chart for products: Breakeven charts may be prepared to cover single products. If one chart is used for each product the relative profitability of a number of products may be seen easily from a series of charts.

Four products are taken and compared as regards costs, sales and profits (Fig.10). In the examples it has been assumed that the same volume of sales is feasible for all products. If this is not so then clearly the different potential sales volumes should be shown on the charts. Many accountants prefer to use the contribution breakeven chart (Fig. 11) The significant fact regarding relative profitability/contributability are:

Product	RANKING		
	Profitability	Contribution	Breakeven
R	1	1	1
I	2	3	2
T	3	4	4
U	2	2	3

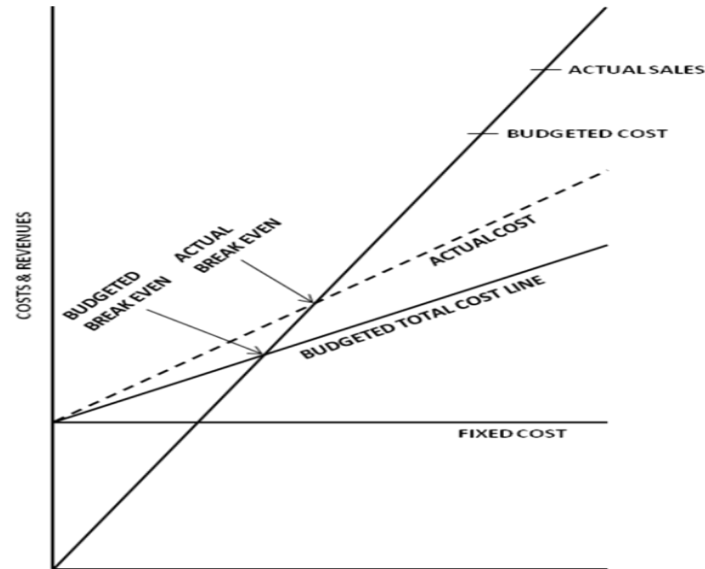


Fig. 13 Control Break Even Charts (Comparing Budgeted and Actual profits)

From the above comparative data, it is obvious that the product "R" is given the first order in the ranking. However product "T" does contribute to fixed costs and therefore, management will have to consider the matter very carefully before discontinuing the production and sale of the product.

Breakeven chart for optimum output:

Selection of the point which gives maximum profit involves the determination the greatest vertical distance which exists between the sales and total cost lines. This is the point where marginal revenue and marginal cost agree. In the fig. 12 optimum output is signified by the arrow.

8.6 Assumption and limitations of breakeven charts: The very concept of economics is based on assumption. Without assumption the validity of the analysis weakens. The important assumption underlying breakeven analyses are:

- (1) Principle of cost variability is valid.
- (2) Costs are resolvable into the fixed and variable components.
- (3) Fixed cost always constant.
- (4) Variable costs vary proportionately with the volume of production.
- (5) Selling price is not ahead with the change in volume.
- (6) Only one product is in existence and in case of multiple, products, sales mix is always constant.
- (7) There is no change in the price level.
- (8) There exists a synchronization between product and sales.
- (9) Productivity per workers is assumed to be constant.

- (10) Revenue and costs are compared with a common activity base e.g. sale value of production or units produced.
- (11) The efficiency of plant can be predicted.

A change in any one of the mentioned facts can alter the breakeven point thereby necessitating that breakeven point be interpreted in the light of the above assumptions.

However, these assumptions cannot so easily be held in practice. These certain limitations, most important of which are:

- (1) In practice all costs cannot be separated easily into fixed and variable costs as there are many border line cases.
- (2) Fixed costs do not remain constant throughout rather they tend to increase in steps.
- (3) Breakeven analysis assumes that variable cost gives a straight line chart. Many of the overhead costs do not observe this tendency. They move no doubt in sympathy with volume of output but not necessarily in direct proportion
- (4) In practice, selling price may not remain fixed and thus it may set give subject revenue line. It may be necessary to give extra discounts to sell extra units.
- (5) The horizontal base lone X axis cannot measure the units sold in as much as different types of products are sold by the same company. This is true in actual practice.
- (6) The assumption that only one product is produced or product mix is constant is difficult to find in practice.
- (7) Synchronization between production and sales is also difficult to meet.

Despite this, breakeven analysis is a useful management device, if constructed and used by those who understand fully its limitations. When prepared scientifically from reliable data, it is an indispensable tool.

Self Assessment:

Fill in the blanks:

1. Break-even analysis helps in determining the of output below which it would not be profitable for a firm to produce.
2. Break-even point is the point of
3. Break-even point is that volume of where the firm breaks even.
4. The _____ shows the extent of profit or loss to the firm at different levels of activity.
5. _____profit analysis provides a useful format for examining a variety of price and output decisions.

8.7 Summary

Break Even Analysis is the most widely known form the cost-volume profit analysis. Breakeven analysis refer to the study of relationship between costs, volume and profit at different levels of sales or production. It is a useful management device, if constructed and used by those who understand fully its limitations. When prepared scientifically from reliable data, it is an indispensable tool.

8.8 Glossary:

Break even point: The point at which the total cost line intersects the turn-over line, that point is known as break even point.

Contribution theory: The contribution theory is the term used to describe the relationship between variable cost and selling price.

Margin of safety: "Margin of Safety" is the difference between the total sales and the sales figure at the breakeven point. This represents the amount by which volume of sales exceeds the breakeven point.

Angle of incidence: This is the angle at which the sales line cuts the total cost line.

Profit Volume graph: Developed from simple break even chart presented in conventional style, profit volume graph is the graphical representation of the relationship between profit and volume.

8.9 Answers: Self Assessment

1. Optimum level
2. Zero profit
3. Sales
4. Break-even chart
5. Contribution

8.10 Terminal Questions

1. Enumerate some of the more important problems which may be solved with the help of breakeven analysis.
2. What do you understand by the breakeven point. Give the formulae. Illustrate your answer.
3. Give the formulae for calculating turnover for desired profits.
4. Explain the concept of contribution theory.
5. Explain the following terms.
 - (i) Angle of incidence
 - (ii) Profit volume ratio
 - (iii) Margin of Safety
6. Explain control breakeven chart.
7. Give some of the more important limitations and assumptions of breakeven charts.

8.11 Suggested Readings

- 1 Pandey, I.M. Financial Management, Vikas Publishing House Pvt. Ltd., New Delhi.
- 2 Monga J.R. Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.
- 3 Lall, B.M. Jain, I.C. Cost Accounting: Principles and Practice, Prentice Hall, Delhi.
- 4 Man Mohan and S. N. Goyal, Principles of Management Accounting, Sahitya Bhawan Agra
- 5 Bhattacharyya, Debarshi. Management Accounting, Pearson Education in India, New Delhi

Lesson – 9

FINANCIAL STATEMENT ANALYSIS

Structure

- 9.0 Learning Objectives
- 9.1 Introduction
- 9.2 Nature of Financial Statement
- 9.3 Limitations of Financial Statements
- 9.4 Importance of Financial Statements
- 9.5 Analysis and interpretation of Financial Statement
- 9.6 Summary
- 9.7 Glossary
- 9.8 Answers: Self Assessment
- 9.9 Terminal Questions
- 9.10 Suggested Readings

9.0 Learning Objectives

After studying the lessons, you should be able to understand:

1. What is Financial Statement
2. Limitations and importance of Financial Statements.
3. Financial statement Analysis and Interpretation.

9.1 Introduction

The accounting system collects, summarises and updates data continuously on assets, liabilities, capital, revenues and expenses. It is necessary to take stock of all these periodically in order to ascertain the financial condition and the results of operation of the enterprise. The details contained in the accounts can be presented in summary form for the purpose. The names are known as financial statements.

The term financial statement refers to the two statements which the accountant prepared at the end of a period of time for a business enterprise. The two statements are:

- (i) The balance sheet or statement of financial position and
- (ii) The income statement or profit and loss account.

The financial statements are summarized reports of accounting transactions. They are prepared for the purpose of presenting a periodic review or report on the progress by the management. The position at a moment in time can be show through a financial statement or a series of activities over a given period of time may be revealed by a financial statement. The former is often known as a balance sheet and the later an income statement.

According to Harry G. Guthmann the balance sheets might be described as financial cross sections taken at certain intervals and the earnings statements as condensed history of the growth or decay between the costs sections.

The two basic statements have been explained now separately:

- (i) Balance Sheet- Accounting standards Board India was defined balance sheet as a statement of the financial position of an enterprise as at given date which exhibits its assets liabilities capital reserves and other account balance at their respective book values. Assets have been defined as tangible objects are in tangible rights owned by an enterprises and carrying probable future benefits. Liability has been defined as the financial obligation of an enterprise other than owners funds capital generally refers to the amount invested in an

enterprise by its owners it is also used to refer to the interest of owners in the statement of affairs which portrays the financial position of an enterprise at a particular date. This is why it is also turned as statement of financial position or statement of financial condition at a given point in time balance sheets represent a basic listing of assets held by the business liabilities owned to outsiders and equity claims by the owners. In nutshell balance sheet is a photograph of financial status at an instant of time.

(ii) **Income Statement** – Income statement is also known as profit and loss statement of profit and loss account. As per Accounting Standards Board, India Profit and loss statement is a financial statement which present the revenues and expenses of an enterprises for an accounting period and shows the excess of revenues over expenses (or vice versa). The income statement provides a periodic assessment of operating condition to determine for a specified period of time the matching of revenue and costs in order to determine the profit or loss for the period. These days the attention has been shifted from balance sheet to the income statement as the primary statement. The main motto of business enterprises is to earn profit and to know earning abilities is more important for the business than to find out the asset levels. The income statement is a condensed and classified record prepared from the various accounts, of the gains and losses to the business for a period of time. It measures the operating performance of the business by matching its accomplishments and its efforts.

The main difference between the two statements is that whereas balance sheet show the financial position at a point of time the income statement measures performances for a span of time.

(iii) **Retained earnings statement**- Companies prepare a third statement known as retained earnings statements which reconciles the balance in this account at the end of the period with that at the beginning. It is in fact an extension of income statement. It can be prepared as a part of income statement too. It is also designated as profit and loss appropriation account and it is prepared as a part of profit and loss account. Debits for taxes and dividends and transfers to reserves etc. are the main adjustments made through this account. As per Accounting Standards Board India appropriation account is an account sometimes included as a separated section of profit and loss account showing application of profits towards dividends and reserves etc.

Statements of changes in financial position sometimes a fourth statement the statement of changes in financial position is added to the list of financial statements. As per Accounting Standards Board India statements of changes in financial position in a financial statement which summarizes for the period covered by it the changes in the financial position in a financial statement of changes in the financial position including the source from which funds were obtained by the enterprise and the specific used to which such funds were applied. This is also called the funds flow statements. It has been discussed in a separate chapter at length.

Notes to financial statement certain notes and schedules are often used to supplement the information comprised in basic financial statement. They are virtually a part of financial statement.

CORPORATE REPORTS

The corporate annual reports contain not only financial statement but data about production, employees, companies past achievements statements of company objectives and policies future plans etc. According to Accounting Standards Board India annual report has been defined as the information provided annually by the management of an enterprise to the owners and other interested persons concerning its operations and financial positions. It includes the information statutorily required e.g. in the case of accompany the balance sheet profit and loss statement and notes on accounts, the auditor's report thereon and the report of the Board of Directors. It also includes other information voluntarily provided e.g. statement of value added graphs charts etc. Value added statement is a statement of the value added that an enterprise has been able to generate and its distribution among those contributing to its generation and value added mean the increase in value of a product or service resulting from an alternation in the form location or availability excluding the cost of bought

out materials or services. For the purpose for which we are studying financial statements here i.e. for the sake of analysis and interpretation besides basic financial statements other relevant statistics and information contained in these reports provide a very useful material.

9.2 Nature of Financial Statement

The financial statements are composed of data which are the result of a combination of:

- (a) Record facts,
- (b) Accounting Policies, assumptions, concepts and conventions,
- (c) Personal judgements.

According to the American Institute to certified public accountants, financial statements reflect a combination of recorded facts, accounting conventions and personal judgements and the judgements and conventions applied effect them materially. The three important factors have been explained now.

(a) Recorded facts:

The items are recorded on the basis of actual figures. Accounting is historical record of transaction. The amounts at which are recorded are cash in hand, cash at bank bills, receivable debtors creditors, cost of goods sold bills payable sales fixed assets etc.

(b) Accounting policies assumptions concepts and conventions:

(1) Accounting policies encompass the principles based on conventions rules and procedures adopted by managements in preparing and presenting financial statements. According to international Accounting standards committee accounting policies refer to the specific accounting bases judged by the business enterprises to be most appropriate to their circumstances and adopted by them for the purpose of preparing their final accounts. According to terminology given by Accounting Standard Board India accounting policies denote the specific accounting principles and the methods of applying those principles adopted by an enterprise financial statements are based on accounting policies which vary from enterprise to enterprise both within a single country and among countries. Certain common guidelines have however been framed. The considerations which should govern the selection and application by management of the appropriate accounting policies and the preparation of the financial statement as under-

(a) Prudence-

Transactions are surrounded by uncertainty. Exercise of prudence is essential in preparation of financial statements. According to Accounting Standards Board India prudence is a concept of care and caution used in accounting according to which in view of uncertainty attached to future events profits are not anticipated but recognized only when realized though not necessarily in cash. Under this concept provision is made for all known liabilities and losses even though the amount cannot be determined with certainty and represents only a best estimate in the light of available information.

(b) Substances: Over form transactions and other events should be accounted for and presented in accordance with their substance and financial reality and not merely with their legal form. It is an accounting concept according to which the substance and not merely the legal form of transactions and events governs their accounting treatment and presentation in financial statements.

(2) Financial Accounting Assumptions: As per Accounting Standards Board India fundamental accounting assumptions mean basic accounting assumptions which underline the preparation and presentation of financial statements usually they are not specifically stated because their acceptance and use are assumed. Disclosure is necessary if they are not followed. According to International Accounting Standards Boards India the following are the fundamental accounting assumptions.

- (i) **Going Concern:** It is an accounting assumption according to which an enterprise is viewed as continuing in operation for the foreseeable future. It is assumed that the enterprise has neither the intention nor the necessity of liquidation or curtailing materially the scale of its operations.
 - (ii) **Consistency:** Accounting policies are consistent from one period to another.
 - (iii) **Accrual:** Accrual assumption means recognition of revenues and costs as they are earned or incurred and not as money is received or paid. It includes recognition of transactions relating to assets and liabilities as they occur irrespective of the actual receipts or payments.
- (3) **Accounting concepts:** The accounting work is carried on the basis of certain accounting concepts. These have been discussed briefly as under:
- (i) **Money measurement concept:** Accounting records concern only such events and transactions as can be interpreted in monetary terms at least partially.
 - (ii) **Business entity concept:** A distinction has to be made between the business and the businessman. As per Accounting Standards Board India the concept refers to the view of the relationship between the accounting entity and its owners which regards the entity as a separate person distinct and apart from its owners.
 - (iii) **Going concern concept:** There is neither any intention nor the necessity of liquidating the business in the foreseeable future. This concept has led to making a distinction between capital and revenue.
 - (iv) **Cost Concept:** The recording of items is on the basis of actual amounts involved.
 - (v) **Dual aspect concept:** At any moment of time the assets possessed by a firm will be equal to the liabilities to the outsiders and the capital belonging to the owners this fundamental accounting equation always holds good.
 - (vi) **Accounting period concept:** The business life is divided into period segments usually of a year in order to study the results of business operations after each period.
 - (vii) **Matching concept:** Revenue of an accounting period is matched with the cost of the period i.e. cost incurred for earning that revenue in order to ascertain the profit made during the period.
 - (viii) **Realization Concept:** Only when sale actually takes place and when an outsider party becomes legally liable to pay the sale proceeds the profit will be said to have accrued.
- (4) **Accounting conventions:** The principles which enjoy the sanctity of application on account of long usage are termed as accounting conventions. The important conventions are as under:
- (i) **Consistency:** Once a method has been adopted it should be consistently followed frequent changes initiate comparisons and decisions may also be fallacious. For example any method is adopted in one year and the other the next year it will create difficulties of several sorts.
 - (ii) **Conservatism:** Anticipated profits are not accounted for but all conceivable losses are provided for. For example closing stock is valued on the principle of cost or market price whichever is lower.
 - (iii) **Materiality:** A great many events which are so trivial that the work of recording them is not justified by the usefulness of the results are not recorded. Though it is difficult to draw a distinction between significant and non significant items. Yet the effort is made on the basis of accounting policies etc.
 - (iv) **Full disclosure:** All facts needed to reach informed conclusion must be disclosed. It doesn't mean abundance of facts and figures indiscriminately heaped upon the reader. Rather it means the stress of substance over form and presenting data in a way as to allow the deducing of significant conclusions.
- (c) **Personal judgements:** Personal judgements also play an important role in accounting though the intentions of accountants are of the best the human quality of judgement is also important. Suppose the

management has decided to value stock at cost or market price whichever is lower. But cost will have to be defined further. The judgement is to be exercised in proper classification of assets classification of expenditure into capital or revenue creation of provisions and reserves etc.

9.3 Limitations of Financial Statements

The limitations of financial statements should be appreciated before proceeding to the aspect of analysis and interpretation of financial statements.

- (i) Precision impossible: Data under financial statements can be precise because accounting conventions and personal judgements affect the recording to a great extent.
- (ii) Monetary expression: Financial statements show facts which can be expressed in money terms only. The extent of skill and experience of the people within the organization the competition in the industry the drive integrity and health of the chief executive the main driving force behind an enterprise the quality of research and development effort future trends of public taste and demand i.e. the outlook for the future maintenance of plant etc. are some of the factors which the financial statements don't reveal.
- (iii) Unstable Monetary Unit: Even though monetary values are shown they can never be at all exact especially under conditions of inflations allowance of depreciation must necessarily be arbitrary changes in price level make figures meaningless as financial statements record transactions at historical costs. No account is taken of the present day values.
- (iv) Interim Nature: A limitation stems from the need to report for relatively short period of the total life span of an enterprise. The frequency of reporting requires a great deal of calculation based on judgements and the greater the degree of such estimation required the greater the amount of uncertainty that is inevitably introduced into the financial statements.
- (v) Cost Balance: The financial statements do not show the worth of the business. Cost balances are shown through the statements.

9.4 Importance of Financial Statements:

The Balance Sheet can explain the position of a company for better than a whole library of books. It gives the salient features of an organization at a glance what it owns and what it owes. The income statement gives insufficient from a very good idea of how that enterprise has done during a particular period. A balance sheet together with the income statement is the only means by which the profitability of an organisation can be judged. Useful and meaningful comparisons can also be made. The progress of the business is known by examining the financial statements.

In the realm of data available for meaningful analysis financial statements are important since (i) they are objective as they portray actual events which have already happened (ii) they are concrete in that they can be quantified and (iii) they can be measured and compared.

9.5 Analysis and Interpretation of Financial Statement

Financial statement analysis is the judgemental process which aims to evaluate the current and past financial position and the results of operation of an enterprise with the primary objective of determining the best possible estimates and predictions about future conditions and performance.

Financial Statement analysis is mainly:

- (i) A study of relationship among the various financial factors in a business as disclosed by a single set of statements and.
- (ii) A study of the trend of these factors as shown in a series of statements.

The financial statement analysis serves the essential function of converting data of which in this computer age, there are a bewildering quantity and variety into useful information which is always scarce. Analysis of financial statements consists in separating facts according to some definite plan arranging them in groups according to certain characteristics and then presenting them in a convenient and easily readable and understandable form.

Use of Analysis

The financial statement analysis can be use as:

- (i) Screening tool: The analysis can serve as a preliminary screening tool in the selection of investments.
- (ii) Forecasting Tool: The analysis can be used as a forecasting tool of future financial conditions and results.
- (iii) Diagnosis tool: Through analysis of financial statement managerial operating or other problem areas can be diagnosed.
- (iv) Evaluation tool: The techniques of analysis can help evaluation of management.

The analysis of financial statements reduces reliance on pure lunches guesses and intuition thereby the curtain of uncertainty surrounding business decision making is unveiled. However the need of judgement is not lessened rather a sound and systematic basic for its rational application is established.

Limitation of analysis

- (i) Heterogeneous Data: Financial statements reflect combination of account balances and therefore figures often do no represent homogeneous data. It creates problems interpretation also.
- (ii) Changing accounting Policies: Financial statements reflect the accounting policies of a concern. These keep on changing some time. Moreover, different concern has different policies which render comparison meaningless.
- (iii) Changing price levels: The recording in financial statements is on the basis of actual cost. Whereas the value of money goes on changing. The comparison is vitiated since fixed assets acquired at different periods in the past are carried at rupees of different value. Whereas all other items are shown at values measured in current rupees. It is like having 100 orange of revenue and deducting 80 organges of cost and 10 grape fruits of cost and saying that the profit left is 10 organges. It is really adding and subtracting oranges, grape fruits apples pears and peaches in the same schedules. Such combination of rupee figures arising in different price levels is called hetrotemporal price.

Myers states: The fact that an unstable measuring unit is used in accounting poses the greatest impediment to interpretation of its result as found in the financial statements.

- (iv) Incomplete information: Financial statement does not include all of the relevant information necessary for evaluating the status progress and future prospects of a company.

How the analysis of financial statements is to be done depends on the informational needs and the specific analytical objectives of the type of users of financial institutions management auditors and, merger analysts and other may be interested in financial analysis. Their needs and objectives differ. Shareholders analyze the statements to decide on whether to hold enlarge or sell their holdings. So these and other investors are interested in estimates of future earning and in financial strength to determine the value of their securities. Credit guarantors are more concerned with future and merger analysis study financial statements to decide about acquisition and merger of business enterprises. Management's interest in the financial condition profitability and progress of an enterprise is pervasive and all compassing. The analysis by management is on a continuous basis to contrast analysis made by other interested parties. Auditor is interested in determining whether financial statements present a true

and fair view of the affairs of business. Others including tax authorities government agencies federations labour unions etc. may also be analyze the statements for some specific purpose.

The financial statements are technical documents analogous to the reports of physicians and engineers for a correct interpretation of financial statements it is essential that the analyst possesses adequate knowledge of the processes leading to the data shown in financial statements and has been properly trained in methods of analysis.

Types of Analysis

(1) On the basis of material used the analysis can be of following types:

- (a) Internal Analysis: Under it the analyst is within the enterprise he is analyzing, he has access to the books of accounts and complete information about the business is at his disposal. Analysis for managerial use is internal analysis. It is meant for internal management and control purposes.
- (b) External Analysis: Under it the analyst is not connected with the enterprise. The only data available to him are the statements and such information as the business is willing to submit analysis for credit extension and investment commitments is external analysis. Normally external analysts have to reach conclusions on the basis of published data.

(2) On the basis of Modus operandi:

The analysis can be of following types:

- (a) Horizontal Analysis: The horizontal analysis consists of study to the behavior of each of the items in the financial statement that is its increases and decreases with the passage of time it is also known as a dynamic type of analysis since it shows the changes which have taken place. The comparison of the items is made across the years the eye look at the comparative analysis is at the horizontal level hence the analysis is termed as horizontal analysis.
- (b) Vertical analysis: The vertical analysis is a study of the quantitative relationship existing among the items at a particular date. It is a static type of analysis or a study of position. Eye look at the in the financial statement are expressed as a percentage to total and is taken as equivalent to 100.

Analysis can be done both horizontally and vertically. As a matter of fact one type of analysis is incomplete in itself both are complementary to each other. Both these analysis form the backbone of the technique of financial statement analysis.

Approaches to Financial Statement Analysis

Financial statement analysis utilizes a variety of approaches to answer the specific questions about company's operating performance growth stability financial condition etc. The more important of these are explained below:

- (i) Direct Measurements: Some factors and relationships are susceptible of direct measurement. To take a simple example debt and equity both can be measured in absolute terms and the relationship between them can also be established directly.
- (ii) Indirect Evidence: Analysis of past financial statement can offer evidence as to financial habits of a management team and management's ability to cope with fluctuations in the level of firm's business activity. Such indirect evidence is not precise or quantifiable but it is important since all managerial decisions are deflected in company's financial statements.
- (iii) Predictive Functions: Future orientation is an important characteristic of entire decision making. The analysis of financial statements should be able to assist in prediction of expected future conditions and results.

- (iv) Comparison: This analysis can be meaningful only when the facts and figures are related to some other comparable phenomenon. Only through comparison. The financial analysis performs an important evaluative as well as attention directing and control functions. The focus is on exceptions and variations, hence control is made easy. The task of selection among alternate choice is also simplified.

Comparison is possible by using

- (a) Internal data i.e. company's past statistics.
- (b) External data e.g. industry data.
- (c) Compiled yardsticks including standards budgets and forecasts.

Historical data may involve an element of subjectivity sometimes, though it is assist to obtain. To eliminate subjective elements, adjustments can be made in the data while analyzing it. External data and compiled yardsticks are objective. But external data may not be that much comparable because of differences in accounting assumptions and policies followed period covered and other factors. Moreover past is seldom an unqualified guide to the future. The standards laid down on a universal level may also be in applicable to the particular case because of the above reasons. However suitable adjustments should be made while interpreting the results derived on comparisons.

Self Assessment

Fill in the blanks:

1. Income statement is also called profit and loss statement (P&L) and _____
2. A retained earnings statement explains the _____ in a company's retained earnings over the reporting period.
3. The _____ provides an insight into the financial status of a company at a particular time.
4. _____ is the comparison of sales and purchase.
5. The excess of credit side over debit side is called _____.
6. The Balance Sheet depicts the _____ of the business on a fixed date.
7. Order of presenting the assets and liabilities in the balance sheet is called _____ of assets and liabilities.
8. If in the business some goods are being manufactured along with the trading activities, a _____ is also prepared.

9.6 Summary

Financial Statement analysis is an important part of overall financial analysis, based on the statements which are the end products of accounting system, viz., Balance Sheet and Profit and Loss Account. Analysis of Financial Statements is a systematic process of the critical examination the financial information contained in the financial statements in order to understand and make decisions regarding the operations in the firm. The Analysis of Financial Statements is a study of relationships among various financial facts and figures as set out in the financial statement i.e. Balance Sheet and Profit and Loss Account. The complex data given in these financial statements is divided into simple and valuable elements and relationships are established between the elements of the same statement or different financial statements.

Glossary:

Financial Statement: A written report which quantitatively describes the financial health of a company.

Trading Account: This account is prepared to determine the amount of gross profit or gross loss on sales.

Balance Sheet: The balance sheet provides an insight into the financial status of a company at a particular time.

Marshalling of Assets and Liabilities: Order of presenting the assets and liabilities in the balance sheet is called marshalling of assets and liabilities.

Retained Earnings Statement: A retained earnings statement explains the changes in a company's retained earnings over the reporting period.

9.7 Answers: Self Assessment

1. Statement of operations
2. Changes
3. Balance sheet
4. Trading account
5. Net profit
6. Financial position
7. Marshalling
8. Manufacturing account

9.8 Self-Test Questions

- (1) Explain the different types of financial analysis?
- (2) What are different categories of items appearing in a balance sheet?
- (3) Explain the different methods of financial statement analysis?
- (4) What do you understand by financial statement analysis? What are its limitations?
- (5) Discuss briefly the different techniques of analysis and interpretation of financial statements?

9.9 Suggested Readings

Bhattacharyya, Debarshi. Management Accounting, Pearson Education in India, New Delhi.

Pandey, I.M., Financial Management, Vikas Publishing House Pvt Ltd., New Delhi.

Monga, J.R, Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.

Lall, B.M. Jain, I.C. Cost Accounting: Principles and Practice, Prentice Hall, Delhi.

Lesson - 10**TOOLS OF FINANCIAL STATEMENT ANALYSIS****Structure:**

- 10.0 Learning Objectives
- 10.1 Introduction
- 10.2 Comparative Financial Statements
- 10.3 Common-Size Financial Statements
- 10.4 Trend Percentages
- 10.5 Ratio Analysis
- 10.6 Summary
- 10.7 Glossary
- 10.8 Answers: Self Assessment
- 10.9 Terminal Questions
- 10.10 Suggested Readings

10.0 Learning Objectives:-

After studying the lesson, you should be able to understand:-

1. Various tools of Financial Statement Analysis
2. Uses of Comparative Financial Statements and Common Size Statements
3. Significance of Ratio Analysis
4. Different Categories of Ratios

10.1 Introduction

A variety of tools can be used by a financial analyst for the purpose of analysis and interpretations of financial statements particularly with a view to suit the requirements of the specific enterprise. The Principal tools are as under:

1. Comparative financial Statements
2. Common Size Financial statements
3. Ratio Analysis
4. Funds flow statement
5. Cash flow statement

10.2 Comparative Financial Statement

Financial statements of two or more periods can be compared by setting them up side by side and reviewing the changes which have occurred in individual items therein from year to year and over the years. The comparison shall reveal not only the trend but the direction velocity and the amplitude of trend.

Comparative balance sheets comparative income statements and comparative statements of changes in financial position can be prepared. The utility of preparing the comparative statements has been explained by the American Institute of certified Public Accounting thus.

“The presentations of comparative financial statements in annual and other reports exchange the usefulness of such reports and brings out more clearly the nature and trend of current changes affecting the enterprise. Such presentation emphasis the fact that statements for a series of period are far more significant than those of a single period and that the accounts of one period are but an instalment of what is essentially a continuous history. In any one year it is ordinarily desired that the Balance Sheet the income statement and the surplus statement be given for one or more preceding years as well as for the current year.”

Comparative balance sheet and comparative income statements have been explained here under:

(1) Comparative Balance Sheet

The comparative balance sheet shows increases and decreases in absolute terms as well as in terms of percentages. The effects of the conduct of a business are reflected in the balance sheet and a comparative of a business are reflected in the balance sheet as at the beginning and the end of a period leads to information about forming an opinion regarding the progress of the company.

If two comparative balance sheets are presented in a statements form four columns of amount can be drawn two year for amounts relation to two years the third for absolute increase/decrease in various items and the fourth for percentages of increase/decrease over previous year. The emphasis under comparative balance sheet is on change rather than on status. These provide a connecting link between a single balance sheet and the income statement since the income statement presents a review of the operating activities of a business and the comparative balance sheet shows the effect of operations on its assets and liabilities.

The preparation of comparative balance sheet has been illustrated below:

Illustration: From the following Balance Sheets of company as at 31st March, 1993, you are required to prepare a comparative Balance Sheet and interpret it.

BALANCE SHEET

(as on 31st March)

Liabilities	1993 Rs. (Lakhs)	1994 Rs. (Lakhs)	Assets	1993 Rs. (Lakhs)	1994 Rs. (Lakhs)
Share Capital		Fixed Assets			
8% Preference Shares	80	80	Building	120	125
Equity Shares	100	120	Plant & Machinery	80	100
Reserves and Surplus			Furniture & Fittings	10	10
General Reserve	20	24	Investments	20	19
Profit and Loss A/C	10	12	Current Assets		
Secured Loans			Loans and Advances		
8% Debentures	25	20	Stocks	8	10
Unsecured Loans			Debtors	5	7
Fixed Deposits	-	5	Bank	4	5

Current Liabilities & Provisions :					
Sundry Creditors	8	9			
Bills Payable	3	4			
Provision for Taxation	4	6			
	250	280		250	280

Solution:

COMPARATIVE BALANCE SHEET

(as on 31st March, 1993 and 1994)

	1993	1994	Absolute Increase or decreases During 1993-94	Percentage increase(+) or decreases (-) during 1993-94
(Figures in lakhs of rupees)				
Assets :				
Fixed Assets				
Building	120	125	+5	4.17%
Plant & Machinery	80	100	+20	2.5%
Furniture and fittings	10	10	-	-
Total Fixed Assets	210	235	+25	11.9%
Investment	20	19	+1	-5%
Current Assets				
Stock	8	10	+2	+25%
Debtors	5	7	+2	+40%
Bank	4	5	+1	+25%
Bills Receivable	3	4	+1	+33.33%
Total Current Assets	0	26	+6	+30%
Total Assets	250	80	+30	+12%
Liabilities & Capital				
Capital & Reserves				
8% Preference Share Capital	80	80	-	-
Equity Share Capital	100	120	+20	+20%
General Reserves	20	24	+4	+20%
Profit and loss Account	10	12	+2	+20%

Total shareholders funds	210	236	+26	+12.38%
Long Term liabilities				
8% Debentures	25	20	-5	-20%
Fixed Deposits	-	5	+5	New
Total	25	25	-	-
Current Liabilities				
Sundry Creditors	8	9	+1	+12.5%
Bills Payable	3	4	+1	+33.3%
Provision for Taxation	4	6	+2	+50%
Total Current Liabilities	15	19	+4	+26.67%
Total Liabilities	40	44	+4	+10%
Total Liabilities and Capital	250	280	+30	+12%

Interpretation :

1. New equity Share are worth Rs. 20 lakhs have been issued during the year, fixed deposits with Rs. 5 Lakhs have been raised and 8% Debentures worth Rs. 5 Lakhs have been redeemed. Preference shares have not been touched.
2. The amount raised had been utilized for the purchase of plant and machinery worth Rs. 20 lakhs and for the buildings worth Rs. 5 lakhs. Investments worth Rs. 1 lakh have been disposed of primarily for redemption of debentures.
3. Current liabilities as well as current assets have increased substantially in relative terms as compared to the previous year.
4. The profit for the year has also increased thus contributing to enhancement of the shareholders funds by 12.38% in total together with increase in capital.

(2) Comparative Income Statements:

Income statements can also be compared likewise. Comparison of income statements for successive period two or more will provide information about the progress of a business. The absolute changes as well as relative changes of various items taking the previous year's figures as the base, may be depicted along with the actual data for the relevant periods.

Thus, both the comparative balance sheet as well as comparative income statement can be horizontally analyzed, that is, by measuring the changes in the items across the years. The percentage changes show facilitate the purpose of focusing attention on the changes that have occurred.

Preparation of comparative income statement has been illustrated below:

Illustration: From the following Profit and Loss Accounts of a Company for the year ended 31st March, 1995 and 1996 you are required to prepare a comparative income Statement and interpret it.

PROFIT AND LOSS ACCOUNT(for the year ended 31st March)

	1995 Rs. (Lakhs)	1996 Rs. (Lakhs)		1995 Rs. (Lakhs)	1996 Rs. (Lakhs)
To cost of goods sold	180	225	By sales	200	250
To operating			By Dividends Received	3	3
Expenses :					
Administration Expenses	6	5			
Selling and Distribution Expenses	6	9			
To interest on Debentures	2	2			
To provision for Taxation	4	6			
To Profit c/d	5	6			
	203	253		203	253
To General Reserve	3	4	By Profit b/d	5	6
To Balance c/f	10	12	By Profit b/f	8	10
	13	16		13	16

Solution:**COMPARATIVE BALANCE SHEET**(at on 31st March, 1995 and 1996)

	1995	1996	Absolute Increase or decreases in 1995- 96	Percentage increase or decreases 1995-96
	(Figures in lakhs of rupees)			
Sales	200	250	50	25%
Less: Cost of goods sold	180	225	+45	25%
Gross Profit	20	25	+5	25%
Less: Operating Expenses:				
Administration Expenses	6	5	- 1	- 16.67%
Selling and Distribution Expenses	6	9	+ 3	50%
	12	14	+ 2	16.67%

Operating Profit	8	11	+ 3	37.5%
Other Incomes:				
Dividend Received	3	3	-	-
Earnings before interested and Tax	11	14	+ 3	27.27%
Less: Interest on Debentures	2	2	-	-
Earnings before Tax	9	12	+3	33.33%
Less: Tax Payable	4	6	+ 2	50%
Earning after Tax	55	6	+ 1	20%

Interpretation:

- (1) Profit after tax has increased by 20% during the period in absolute terms there has been an increase of Rs. Lakh during 1983-1984.
- (2) The sales have increased by 25% and since the cost of goods sold has increased by the same percentage, gross profit has also gone up by 25%.
- (3) There has been a significant increase in selling and distribution expenses i.e. 50% through the administration expenses have gone down by 16.67%.
- (4) Income received on investments as well as interest on debentures have remained constant.

10.3 Common –size Financial Statements:

The proportion which a single item represent within a total group or sub-group, if calculated, will give as idea about the relative importance of items interest. The total group figure is the base and can be taken as 100. Since all other component items are expressed as a percentage of the total, which has a common-size (i.e. 100), the financial statement are known as common-size financial statements are known as common-size financial statements. This is in fact, a vertical analysis of financial statements following the eye as one review the statement.

In a balance sheet, the ratio of each asset total assets and the ratio of each liability and capital item to total liabilities and capital (which is the same amount as total assets) is computed. The figure of total assets on the total of liabilities and capital is taken as 100. Similarly, in the income statements, net sales (i.e. sales less returns) are set at 100 percent and every other item in the statement is expressed as a percent of net sales. These vertical percentages serve as indicators of the significant relationships which exist between the expenses and the sales.

COMMON –SIZE BALANCE SHEET

(as at 31st March, 1996 and 1997)

Assets	1996 %	1997 %
	100	100
Fixed Assets:		
Building	48	44.64
Plant & Machinery	32	35.71

Furniture and Fittings	4	3.57
Total Fixed Assets	84	83.92
Investments	8	6.79
Current Assets		
Stock	3.2	3.57
Debtors	2.0	2.50
Bank	1.6	1.79
Bills Receivable	1.2	1.43
Total Current Assets	8	9.29
Total Assets	100	100
Liabilities & Capital	100	100
Capital & Reserves:		
8% Preference Share Capital	32	28.57
Equity Share Capital	40	42.86
General Reserve	8	8.57
Profit and loss account	4	4.29
Total Shareholders' funds	84	84.29
Long-term Liabilities		
8% Debentures	10	7.14
Fixed Deposits	-	1.79
Total	10	8.93
Current Liabilities		
Sundry Creditors	3.2	3.21
Bills Payable	1.2	1.43
Provision for Taxation	1.6	2.14
Total Current Liabilities	6	6.78
Total Liabilities	16	15.71
Total Liabilities and Capital	100	100

Interpretation:

- (1) The Company requires a large investment in fixed assets since it has invested about 84% of its assets in them. As a percentage to total assets, investment in plant and machinery has increased and building decreased.
- (2) The current assets to total assets have risen by 1.29% during the period, particularly because the percentage of investment in total assets has fallen.

- (3) Shareholder's funds are 84% of the total liabilities and capital (or total assets) as at 31st March 1996, the percentage has slightly improved as on 31st March, 1997.
- (4) Fixed deposits have been raised during the year and debentures have been redeemed, but overall percentage of long term loans has declined from 10% to 8.93%.
- (5) Current liabilities have gone up from, 6% to 6.78 of total liabilities and capital.

COMMON –SIZE INCOME STATEMENT
(as at 31st March, 1996 and 1997)

	1996	1997
Sales		
Less: Cost of goods sold	100.0	100.0
Gross Profit	90.0	90.0
Gross Profit	10.0	10.0
Less: Operating Expenses		
Administration Expenses	3.0	2.0
Selling and Distribution Expenses	3.0	3.6
	6.0	5.6
Operating Profit	4.0	4.4
Other Incomes		
Dividends Received	1.5	1.2
Earnings before interest and tax	5.5	5.6
Less : Interest on Debentures	1.0	0.8
Earnings before tax	4.5	4.8
Less Tax Payable	2.0	2.4
Earnings after Tax	2.5	2.4

Interpretation:

- (1) Cost of goods sold is 90% of sales during both the years, hence gross profit is constant at 10% of sales.
- (2) The ratio of operating expenses to sales has gone down from 6% to 5.6% in total. Though selling and distribution expenses have increased from 3% to 3.6%, but the administration expense has covered from 3% to 2%. It has resulted in an improvement of the operating profit to sales ratio.
- (3) Other incomes as a percentage of sales have declined, so, the expenditure in respect of interest on debentures. However, the effect on earnings before tax could not be much and earnings before tax to sales has stopped up from 4.5% to 4.8% during the period.
- (4) Earnings after tax to sales have stopped down from 2.5% to 2.4% because of higher tax incidence.

Care must be taken in interpreting the changing proportions of components as disclose by common-size financial statements. For example a particular value might not have changed over the years but the proportion

might have increased or decreased due to fall or increase in total value. In such a case, the interpretation of common-size statements requires an examination of the actual figures and the basis on which they are computed.

Wherever inter-firm comparison is to be made the technique of analysis is very useful. Since the financial statements of different firms can be recast into uniform common-size format regardless of the size of individual accounts. However, conclusions will be valid only when data are comparable. The price levels must be the same and the accounting methods used by firms must be similar.

Moreover, the comparative statements do not give information about the trends of the individual items but the trends of their relationship to the total. The total is affected by variations in all components. If industry norms as to percentages of individual items to total are prescribed, interpretation is easier, otherwise such an analysis may not be very helpful also at times, for the analyst. To summarise, this device should be used to study proportions in a single statement and not for study of trends.

10.4 Trend Percentages:

Whenever the comparison is to be made for a longer period, the comparative financial statements may not serve the purpose fully, since the data become too cumbersome. The best course in such a case, is to compare the figures with the help of index numbers. Index numbers can be computed by taking a common base. The figures of the initial year, for which data are available, by choice or otherwise, can be taken as 100 and the figures of all the later years can be converted into index numbers i.e. as a percentage of the initial figure of course, of the same item. This process sets a longer term trend, comparison. The trend percentages may be computed only in respect of certain important items only.

The year which is to be chosen as a base year should be as typical or normal as possible and need not necessarily be the earliest year in the series. The trend analysis conveys, a better understanding of management's philosophies, policies and motivations, which have brought about the changes revealed over the years. The more diverse the economic environments covering the periods compared are the better a picture can be obtained of the ways in which the company has weathered its adversities and taken advantage of its opportunities. However, comparisons would be meaningful only when accounting policies are uniform and price level changes do not present a distorted picture of the phenomenon.

The computation of trend percentages has been illustrated below:

Illustration:

Calculate the trend percentages from the following figures of X Ltd., taking 1989 as the base and interpret them.

(in Lakhs of Rs.)

Year	1989	1990	1991	1992	1993
Sales	1,881	2,340	2,655	3,021	3,768
Stock	709	781	816	944	1,154
Profit before tax	321	435	458	527	-

Trend Percentage (Base Year 1989: 100)

Year	Sales		Stock		Profit before tax	
	Amount	Trend	Amount	Trend	Amount	Trend

	(Rs. Lakhs)	Percentage	(Rs. Lakhs)	Percentage	(Rs. Lakhs)	Percentage
1989	1,881	100	709	100	321	100
1990	2,340	124	781	110	435	136
1991	2,655	141	816	115	454	143
1992	3,021	161	944	133	527	164
1993	3,768	200	1,154	162	672	209

Interpretation:

- (1) The index of 1993 is double that of 1989 in respect of sales. The company has been progressing; the sales have been increasing year by year.
- (2) Profits before tax have more than doubled during the period. The profits have been rising every year. The rate of increase in profit is more than the rate of increase in sales every year.
- (3) Stocks have also been increasing every year; but the index is only 162 in 1993, with 1989 as the base; implying thereby that the stocks have not increased less than proportionately as compared to sales.

If price level changes are not significant, the company's overall performance can be said to be satisfactory.

10.5 Ratio Analysis :

Ratio analysis is the process of determining and interpretation Numerical relationship based on financial statements. A ratio is a statistical yardstick that provides a measure of the relationship between two variables or figures. This relationship can be expressed as percent (cost of goods sold as a percentage of sales) or as a quotient (current assets as a certain number of times the current liabilities).

As ratios are simple to calculate and easy to understand, there is tendency to employ them profusely. While such statistical calculations stimulate thinking and develop understanding; there is a danger of the accumulation of a mass of data that obscures rather than clarifies relationships. The financial analyst has to steer a careful course. His experience and objective of analysis help him in determining which of the ratios are more meaningful in a given situation.

The persons interested in the financial statements can be grouped under three heads:- (i) owners or investors; (ii) creditors; and (iii) financial executives. Although all these three groups are interested in the financial conditions and operating results of an enterprise, the primary information that each seeks to obtain from these statements differs materially, reflecting the purpose that the statement is to serve. Investors desire primarily a basis for estimating earning capacity. Creditors (trade and financial) are concerned primarily with liquidity and ability to pay interest and redeem loan within a specified period. Management is interested in evolving analytical tools that will measure cost efficiency, liquidity and profitability with a view to making intelligent decisions.

The significance of ratios varies in those three groups, Commercial bankers and trade creditors and the institutional lenders are mostly concerned with the ability of a borrowing enterprise to meet its financial obligations timely. As a result, they are more interested in ratios like the current ratio, acid-test ratio, turnover of receivables, inventory turnover coverage of interest by the level of earnings etc. Long-term creditors would be interested in the working capital position of the borrower as an indication of ability to pay interest and principal in case earnings decline. They may also find valuable the ratios of total debt to equity, net worth to total assets, long-term debt to net working capital, fixed assets to net worth, fixed assets to long term debt and fixed debt to total capitalization. The number of times fixed charges are covered by earnings before interest and taxes will be of particular interest for such long-term creditors. Investors in shares are primarily interested in per share ratio like earnings per share, book value per share, market price per share, dividends per share etc. They would also

be interested in knowing the capitalization rate (E/P ratio-Earnings per share/price per share ratio) which is the reciprocal of PIE ratio (price/earnings ratio) and also the dividend yield, i.e. D/P. For financial management the various ratios discussed subsequently are helpful which cover a period of years and the situation of competing companies in the same industry.

The discussion of each ratio covers the following aspects; the formula for the ratio; a numerical example; reference level (if any) consisting of a generally accepted rule of thumb; an explanation of details involved to calculating the ratio; and indication of the information that a ratio can provide to the financial manager.

Classification of Ratios

Financial ratios can be classified under the following five groups: (i) Structural ; (ii) Liquidity; (iii) Profitability; (iv) Turnover; and (v) Miscellaneous. The Balance Sheet and Profit and Loss Accounts of Hypothetical Ltd., have been recast with a view to illustrating the computation of various ratios.

(i) Structural Group

- (a) **Funded debt to total capitalization :** The term 'total' capitalization comprises long term debt, capital stock and reserves and surplus. The ratio of funded debt to total capitalization is computed by dividing funded debt by total capitalization. It can also be expressed as percentage of the funded debt to total capitalization. No, hard and fast rule can be set down as to what a proper relationship should be. Earning power of a company may justify a higher percentage. It is, however, necessary to note that a too heavy debt burden reduces the margin" of safety for lenders increases fixed charges upon earning, decreases earning available for distribution to shareholders; and in the case of continued inadequate or on profits may invite insolvency and force reorganization.
- (b) **Debt to equity:** Due care must be given to the computation and interpretation of this ratio. The definition of debt takes two forms; one includes the current liabilities while the other excludes them. The difference in the meaning of debt is confusing in general. The amount of debt that a firm can reasonably carry depends on varied factors. A public utility with stable earnings and favourable prospects can safely finance a much larger percentage of its assets with debt as against a manufacturer with an erratic record of profitability. Whether a particular ratio depicts a good or bad condition has to be concluded after due care.
- (c) **Equity (net worth) to net fixed assets:** This ratio gives an indication of the extent to which equity capital is invested in net fixed assets. In case of net fixed being assets being in excess of worth, difficulties may arise to provide depreciation resulting in a reducing in profits. In addition, the more the shareholders contribution is tied up in fixed assets the less is the amount available for investment in current assets, which in other words, means that creditors have contributed towards large proportion of the net fixed assets. The higher this ratio the less the protection for creditors. Where net fixed assets exceed net worth, it may be a signal for many industrial concerns which should plan for an additional equity capital.
- (d) **Net fixed assets to funded debt:** these ratio-acts as a – supplementary measure to determine security of the lenders. A ratio of 2: 1 would mean that for every rupee of long term indebtedness, there is book value and actual liquidating value may be greatly at variance and in interpreting this ratio, this fact must be borne in mind.
- (e) **Funded (long term) debt to net working capital:** This ratio is calculated by dividing the long term debt by the amount of the net working capital. It helps in examining creditors' contribution to the liquid assets of the firm. Funded debt should not exceed net working capital for most industrial concerns, in fact, it should be less. If net working capital is less than funded debt, difficulty in meeting financial obligations is likely to arise over the long run.

(ii) Liquidity Group

(a) Current Ratio: The current ratio is computed by dividing current assets normally include cash, marketable securities, sundry debtors (accounts receivables) and inventory, and current liabilities consist of sundry creditors (accounts payable), short term loans and advances (including cash credit facilities taken from commercial banks, current maturities of long-term debts), current liabilities and provisions of taxes and other accrued expenses. This ratio is generally acceptable measures of short-term creditors are covered by assets that are likely to be converted into cash in a period corresponding to the maturity of the claims.

This relationship is a prime importance to the short term creditor since it gives an indication of a borrower's ability to meet his current obligations. It should, however, be borne in mind that current assets are not the only source of funds to meet current liabilities. A firm can borrow from new creditors to repay the old.

In interpreting this ratio, consideration should be given to the proportion of the various components of current assets. A current ratio of 2: 1 has long been considered generally satisfactory but indiscriminate use of this standard is unsound. This ratio varies from industry to industry and within the same company from season to season. One should be careful to determine acceptable standards within the industry in which the company operates.

(b) Acid-test-ratio: This is also termed as quick ratio. It is determined by dividing 'quick assets' i.e. 'cash' marketable investments and sundry debtors by current liabilities. This ratio is a better test of financial strength than the current ratio as it gives no consideration to inventory which may be vary slow moving.

It is supplementary measure of liquidity and places more emphasis on immediate conversion of assets into cash than does the current ratio. A quick ratio of 1:1 has usually been considered favourable since for every rupee of current liabilities there is a rupee of quick assets. But accounts receivables may not be convertible into cash at face value on a short notice. Like current ratio a reasonable standards for the acid-test ratio varies from season to season in a company and from company to company in an industry.

(iii) Profitability Group:

(a) Operating ratio: It is calculated by dividing the total operating expenses by net sales and is expressed as a percentage. Total operating expenses includes all costs except financing costs and income tax. This is the most general measure of operating efficiency and is important to management in judging its operations.

(b) Operating profit to sales: The difference between the operating ratio and 100 is the ratio of operating profit (earnings before interest and taxes) to net sales. The lower the operating ratio, the higher the margin of profit.

While this ratio serves as an index of overall efficiency, its usefulness is limited by its vulnerability to changes resulting from accounting decisions. For instance, a high ratio may signify nothing more than a management policy of not providing necessary maintenance and depreciation. This ratio is very useful for purposes of internal analysis in detecting the areas of difficulty.

(c) Net Profit to sales: This ratio is also called as the net profit ratio and net profit margin. It is determined by relating the net income after taxes to the net sales for the period and measure the profit per rupee of sales. This percentage, in conjunction with the operating ratio, throws light on the importance of the company's non-operating activities.

(d) Coverage of interest payment: This ratio is determined by dividing interest charges on long-term borrowings and dividend on preference shares into the company's earnings before interest and taxes for the (EVIT).

EBIT (Earnings before interest and taxes)

Interest

The numerator indicated the extent of earning available for the payment of interest. This ratio is used mainly as a measure for the firm's ability to meet its interest obligations. Sinking fund payments or instalments due or repayment of capital can be added to the interest charges in order to determine the capacity of the company to serve its debt obligations. This can be stated as:

EBIT (Earnings before interest and taxes)

Interest + Sinking fund payment $(1/1 - t)$

Where 1 stands for the tax rate payment by the company on its income.

(e) Return on investment: This relationship can be examined under two heads:

- (i) EBIT/Capital Employed and
- (ii) Net profit to Net Worth

This ratio examines the relationship between the size of operating profits (EBIT) and the capital employed. It is one of the most basic ratios. It can be computed in a number of ways in relation to total assets, capitalization (equity capital plus, long-term debt) or owner's equity. From the management point of view, the meaningful relationship is between the earnings before interest and taxes and the capital employed. This relationship is expressed as EBIT/Capital Employed and provides a good indication of the profitability of the capital employed in the firm. There is a variation of this ratio by dividing the EBIT by capitalization and not capital as distinguished from the capital supplied by short – term creditors. Some analysis adjusts this measure by using average capital employed during the year while others prefer endings balances.

For determining return on the investment of the equity holders in a company, the aforementioned ratio has to be modified. For the shareholders, the relationship between the net profits and the net worth is more meaningful. For calculating this ratio, the cost of borrowed capital and income tax are deducted from earnings. It is a fair measure for appraising the earning power of the equity investment, i.e. net worth. However, the accounting and operating policies of a firm influence the reliability of this measure. In addition, shareholders frequently relate the earnings available to them to the market value rather than to book value of their shares.

(iv) Turnover Group

- (a) Assets Turnover: This ratio is also turned as capital turnover. It is calculated by dividing net sales by the net tangible assets but low ratio may be caused by large outlays for fixed assets. Results of this ratio should be interpreted in the light of other factors in operation.
- (b) Net working capital turnover: It is computed by dividing average net current assets into net sales. It helps in measuring the efficiency of the employment or working capital. Generally speaking, the higher the turnover, the greater the efficiency and the larger the rate of profits. However, a very high ratio may signify a potentially dangerous situation on the shortage of working capital.
- (c) Receivable turnover (collection period): This ratio measures the relationship between credit sales during a particular accounting period and the average receivable (sundry debtors) outstanding during the period. This ratio is also called the collection ratio or book debts to sales ratio. It is expressed in two forms.
 - (i) Net sales/average amount of accounts receivables.
 - (ii) Average collection period after calculating average daily sales (sales/days) and dividing accounts receivables by sales per day. A quicker way of obtaining this very result is to calculate the percentage of receivables to sales for the period and to apply this percentage of the number of days in the period. Usually, for this purpose the number of days is 360 instead

of 365. In order to concentrate upon credit policy, cash transactions (if the data are available should be excluded from net sales in computing his ratio).

The average collection period is rough measure of the overall quality of the accounts receivables and of the credit policies of a firm. However, care should be taken in interpreting this figure is sales fluctuate widely in a given period. Further, a firm selling both for cash and on credit presents a problem and the credit sales should be separated from the cash sales.

The collection ratio is a good supplementary test of the validity of the current ratio. If it is substantially in excess of the usual trade terms in the industry, it gives signal that many of the receivable may never be collected. Difficulty can be caused by the excessive amount of the working capital locked up a receivables. In such cases, the analyst should prepare a detailed ageing statement of accounts receivables by classifying accounts receivables into groups by difference of sales in monthly appropriate time intervals (depending on the credit terms) to see which portion is current and which is overdue. A ratio analysis of overdue accounts in proportion to outstanding accounts from selected periods can then be prepared. Care should be taken that all cash sales are excluded. However, this information is not available to an external analyst.

This measure can be compared to the credit terms granted to customers in the industry concerned and any major deviation from this norm would be a warning signal. The promptness with which accounts are collected is an indicator of the effectiveness of the credit departments as well as reflection of the quality of the accounts receivable.

(d) Inventory turnover: There are two ways of presenting the relationship of inventory to sales or cost of goods sold:

- (i)
$$\frac{\text{Sales}}{\text{Ending inventory}}$$
- (ii)
$$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

(i) Sales/Ending Inventory: This ratio has got two limitations:

- (a) Ending inventory figure may not be representative of the level of inventory throughout the year and
- (b) Investment inventory should be related to the cost of goods sold as against sales which contain the element of profits over and above the recorded cost of goods. Thus, the relationship is not entirely that of comparable figures and any comparative studies of the ratio between companies may be misleading through difference in the gross margin taken on sales.

(ii) Cost of goods sold/average inventory: This relationship express the frequency with which average level of inventory investment is turn over through operations. The higher the inventory turnover, the larger the amount of profit, the smaller the amount of capital tied up in inventory and the more current the merchandise stock. Moreover, a firm with a high turnover has a great competitive advantage as it can afford to sell its merchandise at a lower price because increased sales volume may yield a larger total profit even through the margin of profit per unit is slightly less.

The inventory turnover is a valuable measure of selling efficiency and inventory quality. A low inventory turnover may be due to a variety of reasons like poor merchandise, over valuation of closing inventor, a large stock of un-saleable goods, overbuying an anticipated future increase in sales, etc.

(v) Miscellaneous group:- Under this head, we can examine the following ratios:

- a) Earning –price ratio
- b) Price-earnings ratio
- c) Divided yield, and
- d) Payout ratio

(a) Earning price ratio: This ratio is also learned as earning yield. It is computed by dividing earnings per share by market price per share. Earnings per share are obtained by dividing the total earnings by the number of shares outstanding. There are, however, difficulties, in finding out the market price, should it be on a certain day or an average of the highest and the lowest market price over-a period? This ratio is very useful for the prospective investors in a company.

The earnings price ratio is computed by dividing earnings per equity share by market price per share and is expressed as a percentage which earnings bear to price. The price-earnings ratio is its reciprocal and is represented by the multiple by which earnings are multiplied to arrive at the market price. The market price of an equity share is influenced by many factors like the dividend and earning rate and record, stability and rate of growth of earning and sales, credit rating and financial strength, managerial competence and efficiency, competitive position of the company etc. A low percentage or a high multiplier, therefore, may reflect a high rate of growth in the past. The equity shares of a well established company with a promising future outlook usually sell at a lower percentage or a higher multiple of current earnings.

(b) Price –earnings ratio: This is the reciprocal of earnings price ratio discussed above. This ratio indicates the times. The earnings per share are covered by its market price. This ratio is useful in financial forecasting. This ratio may show great diversity between one company and another as share prices fluctuate widely. It is a rule of thumb that equity shares in industrial companies should sell at 10 times of earnings i.e. earnings price ratio should be 10 percent; the percentage may be lower or the multiplier higher in the case of companies commanding investment prestige and showing a progressive increase in earning power. By comparing the earnings price percentages of multiplier at which shares are selling in relation to earnings, it is determined whether shares are underpriced or overpriced.

(c) Divided yield: This ratio measures relationship between the dividend per share and the market price. For an investor, not only the amount of this ratio is important but also be extent of coverage of this ratio by the earnings yield.

(d) Payout ratio: This ratio is calculated by dividing per share by the earnings per share. The attractiveness of investment depends on its earnings power and profitability over a period of time. The rate of earnings per share is the best single measure of profitability. It reflects productivity of investment. As earnings fluctuate from year to year, they have to be studied over a number of years covering periods of depression and prosperity in order to find out a trend after making due allowance for abnormal factors. The j rate of earnings per share also indicates the dividend protection available to equity share which is particularly significant in a growth situation.

This ratio express the amount of equity of dividend as a percentage of earnings available for equity shares after meeting all charges. A ratio lower than 100 percent indicates retention of earning in the firm whereas a ratio higher than 100% indicates distribution of a part of reserves by way of dividends, the payout ratio may be relatively lower when earnings are utilized for financings growth or expansion. The payout ratio is a test of managerial ability and reputation. But in analyzing growth shares the payout ratio may be important because shares primarily sell on the basis of earnings as against dividends.

Limitation of ratio analysis

Limitation of ratio analysis arises due to difficulties in making comparisons. While reasonably accurate reports of actual performance are possible, is always a challenging job to find an adequate standard. The conclusions

drawn from the ratios can be no better than the standards against which they are compared. Further when one says that performance is good or bad, better or worse, there is an implicit or explicit comparison of actual performance to some standard. The standards of comparison, discussed earlier, can be thought of as a quality range rather than a single number. If actual performance is within this range, it may be regarded as satisfactory but when it begins to outside the range, it is an indication of unsatisfactory situation.

It is difficult to evaluate the difference in the factors that affect one company's performance in a particular year as compared with that of a another year and that of another company. This task becomes more difficult when comparison is made on one company with another when these are of substantially different size, age and diversified products.

While making comparisons of ratios, due allowance should be made for changes in price level. A change in price level can seriously affect the validity of comparison of ratios computed for different time periods and particularly in case of ratios whose, numerator and denominator are expressed in different kinds of rupees. Many assets amount are expressed as unexpanded historical rupee costs. The fixed assets of one company may be purchased at a time when prices are low or they may be fully depreciated. If these fixed assets are compared with the fixed assets of other companies which purchased them at a time of higher price or if they were relatively new, then the return on investment ratio for the company that carried its assets at a low book value would be much higher as compared to that of other companies.

Comparisons are also made difficult due to differences in definition. The terms like gross profit, operating profit, net profit, etc. have not got precise definitions and there is a considerable diversity in practice as to how they should be measured. Difficulties may further arise due to difference in date collection.

A balance sheet may fail to reflect the average or typical situation as it is prepared as on one moment of time. It ignores short term fluctuation in assets and equities that may occur within the period covered by the two balance sheet dates. A company that is analyzing its own data can study the seasonal movements by using monthly rather than annual balance sheets. Such balance sheets are usually not avoidable to the outsider. It should also be recognized that companies often take result to window dressing which may not be visible to an outsider and affect the validity or comparison.

Various differences are found amounting any the accounting methods used by different companies which variously affect the comparability of financial Statement. Methods of recording and valuing assets write-offs, costs, expenses etc. differ from company to company. The methods for establishing inventory values also leave great freedom to management. The balance sheet figures for assets need not correspond to the value of the company either as a going concern or in liquidation.

As ratios are simple to calculate and easy to understand, there is a tendency to over employ them. While such statistical approach stimulates thinking. It is also likely to lead to the accumulation of a mass of data; if due care is not taken, that might obscure rather than clarify relationships. Further, ratios do not provide a definite answer to financial problems.

There is always the question of judgement as to what significance should be given to the figures. While some standards of reference and sources of background material may be found useful in this connection in the final analysis, one must rely upon one's own good sense in selecting and overrating the ratios. The fact that there are no mechanical solutions to business problems should not be overlooked.

From where fund comes and where goes, how much fund has been generated from the operations of the business, external sources of finance, major commitments of funds during the year.

The funds are defined in three ways. Very broadly, funds means total resources and very normally it means cash. Funds mean net working capital. Funds flow Statement can be prepared by using three measures and are:

Fund Flow analysis - Total resources basis

Fund Flow analysis - Working capital basis

Fund Flow analysis - Cash basis (cash flow statement)

These statements are very useful in studying the flow or movement of funds. A projected statement can be very effective tool planning.

Funds Flow statement and Cash Flow Statement will be explained in next lesson.

Self Assessment

Fill in the blanks:

1. _____ enables the analyst to compare items on a single financial statement or to examine the relationships between items on two financial statements.
2. When using _____, the analyst calculates each item on a single financial statement as a percentage of a total.
3. In trend analysis, _____ are compared over time, typically years.
4. Financial _____ are only meaningful when compared with other information.
5. A common-size income statement usually shows each revenue or expense item as a percentage of _____.
6. Computation of ratios for an accounting period is a form of _____ analysis.
7. In the analysis of financial information, trend analysis is the presentation of amounts as a _____ of a base year.
8. Trend analysis can also include the monitoring of a company's _____ over a period of many years.
9. Ratio analysis, as a technique or analysis of _____ uses this method of comparing the various items found in financial statements.
10. The _____ of the firms are studied on the basis of the total capital employed, total asset employed and so on.
11. Current assets ratio establishes the relationship between the _____ and current liabilities.
12. Liquid Asset = Current Assets – (_____ + Prepaid Expenses)
13. The operating ratio is establishing the relationship between the _____ and operating expenses with the total sales volume.
14. The _____ is nothing but the combination of both noncurrent liabilities and owners' equity.
15. The net profit ratio is an indicator of overall _____ of the firm in terms of return out of sales volume.

TYPICAL ILLUSTRATION

Illustration:

Following is the statement of cost of goods manufactured by Nirmala Private Limited Present the data in a suitable form for analysis:

	1981 Rs.	1980 Rs.
Raw Materials		
Opening stock	23,000	21,000
Purchases	2,37,000	2,15,000
	2,60,000	2,36,000
Closing stock	26,000	23,000
Materials consumed	2,34,000	2,13,000
Direct Labour	3,16,000	2,53,000
Manufacturing expenses	1,42,000	1,21,000
	6,92,000	5,87,000
Variations in Goods in Processes of stock		
Opening of year	14,000	13,000
Closing of year	16,000	14,000
Increase	2,000	1,000
Cost of Goods Manufactured	6,90,000	5,86,000

Nirmala Private Ltd.

COMPARATIVE STATEMENT OF COST OF GOODS MANUFACTURED

	Amount		% of cost of Goods Manufactured		Increase (+) Decrease (-)	
	1971	1970	1971	1970	Amount	%
Raw Materials uses	2,34,000	2,13,000	33.91	36.35	+21,000	+9.86
Direct Labour	3,16,000	2,53,000	45.80	43.17	+63,000	+24.90
Mfg. Expenses	1,42,000	1,21,000	20.58	20.65	+21,000	+17.36
	6,92,000	5,87,000	100.29	100.17	+1,05,000	+17.89
Less: Adjustment for increase in goods in processes of Stock	2,000	1,000	0.29	0.17	+1,000	
Cost of Goods Manufactured	6,90,000	5,86,000	100.00	100.00	+1,04,000	17.75

10.6 Summary

Techniques of Financial Statement Analysis can be defined as the tool or method of analyzing Financial Statements, evaluating its performance, and identifying the strength and weakness of the enterprise by interpreting the results and taking corrective measures. These methods would help the analyst to present the information from the Financial Statements in such a form that would help the users to understand the core

areas of the functioning of the business of an enterprise. There are several techniques or tools which are generally used for analyzing the Financial Statements, but none of them alone are sufficient for interpreting the overall performance of the enterprise and for decision-making as well. Rather, a combination of few techniques.

Comparative Financial Statement Analysis is a form of horizontal analysis where the Financial Statements of two or more years, or of two or more different companies, or of a company and its industry, are compared, analyzed and interpreted.

Through horizontal or comparative analysis of Financial Statements, a comparative study of different items or elements of Financial Statements of two or more years can be made, but the relative position of each item of the Financial Statements cannot be known. To study the relative significance of every item in the Financial Statements, a vertical analysis is proved to be very much effective. An important tool to such analysis is the 'Common-size Statements.'

A Ratio is a relationship between two or more items expressed in mathematical terms. It is an expression of quantitative relationship between two amounts or items which is expressed in numbers or percentage.

Ratio Analysis a tool adopted for determining the quantitative relationship between two or more financial data as obtained from the Financial Statements. As Ratio Analysis is a very powerful tool of analyzing Financial Statements, it plays a vital role to the facts of determining the financial strength and weakness of an enterprise. Its importance lies in the fact that it presents various information as obtained from the Financial Statements in a comparative way, and helps in analyzing the performance of the enterprise.

10.7 Glossary:

Assets: Assets are economic resources owned by business or company.

Balance Sheet: A balance sheet or statement of financial position is a summary of a person's or organization's balances.

Comparative Statements: Comparative statements are the financial statements which follow a consistent format but which cover different periods of time. Comparative statements are very useful for spotting trends.

Financial Statement: A written report which quantitatively describes the financial health of a company.

Trend analysis: In trend analysis, financial ratios are compared over time, typically years.

Current Assets: Current assets are in the form of cash, equivalent to cash or easily convertible into cash.

Current Liabilities: Current liabilities are short-term financial resources or payable in short span of time within a year.

Income Statement Ratios: These ratios are computed from the statements of Trading, Profit & Loss account of the enterprise.

10.8 Answers: Self Assessment

1. Ratio analysis
2. Vertical analysis
3. Financial ratios
4. Ratios
5. Net sales
6. Horizontal
7. Percentage

8. Financial ratios
9. Financial statement
10. Profitability
11. Current assets
12. Closing Stock
13. Cost of goods sold
14. Capital employed
15. Earning capacity

10.9 Terminal Questions:

1. What different tools are used for the analysis of financial statements?
2. Explain the following and indicate their uses as techniques for financial statement analysis.
 - (a) Comparative Balance Sheet
 - (b) Common-Size Statements
 - (c) Trend Analysis
3. What is the importance of comparative statements of management? Illustrate your answer with particular reference to comparative income statement and state how these statements are prepared?

Numerical Questions

1. Prepare a Comparative balance sheet from the following data and interpret it:

BALANCE SHEET

As at 31st December

	2010 Rs. Lakhs	2011 Rs. Lakhs
Assets		
Current Assets	72	174
Investments	40	33
Plant and Machinery	70	81
Intangible Assets	118	12
Total Assets	200	300
Liabilities		
Current Liabilities	40	93
Long-Term Liabilities	30	42
Total Liabilities	70	135
Shareholder's Funds		
Share Capital	90	126
Retained Earnings	40	39
	130	165

2. Using the figures of Q.I. prepare a common-size balance sheet and interpret it.
3. Prepare comparative income statement from the following data and in the light of conditions in 2011 interpret the changes in 2012.

INCOME STATEMENT

	2010 Rs. Lakhs	2011 Rs. Lakhs
Gross Sales	15,300	18,360
Less: Sales Returns and Allowances	300	350
	15,000	15,010
Cost Sales	9,100	10,125
Gross Profit	5,900	7,885
Operating Expenses:		
Administration Expenses	1,500	1,700
Selling expenses	3,000	3,300
Total Expenses	4,500	5,000
Income from Operations	1,400	2,885
Other Income	150	200
Total Income	1,550	3,085
Other Expenses	200	300
Net Income for the year	1,350	2,785

4. Using figures of Q.3 prepare common-size income statement and interpret it.
5. Calculate the trend percentages from the following data:

	2005 Rs. Lakhs	2011 Rs. Lakhs
Working Capital	16,70,602	76,50,191
Plant and Equipment	19,95,684	48,35,367
Long-term Debt	14,56,000	28,00,000
Net Tangible Assets	56,16,046	99,75,218
Also interpret the result		

6. What is meant by Ratio Analysis?
7. What are the steps in Ratio Analysis?

10.10 Suggested readings

Bhattacharyya, Debarshi. Management Accounting, Pearson Education in India, New Delhi.

Pandey, I.M. Financial Management, Vikas Publishing House Pvt Ltd., New Delhi.

Mongra, J.R. Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.

Lall, B.M. Jain I.C. Cost Accounting: Principles and Practice, Prentice Hall, Delhi.

Lesson-11

CASH FLOW STATEMENT

Structure:-

- 11.0 Learning objectives
- 11.1 Introduction
- 11.2 Funds Flow Statement
- 11.3 Advantages of Fund Flow Statement
- 11.4 Disadvantages of Funds Flow Statement
- 11.5 Steps for Making Funds Flow Statement
- 11.6 Cash Flow Statement
- 11.7 Advantages of Cash Flow Statement
- 11.8 Disadvantages Of Cash Flow Statement
- 11.9 Difference between Funds Flow Statement And Cash Flow Statement
- 11.10 Presentation of Cash Flow Statement
- 11.11 Summary
- 11.12 Glossary
- 11.13 Answers: Self Assessment
- 11.14 Terminal Questions
- 11.15 Suggested Readings
- 11.0 Learning Objectives**

After studying the lesson, you should be able to understand:

1. Meaning and concept of funds flow statement
2. Advantages and disadvantages of funds flow statement
3. Methods of preparation of funds flow statement
4. Meaning and concept of cash flow statement
5. Advantages and disadvantages of cash flow statement
6. Distinction between funds flow statement and cash flow statement
7. Methods of preparing cash flow statement

11.1 Introduction

Financial statements are compilation of financial data, arranged and organized in a systematic and summarized manner according to the accounting principles, to access financial position of an enterprise as regards to its profitability, efficiency, long- and short-term solvency, and growth potential. On the basis of the information as disclosed in the Financial Statements, users of them come to know about the growth, profitability, solvency and the financial strength of an enterprise. It is a tool in the hands of the management of an enterprise by which they present the financial position of the enterprise before the interested parties such as shareholders, lenders, creditors and so on. A number of statements prepared at the end of every Accounting Period are collectively called Financial Statements. Financial Statements include the following:

- . Comparative Financial Statements
- . Common size financial Statements
- . Ratio Analysis
- . Funds Flow Statement
- . Cash Flow Statement

In this lesson we will discuss Fund Flow and Cash Flow Statement.

11.2 Funds Flow Statement

Definition of Fund: Fund means working capital. If current assets of company is more than current liability of business, it is called working capital and working capital's other name is Fund.

Fund = Working capital = Current assets - Current liability

Definition of Flow of Fund: Flow of fund means movement of fund. Due to the activity of business fund is transfer from one asset to another assets. If fixed assets are converted into current asset or fixed liability is converted into current liabilities, these are the flow of fund. But if current assets are changed with current assets or current assets are changed into current liabilities, then, there is no flow of fund because there is no change in working capital. Suppose, we get the money from debtor, this is not flow of fund because, working capital is not changed. Both items of current assets and when current assets change into current assets, there will not be change in working capital.

Flow of Fund = Fixed asset changes into current asset or current asset changes into fixed assets

Or

Fixed liability changes into current liability or current liability changes into fixed liability.

A Funds Flow statement states

The changes in the working capital of the business in relation to the operations in one time period. For example, if the inventory of the business increased from Rs1, 40,000 to Rs.1, 60,000 then this increase of Rs. 20,000 is the increase in the working capital for the corresponding period and will be mentioned on the funds flow statement. Net working capital is the total change in the business's working capital, calculated as total change in current assets minus total change in current liabilities. A Funds flow statement is prepared to show changes in the assets, liabilities and equity between two balance sheets dates, it is also called statement of sources and uses of funds.

11.3 Advantages of Fund Flow Statement

A Funds flow statement is prepared to show changes in the assets, liabilities and equity between two balance sheets dates, it is also called statement of sources and uses of funds. The advantages of such a financial statement are many fold.

Some of these are:

Funds flow statement reveals the net result of Business operations done by the company during the year.

In addition to the balance sheet, it serves as an additional reference for many interested parties like analyst, creditors, suppliers, government to look into financial position of the company.

The Fund Flow Statement shows how the funds were raised from various sources and also how those funds were deployed by a company, therefore it is a great tool for management when it wants to know about where and from what sources

Funds were raised and also how those funds got utilized into the business.

It reveals the causes for changes in liabilities and assets between the two balance sheet dates therefore providing a detailed analysis of the balance sheet of the company.

Funds flow statement helps the management in deciding its future course of plans and also it acts as a control tool for the management.

Funds flow statement should not be looked alone rather it should be used along with balance sheet in order to judge the financial position of a company in a better way.

11.4 Disadvantages of Funds Flow Statement

Funds flow statement has many advantages; however it has some disadvantages or limitations also. Let's look at some of the limitations of funds flow statement.

Funds Flow statement has to be used along with balance sheet and profit and loss account for inference of financial strengths and weakness of a company it cannot be used alone.

Funds Flow Statement does not reveal the cash position of the company, and that is why a company has to prepare cash flow statement in addition to funds flow statement.

Funds flow statement only rearranges the data which is there in the books of account and therefore it lacks originality. In simple words it presents the data in the financial statements in a systematic way and therefore many companies tend to avoid preparing funds flow statements.

Funds flow statement is basically historic in nature, that is it indicates what happened in the past and it does not communicate anything about the future, only estimates can be made based on the past data and therefore it cannot be used by the management for taking decisions related to the future.

We can conclude that shorter the planning period more relevant is the "Cash Flow Statement" and longer the planning period more relevant is the "Fund Flow Statement".

11.5 Steps for Making Funds Flow Statement

First Step

Making of Fund Flow Statement

For making of fund flow statement. It is very necessary to make statement of changes of working capital. Because net increase in working capital is use of fund and net decrease in working capital is source of fund. So, it is duty of fund and net decrease in working capital is source of fund. So, it is duty of accountant to make statement of changes of working capital is very easy and simple.

We take two balance sheets, one is current year balance sheet and other is previous year balance sheet. Then we separate current assets and current liabilities

If current assets are more than previous year current assets, it means increase in working capital.

If current assets are less than previous year current assets, it means decrease in working capital. Because, relationship between current assets and working capital is positive and if any changes in current assets, working capital will change in same direction.

If current liabilities are more than previous year current liabilities, it means decrease in working capital.

If current liabilities are less than previous year current liabilities, it means increase in working capital. Relationship between working capital and current liabilities are inverse.

Statement or schedule of changes in working capital

Particular-----	previous year	Current year	Effect on working
-----		Increase	Decrease
		↓	↓

Current Assets

- Cash in hand
- Bills receivable
- Sundry debtors
- Temporary investments
- Stocks/ inventories
- Prepaid expenses
- Accrued incomes

 Total current assets ----- ----- -----

Current Liabilities

- Bills payable
- Sundry creditors
- Bank overdraft
- Short term advances
- Dividends payables
- Provision for taxation

 Total current Liabilities ----- ----- -----

 Working capital

CA-CL

Net increase or decrease in working capital= Increase in working capital- Decrease in working capital

2nd Step

Statement showing the fund from operation

Because it is the source of fund and will show in fund flow statement's source side. So before making fund flow statement showing the fund from operation.

Operation means business activity and fund from operation means profit from business activity. So, you will easy understand that profit from business activity between two accounting period must be the source of fund.

Statement of fund from operations

-----	Amount	↓

Closing balance of profit and loss account or retained earnings as

Given in the Balance sheet

Add non-fund and non operating items which have been already

Debited to profit and loss account

1. Depreciation
2. Amortization of fictitious and intangible assets
 - Good will
 - Patents
 - Trade marks
 - Preliminary expenses
 - Discount on issue of shares
3. Appropriation of retained earning such as
 - Transfer to general reserve
 - Dividend equalization fund
 - Transfer to sinking fund
 - Contingency reserve etc.
4. Loss on sale of any non-current or fixed assets such as
 - Loss on sale of land and building
 - Loss on sale of machinery
 - Loss on sale of furniture
 - Loss on sale of long term investments
5. Dividends including
 - Interim dividend
 - Proposed dividend
 - (If it is an appropriation of profit and not taken as current liability)
6. Provision for taxation (if it is not ten as current liability)
7. Any other non fund/ non operating items which have been debited to P\L account

 Total (A) -----|xxxxxx|

Less Non-Fund or non operating items which have already been credited to profit and loss account

1. Profit or gain from the sale of non current/ fixed asset such as
 - Profit on sale of land and building
 - Profit on sale of plant and machinery
 - Profit on sale of long term investment etc.
2. Appreciation in the value of fixed assets such as increase in the value of land if it has
 Been credited to profit and loss account

3. Dividends received
4. 4. Excess provisions retransferred to profit and loss account or written back.
5. Any other non operating items which has been credited to profit and loss account
6. Opening balance of profit and loss account or retained earnings as given in the balance sheet

 Total (B) ----- xxxxx ↓
 ----- ↓

Funds received from operations or business activities = total (A) –Total (B)

You can make also above statement in t shape adjusted profit and loss account form.

3rd Step

Fund flow statement

A Source of funds

1. Fund from operation (balance of second step)
2. Issue of shares capital
3. Issue of debentures
4. Raising of long terms loans
5. Receipt from partly paid shares, called up
6. Amount received from sales of non current or fixed assets
7. Non trading receipts such as dividend received
8. Sale of investments (Long term)

Decrease in working capital as per schedule of changes in working capital

Total -----

Applications or uses of funds

1. Funds lost in operations (Balance negative in second step)
2. Redemption of preference share capital
3. Redemption of debentures
4. Repayment of long term loans
5. Purchase of long term loans
6. Purchase of long term investments
7. Non trading payments
8. Payment of tax
9. Payment of dividends
10. Increase in working capital (As per positive balance of 1st step)

 Total----->-----

Illustration:

From the following information prepare

i) A schedule of change in working capital

ii) A Fund flow statement

liabilities	31 March		Asset	31 March	
	2006	2007		2006	2007
Capital	18,50,000	21,00,000	Goodwill(at cost)	6,00,000	6,00,000
Profit/Loss appropriation	14,78,000	17,64,000	Land and building	18,50,000	22,00,000
Bank loan	12,00,000	9,00,000	Plant and machinery	4,74,000	5,24,000
Bills payable	4,00,000	6,80,000	Furniture and fittings	1,94,000	1,94,000
Sundry creditors	14,00,000	12,20,000	Stock/inventories	8,26,000	7,24,000
Reserve for taxation	2,00,000	1,80,000	Sundry debtors	12,00,000	12,80,000
			Bills receivable	8,00,000	7,21,000
			Bank	5,00,000	4,83,000
			cash	84,000	1,18,000
	65,28,000	68,44,000		65,28,000	68,44,000

Solution – schedule of changes in working capital

Schedule/statement of changes in working capital for the period from _ to _

Particular	Previous period	Current period	Working capital changes
------------	-----------------	----------------	-------------------------

			Increase Decrease	
A. CURRENT ASSETS				
1)stock/inventories	8,26,000	7,24,000		1,02,000
2)Sundry debtors	12,00,000	12,80,000	80,000	
3)bills receivable	8,00,000	7,21,000		79,000
4)bank	5,00,000	4,83,000		17,000
5)cash	84,000	1,18,000	34,000	
	34,10,000	33,26,000	1,14,000	1,98,000
A.CURRENT LIABILITIES/PROVISION				
1)bills payable	4,00,000	6,80,000		2,80,000
2)sundry creditors	14,00,000	12,20,000	1,80,000	
3)provision	2,00,000	1,80,000	20,000	
	20,00,000	20,80,000	3,14,000	4,78,000

Working capital(A-B)	14,10,000	12,46,000
Change in working capital	(12, 46,000 -- 14, 10,000)	
(Or)	(3, 14,000 - 4, 78,000)	= 1, 64,000

FUND FLOW STATEMENT

Statement form

Fund Flow Statement for the period from _to_

Particular	Amount	amount
SOURCES (INFLOW) OF FUNDS		
1)Capital	2,50,000	
2)p/l appropriation	2,86,000	5,36,000
Less APPLICATION (OUT FLOW) OF FUNDS		
1)land and building	3,50,000	
2)plant and machinery	50,000	
3)bank loan	3,00,000	7,00,000

Change in working capital		-1,64,000
----------------------------------	--	------------------

There is a decrease in Net working capital to the extent of Rs 1,64,000

T Form

Statement of sources and application of funds for period from to

Sources (inflows) of funds	Amount	Application(outflow) of funds	
1)capital	2,50,000	1)land and building	3,50,000
2)p/l appropriation	2,86,000	2)plant, machinery	50,000
		3)bank loan	3,00,000
	5,36,000		7,00,000

Chang in working capital 1,64,000

(Sources / inflows of funds)<(application /out flows of funds)

11.6 Cash Flow Statement

A **Cash Flow** statement is a statement showing changes in cash position of the firm from one period o another. It explains the inflows (receipts) and outflows (disbursements) of cash over a period of time. The inflows of cash may occur from sale of goods, sale of assets, receipts from debtors, interest, dividend, rent, issue of new shares and debentures raising of loans, short-term borrowing, etc. The cash flows may occur on account of purchase of goods, purchase of assets, payment of loans loss on operations, payment of tax and dividend, etc.

A cash flow statement is different from a cash budget. A cash flow statement shows the cash inflows and outflows which have already taken place during a past time period. On the other hand a cash budget shows cash inflows and outflows which are expected to take place during a future time period. In other words, a cash budget is a projected cash flow statement.

11.7 Advantages of Cash Flow Statement

1. It shows the actual cash position available with the company between the two balance sheet dates which funds flow and profit and loss account are unable to show. So, it is important to make a cash flow report if one wants to know about the liquidity position of the company.
2. It helps the company in accurately projecting the future liquidity position of the company enabling it arrange for any shortfall in money by arranging finance in advance and if there is excess than it can help the company in earning extra return by deploying excess funds.
3. It acts like a filter and is used by many analyst and investors to judge whether company has prepared the financial statements properly or not because if there is any discrepancy in the cash position as shown by balance sheet and the cash flow statement,

11.8 Disadvantages of Cash Flow statement

1. Since it shows only cash position, it is not possible to deduce actual profit and loss of the company by must looking at this statement.
2. In isolation this is of no use and it requires other financial statements like balance sheet, profit and loss etc..., and therefore limiting its use.

11.9 Difference between Funds Flow Statement and Cash Flow Statement

	Basis of Difference	Funds Flow Statement	Cash Flow Statement
1.	Basis of Analysis	Funds flow statement is based on border concept i.e. working capital.	Cash flow statement is based on narrow concept i.e. cash, which is only one of the elements of working capital.
2.	Source	Funds flow statement tells about the various sources from where the funds generated with various uses to which they are put.	Cash flow statement starts with the opening balance of cash and reaches to the closing balance of cash by proceeding through sources and uses.
3.	Usage	Funds flow statement is more useful in assessing the long-range financial strategy.	Cash flow statement is useful in understanding the short-term phenomena affecting the liquidity of the business.
4.	Schedule Changes in Working Capital	In funds flow statement changes in current assets and current liabilities are shown through the schedule of changes in working capital.	In cash flow statement changes in current assets and current liabilities are shown in cash flow statement itself.
5.	End result	Funds flow statement shows the causes of changes in net working capital.	Cash flow statement shows the changes in cash.
6.	Principal Accounting	Funds flow statement is in alignment with the accrual basis of accounting.	In cash flow statement data obtained on accrual basis are converted into cash basis.

11.10 Presentation of a Cash Flow Statement

An enterprise presents its cash flows from operating investing and financing activities in a manner which is most appropriate to its business. Classification by activity provides information that allows users to access the impact of those activities on the financial position of the enterprise and the amount of its cash and cash equivalents. This information may also be used to evaluate the relationships among those activities.

A single transaction may include cash flows that are classified differently. For example, when the instalment paid in respect of a fixed asset acquired on deferred payment basis includes interest and loan, the interest element.

Cash flow activities

The cash flow statement is partitioned into three segments, namely:

- 1) Cash flow resulting from operating activities;
- 2) Cash flow resulting from investment activities;
- 3) Cash flow resulting from financing activities.

The money coming into the business is called cash flow, and money going out from the business is called cash flow outflow.

Operating Activities

The amount of cash flows arising from operating activities is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, pay dividends, repay loans and make new investments without recourse to external sources of financing. Information about the specific components of historical operating cash flow is useful, in conjunctions with other information, in forecasting future operating cash flow.

Cash flows from operating activities are primarily derived from the principal revenue-producing activities of the enterprise. Therefore, they generally result from the transactions and other events that enter into the determination of net profit or loss. Examples of cash flow from operating activities are:

- (a) Cash receipts from the sale of goods and the rendering of services;
- (b) Cash receipts from royalties, fees, commissions and other revenue;
- (c) Cash payments to suppliers for goods and services;
- (d) Cash payments to and on behalf of employees;
- (e) Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits;
- (f) Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities; and
- (g) Cash receipts and payments relating to futures contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.

Some transactions, such as the sale of an item of plant, may give rise to gain or loss which is included in the determination of net profit or loss.

However, the cash flows relating to such transactions are cash flows from investing activities.

An enterprise may hold securities and loans or dealing or trading purposes, in which case they are similar to inventory acquired specifically for resale. Therefore, cash flows arising from the purchase and sale of dealing or trading securities are classified as operating activities. Similarly, cash advances and loans made by financial enterprises are usually classified as operating activities since they relate to the main revenue-producing activity of that enterprise.

Investing Activities

The separate disclosure of cash flows arising from investing activities is important because the cash flows represent the extent to which expenditures have been made for resources intended to generate future income and cash flows. Examples of cash flows arising from investing activities are:

- (a) Cash payments to acquire fixed assets (including intangibles). These payments include those relating to capitalized research and development costs and self-constructed fixed assets;
- (b) Cash receipts from disposal of fixed assets (including intangibles);
- (c) Cash payments to acquire shares, warrants or debt instruments of other enterprises and interests in joint ventures (other than payments for those instruments considered to be cash equivalents and those held for dealing or trading purposes);

- (d) Cash receipts from disposal of shares, warrants or debt instruments of other enterprises and interests in joint ventures other than receipt from those instruments considered to be cash equivalents and those held or dealing or trading purposes.);
- (e) Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise);
- (f) Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise);
- (g) Cash payments for futures contracts, forward contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes or the payments are classified as financing activities; and
- (h) Cash receipts from futures contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purposes or the receipts are classified as financing activities.

When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedge.

Financing Activities

The separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprises. Examples of cash flows arising from financing activities are:

- (a) Cash proceeds from issuing shares or other similar instruments;
- (b) Cash proceeds from issuing debentures, loans, notes, bonds, and other short or long-term borrowings; and
- (c) Cash repayments of accounts borrowed.

Reporting Cash Flows from Operating Activities

An enterprise should report cash flows from operating activities using either:

- (a) The direct method, whereby major classes of gross cash receipts and gross cash payments are disclosed; or
- (b) The indirect method, whereby net profit or loss is adjusted for the effects of transactions of non-cash nature, any deferrals or accruals of past or future operating cash receipts or payments, and items of income or expense associated with investing or financing cash flows.

The Direct Method provides information which may be useful in estimating future cash flows and which is not available under the indirect method and is, therefore, considered more appropriate than the indirect method. Under the direct method, information about major classes of gross cash receipts and gross cash payments may be obtained either:

- (a) From the accounting records of the enterprise; or
- (b) By adjusting sales, cost of sales interest and similar income and interest expense and similar charges for a financial enterprise) and other items in the statement of profit and loss for:
 - i) Changes during the period in inventories and operating receivables and payables; (ii) other non-cash items; and
 - ii) Other items for which the cash effects are investing or financing cash flows.

Under the indirect method, the net cash flow from operating activities is determined by adjusting net profit or loss for the effects of:

- (a) Changes during the period in inventories and operating receivable and payables;
- (b) Non-Cash items such as depreciation, provisions, deferred taxes, and unrealized foreign exchange gains and losses; and
- (c) All other items for which the cash effects are investing or financing cash flows.

Alternatively, the net cash flows from operating activities may be presented under the indirect method by showing the operating revenues and expenses excluding non-cash items disclosed in the statement of profit and loss and the changes during the period in inventories and operating receivables and payables.

Reporting Cash Flows from investing and Financing Activities

An enterprise should report separately major classes of gross cash receipts and gross cash payments arising from investing and financing activities, except to the extent that cash flows described in paragraph 1 and 3 are reported on a net basis.

Reporting Cash Flows on a Net Basis

- 1) Cash flows arising from the following operating, investing or financing activities may be reported on a net basis:
 - (a) Cash receipts and payments on behalf of customer when the cash flows reflect the activities of the customer rather than those of the enterprise; and
 - (b) Cash receipts and payments for items in which the turnover is quick, the amounts are large, and the maturities are short.
- 2) Examples of cash receipts and payments referred to in paragraph 1 (a) are :
 - a) The acceptance and repayment of demand deposits by a bank;
 - b) Funds held for customers by an investment enterprise; and
 - c) Rent collected on behalf of, and paid over to, the owners of properties

Examples of cash receipts and payments referred to in paragraph 1 (b) are advances made for, and the repayments of:

- (a) Principal amounts relating to credit card customers;
 - (b) The purchase and sale of investments ; and
 - (c) Other short-term borrowings, for example, those which have a maturity period of three months or less.
- 3) Cash flows arising from each of the following activities of a financial enterprise may be reported on a net basis:
 - a) Cash receipts and payments for the acceptance and repayment of deposits with a fixed maturity date;
 - b) The placement of deposits with and withdrawal of deposits from other financial enterprises; and
 - c) Cash advances and loans made to customers and their payment of those advances and loans.

PROFORMA OF CASH FLOW STATEMENT AS PRESCRIBED IN AS-3

Performa of Cash Flow Statement under Direct Method

Cash Flow Statement of _____ for the period ended _____

	Rs.	Rs.	Rs.
A . Cash Flows from Operating Activities:			
Cash Receipts from Customers			
Less: Cash Paid to Suppliers & Employees			
Cash Generated from Operation			
Less: Income Tax Paid			
Cash flows from operation before Extraordinary items			
Add: Proceeds from any Disaster Settlement			
Net Cash Flow From Operating Activities			
B. Cash Flows from Investing Activities:			
Proceeds from Sale of Fixed Assets including Investment			
Less: Purchase of Fixed Assets Including Investments			
Add: Interest Received			
Dividend Received			
Net Cash Flow from Investing Activities			
C. Cash Flows from Financing Activities:			
Proceeds from Issuance of Share Capital			
Proceeds from Long –term Borrowings			
Less: Repayment of Long-term Borrowings including Redemption of Preference Shares			
Less: Interest Paid			
Dividend Paid			
Net Cash Flow from Financing Activities			
the period			
Net Increase in Cash & Cash Equivalents			
Add: Cash & Cash Equivalent at the beginning of Cash &			
Cash Equivalents at the end of the period			

Performa of Cash Flow Statement under Indirect Method

Cash Flow Statement for the period ended _____

	Rs.	Rs.	Rs.
Cash Flows from Operating Activities:			
Net profit for the period before Taxation & Extraordinary			
Add: Adjustment for Non-current and Non-operating Items	—		
Charged to Profit & Loss A/C	—		
Depreciation	—		
Interest Paid	—		—
Foreign Exchange Loss			
Loss on sale of Fixed Assets & Investment			
	--		—
Less: Adjustment for Non-current and Non-Operating Items	--		
Credited to Profit & Loss A/C	--		
Interest Earned	---		
Dividend Earned			—
Profit on Sale of Fixed Assets & Investments			
Operating Profit before Working Capital Changes			—
Add: Increase in Operating Current Liabilities			—
Decrease in Operating Current Assets			—
Less: Increase in Operating Current Assets			—
Decrease in Operating Current Liabilities			—
Cash Generated from Operation			
Less: Income Tax Paid			
Add: Proceeds from any Disaster Settlement			—
Net Cash Flow from Operating Activities			—
B. Cash Flows from Investing Activities:			
Proceeds from Sale of Fixed Assets including Investments			—
Less: Purchase of Fixed Assets including Investments			—
Add: Interest Received			—
Dividend Received			—

Net Cash Flow from Investing Activities			
C. Cash Flows from Financing Activities:			
Proceeds from Issuance of Share Capital			
Proceeds from Long-term Borrowings			
Less: Repayment of Long-term Borrowings Including Redemption Of Preference Shares			
Less: Interest Paid			
Dividend Paid			
Net Cash Flow from Financing Activities			
Net increase in Cash & Cash Equivalents			
Add: Cash & Cash Equivalents at the beginning of the period			
Cash & Cash Equivalents at the end of the period			

SIGNIFICANT NON-CASH TRANSACTION

Some investing and financing activities do not require the use of cash or cash equivalents such as the acquisition of assets by issue of debentures or the acquisition of an enterprise by means of issue of shares and debentures or the conversion of debentures into shares and soon. **These non-cash and non-cash equivalents should be excluded from a cash flow statement.** Such significant non-cash transactions should be disclosed elsewhere **preferably in a separate schedule in a way that provides** all relevant information about these significant investing and financing activities.

FORMAT OF THE CASH FLOW STATEMENT

The three activities, namely: **operating, investing and financing** form the basis of general format of cash flow statement. **AS-3 (Revised)** has not provided any specific format but an idea of the format can be had from the illustrations appearing thereof. There is then not enough scope or flexibility in presenting the cash flows. However a widely used format and approved by **Securities and Exchange Board of India (SEBI)** is given below:

Company Name

Cash Flow Statement For The Year Ending.....

A. Cash Flows from Operating Activities		
Net profit before tax and extraordinary items		
Adjustments for:		
Depreciation and amortization of fixed assets		
Amortization of Intangible Assets		
Foreign exchange Investments		
(Exchange rate effects)		

<p>Gain or loss on sale of Fixed Assets</p> <p>Interest /dividend</p> <p>Operating profit before working capital changes.</p> <p>Adjustments for:</p> <p style="padding-left: 40px;">Trade and other receivables</p> <p style="padding-left: 40px;">Inventories</p> <p style="padding-left: 40px;">Trade payables etc.</p> <p>Cash generation from operations</p> <p style="padding-left: 40px;">Interest Paid</p> <p style="padding-left: 40px;">Direct taxes (Income Tax)</p> <p>Cash before extraordinary items</p> <p style="padding-left: 40px;">Deferred revenue</p> <p>Net cash from (used in) operating activities</p> <p>A. Cash Flows from Investing Activities</p> <p style="padding-left: 40px;">Purchase of fixed assets</p> <p style="padding-left: 40px;">Sale of fixed assets</p> <p style="padding-left: 40px;">Sale of investments</p> <p style="padding-left: 40px;">Purchase of investments</p> <p style="padding-left: 40px;">Interest received</p> <p style="padding-left: 40px;">Dividend received</p> <p style="padding-left: 40px;">Loans to subsidiaries</p> <p>Net cash from (used in) investing activities</p> <p>C. Cash flows from financing activities</p> <p style="padding-left: 40px;">Proceeds from issue of share capital</p> <p style="padding-left: 40px;">Proceeds from long term borrowings</p> <p style="padding-left: 40px;">Repayment to finance/ lease liabilities</p> <p style="padding-left: 40px;">Dividend paid.</p> <p>Net cash from (used in) financing activities</p> <p>Increase (Decrease) in cash and cash equivalents.</p> <p style="text-align: center;">(A+B+C)</p> <p>Cash and Cash equivalents at the beginning of the year. Cash and Cash equivalents at the close of the year.</p>		
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Note :-> Non-cash investing and financing activities such as Purchase of Building by issue of share capital is not shown in the body of cash flows statement given above. Report this information in a separate schedule.

BASIC INFORMATION FOR PREPARING CASH FLOW STATEMENT

The basic information needed for the preparation of a statement of cash flows usually comes from the following three sources:

- (i) **Comparative balance sheet:** It means the balance sheets in the beginning and at the end of the accounting period. These comparative balance sheets indicate the amount of changes that have taken place in assets, liabilities and owners capital accounts. **A detailed analysis of these changes will disclose the amount of cash flows.**
- (ii) **Profit and Loss statement of the current accounting period:** Information in this statement enables the users to determine the amount of cash provided by or used in operations during the accounting period after making adjustments for non-cash and non-operating items, current liabilities items.
- (iii) **Selected additional information:** In addition to the comparative balance sheets and income statement of current year, **selected additional transactions data are needed to extract the hidden transactions e..**, sale and purchase of fixed assets for cash. It means that additional information is needed to determine how cash was provided or used during the accounting period

Sample cash flow statement using the direct method		
Cash flows from operating activities	Amount (Rs.)	
Cash receipts from customers	9,500	
Cash paid to suppliers and employees	(2,000)	
Cash generated from operations (sum)	7,500	
Interest paid	(2,000)	
Income tax paid	(3,000)	
Net cash flows from investing activities		2,500
Cash flows from investing activities		
Proceeds from sale of equipment	7,500	
Dividend received	3,000	
Net cash flows from investing activities		10,500
Cash flows from financing activities		
Dividends paid	(2,500)	

Net cash flows used in financing activities		(2,500)
Net increase in cash and cash equivalents		10,500
Cash and cash equivalents, beginning of year		1,000
Cash and cash equivalents, end of		11,500

Example:**XYZ co. Ltd.Cash Flow Statement**

(all numbers in millions of Rs.)

	Period ending		
	31 Mar 2010	31 Mar 2009	31 Mar 2008
Net Income	21,538	24,589	17,046
Operating activities, cash flows provided by or used in:			
Depreciation and amortization	2,790	2,592	2,747
Adjustments to net income	4,617	621	2,910
Decrease (Increase) in accounts receivable	12,503	17,236	----
Increase (decrease) in liabilities (A/P, taxes payable)	131,622	19,822	36,856
Decrease (increase) in inventories	----	----	----
Increase (decrease) in other operating Activities	(173, 057)	(33,0621)	(62, 963)
Net cash flow from operating Activities	13	31,799	(2,404)
Investing activities, cash flows provided by or used in :			
Capital Expenditures	(4,035)	(3,724)	(3,011)
Investments	(201,377)	(71,710)	(75,649)
Other Cash flows from investing activities	1,606	17,009	(571)
Net Cash flows from investing	(204,206)	(58,425)	(79,231)

Activities			
Financing activities, cash flows provided by or used in :			
Dividends Paid	(9,826)	(9,188)	(8,375)
Sale (repurchase) of stock	(5,327)	(12,090)	133
Increase (decrease) in debt	101,122	26,651	21,204
Other cash flows from financing activities	120,461	27,910	70,349
Net cash flows from financing Activities	206,430	33,283	83,311
Effect of exchange rate changes			
Net increase (decrease) in cash and cash Equivalents	645	(1,240)	731
	2,882	4,817	2,407

Self Assessment

Fill in the blanks:

1. The fund flows statement depicts the _____ receipts and cash disbursements/ payments.
2. Fund flows means a study of _____.
3. The cash flows statement is being prepared on the basis of extracted information of _____ of the enterprise.
4. The _____ are availed through two different types of receipts viz. sales, dividends, interests known as regular receipts and sale of assets, investments known as irregular receipts of the business enterprise.
5. The cash includes not only means that cash in hand but also _____.
6. Cash flows from _____ activities are earned from the principal revenue - producing activities of an enterprise.
7. _____ activities of an enterprise include the purchase of fixed assets.
8. Cash proceeds from issuing shares or other similar instruments are the examples of cash flows from _____ activities.
9. The _____ are not recorded in cash flows statement because they do not have a direct impact on the current cash flows while they affect the capital and assets as purchase of fixed assets by the issue of shares or debentures.
10. Cash flows arising from the _____ is shown in the cash flows statement after classifying it into operating, investing and financing activities.

11.11 Summary

A fund flow statement is a summarised statement of movement of fund (i.e. working capital) from different activities of a concern during an accounting period. It is prepared to locate various sources of funds inflows into the business and also to identify various purposes of funds outflow from business during two consecutive balance sheet data.

Cash flows statement indicates sources of cash inflows and transactions of cash outflows prepared for a period. It is an important tool of financial analysis and is mandatory for all the listed companies. The cash flows statement indicates inflow and outflow in terms of three components: (1) Operating, (2) Financing, and (3) Investment activities. Cash inflows include sale of assets or investments, and raising of financial resources. Cash outflows include purchase of assets or investments and redemption of financial resources. There are two methods of converting net profit into net cash flows from operating activities: Direct method, and indirect method.

11.12 Glossary:

Fund: Fund means working capital

Flow: Flow means changes occurred in between two different time periods.

Fund from Operations: Income generated from only operations.

Decrease in Working Capital: Decrease in Net working capital i.e. Excess of current liabilities over the current assets - Resources side of the fund flow.

Fund Lost in Operations: Loss incurred in the operations.

Increase in Working Capital: Increase in Net working capital i.e. Excess of current assets over the current liabilities- Applications side of the fund flow.

Non-current Assets: Long-term assets.

Non-current Liabilities: Long-term financial resources.

Statement of changes in Working Capital: Enlisting the changes taken place in between the current assets and current liabilities of two different time horizons.

Cash: It includes cash in hand and demand deposits with bank.

Flow of Cash: It means the change in cash. It also includes the inflow and outflow of cash.

Cash Flow Statement: The statement which indicates the flow (movement) of cash during a period.

Cash Equivalents: refer short-term risk free highly liquid investment.

11.13 Answers: Self Assessment

1. Cash
2. Working capital change
3. Historical records
4. Cash resources
5. Cash at bank
6. Operating
7. Investing
8. Financing
9. Non-cash transactions
10. Extra-ordinary item

11.14 Terminal Questions:

1. Discuss the different concepts of fund? What is the generally accepted concept of fund?
2. What is the Fund Flow Statement? Draw up a Performa of Fund Flow Statement.
3. Define Cash Flow Statement what are its uses?
4. What are the advantages and limitations of Cash Flow Statement?
5. Why is Cash Flow Statement prepared? What is its importance?
6. Distinguish between Cash Flow Statement and Fund Flow Statement.

11.15 Suggested Readings

Bhattacharyya, Debarshi. Management Accounting, Person Education in India, New Delhi.

Pandey, I.M., Financial Management, Vikas publishing House Pvt Ltd., New Delhi.

Monga, J.R, Fundamentals of Corporate Accounting, Mayur Paperbacks, New Delhi.

Lesson -12

REPORTING

Structure:

- 12.0 Learning Objectives
- 12.1 Introduction
- 12.2 Information Needs of Different Management Levels
- 12.3 General Principles of Reporting
- 12.4 Modes of Reporting
- 12.5 Reports to different levels of Management
- 12.6 Preparation of Reports
- 12.7 Use of Reports by Management
- 12.8 Summary
- 12.9 Glossary
- 12.10 Answers: Self Assessment
- 12.11 Terminal Questions
- 12.12 Suggested Readings

12.0 Learning Objectives:

After studying the lesson, you will be able to understand:

1. Meaning and concept of reporting.
2. Various modes of reporting
3. Reporting needs of different levels of management
4. Uses of reporting

12.1 Introduction:

Reporting is an important output of accounting function. Management needs information for taking decision and appraising performance. The required information is furnished by means of reports. Reports are communications, usually in the written form, of facts which should be brought to attention of management personnel who can use them to take appropriate actions. In other words a report is one of the controlling devices in the form of a written communication addressed to a specific action. Good reporting provides an invaluable tool of control for different levels of management.

There is a good deal of difference between communication and report. The superior communicates order to the subordinates. The subordinates communicate results. The word "Report" is usually used for the factual communication from a lower level to a higher level of authority.

Reporting is important to accounting system. As an organisation grows management is likely to rely to a greater extent upon information compiled, summarized and interpreted by the accounting department. Being the custodian of the factual data on costs, sales and profits, the accountant provides a significant information service. It is the duty of the accountant to evolve suitable system of reporting cost and financial data in a quick, efficient and accurate manner. With the facts and information presented in the reports the management is able to evaluate the performance and plan for the future.

12.2 Information Needs of Different Management Levels

The system of reporting has to meet requirements of management at different levels. All managers require information to perform their managerial functions (mainly, planning and controlling) and make effective decisions. The information that managers require will vary, depending on the nature of the work they do and the tasks they seek to accomplish. Information needs also vary by levels in the organizational hierarchy.

Generally, the reporting levels, with their reporting needs, may be divided into following three broad categories:

1. Operating and Direct Supervision Level:

This management level consists of foreman, superintendents, section chiefs, masters of machines, etc. Operating supervisors, generally, need specific and detailed reporting of day to day working of the operations under their charge. Operating supervisors should receive reports concerning the effectiveness of their operations, showing planned performance, actual performance and variations from the planned in order to find that operating supervisors may be able to use their reports for the control of future operations. It is necessary that the reports give specific information about the department reported. The reports must emphasise cost control aspects and department operating efficiency.

2. Middle Management Level or Co-ordination Level:

This level comprises the heads of departments such as Works Manager, Purchase Executive, Sales Manager, Chief Accountant, etc. They need general reports that enable them to manage their departments efficiently. They also need special reports of various types to provide information for planning future policies of the organization. For example, research department may require information regarding the cost of using certain plants facilities for a new product to be introduced.

Reports directed to this level should be such as to assist in administering policies and in appraising the performance of operating supervisors. At this level, having a multiplicity of activities under them, the requirements of middle management cannot simply be met through reports in physical terms to disclose performance; money value have also to be reported.

3. General Management or Top Management Level:

This level comprises Board of Directors, Managing Directors, Chief Executive, etc., who are concerned with formulation not only for internal control, but also external data which enable them to adapt the organisation to outside conditions. The reporting system at this level should enable the management to make comparison to review organizational performance and to appraise the effectiveness of subordinate executives. In order to facilitate the application of the "Principal to exception: departmental reports should be summarized by total only. It would be then possible for management to discover weak areas in quick review and to study, the details of particular reports, where necessary. In appraising plans for future action, management requires factual information concerning the matter at hand. The writer of a planning report requires information about company's own resources in addition to information about external conditions to the organisation, supplemented by imaginative judgement.

12.3 General Principles of Reporting:

A good reporting system is helpful to the management in planning and controlling. Every level of management needs information relating to its activities centre so that effective planning may be undertaken and current activities may be controlled and necessary corrective action may also be taken in time, if needed. Some general principles are followed for making the reporting system effective. These principles are discussed below:

1. **Good form and Content:** The report should be in suitable form, having a suggestive title, sub headings and paragraph divisions. Where details are quoted, they may be placed in the appendix,

giving only the significant totals in the body of the report. The reports should bear the date on which it is put up. The names of the recipients of the report should be indicated on the top of the report. When reports are put up in response to a request or letter, report should bear a cross reference to such request or letter. The report should contain facts rather than opinions. Opinions expressed, if any should be the logical sequence of facts presented in the report. The contents of the report should follow the following logical sequence:

- (a) Summary of present position.
 - (b) Courses of actions which might be taken, with the expected results.
 - (c) Recommendations and the reasons for submission.
2. **Promptness:** Since reports are used as a controlling device they should be presented at the earliest or immediately after the happenings of an event. The time required for preparation of reports should be reduced to the minimum; for routine reports the period should be known and strictly adhered to. It will be a waste of time and effort to prepare information that is too late to be of any use. The absence of information when needed will either mean wrong decisions or ferment of decisions on matters that may be urgent in nature.
 3. **Accuracy:** The information should be as accurate as possible. However, the degree of accuracy may differ in different reports. Sometimes, part information may be supplied as a guide for future policy making, so the degree of accuracy may be less. The supply of exact figures may involve a problem of understanding. Approximate figures are more understandable than accurate figures given up to paise. Accuracy should also not involve excessive cost of preparation nor should it be achieved at the sacrifice of promptness of presentation. It will be better to have approximate figures at a proper time than delayed information prepared accurately.
 4. **Proper Flow of Information:** A good reporting system should have a proper flow of information. The information should flow from the proper place to the right levels of management. The information should be sent in the right form and at proper time so that it helps in planning and coordination. The frequency of reports will depend upon the nature of report, the types of data required for preparing the information and cost involved in preparing such reports. The flow of reports should be such that it does not cause delay in taking decisions. The reports should flow at regular intervals so that international needs of different managerial levels are met at a proper time.
 5. **Comparison:** The information supplied through reports will be more useful when it is supplied in comparison with past figures, standards set or objectives laid down. The decision-making authority will be able to make use of comparative figures while making a decision. Corrective measures can also be initiated to improve upon past performance.
 6. **Simple:** The information should be presented in a clear manner by avoiding extraneous data. Only relevant important information should become the part of a report. If supporting information cannot be avoided, then it should be given in appendix or separate chart should be attached to it.
 7. **Cost Consideration:** The benefits derived from reporting system must be commensurate with the cost involved in it. Though it is not possible to assess the benefit of this system in monetary terms, there should be an endeavour to make the system as economic as possible.
 8. **Visual Aids:** The method of presenting information should be such that it attracts the eye and enables the reader to form an opinion about the information. The graphic presentation of information will enable the reader to find out the trends and also to determine deviations more quickly than in other methods. The arrangement of presentation should be brief, clear and complete. Simplicity is a good guide for reports preparation.

9. **Length of Reports:** Every report should as far as possible, be brief, but this should not be at the cost of clarity and accuracy. It is also important to note that a brief report submitted in time will yield better results than a detailed but delayed report.
10. **Controllability:** When reporting performance against plans and targets, variances requires analysis as to those variances which are controllable by the recipient of the report and others which are outside his control. To make the report complete there is no objections to mention all variables relating to the area covered. But variance which are beyond the control of executive received the report should be stated separately in the report.

12.4 Modes of Reporting:

Graphs and charts enable presentation of information in a simple and effective way. A mass of detailed figures may be expressed through a bar or line on a squared paper. Graphics, Charts present information in a pictorial manner and easily attract all classes of executives to see and study them. Graphic charts are far more effective media for disclosing trends and main comparisons. Charts are usually used to supplement or narrative reports consisting of figures.

Various methods of graphic presentation are available, relatively more important of these are detailed below:

- (1) **Bar Charts:** A bar chart makes use of horizontal and vertical columns to represent magnitudes of values, quantity or period; the longer column, the higher the magnitude. Bar charts can be of different types:
 - (a) **Simple Bar Charts:** A simple bar chart is one of the commonest ways of indicating direct comparisons of size, such as production, sales, product costs, labour employed, etc., over a period of different manufacturing units.
 - (b) **Multiple Bar Charts:** The technique of simple bar chart can be extended to represent two or more sets of inter related data on one chart. Multiple bar chart are useful for comparison of the same type of data over a period of time.
 - (c) **Sub divided Bar Charts:** These bar charts are used to present such data which are shown in the parts or which are totals of various sub divisions. They are used in indicating the analysis of cost or sales by their constituent elements.
 - (d) **Percentage Bar Charts:** The same data may be expressed in a percentage form, with the only difference that the division into components is shown on a percentage basis, the whole bar representing 100%. These charts have therefore, added advantages of comparison on a relative basis.
- (2) **Pie or Circular Charts:** Pie charts are also percentage charts but these are presented as segments of a circle, instead of a component of bars.
- (3) **Z-Charts:** Comprising three curves on a single graph, the Z chart is so called, because on completion, it is similar to the shape of letter Z. These curves usually represent the following:
 - (a) Current figures for the period concerned.
 - (b) Cumulative amount of the latest data.
 - (c) Moving annual total

The moving annual total figure is calculated by taking the total figure of the previous twelve months, adding the figure for the current month of the previous year.

- (4) **Break Even Charts:** This chart shows the interrelationship between variable and fixed costs and sales value. It indicates the break-even point i.e. the point at which total cost is equal to total revenue. It also shows the estimated profit or loss at different levels of activity.
- (5) **Profit Volume Chart:** This is a variation of break even chart. Cost data are not plotted, only contribution is plotted. Profit volume graph can be drawn if any two points on the profit or contribution lines are known i.e. fixed cost. Break-even point, or profit at a given level from the graph, the probable profits at any other level can read within the range.
- (6) **Gantt Chart:** This chart develops by H.L. Gantt is a special type of bar chart in which bars are drawn horizontally. This chart shows the bars of planned schedules and accomplished performance. Gantt chart extensively used for machine loading. Gantt chart shows planned and actual machine loading.

12.5 Reports to different levels of Management:

Distribution of the monthly performance report (and its segments) should follow essentially the same pattern as the annual profit budget plan. Certain executives need the complete monthly performance report. Other members of the management only need those schedules related to their particular responsibility centres. Lower levels of management may receive only one of the detailed segments. On the other hand, the higher the level of management, the greater the need for summaries, yet these summaries must be supported by adequate detail to identify particular aspects of operations.

(1) Report to the Board of Directors:

The Directors are not interested in the detailed account or day to day affairs of the company. Their primary interest lies in the overall working of the company. They are, therefore interested in the Profit and Loss account and Balance Sheet of the company. What interests them is the general trend of performance. Since the directors have to control every function in the organisation, the number of reports which directors receive will be many. Board of Directors should be furnished with the under mentioned reports:

1. A copy of master budget with forecast of sales and comparable trading results. This would enable the Board to take remedial action where there have been significant variances from the budgeted figures.
2. Summaries of department budgets and any deviations of actual performance from the budgeted performance. On the basis of this, the Board may call for explanations from the heads of departments for any shortfalls in the performance.
3. Copies of Cost budget and capital expenditure budgets with information regarding any deviations of actual performance from budget performance. On the basis of information provided in this report the Board may take such actions as it deems fit.
4. Reports showing the trend of production and sales. This would enable Management to keep in touch with the position regarding the quantum of production and sales affected.
5. Reports showing the general trend of pointing out the favourable and unfavourable variances from the standard costs.
6. Summary of important ratios, viz. the stock turnover ratio, fixed assets turnover ratio, percentage of debtors to sale, current ratio and other overall efficiency and operating ratios may be used by the Board.
7. Profitability calculations for each capital project would enable management to ascertain where or not capital employed in different projects is yielding an adequate return.

(2) Reports to Top Management:

In big companies, where the delegation of responsibility has been pushed to the farthest possible limits top management acts as a clearing house between the operating managers and Board of Directors.

Being responsible for the performance of their managerial functions, top management is interested more in the operational side of the undertaking than in the purely financial side. They act as supervisors of, and advisors to all divisional heads. Top management lives up to this role by receiving reports of variances from the budgeted figures and these are very carefully studied and analysed.

(3) Reporting to Top Divisional Management:

The main difference between the top management and the divisional management is that the latter has to operate within the framework of policy laid down by the company. In case where the decentralization of authority is not complete, some of the functions of divisional management would come under the jurisdiction of central authority and the procedure of reporting would vary accordingly.

(4) Reports to Junior Management Level:

These reports are meant for floor level workers. The main difference between them and the reports to top management or middle management are:

- (a) These reports are likely to be in physical term only, but may be in both physical and monetary terms.
- (b) These reports are prepared normally by the supervisors himself.

Some of these reports are almost in the form of the scrap of paper without any attempt being made to give them a standard format. Sometimes, reports are given to workmen themselves. They help in infusing a certain amount of competitive spirits among the workers by comparing the output per man hour of different workers doing similar jobs.

12.6 Preparation of Reports:

In view of the various problems involved in management reporting it is necessary that the writer of the reports must be qualified for his jobs. He must be a financial analyst and, in that capacity, must be well trained in the fundamentals of accounting, finance and management. He must be objective and must be able to communicate the results of his analysis in such a manner that can lead to effective action. As the task of reporting effectively to management is a problem of communication, it is necessary that men entrusted with the task of preparing reports must be able to put across their ideas cogently and clearly.

Reports are prepared by the accounting staff attached to the different parts of the organization. The controller prepares and advises on the reports at the central office level. The Divisional Controller does the same job at the divisional office level. The Controller and his establishment lay down the policy and outline, the methods of doing the job of reporting at the lower level of management so that suitable reports are made available to Plant Managers, Factory Managers and authorities need such reports.

12.7 Use of Reports by Management:

The importance of the system of 'Reporting to Management' lies in the fact that it enables the management to feel the pulse of undertaking. There might be occasions when a particular report does not meet the requirement in a manner as is expected. Upon the emergence of such a situation, the report is either scrapped or readjusted to the needs. Thus, the system of reporting is not static but is in a state of continuous development.

The usefulness of the reporting system to management falls broadly into two categories, i.e.

(i) future planning and (ii) review of past performances. Reports dealing with forecast conditions, under which planned operations would be carried out, are of great use in deciding the future policy. Reports enable management at all levels to keep itself abreast of past performance as well as developments and it can keep a check on individual operating levels. These reports furnish the answer to questions which are frequently arising.

'What happened and where'? 'Who was responsible'? The last question lies by and large, outside the purview of accounting department because it is affected by a number of factors not susceptible to accounting treatment. Despite this deficiency of accounting techniques the report must include acceptable explanations from the people on the job.

It is important to realize that reports and reporting methods are not, in themselves, a control. They are intended to provide executives with a factual basis for the execution of their duties. The fact to be stressed is that it is not the writer of reports who establishes policy, the report writer establishes and interprets facts from which policies are developed by operating executives.

Self Assessment

Fill in the blanks:

1. A good reporting system is helpful to the management in planning and _____.
2. A good reporting system should have a proper flow of _____.
3. The _____ of information will enable the reader to find out the trends and also to determine deviations more quickly than in other methods.
4. The decision-making authority will be able to make use of _____ figures while making a decision.
5. Accuracy should also not involve _____ of preparation nor it should be achieved at the sacrifice of promptness of presentation.
6. Information that originates within an organisation is referred to as _____ information.
7. Performance report must clearly distinguish between _____ and _____ items.
8. _____ procedures constitute a key aspect of effective control.

12.8 Summary:

Management information system can be helpful to the management in undertaking managerial functions smoothly and effectively. It is an approach of providing timely, adequate information to the right person in the organization. This information is furnished into useful quantum's of knowledge in the form of reports. A good report is a communication that contains factual information, organized and presented in clear, correct and coherent language. So the process of providing information to the management is known as management reporting. Reports may be presented in a number of ways, i.e.' written, graphic and oral.

12.9 Glossary:

Report: Report is a form of statement that presents and examines facts relating to an event, problem, progress of action, state of business affairs etc. and for the purpose of conveying information, reporting findings, putting forward ideas and making recommendations as the basis of action.

Management Information System (MIS): It refers to the data equipment and computer programmes that are used to develop information for managerial use.

Management Reporting: The process of providing information to the management is known as management reporting. The reports are regularly sent to various levels of management as to enable in judging the effectiveness of their responsibility centres. These reports also become a base for taking corrective measures, if necessary.

Performance Measures: A form of reporting for different levels of an organization and for managers on financial and non-financial performances. It is useful for allocation of resources, costs, revenues.

12.10 Answers: Self Assessment

1. Controlling
2. Information
3. Graphic presentation
4. Comparative
5. Excessive cost
6. internal
7. Controllable, non-controllable
8. Follow-up

12.11 Terminal Questions:

1. What do you understand by Reporting to Management?
2. Describe the informational needs of different levels of management.
3. Discuss various kinds of reports prepared by the management accountant for different levels of management.

12.12 Suggested Readings:

Bhattacharyya, Debarshi. Management Accounting, Pearson Education in India, New Delhi
Pandey, I.M., Financial Management, Vikas Publishing House Pvt Ltd., New Delhi.
Goyal, Man Mohan. Principles of Management Accounting

ASSIGNMENTS

Attempt any four assignments. Assignments are compulsory.

1. What is management accounting? Differentiate between financial accounting and management accounting.
2. What is budget, budgeting and budgeting control?
3. Explain the investment criteria. Discuss the various methods of appraisal of investment proposals.
4. 'Responsibility Accounting is an important device of control'. Discuss.
5. Describe the applications of marginal costing.
6. What different tools are used for the analysis of financial statements?
7. Describe the informational needs of different levels of management.
8. Why is Cash Flow Statement prepared? What is its importance? Distinguish between Cash Flow Statement and Fund Flow Statement