MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

UNIT – 1

Introduction to managerial economics

INTRODUCTION TO MANAGERIAL ECONOMICS

Introduction :

Managerial Economics as a subject gained popularity in USA after the publication of the book "Managerial Economics" by Joel Dean in 1951.

Managerial Economics refers to the firm's decision making process. It could be also interpreted as "Economics of Management" or "Economics of Management". Managerial Economics is also called as "Industrial Economics" or "Business Economics".

As Joel Dean observes managerial economics shows how economic analysis can be used in formulating polices.

Meaning & Definition:

- In the words of E. F. Brigham and J. L. Pappas Managerial Economics is "the applications of economics theory and methodology to business administration practice".
- Managerial Economics bridges the gap between traditional economics theory and real business practices in two days. First it provides a number of tools and techniques to enable the manager to become more competent to take decisions in real and practical situations. Secondly it serves as an integrating course to show the interaction between various areas in which the firm operates.
- C. I. Savage & T. R. Small therefore believes that managerial economics "is concerned with business efficiency".
- M. H. Spencer and Louis Siegelman explain the "Managerial Economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management".
- It is clear, therefore, that managerial economics deals with economic aspects of managerial decisions of with those managerial decisions, which have an economics contest. Managerial economics may therefore, be defined as a body of knowledge, techniques and practices which give substance to those economic concepts which are useful in deciding the business strategy of a unit of management.
- Managerial economics is designed to provide a rigorous treatment of those aspects of economic theory and analysis that are most use for managerial decision analysis says J. L. Pappas and E. F. Brigham.

Managerial Economics, therefore, focuses on those tools and techniques, which are useful in decision-making.

Nature and scope of managerial economics:

Nature of managerial economics:

Managerial economics is, perhaps, the youngest of all the social sciences. Since it originates from Economics, it has the basis features of economics, such as assuming that other things remaining the same (or the Latin equivalent ceteris paribus). This assumption is made to simplify the complexity of the managerial phenomenon under study in a dynamic business environment so many things are changing simultaneously. This set a limitation that we cannot really hold other things remaining the same. In such a case, the observations made out of such a study will have a limited purpose or value. Managerial economics also has inherited this problem from economics.
Further, it is assumed that the firm or the buyer acts in a rational manner (which normally does not happen). The buyer is carried away by the advertisements, brand loyalties, incentives and so on, and, therefore, the innate behaviour of the consumer will be rational is not a realistic assumption. Unfortunately, there are no other alternatives to understand the subject other than by making such assumptions. This is because the behaviour of a firm or a consumer is a complex phenomenon.
The other features of managerial economics are explained as below:

(a) ***Close to microeconomics***: Managerial economics is concerned with finding the solutions for different managerial problems of a particular firm. Thus, it is more close to microeconomics.

(b) ***Operates against the backdrop of macroeconomics***: The macroeconomics conditions of the economy are also seen as limiting factors for the firm to operate. In other words, the managerial economist has to be aware of the limits set by the macroeconomics conditions such as government industrial policy, inflation and so on.

(c) ***Normative statements***: A normative statement usually includes or implies the words 'ought' or 'should'. They reflect people's moral attitudes and are expressions of what a team of people ought to do. For instance, it deals with statements such as 'Government of India should open up the economy. Such statement are based on value judgments and express views of what is 'good' or 'bad', 'right' or ' wrong'. One problem with normative statements is that they cannot to verify by looking at the facts, because they mostly deal with the future. Disagreements about such statements are usually settled by voting on them.

(d) ***Prescriptive actions***: Prescriptive action is goal oriented. Given a problem and the objectives of the firm, it suggests the course of action from the available alternatives for optimal solution. If does not merely mention the concept, it also explains whether the concept can be applied in a given context on not. For instance, the fact that variable costs are marginal costs can be used to judge the feasibility of an export order.

(e) ***Applied in nature***: 'Models' are built to reflect the real life complex business situations and these models are of immense help to managers for decision-making. The different areas where models are extensively used include inventory control, optimization, project management etc. In managerial

economics, we also employ case study methods to conceptualize the problem, identify that alternative and determine the best course of action.

(f) Offers scope to evaluate each alternative: Managerial economics provides an opportunity to evaluate each alternative in terms of its costs and revenue. The managerial economist can decide which is the better alternative to maximize the profits for the firm.

(g) Interdisciplinary: The contents, tools and techniques of managerial economics are drawn from different subjects such as economics, management, mathematics, statistics, accountancy, psychology, organizational behavior, sociology and etc.

(h) Assumptions and limitations: Every concept and theory of managerial economics is based on certain assumption and as such their validity is not universal. Where there is change in assumptions, the theory may not hold good at all.

Scope of managerial economics:

The scope of managerial economics refers to its area of study. Managerial economics refers to its area of study. Managerial economics, Provides management with a strategic planning tool that can be used to get a clear perspective of the way the business world works and what can be done to maintain profitability in an ever-changing environment. Managerial economics is primarily concerned with the application of economic principles and theories to five types of resource decisions made by all types of business organizations.

a. The selection of product or service to be produced.
b. The choice of production methods and resource combinations.
c. The determination of the best price and quantity combination
d. Promotional strategy and activities.
e. The selection of the location from which to produce and sell goods or service to consumer.

The production department, marketing and sales department and the finance department usually handle these five types of decisions.

The scope of managerial economics covers two areas of decision making

a. Operational or Internal issues
b. Environmental or External issues

a. Operational issues:

Operational issues refer to those, which wise within the business organization and they are under the control of the management. Those are:

1. Theory of demand and Demand Forecasting
2. Pricing and Competitive strategy
3. Production cost analysis
4. Resource allocation
5. Profit analysis
6. Capital or Investment analysis
7. Strategic planning

1. Demand Analyses and Forecasting:

A firm can survive only if it is able to the demand for its product at the right time, within the right quantity. Understanding the basic concepts of demand is essential for demand forecasting. Demand analysis should be a basic activity of the firm because many of the other activities of the firms depend upon the outcome of the demand fore cost. Demand analysis provides:

1. The basis for analyzing market influences on the firms; products and thus helps in the adaptation to those influences.
2. Demand analysis also highlights for factors, which influence the demand for a product. This helps to manipulate demand. Thus demand analysis studies not only the price elasticity but also income elasticity, cross elasticity as well as the influence of advertising expenditure with the advent of computers, demand forecasting has become an increasingly important function of managerial economics.

2. Pricing and competitive strategy:

Pricing decisions have been always within the preview of managerial economics. Pricing policies are merely a subset of broader class of managerial economic problems. Price theory helps to explain how prices are determined under different types of market conditions. Competitions analysis includes the anticipation of the response of competitions the firm's pricing, advertising and marketing strategies. Product line pricing and price forecasting occupy an important place here.

3. Production and cost analysis:

Production analysis is in physical terms. While the cost analysis is in monetary terms cost concepts and classifications, cost-out-put relationships, economies and diseconomies of scale and production functions are some of the points constituting cost and production analysis.

4. Resource Allocation:

Managerial Economics is the traditional economic theory that is concerned with the problem of optimum allocation of scarce resources. Marginal analysis is applied to the problem of determining the level of output, which maximizes profit. In this respect linear programming techniques has been used to solve optimization problems. In fact lines programming is one of the most practical and powerful managerial decision making tools currently available.

5. Profit analysis:

Profit making is the major goal of firms. There are several constraints here an account of competition from other products, changing input prices and changing business environment hence in spite of careful planning, there is always certain risk involved. Managerial economics deals with techniques of averting of minimizing risks. Profit theory guides in the measurement and management of profit, in calculating the pure return on capital, besides future profit planning.

6. Capital or investment analyses:

Capital is the foundation of business. Lack of capital may result in small size of operations. Availability of capital from various sources like equity capital, institutional finance etc. may help to undertake large-scale operations. Hence efficient allocation and management of capital is one of the most important tasks of the managers. The major issues related to capital analysis are:

1. The choice of investment project
2. Evaluation of the efficiency of capital
3. Most efficient allocation of capital

Knowledge of capital theory can help very much in taking investment decisions. This involves, capital budgeting, feasibility studies, analysis of cost of capital etc.

7. Strategic planning:

Strategic planning provides management with a framework on which long-term decisions can be made which has an impact on the behavior of the firm. The firm sets certain long-term goals and objectives and selects the

strategies to achieve the same. Strategic planning is now a new addition to the scope of managerial economics with the emergence of multinational corporations. The perspective of strategic planning is global.

It is in contrast to project planning which focuses on a specific project or activity. In fact the integration of managerial economics and strategic planning has given rise to be new area of study called corporate economics.

B. Environmental or External Issues:

An environmental issue in managerial economics refers to the general business environment in which the firm operates. They refer to general economic, social and political atmosphere within which the firm operates. A study of economic environment should include:

a. The type of economic system in the country.
b. The general trends in production, employment, income, prices, saving and investment.
c. Trends in the working of financial institutions like banks, financial corporations, insurance companies
d. Magnitude and trends in foreign trade;
e. Trends in labour and capital markets;
f. Government's economic policies viz. industrial policy monetary policy, fiscal policy, price policy etc.

The social environment refers to social structure as well as social organization like trade unions, consumer's co-operative etc. The Political environment refers to the nature of state activity, chiefly states' attitude towards private business, political stability etc.

The environmental issues highlight the social objective of a firm i.e.; the firm owes a responsibility to the society. Private gains of the firm alone cannot be the goal.

The environmental or external issues relate managerial economics to macro economic theory while operational issues relate the scope to micro economic theory. The scope of managerial economics is ever widening with the dynamic role of big firms in a society.

Micro economics and macro economics:

Microeconomics:

The study of an individual consumer or a firm is called microeconomics (also called the *Theory of Firm*). Micro means 'one millionth'. Microeconomics deals with behavior and problems of single individual and of micro organization. Managerial economics has its roots in microeconomics and it deals with the micro or individual enterprises. It is concerned with the application of the concepts such as price theory, Law of Demand and theories of market structure and so on.

Macroeconomics:

The study of 'aggregate' or total level of economics activity in a country is called *macroeconomics*. It studies the flow of economics resources or factors of production (such as land, labour, capital, organisation and technology) from the resource owner to the business firms and then from the business firms to the households. It deals with total aggregates, for instance, total national income total employment, output and total investment. It studies the interrelations among various aggregates and examines their nature and behaviour, their determination and causes of fluctuations in the. It deals with the price level in general, instead of studying the prices of individual commodities. It is concerned with the level of employment in the economy. It discusses aggregate consumption, aggregate investment, price level, and payment, theories of employment, and so on.

Though macroeconomics provides the necessary framework in term of government policies etc., for the firm to act upon dealing with analysis of business conditions, it has less direct relevance in the study of theory of firm.

Managerial economics relationship with other disciplines:

Many new subjects have evolved in recent years due to the interaction among basic disciplines. While there are many such new subjects in natural and social sciences, managerial economics can be taken as the best example of such a phenomenon among social sciences. Hence it is necessary to trace its roots and relation ship with other disciplines.

1. Relationship with economics:

The relationship between managerial economics and economics theory may be viewed form the point of view of the two approaches to the subject Viz. Micro Economics and Marco Economics. Microeconomics is the study of the economic behavior of individuals, firms and other such micro organizations. Managerial economics is rooted in Micro Economic theory. Managerial Economics makes use to several Micro Economic concepts such as marginal cost, marginal revenue, elasticity of demand as well as price theory and theories of market structure to name only a few. Macro theory on the other hand is the study of the economy as a whole. It deals with the analysis of national income, the level of employment, general price level, consumption and investment in the economy and even matters related to international trade, Money, public finance, etc.

The relationship between managerial economics and economics theory is like that of engineering science to physics or of medicine to biology. Managerial economics has an applied bias and its wider scope lies in applying economic theory to solve real life problems of enterprises. Both managerial economics and economics deal with problems of scarcity and resource allocation.

2. Management theory and accounting:

Managerial economics has been influenced by the developments in management theory and accounting techniques. Accounting refers to the recording of pecuniary transactions of the firm in certain books. A proper knowledge of accounting techniques is very essential for the success of the firm because profit maximization is the major objective of the firm.

Managerial Economics requires a proper knowledge of cost and revenue information and their classification. A student of managerial economics should be familiar with the generation, interpretation and use of accounting data. The focus of accounting within the firm is fast changing from the concepts of store keeping to that if managerial decision making, this has resulted in a new specialized area of study called "Managerial Accounting".

3. Managerial Economics and mathematics:

The use of mathematics is significant for managerial economics in view of its profit maximization goal long with optional use of resources. The major problem of the firm is how to minimize cost, hoe to maximize profit or how to optimize sales. Mathematical concepts and techniques are widely used in economic logic to solve these problems. Also mathematical methods help to estimate and predict the economic factors for decision making and forward planning.

Mathematical symbols are more convenient to handle and understand various concepts like incremental cost, elasticity of demand etc., Geometry, Algebra and calculus are the major branches of mathematics which are of use in managerial economics. The main concepts of mathematics like logarithms, and exponentials, vectors and determinants, input-output models etc., are widely used. Besides these usual tools, more advanced techniques designed in the recent years viz. linear programming, inventory models and game theory fine wide application in

4. Managerial Economics and Statistics:

Managerial Economics needs the tools of statistics in more than one way. A successful businessman must correctly estimate the demand for his product. He should be able to analyses the impact of variations in tastes. Fashion and changes in income on demand only then he can adjust his output. Statistical methods provide and sure base for decision-making. Thus statistical tools are used in collecting data and analyzing them to help in the decision making process.

Statistical tools like the theory of probability and forecasting techniques help the firm to predict the future course of events. Managerial Economics also make use of correlation and multiple regressions in related variables like price and demand to estimate the extent of dependence of one variable on the other. The theory of probability is very useful in problems involving uncertainty.

5. Managerial Economics and Operations Research:

Taking effectives decisions is the major concern of both managerial economics and operations research. The development of techniques and concepts such as linear programming, inventory models and game theory is due to the development of this new subject of operations research in the postwar years. Operations research is concerned with the complex problems arising out of the management of men, machines, materials and money.

Operation research provides a scientific model of the system and it helps managerial economists in the field of product development, material management, and inventory control, quality control, marketing and demand analysis. The varied tools of operations Research are helpful to managerial economists in decision-making.

6. Managerial Economics and the theory of Decision- making:

The Theory of decision-making is a new field of knowledge grown in the second half of this century. Most of the economic theories explain a single goal for the consumer i.e., Profit maximization for the firm. But the theory of decision-making is developed to explain multiplicity of goals and lot of uncertainty.

As such this new branch of knowledge is useful to business firms, which have to take quick decision in the case of multiple goals. Viewed this way the theory of decision making is more practical and application oriented than the economic theories.

7. Managerial Economics and Computer Science:

Computers have changes the way of the world functions and economic or business activity is no exception. Computers are used in data and accounts maintenance, inventory and stock controls and supply and demand predictions. What used to take days and months is done in a few minutes or hours by the computers. In fact computerization of business activities on a large scale has reduced the workload of managerial personnel. In most countries a basic knowledge of computer science, is a compulsory programme for managerial trainees.

To conclude, managerial economics, which is an offshoot traditional economics, has gained strength to be a separate branch of knowledge. It strength lies in its ability to integrate ideas from various specialized subjects to gain a proper perspective for decision-making.

A successful managerial economist must be a mathematician, a statistician and an economist. He must be also able to combine philosophic methods with historical methods to get the right perspective only then; he will be good at predictions. In short managerial practices with the help of other allied sciences.

Role and responsibilities of managerial economist in business decisions:

Making decisions and processing information are the two primary tasks of the managers. Managerial economists have gained importance in recent years with the emergence of an organizational culture in production and sales activities.

A management economist with sound knowledge of theory and analytical tools for information system occupies a prestigious place among the personnel. A managerial economist is nearer to the policy-making. Equipped with specialized skills and modern techniques he analyses the internal and external operations of the firm. He evaluates and helps in decision making regarding sales, Pricing financial issues, labour relations and profitability. He helps in decision-making keeping in view the different goals of the firm.

His role in decision-making applies to routine affairs such as price fixation, improvement in quality, Location of plant, expansion or contraction of output etc. The role of managerial economist in internal management covers wide areas of production, sales and inventory schedules of the firm.

The most important role of the managerial economist relates to demand forecasting because an analysis of general business conditions is most vital for the success of the firm. He prepares a short-term forecast of general business activity and relates general economic forecasts to specific market trends. Most firms require two forecasts one covering the short term (for nest three months to one year) and the other covering the long term, which represents any period exceeding one-year. He has to be ever alert to gauge the changes in tastes and preferences of the consumers. He should evaluate the market potential. The need to know forecasting techniques on the part of the managerial economics means, he should be adept at market research. The purpose of market research is to provide a firm with information about current market position as well as present and possible future trends in the industry. A managerial economist who is well equipped with this knowledge can help the firm to plan product improvement, new product policy, pricing, and sales promotion strategy.

The fourth function of the managerial economist is to undertake an economic analysis of the industry. This is concerned with project evaluation and feasibility study at the firm level i.e., he should be able to judge on the basis of cost benefit analysis, whether it is advisable and profitable to go ahead with the project. The managerial economist should be adept at investment appraisal methods. At the external level, economic analysis involves the knowledge of competition involved, possibility of internal and foreign sales, the general business climate etc.

Another function is security management analysis. This is very important in the case of defense-oriented industries, power projects, and nuclear plants where security is very essential. Security management means, also that the production and trade secrets concerning technology, quality and other such related facts should not be leaked out to others. This security is more necessary in strategic and defense-oriented projects of national importance; a managerial economist should be able to manage these issues of security management analysis.

The sixth function is an advisory function. Here his advice is required on all matters of production and trade. In the hierarchy of management, a managerial economist ranks next to the top executives or the policy maker who may be doyens of several projects. It is the managerial economist of each firm who has to advise them on all matters of trade since they are in the know of actual functioning of the unit in all aspects, both technical and financial.

Another function of importance for the managerial economist is a concerned with pricing and related problems. The success of the firm depends upon a proper pricing strategy. The pricing decision is one of the most difficult decisions to be made in business because the information required is never fully available. Pricing of established products is different from new products. He may have to operate in an atmosphere constrained by government regulation. He may have to anticipate the reactions of competitors in pricing. The managerial economist has to be very alert and dynamic to take correct pricing decision in changing environment. Finally the specific function of a

recognizes the social responsibility of the firm. It refers to the impact of a firm on environmental factors. It should not have adverse impact on pollution and if possible try to contribute to environmental preservation and protection in a positive way.

The role of management economist lies not in taking decision but in analyzing, concluding and recommending to the policy maker. He should have the freedom to operate and analyze and must possess full knowledge of facts. He has to collect and provide the quantitative data from within the firm. He has to get information on external business environment such as general market conditions, trade cycles, and behavior pattern of the consumers. The managerial economist helps to co-ordinate policies relating to production, investment, inventories and price.

He should have equanimity to meet crisis. He should act only after analysis and discussion with relevant departments. He should have diplomacy to act in advisory capacity to the top executive as well as getting co-operation from different departments for his economic analysis. He should do well to have intuitive ability to know what is good or bad for the firm.

He should have sound theoretical knowledge to take up the challenges he has to face in actual day to day affairs. "BANMOL" referring to the role of managerial economist points out. "A managerial economist can become a for more helpful member of a management group by virtue of studies of economic analysis, primarily because there he learns to become an effective model builder and because there he acquires a very rich body of tools and techniques which can help to deal with the problems of the firm in a far more rigorous, a far more probing and a far deeper manner".

QUESTIONS

1. What is managerial economics? Explain its focus are as
2. Point out the importance of managerial economics in decision making
3. What are the contributions and limitations of economic analysis in business decision making
4. Managerial Economics is the discipline which deals with the applications of economic theory to business management discuss.
5. Explain the fundamental concepts of managerial economics
6. Discuss the nature & Scope of Managerial economics
7. Managerial Economics is the study of allocation of resources available to a firm or other unit of management among the activities of that unit explains.
8. Explain the nature of problems studies in managerial economics. What is the importance of the study of such problems in business management?
9. Explain the role and responsibilities of a managerial economics?
10. "Managerial Economics is an integration of economic theory and with business practice for the purpose of facilitating decision making and forward planning" explain.

QUIZ

1. Managerial Economics as a subject gained popularity first in_____. ( )
   (a) India (b) Germany (c) U.S.A (d) England
2. When the subject Managerial Economics gained popularity? ( )
   (a) 1950 (b) 1949 (c) 1951 (d) 1952
3. Which subject studies the behavior of the firm in theory and practice? ( )
   (a) Micro Economics (b) Macro Economics
   (c) Managerial Economics (d) Welfare Economics
4. Which subject bridges gap between Economic Theory and Management Practice? ( )
   (a) Welfare Economics (b) Micro Economics
   (c) Managerial Economics (d) Macro Economics
5. Application of Economics for managerial decision-making is called____. ( )
   (a) Macro Economics (b) Welfare Economics
   (c) Managerial Economics (d) Micro Economics
6. Which areas covered by the subject "Managerial Economics". ( )

(c) Operational & Environmental issues (d) None

7. The relationship between Managerial Economics and Economic Theory is like that of Engineering Science to Physics (or) Medicine to _____. ( )
   (a) Mathematics (b) Economics
   (c) Biology (d) Accountancy

8. Making decisions and processing information are the two Primary tasks of the Managers . It was explained by the subject _____. ( )
   (a) Physics (b) Engineering Science
   (c) Managerial Economics (d) Chemistry

9. Managerial Economics is close to_____Economics ( )
   (a) National (b) Business (c) Micro (d) Industrial

10. The theory of firm also called as_____. ( )
   (a) Welfare Economics (b) Industrial Economics
   (c) Micro Economics (d) None

11. "Any activity aimed at earning or spending money is called _____activity". ( )
   (a) Service activity (b) Accounting activity
   (c) Economic activity (d) None

Note: Answer is "C" for all the above questions.

UNIT – 2

Demand analysis

DEMAND ANALYSIS

Introduction & Meaning:

Demand in common parlance means the desire for an object. But in economics demand is something more than this. According to Stonier and Hague, "Demand in economics means demand backed up by enough money to pay for the goods demanded". This means that the demand becomes effective only it if is backed by the purchasing power in addition to this there must be willingness to buy a commodity.

Thus demand in economics means the desire backed by the willingness to buy a commodity and the purchasing power to pay. In the words of "Benham" "The demand for anything at a given price is the amount of it which will be bought per unit of time at that Price". (Thus demand is always at a price for a definite quantity at a specified time.) Thus demand has three essentials – price, quantity demanded and time. Without these, demand has to significance in economics.

LAW of Demand:

Law of demand shows the relation between price and quantity demanded of a commodity in the market. In the words of Marshall, "the amount demand increases with a fall in price and diminishes with a rise in price".

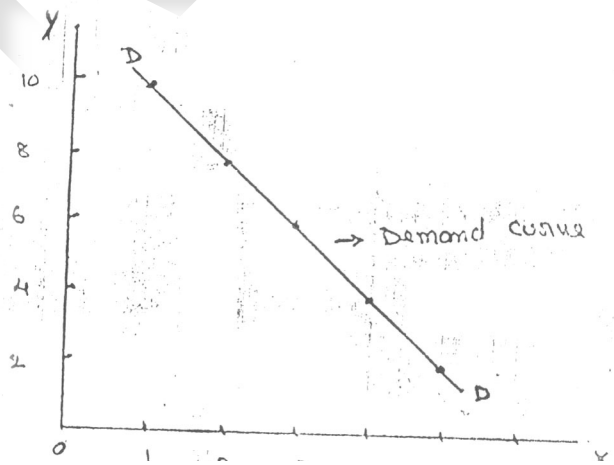
A rise in the price of a commodity is followed by a reduction in demand and a fall in price is followed by an increase in demand, if a condition of demand remains constant.

The law of demand may be explained with the help of the following demand schedule.

Demand Schedule.

Price of Appel (In. Rs.)	Quantity Demanded
10	1
8	2
6	3
4	4
2	5

When the price falls from Rs. 10 to 8 quantity demand increases from 1 to 2. In the same way as price falls, quantity demand increases on the basis of the demand schedule we can draw the demand curve.



Price

The demand curve DD shows the inverse relation between price and quantity demand of apple. It is downward sloping.

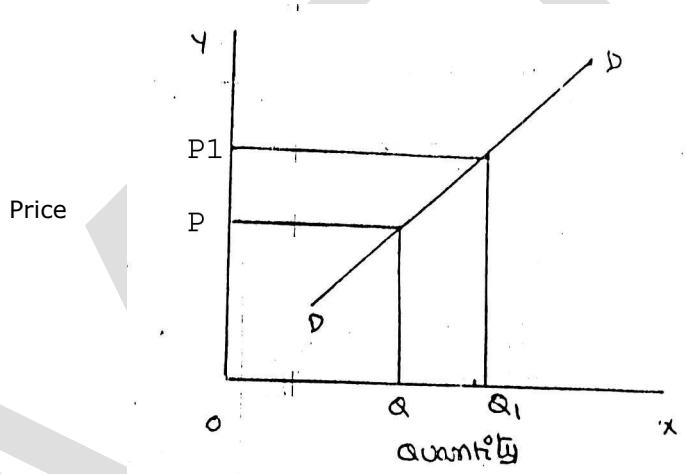
Assumptions:

Law is demand is based on certain assumptions:

1. This is no change in consumers taste and preferences.
2. Income should remain constant.
3. Prices of other goods should not change.
4. There should be no substitute for the commodity
5. The commodity should not confer at any distinction
6. The demand for the commodity should be continuous
7. People should not expect any change in the price of the commodity

Exceptional demand curve:

Some times the demand curve slopes upwards from left to right. In this case the demand curve has a positive slope.



When price increases from OP to Op1 quantity demanded also increases from to OQ1 and vice versa. The reasons for exceptional demand curve are as follows.

1. Giffen paradox:

The Giffen good or inferior good is an exception to the law of demand. When the price of an inferior good falls, the poor will buy less and vice versa. For example, when the price of maize falls, the poor are willing to spend more on superior goods than on maize if the price of maize increases, he has to increase the quantity of money spent on it. Otherwise he will have to face starvation. Thus a fall in price is followed by reduction in quantity demanded and vice versa. "Giffen" first explained this and therefore it is called as Giffen's paradox.

2. Veblen or Demonstration effect:

'Veblan' has explained the exceptional demand curve through his doctrine of conspicuous consumption. Rich people buy certain good because it gives social distinction or prestige for example diamonds are bought by the

richer class for the prestige it possess. It the price of diamonds falls poor also will buy is hence they will not give prestige. Therefore, rich people may stop buying this commodity.

3. Ignorance:

Sometimes, the quality of the commodity is Judge by its price. Consumers think that the product is superior if the price is high. As such they buy more at a higher price.

1. Speculative effect:

If the price of the commodity is increasing the consumers will buy more of it because of the fear that it increase still further, Thus, an increase in price may not be accomplished by a decrease in demand.

5. Fear of shortage:

During the times of emergency of war People may expect shortage of a commodity. At that time, they may buy more at a higher price to keep stocks for the future.

2. Necessaries:

In the case of necessaries like rice, vegetables etc. people buy more even at a higher price.

Factors Affecting Demand:

There are factors on which the demand for a commodity depends. These factors are economic, social as well as political factors. The effect of all the factors on the amount demanded for the commodity is called Demand Function.

These factors are as follows:

1. Price of the Commodity:

The most important factor-affecting amount demanded is the price of the commodity. The amount of a commodity demanded at a particular price is more properly called price demand. The relation between price and demand is called the Law of Demand. It is not only the existing price but also the expected changes in price, which affect demand.

2. Income of the Consumer:

The second most important factor influencing demand is consumer income. In fact, we can establish a relation between the consumer income and the demand at different levels of income, price and other things remaining the same. The demand for a normal commodity goes up when income rises and falls down when income falls. But in case of Giffen goods the relationship is the opposite.

3. Prices of related goods:

The demand for a commodity is also affected by the changes in prices of the related goods also. Related goods can be of two types:

(i). Substitutes which can replace each other in use; for example, tea and coffee are substitutes. The change in price of a substitute has effect on a commodity's demand in the same direction in which price changes. The rise in price of coffee shall raise the demand for tea;

(ii). Complementary foods are those which are jointly demanded, such as pen and ink. In suchcascomplementary goods have opposite relationship between price of one commodity and the amount demanded for the other. If the price of pens goes up, their demand is less as a result of which the demand for ink is also less. The price and demand go in opposite direction. The effect of changes in price of a commodity on amounts demanded of related commodities is called Cross Demand.

1. Tastes of the Consumers:

The amount demanded also depends on consumer's taste. Tastes include fashion, habit, customs, etc. A consumer's taste is also affected by advertisement. If the taste for a commodity goes up, its amount demanded is more even at the same price. This is called increase in demand. The opposite is called decrease in demand.

5. Wealth:

The amount demanded of commodity is also affected by the amount of wealth as well as its distribution. The wealthier are the people; higher is the demand for normal commodities. If wealth is more equally distributed, the demand for necessaries and comforts is more. On the other hand, if some people are rich, while the majorities are poor, the demand for luxuries is generally higher.

6. Population:

Increase in population increases demand for necessaries of life. The composition of population also affects demand. Composition of population means the proportion of young and old and children as well as the ratio of men to women. A change in composition of population has an effect on the nature of demand for different commodities.

7. Government Policy:

Government policy affects the demands for commodities through taxation. Taxing a commodity increases its price and the demand goes down. Similarly, financial help from the government increases the demand for a commodity while lowering its price.

8. Expectations regarding the future:

If consumers expect changes in price of commodity in future, they will change the demand at present even when the present price remains the same. Similarly, if consumers expect their incomes to rise in the near future they may increase the demand for a commodity just now.

9. Climate and weather:

The climate of an area and the weather prevailing there has a decisive effect on consumer's demand. In cold areas woolen cloth is demanded. During hot summer days, ice is very much in demand. On a rainy day, ice cream is not so much demanded.

10. State of business:

The level of demand for different commodities also depends upon the business conditions in the country. If the country is passing through boom conditions, there will be a marked increase in demand. On the other hand, the level of demand goes down during depression.

ELASTICITY OF DEMAND

Elasticity of demand explains the relationship between a change in price and consequent change in amount demanded. "Marshall" introduced the concept of elasticity of demand. Elasticity of demand shows the extent of change in quantity demanded to a change in price.

In the words of "Marshall", "The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in Price"

Elastic demand: A small change in price may lead to a great change in quantity demanded. In this case, demand is elastic.

In-elastic demand: If a big change in price is followed by a small change in demanded then the demand in "inelastic".

Types of Elasticity of Demand:

There are three types of elasticity of demand:

1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

1. Price elasticity of demand:

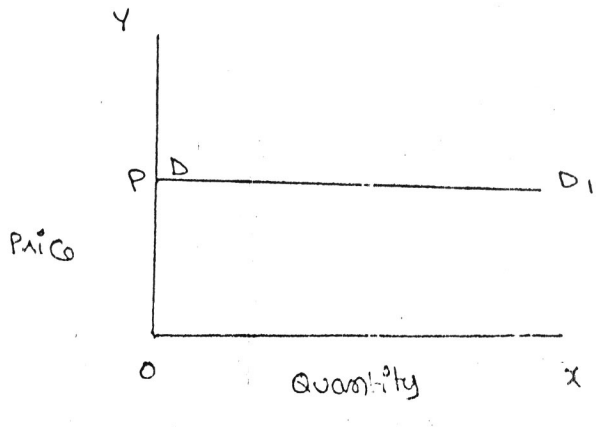
Marshall was the first economist to define price elasticity of demand. Price elasticity of demand measures changes in quantity demand to a change in Price. It is the ratio of percentage change in quantity demanded to a percentage change in price.

$$\text{Price elasticity} = \frac{\text{Proportionate change in the quantity demand of commodity}}{\text{Proportionate change in the price of commodity}}$$

There are five cases of price elasticity of demand

A. Perfectly elastic demand:

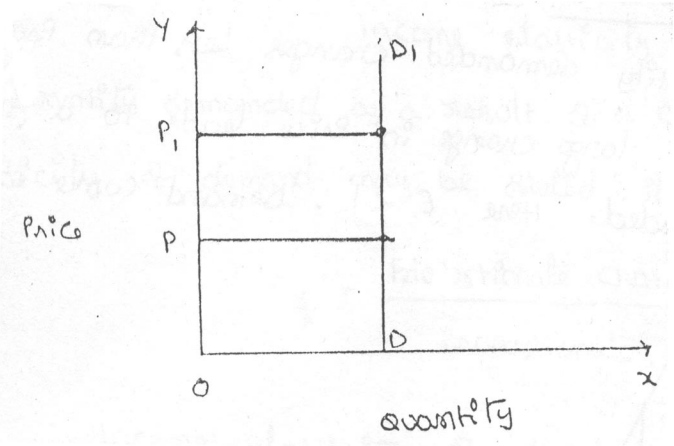
When small change in price leads to an infinitely large change is quantity demand, it is called perfectly or infinitely elastic demand. In this case E=∞



The demand curve DD1 is horizontal straight line. It shows the at "OP" price any amount is demand and if price

B. Perfectly Inelastic Demand :

In this case, even a large change in price fails to bring about a change in quantity demanded.

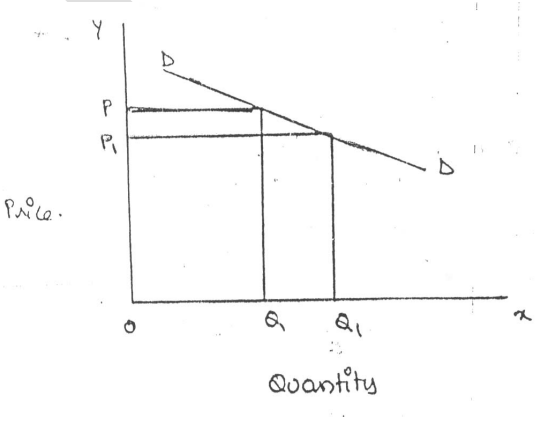


When price increases from 'OP' to 'OP', the quantity demanded remains the same. In other words the response of demand to a change in Price is nil. In this case 'E'=0.

C. Relatively elastic demand:

Demand changes more than proportionately to a change in price. i.e. a small change in price loads to a very big change in the quantity demanded. In this case

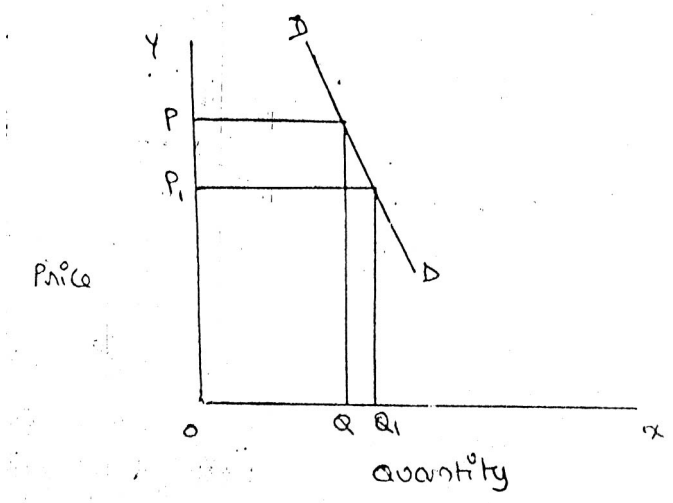
E > 1. This demand curve will be flatter.



When price falls from 'OP' to 'OP', amount demanded in crease from "OQ' to "OQ1' which is larger than the change in price.

D. Relatively in-elastic demand.

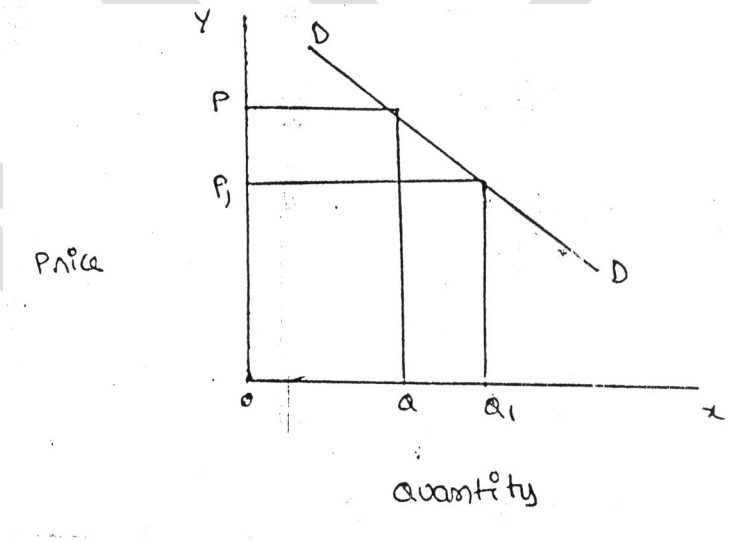
Quantity demanded changes less than proportional to a change in price. A large change in price leads to small change in amount demanded. Here E < 1. Demanded carve will be steeper.



When price falls from "OP' to 'OP1 amount demanded increases from OQ to OQ1, which is smaller than the change in price.

E. Unit elasticity of demand:

The change in demand is exactly equal to the change in price. When both are equal E=1 and elasticity if said to be unitary.



When price falls from 'OP' to 'OP1' quantity demanded increases from 'OP' to 'OP1', quantity demanded increases from 'OQ' to 'OQ1'. Thus a change in price has resulted in an equal change in quantity demanded so price

2. Income elasticity of demand:

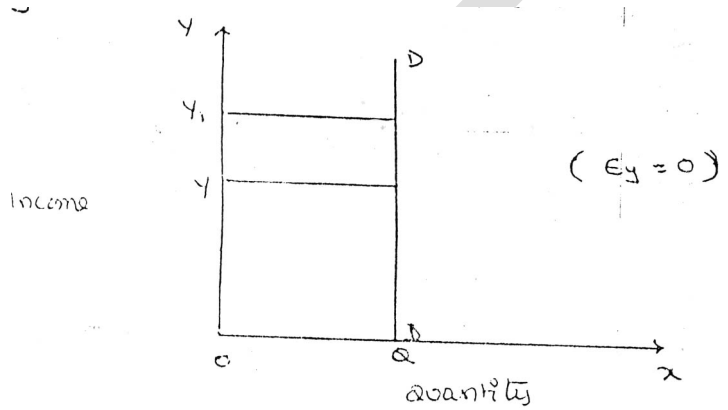
Income elasticity of demand shows the change in quantity demanded as a result of a change in income. Income elasticity of demand may be slated in the form of a formula.

$$\text{Income Elasticity} = \frac{\text{Proportionate change in the quantity demand of commodity}}{\text{Proportionate change in the income of the people}}$$

Income elasticity of demand can be classified in to five types.

A. Zero income elasticity:

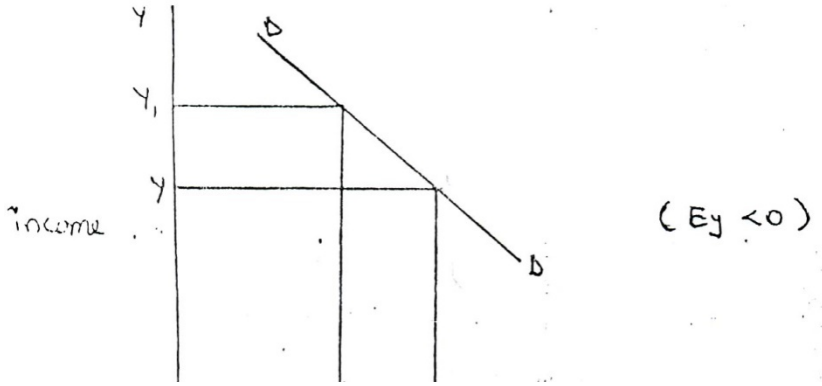
Quantity demanded remains the same, even though money income increases. Symbolically, it can be expressed as Ey=0. It can be depicted in the following way:



As income increases from OY to OY1, quantity demanded never changes.

B. Negative Income elasticity:

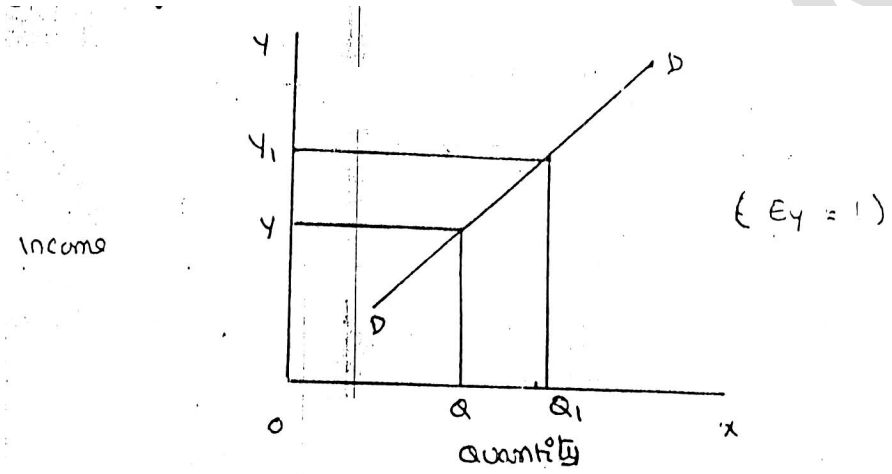
When income increases, quantity demanded falls. In this case, income elasticity of demand is negative. i.e., Ey< 0.



When income increases from OY to OY1, demand falls from OQ to OQ1.

c. Unit income elasticity:

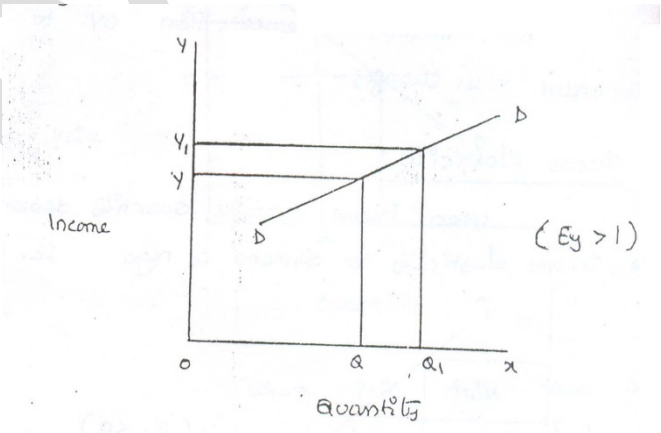
When an increase in income brings about a proportionate increase in quantity demanded, and then income elasticity of demand is equal to one. Ey = 1



When income increases from OY to OY1, Quantity demanded also increases from OQ to OQ1.

d. Income elasticity greater than unity:

In this case, an increase in come brings about a more than proportionate increase in quantity demanded. Symbolically it can be written as Ey> 1.

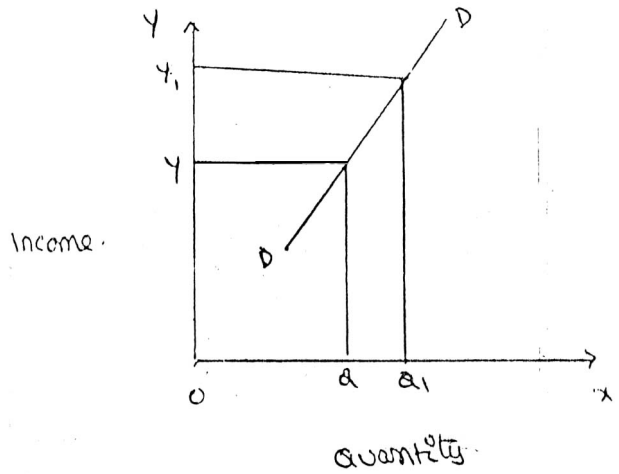


It shows high-income elasticity of demand. When income increases from OY

to OY1, Quantity demanded increases from OQ to OQ1.

E. Income elasticity leas than unity:

When income increases quantity demanded also increases but less than proportionately. In this case E < 1.



An increase in income from OY to OY, brings what an increase in quantity demanded from OQ to OQ1, But the increase in quantity demanded is smaller than the increase in income. Hence, income elasticity of demand is less than one.

3. Cross elasticity of Demand:

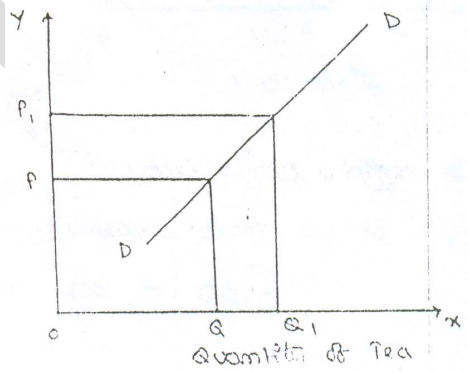
A change in the price of one commodity leads to a change in the quantity demanded of another commodity. This is called a cross elasticity of demand. The formula for cross elasticity of demand is:

$$\text{Cross elasticity} = \frac{\text{Proportionate change in the quantity demand of commodity "X"}}{\text{Proportionate change in the price of commodity "Y"}}$$

a.In case of substitutes, cross elasticity of demand is positive. Eg: Coffee and Tea

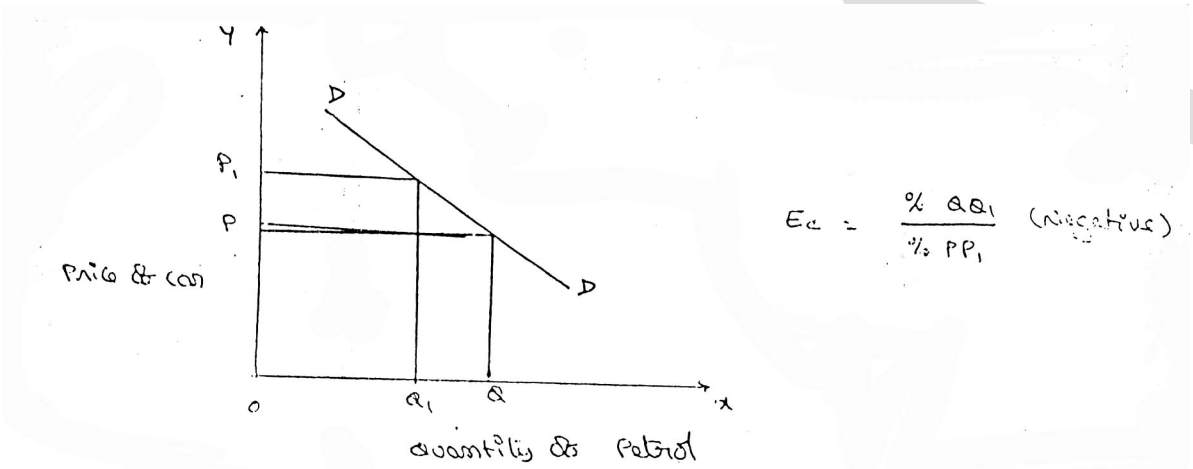
When the price of coffee increases, Quantity demanded of tea increases. Both are substitutes.

Price of Coffee



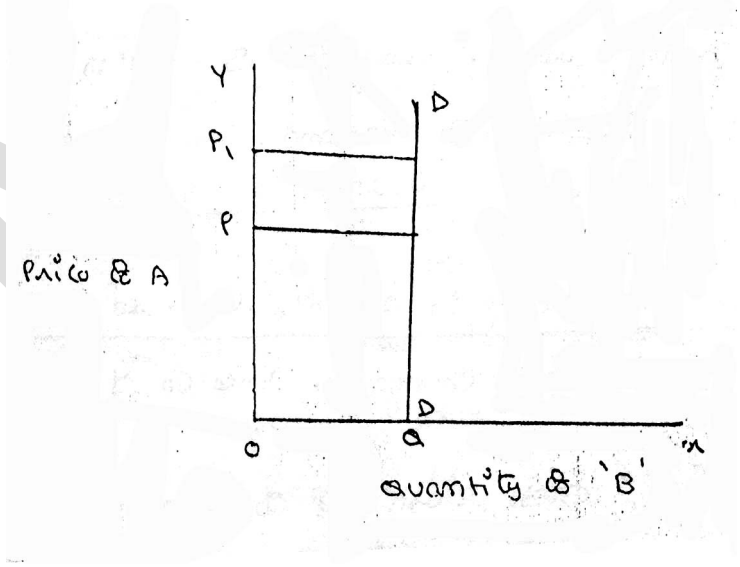
b.Incase of compliments, cross elasticity is negative. If increase in the price of one commodity leads to a decrease in the quantity demanded of another and vice versa

When price of car goes up from OP to OP!, the quantity demanded of petrol decreases from OQ to OQ!. The cross-demanded curve has negative slope.



$$E_c = \frac{\%\ \Delta Q_1}{\%\ PP_1}$$ (Negative)

c.In case of unrelated commodities, cross elasticity of demanded is zero. A change in the price of one commodity will not affect the quantity demanded of another.



Quantity demanded of commodity "b" remains unchanged due to a change in the price of 'A', as both are unrelated goods.

Factors influencing the elasticity of demand

Elasticity of demand depends on many factors.

1. Nature of commodity:

Elasticity or in-elasticity of demand depends on the nature of the commodity i.e. whether a commodity is a necessity, comfort or luxury, normally; the demand for Necessaries like salt, rice etc is inelastic. On the other band, the demand for comforts and luxuries is elastic.

2. Availability of substitutes:

Elasticity of demand depends on availability or non-availability of substitutes. In case of commodities, which have substitutes, demand is elastic, but in case of commodities, which have no substitutes, demand is in elastic.

3. Variety of uses:

If a commodity can be used for several purposes, than it will have elastic demand. i.e. electricity. On the other hand, demanded is inelastic for commodities, which can be put to only one use.

4. Postponement of demand:

If the consumption of a commodity can be postponed, than it will have elastic demand. On the contrary, if the demand for a commodity cannot be postpones, than demand is in elastic. The demand for rice or medicine cannot be postponed, while the demand for Cycle or umbrella can be postponed.

5. Amount of money spent:

Elasticity of demand depends on the amount of money spent on the commodity. If the consumer spends a smaller for example a consumer spends a little amount on salt and matchboxes. Even when price of salt or matchbox goes up, demanded will not fall. Therefore, demand is in case of clothing a consumer spends a large proportion of his income and an increase in price will reduce his demand for clothing. So the demand is elastic.

6. Time:

Elasticity of demand varies with time. Generally, demand is inelastic during short period and elastic during the long period. Demand is inelastic during short period because the consumers do not have enough time to know about the change is price. Even if they are aware of the price change, they may not immediately switch over to a new commodity, as they are accustomed to the old commodity.

7. Range of Prices:

Range of prices exerts an important influence on elasticity of demand. At a very high price, demand is inelastic because a slight fall in price will not induce the people buy more. Similarly at a low price also demand is inelastic. This is because at a low price all those who want to buy the commodity would have bought it and a further fall in price will not increase the demand. Therefore, elasticity is low at very him and very low prices.

Importance of Elasticity of Demand:

The concept of elasticity of demand is of much practical importance.

1. Price fixation:

Each seller under monopoly and imperfect competition has to take into account elasticity of demand while fixing the price for his product. If the demand for the product is inelastic, he can fix a higher price.

2. Production:

Producers generally decide their production level on the basis of demand for the product. Hence elasticity of demand helps the producers to take correct decision regarding the level of cut put to be produced.

3. Distribution:

Elasticity of demand also helps in the determination of rewards for factors of production. For example, if the demand for labour is inelastic, trade unions will be successful in raising wages. It is applicable to other factors of production.

4. International Trade:

Elasticity of demand helps in finding out the terms of trade between two countries. Terms of trade refers to the rate at which domestic commodity is exchanged for foreign commodities. Terms of trade depends upon the elasticity of demand of the two countries for each other goods.

5. Public Finance:

Elasticity of demand helps the government in formulating tax policies. For example, for imposing tax on a commodity, the Finance Minister has to take into account the elasticity of demand.

6. Nationalization:

The concept of elasticity of demand enables the government to decide about nationalization of industries

Demand forecasting:

Introduction:

The information about the future is essential for both new firms and those planning to expand the scale of their production. Demand forecasting refers to an estimate of future demand for the product.

It is an 'objective assessment of the future course of demand". In recent times, forecasting plays an important role in business decision-making. Demand forecasting has an important influence on production planning. It is essential for a firm to produce the required quantities at the right time.

It is essential to distinguish between forecasts of demand and forecasts of sales. Sales forecast is important for estimating revenue cash requirements and expenses. Demand forecasts relate to production, inventory control, timing, reliability of forecast etc. However, there is not much difference between these two terms.

Types of demand Forecasting:

Based on the time span and planning requirements of business firms, demand forecasting can be classified in to 1. Short-term demand forecasting and 2. Long – term demand forecasting.

1. Short-term demand forecasting:

Short-term demand forecasting is limited to short periods, usually for one year. It relates to policies regarding sales, purchase, price and finances. It refers to existing production capacity of the firm. Short-term forecasting is essential for formulating is essential for formulating a suitable price policy. If the business people expect of rise in the prices of raw materials of shortages, they may buy early. This price forecasting helps in sale policy formulation. Production may be undertaken based on expected sales and not on actual sales. Further, demand forecasting assists in financial forecasting also. Prior information about production and sales is essential to provide additional funds on reasonable terms.

2. Long – term forecasting:

In long-term forecasting, the businessmen should now about the long-term demand for the product. Planning of a new plant or expansion of an existing unit depends on long-term demand. Similarly a multi product firm must take into account the demand for different items. When forecast are mode covering long periods, the probability of error is high. It is vary difficult to forecast the production, the trend of prices and the nature of competition. Hence quality and competent forecasts are essential.

Prof. C. I. Savage and T.R. Small classify demand forecasting into time types. They are 1. Economic forecasting, 2.Industry forecasting, 3.Firm level forecasting. Economics forecasting is concerned with the economics, while industrial level forecasting is used for inter-industry comparisons and is being supplied by trade association or chamber of commerce. Firm level forecasting relates to individual firm.

Methods of demand forecasting:

Several methods are employed for forecasting demand. All these methods can be grouped under survey method and statistical method. Survey methods and statistical methods are further subdivided in to different categories.

1. Survey Method:

Under this method, information about the desires of the consumer and opinion of exports are collected by interviewing them. Survey method can be divided into four type's viz., Option survey method; expert opinion; Delphi method and consumers interview methods.

a. Opinion survey method:

This method is also known as sales-force composite method (or) collective opinion method. Under this method, the company asks its salesman to submit estimate of future sales in their respective territories. Since the forecasts of the salesmen are biased due to their optimistic or pessimistic attitude ignorance about economic developments etc. these estimates are consolidated, reviewed and adjusted by the top executives. In case of wide differences, an average is struck to make the forecasts realistic.

This method is more useful and appropriate because the salesmen are more knowledge. They can be important source of information. They are cooperative. The implementation within unbiased or their basic can be corrected.

B. Expert opinion method:

Apart from salesmen and consumers, distributors or outside experts may also e used for forecasting. In the United States of America, the automobile companies get sales estimates directly from their dealers. Firms in advanced countries make use of outside experts for estimating future demand. Various public and private agencies all periodic forecasts of short or long term business conditions.

C. Delphi Method:

A variant of the survey method is Delphi method. It is a sophisticated method to arrive at a consensus. Under this method, a panel is selected to give suggestions to solve the problems in hand. Both internal and external experts can be the members of the panel. Panel members one kept apart from each other and express their views in an anonymous manner. There is also a coordinator who acts as an intermediary among the panelists. He prepares the questionnaire and sends it to the panelist. At the end of each round, he prepares a summary report. On the basis of the summary report the panel members have to give suggestions. This method has been used in the area of technological forecasting. It has proved more popular in forecasting. It has provided more popular in forecasting non-economic rather than economic variables.

D. Consumers interview method:

In this method the consumers are contacted personally to know about their plans and preference regarding the consumption of the product. A list of all potential buyers would be drawn and each buyer will be approached and asked how much he plans to buy the listed product in future. He would be asked the proportion in which he intends to buy. This method seems to be the most ideal method for forecasting demand.

2. Statistical Methods:

Statistical method is used for long run forecasting. In this method, statistical and mathematical techniques are used to forecast demand. This method relies on post data.

a. Time series analysis or trend projection methods:

A well-established firm would have accumulated data. These data are analyzed to determine the nature of existing trend. Then, this trend is projected in to the future and the results are used as the basis for forecast. This is called as time series analysis. This data can be presented either in a tabular form or a graph. In the time series post data of sales are used to forecast future.

b. Barometric Technique:

Simple trend projections are not capable of forecasting turning paints. Under Barometric method, present events are used to predict the directions of change in future. This is done with the help of economics and statistical indicators. Those are (1) Construction Contracts awarded for building materials (2) Personal income (3) Agricultural Income. (4) Employment (5) Gross national income (6) Industrial Production (7) Bank Deposits etc.

c. Regression and correlation method:

Regression and correlation are used for forecasting demand. Based on post data the future data trend is forecasted. If the functional relationship is analyzed with the independent variable it is simple correction. When there are several independent variables it is multiple correlation. In correlation we analyze the nature of relation between the variables while in regression; the extent of relation between the variables is analyzed. The results are expressed in mathematical form. Therefore, it is called as econometric model building. The main advantage of this method is that it provides the values of the independent variables from within the model itself.

QUESTIONS

1. What is meant by elasticity of demand? How do you measure it? What are determinates of elasticity of demand?
2. What is the utility of demand forecasting? What are the criteria for a good forecasting method? Forecasting of demand for a new product? ' Economic indicators'
3. What is promotional elasticity of demand? How does if differ from cross elasticity of demand.
4. Explain in law of demand. What do you mean by shifts in demand curve?
5. What is cross elasticity of demand? Is it positive for substitute or complements? Show in a diagram relating to the demand for coffee to the price of tea?
6. Income elasticity of demand and distinguish its, various tapes. How does it differ from pure elasticity of demand?
7. What is meant by demand? Everyone desires a Maruti 800 Car – Does this mean that the demand for Maruti Car is large?
8. Calculate price elasticity of demand:
   Q1= 4000 P1= 20
   Q2= 5000 P2= 19
9. What is demand analysis? Explain the factor influencing the demand for a product? What are the various factors that influence the demand for a computer.

QUIZ

1. Who explained the "Law of Demand"? ( )
   (a) Joel Dean (b) Cobb-Douglas
   (c) Marshall (d) C.I.Savage&T.R.Small
2. Demand Curve always _____ sloping. ( )
   (a) Positive (b) Straight line (c) Negative (d) Vertical
3. Geffen goods, Veblan goods and speculations are exceptions to___. ( )
   (a) Cost function (b) Production function
   (c) Law of Demand (d) Finance function
4. Who explained the "Law of Demand"? ( )
   (a) Cobb-Douglas (b) Adam smith
   (c) Marshall (d) Joel Dean
5. When PE = ∝ (Price Elasticity of Demand is infinite), we call it ___. ( )
   (a) Relatively Elastic (b) Perfectly Inelastic
   (c) Perfectly Elastic (d) Unit Elastic
6. Income Elasticity of demand when less than 'O' (IE = < O), it is termed as _____. ( )
   (a) Income Elasticity less than unity (b) Zero income Elasticity
   (c) Negative Income Elasticity (d) Unit Income Elasticity
7. The other name of inferior goods is _____. ( )
   (a) Veblan goods (b) Necessaries
   (c) Geffen goods (d) Diamonds
8. Estimation of future possible demand is called _____. ( )
   (a) Sales Forecasting (b) Production Forecasting
   (c) Income Forecasting (d) Demand Forecasting
9. How many methods are employed to forecast the demand ( )
   (a) Three (b) Four
   (c) Two (d) Five
10. What is the formula for Price Elasticity of Demand? ( )
    (a) $\frac{\%\text{ of change in the Price}}{\%\text{ of change in the Demand}}$ (b) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Income}}$
    (c) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Price}}$ (d) $\frac{\%\text{ of change in the Demand of 'X'}}{\%\text{ of change in the Price of 'Y'}}$
11. When a small change in price leads great change in the quantity demand, We call it _____. ( )
    (a) Inelastic Demand (b) Negative Demand
    (c) Elastic Demand (d) None
12. When a great change in price leads small change in the quantity demand, We call it _____. ( )
    (a) Elastic Demand (b) Positive Demand
    (c) Inelastic Demand (d) None
13. "Coffee and Tea are the _____ goods". ( )
    (a) Relative (b) Complementary
    (c) Substitute (d) None
14. Consumers Survey method is one of the Survey Methods to forecast the__. ( )
    (a) Sales (b) Income

(c) Demand (d) Production

15. What is the formula for Income Elasticity of Demand? ( )
    (a) $\frac{\%\text{ of change in the Income}}{\%\text{ of change in the Demand}}$ (b) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Price}}$
    (c) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Income}}$ (d) $\frac{\%\text{ of change in the Demand of 'X'}}{\%\text{ of change in the Price of 'Y'}}$
16. What is the formula for Cross Elasticity of Demand? ( )
    (a) $\frac{\%\text{ of change in the Price of 'X'}}{\%\text{ of change in the Demand of 'Y"}}$ (b) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Price}}$
    (c) $\frac{\%\text{ of change in the Demand of 'X'}}{\%\text{ of change in the Price of 'Y'}}$ (d) $\frac{\%\text{ of change in the Demand}}{\%\text{ of change in the Income}}$
17. When PE = 0 (Price Elasticity of Demand is Zero), we call it ___. ( )
    (a) Relatively Elastic demand (b) Perfectly Elastic demand
    (c) Perfectly Inelastic demand (d) Unit Elastic demand
18. When PE =>1 (Price Elasticity of Demand is greater than one), We call it ___. ( )
    (a) Perfectly Elastic demand (b) Perfectly inelastic demand
    (c) Relatively Elastic demand (d) relatively inelastic demand
19. When PE =<1 (Price Elasticity of Demand is less than one), We call it ___. ( )
    (a) Perfectly inelastic demand (b) Relatively Elastic demand
    (c) Relatively inelastic demand (d) perfectly Elastic demand
20. When PE =1 (Price Elasticity of Demand is one), we call it ___. ( )
    (a) Perfectly Elastic demand (b) Perfectly inelastic demand
    (c) Unit elastic demand (d) Relatively Elastic demand
21. When Income Elasticity of demand is Zero (IE = 0), It is termed as ___. ( )
    (a) Negative Income Elasticity (b) Unit Income Elasticity
    (c) Zero Income Elasticity (d) Infinite Income Elasticity

Note: Answer is "C" for all the above questions.

UNIT – 3

Production analysis and cost analysis

PRODUCTION ANALYSIS

Introduction:

The production function expresses a functional relationship between physical inputs and physical outputs of a firm at any particular time period. The output is thus a function of inputs. Mathematically production function can be written as

$$Q= f (A, B, C, D)$$

Where "Q" stands for the quantity of output and A, B, C, D are various input factors such as land, labour, capital and organization. Here output is the function of inputs. Hence output becomes the dependent variable and inputs are the independent variables.

The above function does not state by how much the output of "Q" changes as a consequence of change of variable inputs. In order to express the quantitative relationship between inputs and output, Production function has been expressed in a precise mathematical equation i.e.

$$Y= a+b(x)$$

Which shows that there is a constant relationship between applications of input (the only factor input 'X' in this case) and the amount of output (y) produced.

Importance:

1. When inputs are specified in physical units, production function helps to estimate the level of production.
2. It becomes is equates when different combinations of inputs yield the same level of output.
3. It indicates the manner in which the firm can substitute on input for another without altering the total output.
4. When price is taken into consideration, the production function helps to select the least combination of inputs for the desired output.
5. It considers two types' input-output relationships namely 'law of variable proportions' and 'law of returns to scale'. Law of variable propositions explains the pattern of output in the short-run as the units of variable inputs are increased to increase the output. On the other hand law of returns to scale explains the pattern of output in the long run as all the units of inputs are increased.
6. The production function explains the maximum quantity of output, which can be produced, from any chosen quantities of various inputs or the minimum quantities of various inputs that are required to produce a given quantity of output.

Production function can be fitted the particular firm or industry or for the economy as whole. Production function will change with an improvement in technology.

Assumptions:

Production function has the following assumptions.

1. The production function is related to a particular period of time.
2. There is no change in technology.
3. The producer is using the best techniques available.
4. The factors of production are divisible.
5. Production function can be fitted to a short run or to long run.

Cobb-Douglas production function:

Production function of the linear homogenous type is invested by Juntwicksell and first tested by C. W. Cobb and P. H. Dougles in 1928. This famous statistical production function is known as Cobb-Douglas production function. Originally the function is applied on the empirical study of the American manufacturing industry. Cabb – Douglas production function takes the following mathematical form.

$$Y = (AK^X L^{1-x})$$

Where Y=output

K=Capital

L=Labour

A, ∞=positive constant

Assumptions:

It has the following assumptions

1. The function assumes that output is the function of two factors viz. capital and labour.
2. It is a linear homogenous production function of the first degree
3. The function assumes that the logarithm of the total output of the economy is a linear function of the logarithms of the labour force and capital stock.
4. There are constant returns to scale
5. All inputs are homogenous
6. There is perfect competition
7. There is no change in technology

Law of variable proportions:

The law of variable proportions which is a new name given to old classical concept of "Law of diminishing returns has played a vital role in the modern economics theory. Assume that a firms production function consists of fixed quantities of all inputs (land, equipment, etc.) except labour which is a variable input when the firm expands output by employing more and more labour it alters the proportion between fixed and the variable inputs. The law can be stated as follows:

"When total output or production of a commodity is increased by adding units of a variable input while the quantities of other inputs are held constant, the increase in total production becomes after some point, smaller and smaller".

"If equal increments of one input are added, the inputs of other production services being held constant, beyond a certain point the resulting increments of product will decrease i.e. the marginal product will diminish". (**G. Stigler**)

"As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish". (**F. Benham**)

The law of variable proportions refers to the behaviour of output as the quantity of one Factor is increased Keeping the quantity of other factors fixed and further it states that the marginal product and average product will eventually do cline. This law states three types of productivity an input factor – Total, average and marginal physical productivity.

Assumptions of the Law:

The law is based upon the following assumptions:

i) The state of technology remains constant. If there is any improvement in technology, the average and marginal out put will not decrease but increase.

ii) Only one factor of input is made variable and other factors are kept constant. This law does not apply to those cases where the factors must be used in rigidly fixed proportions.

iii) All units of the variable factors are homogenous.

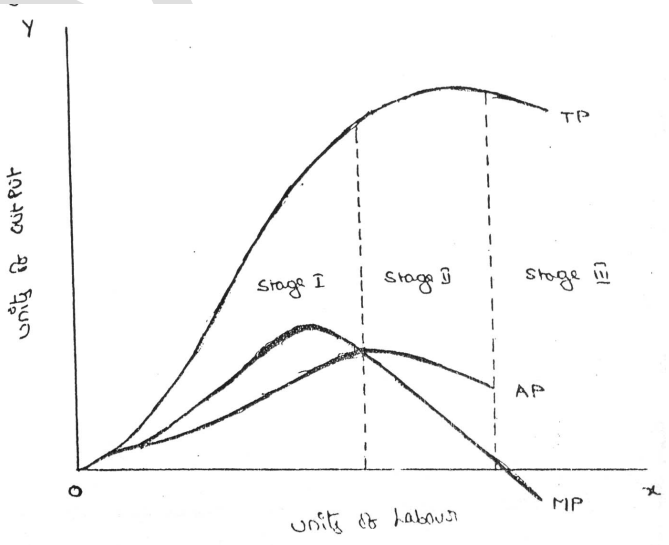
Three stages of law:

The behaviors of the Output when the varying quantity of one factor is combines with a fixed quantity of the other can be divided in to three district stages. The three stages can be better understood by following the table.

Fixed factor	Variable factor (Labour)	Total product	Average Product	Marginal Product	
1	1	100	100	-	Stage I
1	2	220	120	120	
1	3	270	90	50	
1	4	300	75	30	Stage II
1	5	320	64	20	
1	6	330	55	10	
1	7	330	47	0	Stage III
1	8	320	40	-10	

Above table reveals that both average product and marginal product increase in the beginning and then decline of the two marginal products drops of faster than average product. Total product is maximum when the farmer employs 6th worker, nothing is produced by the 7th worker and its marginal productivity is zero, whereas marginal product of 8th worker is '-10', by just creating credits 8th worker not only fails to make a positive contribution but leads to a fall in the total output.

Production function with one variable input and the remaining fixed inputs is illustrated as below



From the above graph the law of variable proportions operates in three stages. In the first stage, total product increases at an increasing rate. The marginal product in this stage increases at an increasing rate resulting in a greater increase in total product. The average product also increases. This stage continues up to the point where average product is equal to marginal product. The law of increasing returns is in operation at this stage. The law of diminishing returns starts operating from the second stage awards. At the second stage total product increases only at a diminishing rate. The average product also declines. The second stage comes to an end where total product becomes maximum and marginal product becomes zero. The marginal product becomes negative in the third stage. So the total product also declines. The average product continues to decline.

We can sum up the above relationship thus when 'A.P.' is rising, "M. P.' rises more than " A. P; When 'A. P." is maximum and constant, 'M. P.' becomes equal to 'A. P.' when 'A. P.' starts falling, 'M. P.' falls faster than ' A. P.'.

Thus, the total product, marginal product and average product pass through three phases, viz., increasing diminishing and negative returns stage. The law of variable proportion is nothing but the combination of the law of increasing and demising returns.

Iso -quants and Iso-costs:

Iso-quants:

The term Isoquants is derived from the words 'iso' and 'quant' – 'Iso' means equal and 'quent' implies quantity. Isoquant therefore, means equal quantity. A family of iso-product curves or isoquants or production difference curves can represent a production function with two variable inputs, which are substitutable for one another within limits.

Iqoquants are the curves, which represent the different combinations of inputs producing a particular quantity of output. Any combination on the isoquant represents the some level of output.

For a given output level firm's production become,

$$Q= f (L, K)$$

Where 'Q', the units of output is a function of the quantity of two inputs 'L' and 'K'.

Thus an isoquant shows all possible combinations of two inputs, which are capable of producing equal or a given level of output. Since each combination yields same output, the producer becomes indifferent towards these combinations.

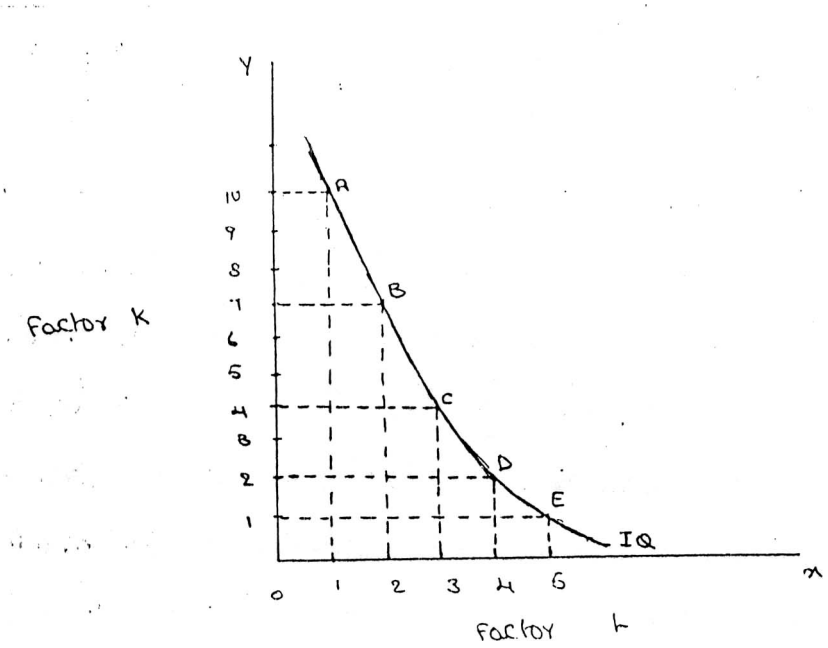
Assumptions:

1. There are only two factors of production, viz. labour and capital.
2. The two factors can substitute each other up to certain limit
3. The shape of the isoquant depends upon the extent of substitutability of the two inputs.
4. The technology is given over a period.

An isoquant may be explained with the help of an arithmetical example.

A	1	10	50
B	2	7	50
C	3	4	50
D	4	4	50
E	5	1	50

Combination 'A' represent 1 unit of labour and 10 units of capital and produces '50' quintals of a product all other combinations in the table are assumed to yield the same given output of a product say '50' quintals by employing any one of the alternative combinations of the two factors labour and capital. If we plot all these combinations on a paper and join them, we will get continues and smooth curve called Iso-product curve as shown below.



Labour is on the X-axis and capital is on the Y-axis. IQ is the ISO-Product curve which shows all the alternative combinations A, B, C, D, E which can produce 50 quintals of a product.

Iso_costs:

Law of Returns:

The law of returns to scale explains the behavior of the total output in response to change in the scale of the firm, i.e., in response to a simultaneous to changes in the scale of the firm, i.e., in response to a simultaneous and proportional increase in all the inputs. More precisely, the Law of returns to scale explains how a simultaneous and proportionate increase in all the inputs affects the total output at its various levels.

The concept of variable proportions is a short-run phenomenon as in these period fixed factors can not be changed and all factors cannot be changed. On the other hand in the long-term all factors can be changed as made variable. When we study the changes in output when all factors or inputs are changed, we study returns to scale. An increase in the scale means that all inputs or factors are increased in the same proportion. In variable proportions, the cooperating factors may be increased or decreased and one faster (Ex. Land in agriculture (or) machinery in industry) remains constant so that the changes in proportion among the factors result in certain changes in output. In returns to scale all the necessary factors or production are increased or decreased to the same extent so that whatever the scale of production, the proportion among the factors remains the same.

When a firm expands, its scale increases all its inputs proportionally, then technically there are three possibilities. (i) The total output may increase proportionately (ii) The total output may increase more than proportionately and (iii) The total output may increase less than proportionately. If increase in the total output is proportional to the increase in input, it means constant returns to scale. If increase in the output is greater than the proportional increase in the inputs, it means increasing return to scale. If increase in the output is less than proportional increase in the inputs, it means diminishing returns to scale.

Let us now explain the laws of returns to scale with the help of isoquants for a two-input and single output production system.

Economics of scale:

Production may be carried on a small scale or o a large scale by a firm. When a firm expands its size of production by increasing all the factors, it secures certain advantages known as economies of production. Marshall has classified these economies of large-scale production into internal economies and external economies.

Internal economies are those, which are opened to a single factory or a single firm independently of the action of other firms. They result from an increase in the scale of output of a firm and cannot be achieved unless output increases. Hence internal economies depend solely upon the size of the firm and are different for different firms.

External economies are those benefits, which are shared in by a number of firms or industries when the scale of production in an industry or groups of industries increases. Hence external economies benefit all firms within the industry as the size of the industry expands.

Causes of internal economies:

Internal economies are generally caused by two factors

1. Indivisibilities 2. Specialization.

1. Indivisibilities

Many fixed factors of production are indivisible in the sense that they must be used in a fixed minimum size. For instance, if a worker works half the time, he may be paid half the salary. But he cannot be chopped into half and asked to produce half the current output. Thus as output increases the indivisible factors which were being used below capacity can be utilized to their full capacity thereby reducing costs. Such indivisibilities arise in the case of labour, machines, marketing, finance and research.

2. Specialization.

Division of labour, which leads to specialization, is another cause of internal economies. Specialization refers to the limitation of activities within a particular field of production. Specialization may be in labour, capital, machinery and place. For example, the production process may be split into four departments relation to manufacturing, assembling, packing and marketing under the charge of separate managers who may work under the overall charge of the general manger and coordinate the activities of the for departments. Thus specialization will lead to greater productive efficiency and to reduction in costs.

Internal Economies:

Internal economies may be of the following types.

A). Technical Economies.

Technical economies arise to a firm from the use of better machines and superior techniques of production. As a result, production increases and per unit cost of production falls. A large firm, which employs costly and superior plant and equipment, enjoys a technical superiority over a small firm. Another technical economy lies in the mechanical advantage of using large machines. The cost of operating large machines is less than that of operating mall machine. More over a larger firm is able to reduce it's per unit cost of production by linking the various processes of production. Technical economies may also be associated when the large firm is able to utilize all its waste materials for the development of by-products industry. Scope for specialization is also available in a large firm. This increases the productive capacity of the firm and reduces the unit cost of production.

B). Managerial Economies:

These economies arise due to better and more elaborate management, which only the large size firms can afford. There may be a separate head for manufacturing, assembling, packing, marketing, general administration etc. Each department is under the charge of an expert. Hence the appointment of experts, division of administration into several departments, functional specialization and scientific co-ordination of various works make the management of the firm most efficient.

C). Marketing Economies:

The large firm reaps marketing or commercial economies in buying its requirements and in selling its final products. The large firm generally has a separate marketing department. It can buy and sell on behalf of the firm, when the market trends are more favorable. In the matter of buying they could enjoy advantages like preferential treatment, transport concessions, cheap credit, prompt delivery and fine relation with dealers. Similarly it sells its products more effectively for a higher margin of profit.

D). Financial Economies:

The large firm is able to secure the necessary finances either for block capital purposes or for working capital needs more easily and cheaply. It can barrow from the public, banks and other financial institutions at relatively cheaper rates. It is in this way that a large firm reaps financial economies.

E). Risk bearing Economies

The large firm produces many commodities and serves wider areas. It is, therefore, able to absorb any shock for its existence. For example, during business depression, the prices fall for every firm. There is also a possibility for market fluctuations in a particular product of the firm. Under such circumstances the risk-bearing economies or survival economies help the bigger firm to survive business crisis.

F). Economies of Research:

A large firm possesses larger resources and can establish it's own research laboratory and employ trained research workers. The firm may even invent new production techniques for increasing its output and reducing cost.

G). Economies of welfare:

A large firm can provide better working conditions in-and out-side the factory. Facilities like subsidized canteens, crèches for the infants, recreation room, cheap houses, educational and medical facilities tend to increase the productive efficiency of the workers, which helps in raising production and reducing costs.

External Economies.

Business firm enjoys a number of external economies, which are discussed below:

A). Economies of Concentration:

When an industry is concentrated in a particular area, all the member firms reap some common economies like skilled labour, improved means of transport and communications, banking and financial services, supply of power and benefits from subsidiaries. All these facilities tend to lower the unit cost of production of all the firms in the industry.

B). Economies of Information

The industry can set up an information centre which may publish a journal and pass on information regarding the availability of raw materials, modern machines, export potentialities and provide other information needed by the firms. It will benefit all firms and reduction in their costs.

C). Economies of Welfare:

An industry is in a better position to provide welfare facilities to the workers. It may get land at concessional rates and procure special facilities from the local bodies for setting up housing colonies for the workers. It may also establish public health care units, educational institutions both general and technical so that a continuous supply of skilled labour is available to the industry. This will help the efficiency of the workers.

D). Economies of Disintegration:

The firms in an industry may also reap the economies of specialization. When an industry expands, it becomes possible to spilt up some of the processes which are taken over by specialist firms. For example, in the cotton textile industry, some firms may specialize in manufacturing thread, others in printing, still others in dyeing, some in long cloth, some in dhotis, some in shirting etc. As a result the efficiency of the firms specializing in different fields increases and the unit cost of production falls.

Thus internal economies depend upon the size of the firm and external economies depend upon the size of the industry.

Diseconomics of scale:

Internal and external diseconomies are the limits to large-scale production. It is possible that expansion of a firm's output may lead to rise in costs and thus result diseconomies instead of economies. When a firm expands beyond proper limits, it is beyond the capacity of the manager to manage it efficiently. This is an example of an internal diseconomy. In the same manner, the expansion of an industry may result in diseconomies, which may be called external diseconomies. Employment of additional factors of production becomes less efficient and they are obtained at a higher cost. It is in this way that external diseconomies result as an industry expands.
The major diseconomies of large-scale production are discussed below:

Internal Diseconomies:

A). Financial Diseconomies:

For expanding business, the entrepreneur needs finance. But finance may not be easily available in the required amount at the appropriate time. Lack of finance retards the production plans thereby increasing costs of the firm.

B). Managerial diseconomies:

There are difficulties of large-scale management. Supervision becomes a difficult job. Workers do not work efficiently, wastages arise, decision-making becomes difficult, coordination between workers and management disappears and production costs increase.

C). Marketing Diseconomies:

As business is expanded, prices of the factors of production will rise. The cost will therefore rise. Raw materials may not be available in sufficient quantities due to their scarcities. Additional output may depress the price in the market. The demand for the products may fall as a result of changes in tastes and preferences of the people. Hence cost will exceed the revenue.

D). Technical Diseconomies:

There is a limit to the division of labour and splitting down of production p0rocesses. The firm may fail to operate its plant to its maximum capacity. As a result cost per unit increases. Internal diseconomies follow.

E). Diseconomies of Risk-taking:

As the scale of production of a firm expands risks also increase with it. Wrong decision by the management may adversely affect production. In large firms are affected by any disaster, natural or human, the economy will be put to strains.

External Diseconomies:

When many firm get located at a particular place, the costs of transportation increases due to congestion. The firms have to face considerable delays in getting raw materials and sending finished products to the marketing centers. The localization of industries may lead to scarcity of raw material, shortage of various factors of production like labour and capital, shortage of power, finance and equipments. All such external diseconomies tend to raise cost per unit.

QUESTIONS

1. Why does the law of diminishing returns operate? Explain with the help of a diagram.
2. Explain the nature and uses of production function.
3. Explain and illustrate lows of returns to scale.
4. a. Explain how production function can be mode use of to reduce cost of Production.
   b. Explain low of constant returns? Illustrate.
5. Explain the following (i) Internal Economics (ii) External Economics (or) Explain Economics of scale. Explain the factor, which causes increasing returns to scale.
6. Explain the following with reference to production functions
   (a) MRTS
   (b) Variable proportion of factor
7. Define production function, explain is equate and is cost curves.
8. Explain the importance and uses of production function in break-even analysis.
9. Discuss the equilibrium of a firm with isoquants.
10. (a) What are isocost curves and iso quants? Do they interest each other
    (b) Explain Cobb-Douglas Production function.

QUIZ

1. How many types of input-output relations discussed by the Law of production. ( )
   (a) Five (b) Four
   (c) Two (d) Three
2. How many stages are there in 'Law of Variable Proportions'? ( )
   (a) Five (b) Two
   (c) Three (d) Four
3. Congregation of body of persons assembling together to work at a certain Time and place is called as ( )
   (a) Firm (b) Industry
   (c) Plant (d) Size
4. When a firm expands its Size of production by increasing all factors, It secures certain advantages, known as ( )
   (a) Optimum Size (b) Diseconomies of Scale
   (c) Economies of Scale (d) None
5. When producer secures maximum output with the least cost combination Of factors of production, it is known as_____ ( )
   (a) Consumer's Equilibrium (b) Price Equilibrium
   (c) Producer's Equilibrium (d) Firm's Equilibrium
6. The 'Law of Variable Proportions' is also called as _____. ( )
   (a) Law of fixed proportions (b) Law of returns to scale
   (c) Law of variable proportions (d) None
7. _____ Is a 'group of firms producing the same are slightly Different products for the same market or using same raw material'. ( )
   (a) Plant (b) Firm
   (c) Industry (d) Size
8. When proportionate increase in all inputs results in an equal Proportionate increase in output, then we call_____. ( )
   (a) Increasing Returns to Scale (b) Decreasing Returns to Scale
   (c) Constant Returns to Scale (d) None
9. When different combinations of inputs yield the same level of output Known as _____. ( )
   (a) Different Quants (b) Output differentiation
   (c) Isoquants (d) Production differentiation
10. Conversion of inputs in to output is called as _____. ( )
    (a) Sales (b) Income
    (c) Production (d) Expenditure
    (c) Increasing Returns to Scale (d) None

Note: Answer is "C" for all the above questions.

COST ANALYSIS

Cost concepts:

A managerial economist must have a clear understanding of the different cost concepts for clear business thinking and proper application. The several alternative bases of classifying cost and the relevance of each for different kinds of problems are to be studied. The various relevant concepts of cost are:

1. Opportunity costs and outlay costs:

Out lay cost also known as actual costs obsolete costs are those expends which are actually incurred by the firm these are the payments made for labour, material, plant, building, machinery traveling, transporting etc., These are all those expense item appearing in the books of account, hence based on accounting cost concept.

On the other hand opportunity cost implies the earnings foregone on the next best alternative, has the present option is undertaken. This cost is often measured by assessing the alternative, which has to be scarified if the particular line is followed.

The opportunity cost concept is made use for long-run decisions. This concept is very important in capital expenditure budgeting. This concept is very important in capital expenditure budgeting. The concept is also useful for taking short-run decisions opportunity cost is the cost concept to use when the supply of inputs is strictly limited and when there is an alternative. If there is no alternative, Opportunity cost is zero. The opportunity cost of any action is therefore measured by the value of the most favorable alternative course, which had to be foregoing if that action is taken.

2. Incremental and sunk costs:

Incremental cost also known as different cost is the additional cost due to a change in the level or nature of business activity. The change may be caused by adding a new product, adding new machinery, replacing a machine by a better one etc.

Sunk costs are those which are not altered by any change – They are the costs incurred in the past. This cost is the result of past decision, and cannot be changed by future decisions. Investments in fixed assets are examples of sunk costs.

3.Short – run and long – run costs:

Short-run is a period during which the physical capacity of the firm remains fixed. Any increase in output during this period is possible only by using the existing physical capacity more extensively. So short run cost is that which varies with output when the plant and capital equipment in constant.

Long run costs are those, which vary with output when all inputs are variable including plant and capital equipment. Long-run cost analysis helps to take investment decisions.

4.Fixed and variable costs:

Fixed cost is that cost which remains constant for a certain level to output. It is not affected by the changes in the volume of production. But fixed cost per unit decrease, when the production is increased. Fixed cost includes salaries, Rent, Administrative expenses depreciations etc.

Variable is that which varies directly with the variation is output. An increase in total output results in an increase in total variable costs and decrease in total output results in a proportionate decline in the total variables costs. The variable cost per unit will be constant. Ex: Raw materials, labour, direct expenses, etc.

Cost output relationship in short-run and long-run:

A proper understanding of the nature and behavior of costs is a must for regulation and control of cost of production. The cost of production depends on money forces and an understanding of the functional relationship of cost to various forces will help us to take various decisions. Output is an important factor, which influences the cost.

The cost-output relationship plays an important role in determining the optimum level of production. Knowledge of the cost-output relation helps the manager in cost control, profit prediction, pricing, promotion etc. The relation between cost and its determinants is technically described as the cost function.

C= f (S, O, P, T ….) Where;

C= Cost (Unit or total cost) S= Size of plant/scale of production

O= Output level P= Prices of inputs T= Technology

Considering the period the cost function can be classified as (a) short-run cost function and (b) long-run cost function. In economics theory, the short-run is defined as that period during which the physical capacity of the firm is fixed and the output can be increased only by using the existing capacity allows to bring changes in output by physical capacity of the firm.

(a) Cost-Output Relation in the short-run:

The cost concepts made use of in the cost behavior are total cost, Average cost, and marginal cost.

Total cost is the actual money spent to produce a particular quantity of output. Total cost is the summation of fixed and variable costs.

$$TC=TFC+TVC$$

Up to a certain level of production total fixed cost i.e., the cost of plant, building, equipment etc, remains fixed. But the total variable cost i.e., the cost of labour, raw materials etc., Vary with the variation in output. Average cost is the total cost per unit. It can be found out as follows.

$$AC= \frac{TC}{Q}$$

The total of average fixed cost (TFC/Q) keep coming down as the production is increased and average variable cost (TVC/Q) will remain constant at any level of output.

Marginal cost is the addition to the total cost due to the production of an additional unit of product. It can be arrived at by dividing the change in total cost by the change in total output.

In the short-run there will not be any change in total fixed cost. Hence change in total cost implies change in total variable cost only.

Cost – output relations

Units of Output Q	Total fixed cost TFC	Total variable cost TVC	Total cost (TFC + TVC) TC	Average variable cost (TVC / Q) AVC	Average fixed cost (TFC / Q) AFC	Average cost (TC/Q) AC	Marginal cost MC
0	-	-	60	-	-	-	-
1	60	20	80	20	60	80	20
2	60	36	96	18	30	48	16
3	60	48	108	16	20	36	12
4	60	64	124	16	15	31	16

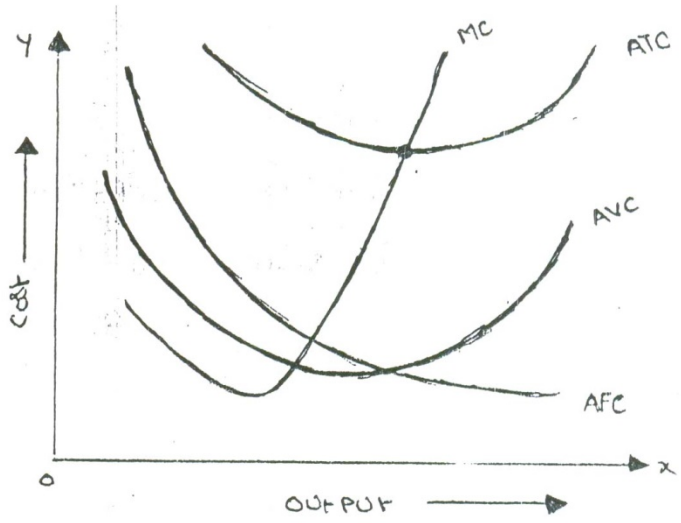
5	60	90	150	18	12	30	26
6	60	132	192	22	10	32	42

The above table represents the cost-output relation. The table is prepared on the basis of the law of diminishing marginal returns. The fixed cost Rs. 60 May include rent of factory building, interest on capital, salaries of permanently employed staff, insurance etc. The table shows that fixed cost is same at all levels of output but the average fixed cost, i.e., the fixed cost per unit, falls continuously as the output increases. The expenditure on the variable factors (TVC) is at different rate. If more and more units are produced with a given physical capacity the AVC will fall initially, as per the table declining up to 3rd unit, and being constant up to 4th unit and then rising. It implies that variable factors produce more efficiently near a firm's optimum capacity than at any other levels of output.

And later rises. But the rise in AC is felt only after the start rising. In the table 'AVC' starts rising from the 5th unit onwards whereas the 'AC' starts rising from the 6th unit only so long as 'AVC' declines 'AC' also will decline. 'AFC' continues to fall with an increase in Output. When the rise in 'AVC' is more than the decline in 'AFC', the total cost again begin to rise. Thus there will be a stage where the 'AVC', the total cost again begin to rise thus there will be a stage where the 'AVC' may have started rising, yet the 'AC' is still declining because the rise in 'AVC' is less than the droop in 'AFC'.

Thus the table shows an increasing returns or diminishing cost in the first stage and diminishing returns or diminishing cost in the second stage and followed by diminishing returns or increasing cost in the third stage.

The short-run cost-output relationship can be shown graphically as follows.



In the above graph the "AFC' curve continues to fall as output rises an account of its spread over more and more units Output. But AVC curve (i.e. variable cost per unit) first falls and than rises due to the operation of the law of variable proportions. The behavior of "ATC' curve depends upon the behavior of 'AVC' curve and 'AFC' curve. In the initial stage of production both 'AVC' and 'AFC' decline and hence 'ATC' also decline. But after a certain point 'AVC' starts rising. If the rise in variable cost is less than the decline in fixed cost, ATC will still continue to decline otherwise AC begins to rise. Thus the lower end of 'ATC' curve thus turns up and gives it a U-shape. That is why 'ATC' curve are U-shaped. The lowest point in 'ATC' curve indicates the least-cost combination of inputs. Where the total average cost is the minimum and where the "MC' curve intersects 'AC' curve, It is not be the maximum output level rather it is the point where per unit cost of production will be at its lowest.

1. If both AFC and 'AVC' fall, 'ATC' will also fall.
2. When 'AFC' falls and 'AVC' rises
    a. 'ATC' will fall where the drop in 'AFC' is more than the raise in 'AVC'.
    b. 'ATC' remains constant is the drop in 'AFC' = rise in 'AVC'
    c. 'ATC' will rise where the drop in 'AFC' is less than the rise in 'AVC'

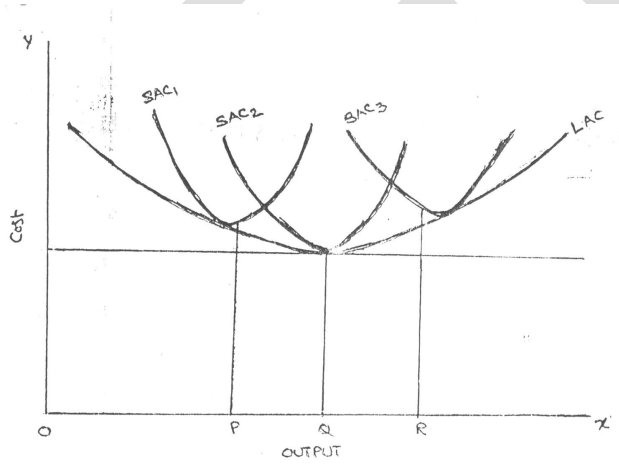
b. Cost-output Relationship in the long-run:

Long run is a period, during which all inputs are variable including the one, which are fixes in the short-run. In the long run a firm can change its output according to its demand. Over a long period, the size of the plant can be changed, unwanted buildings can be sold staff can be increased or reduced. The long run enables the firms to expand and scale of their operation by bringing or purchasing larger quantities of all the inputs. Thus in the long run all factors become variable.

The long-run cost-output relations therefore imply the relationship between the total cost and the total output. In the long-run cost-output relationship is influenced by the law of returns to scale.

In the long run a firm has a number of alternatives in regards to the scale of operations. For each scale of production or plant size, the firm has an appropriate short-run average cost curves. The short-run average cost (SAC) curve applies to only one plant whereas the long-run average cost (LAC) curve takes in to consideration many plants.

The long-run cost-output relationship is shown graphically with the help of "LCA' curve.



To draw on 'LAC' curve we have to start with a number of 'SAC' curves. In the above figure it is assumed that technologically there are only three sizes of plants – small, medium and large, 'SAC', for the small size, 'SAC2' for the medium size plant and 'SAC3' for the large size plant. If the firm wants to produce 'OP' units of output, it will choose the smallest plant. For an output beyond 'OQ' the firm wills optimum for medium size plant. It does not mean that the OQ production is not possible with small plant. Rather it implies that cost of production will be more with small plant compared to the medium plant.

For an output 'OR' the firm will choose the largest plant as the cost of production will be more with medium plant. Thus the firm has a series of 'SAC' curves. The 'LCA' curve drawn will be tangential to the entire family of 'SAC' curves i.e. the 'LAC' curve touches each 'SAC' curve at one point, and thus it is known as envelope curve. It is also known as planning curve as it serves as guide to the entrepreneur in his planning to expand the production in

future. With the help of 'LAC' the firm determines the size of plant which yields the lowest average cost of producing a given volume of output it anticipates.

Break even analysis(BEA)

The study of cost-volume-profit relationship is often referred as BEA. The term BEA is interpreted in two senses. In its narrow sense, it is concerned with finding out BEP; BEP is the point at which total revenue is equal to total cost. It is the point of no profit, no loss. In its broad determine the probable profit at any level of production.

Assumptions:

1. All costs are classified into two – fixed and variable.
2. Fixed costs remain constant at all levels of output.
3. Variable costs vary proportionally with the volume of output.
4. Selling price per unit remains constant in spite of competition or change in the volume of production.
5. There will be no change in operating efficiency.
6. There will be no change in the general price level.
7. Volume of production is the only factor affecting the cost.
8. Volume of sales and volume of production are equal. Hence there is no unsold stock.
9. There is only one product or in the case of multiple products. Sales mix remains constant.

Merits:

1. Information provided by the Break Even Chart can be understood more easily then those contained in the profit and Loss Account and the cost statement.
2. Break Even Chart discloses the relationship between cost, volume and profit. It reveals how changes in profit. So, it helps management in decision-making.
3. It is very useful for forecasting costs and profits long term planning and growth
4. The chart discloses profits at various levels of production.
5. It serves as a useful tool for cost control.
6. It can also be used to study the comparative plant efficiencies of the industry.
7. Analytical Break-even chart present the different elements, in the costs – direct material, direct labour, fixed and variable overheads.

Demerits:

1. Break-even chart presents only cost volume profits. It ignores other considerations such as capital amount, marketing aspects and effect of government policy etc., which are necessary in decision making.
2. It is assumed that sales, total cost and fixed cost can be represented as straight lines. In actual practice, this may not be so.
3. It assumes that profit is a function of output. This is not always true. The firm may increase the profit without increasing its output.
4. A major draw back of BEC is its inability to handle production and sale of multiple products.
5. It is difficult to handle selling costs such as advertisement and sale promotion in BEC.
6. It ignores economics of scale in production.
7. Fixed costs do not remain constant in the long run.
8. Semi-variable costs are completely ignored.

9. It assumes production is equal to sale. It is not always true because generally there may be opening stock.
10. When production increases variable cost per unit may not remain constant but may reduce on account of bulk buying etc.
11. The assumption of static nature of business and economic activities is a well-known defect of BEC.

1. Fixed cost
2. Variable cost
3. Contribution
4. Margin of safety
5. Angle of incidence
6. Profit volume ratio
7. Break-Even-Point

1. ***Fixed cost:*** Expenses that do not vary with the volume of production are known as fixed expenses. Eg. Manager's salary, rent and taxes, insurance etc. It should be noted that fixed changes are fixed only within a certain range of plant capacity. The concept of fixed overhead is most useful in formulating a price fixing policy. Fixed cost per unit is not fixed.

2. ***Variable Cost:*** Expenses that vary almost in direct proportion to the volume of production of sales are called variable expenses. Eg. Electric power and fuel, packing materials consumable stores. It should be noted that variable cost per unit is fixed.

3. ***Contribution:*** Contribution is the difference between sales and variable costs and it contributed towards fixed costs and profit. It helps in sales and pricing policies and measuring the profitability of different proposals. Contribution is a sure test to decide whether a product is worthwhile to be continued among different products.

Contribution = Sales – Variable cost

Contribution = Fixed Cost + Profit.

4. ***Margin of safety:*** Margin of safety is the excess of sales over the break even sales. It can be expressed in absolute sales amount or in percentage. It indicates the extent to which the sales can be reduced without resulting in loss. A large margin of safety indicates the soundness of the business. The formula for the margin of safety is:

Present sales – Break even sales **or** $\frac{\text{Profit}}{\text{P. V. ratio}}$

Margin of safety can be improved by taking the following steps.

1. Increasing production
2. Increasing selling price
3. Reducing the fixed or the variable costs or both
4. Substituting unprofitable product with profitable one.

5. ***Angle of incidence:*** This is the angle between sales line and total cost line at the Break-even point. It indicates the profit earning capacity of the concern. Large angle of incidence indicates a high rate of profit; a small angle indicates a low rate of earnings. To improve this angle, contribution should be increased either by raising the selling price and/or by reducing variable cost. It also indicates as to what extent the output and sales price can be changed to attain a desired amount of profit.

6. ***Profit Volume Ratio*** is usually called P. V. ratio. It is one of the most useful ratios for studying the profitability of business. The ratio of contribution to sales is the P/V ratio. It may be expressed in percentage

Therefore, every organization tries to improve the P. V. ratio of each product by reducing the variable cost per unit or by increasing the selling price per unit. The concept of P. V. ratio helps in determining break even-point, a desired amount of profit etc.

The formula is, $\frac{\text{Contribution}}{Sales}$ X 100

7. ***Break – Even- Point:*** If we divide the term into three words, then it does not require further explanation.

   Break-divide

   Even-equal

   Point-place or position

   Break Even Point refers to the point where total cost is equal to total revenue. It is a point of no profit, no loss. This is also a minimum point of no profit, no loss. This is also a minimum point of production where total costs are recovered. If sales go up beyond the Break Even Point, organization makes a profit. If they come down, a loss is incurred.

   1. Break Even point (Units) = $\frac{\text{Fixed Expenses}}{\text{Contribution per unit}}$
   2. Break Even point (In Rupees) = $\frac{\text{Fixed expenses}}{\text{Contribution}}$ X sales

QUESTIONS

1. What cost concepts are mainly used for management decision making? Illustrate.
2. The PV ratio of matrix books Ltd Rs. 40% and the margin of safety Rs. 30. You are required to work out the BEP and Net Profit. If the sales volume is Rs. 14000/-
3. A Company reported the following results for two period

Period	Sales	Profit
I	Rs. 20,00,000	Rs. 2,00,000
II	Rs. 25,00,000	Rs. 3,00,000

Ascertain the BEP, PV ratio, fixes cost and Margin of Safety.

4. Write short notes on the following
   a) Profit – Volume ratio b)Margin of Safety
5. Write short notes on: (i) Suck costs (ii) Abandonment costs
6. The information about Raj & Co are given below:
   PV ratio : 20%
   Fixed Cost : Rs. 36,000/-
   Selling Price Per Unit: Rs. 150/-
   Calculate (i) BEP in rupees (ii) BEP in Units
   (iii) Variable cost per unit
   (iv) Contribution per unit
7. Define opportunity cost. List out its assumptions & Limitation.
8. (a) Explain the utility of BEA in managerial decision making
   (b) How do you explain break even chart? Explain.
9. Write short motes on:
   (i) Fixed cost & variable cost
   (ii) Out of pocket costs & imputed costs
   (iii) Explicit & implicit Costs
   (iv) Short rum cost
10. Write short note on the following:
    (a) PV ratio
    (b) Margin of Safety
    (c) Angle of incidence
    (d)
11. Explain Cost/Output relationship in the short run.
12. Appraise the usefulness of BEA for a multi product organization
13. Describe the BEP with the help of a diagram and its uses in business decision making.
14. If sales in 10000 units and selling price Rs. 20/- per unit. Variable cost is Rs. 10/- per unit and fixed cost is Rs. 80000. Find out BEP in Units and sales revenue what is profit earned? What should be the sales for earning a profit of Rs. 60000/-
15. How do you determine BEP in terms of physical units and sales value? Explain the concepts of margin of safety & angle of incidence.
16. Sales are 1,10,000 producing a profit of Rs. 4000/- in period I, sales are 150000 producing a profit of Rs. 12000/- in period II. Determine BEP & fixed expenses.
17. When a Mc change does Ac changed (a) at the same rate (b) at a higher rate or (c) at a lower rate? Illustrate your answer with a diagram.
18. Explain the relationship between MC, AC and TC assuming a short run non-linear cost function.
19. Sale of a product amounts to 20 units per months at Rs. 10/- per unit. Fixed overheads is Rs. 400/- per month and variable cost is Rs. 6/- per unit. There is a proposal to reduce prices by 107. Calculate present and future P-V ratio. How many units must be sold to earn a target profit of present level?

QUIZ

1. The cost of best alternative forgone is_____ ( )
   (a) Outlay cost (b) Past cost
   (c) Opportunity cost (d) Future cost
2. If we add up total fixed cost (TFC) and total variable cost (TVC), we get__ ( )
   (a) Average cost (b) Marginal cost
   (c) Total cost (d) Future cost
3. _____ costs are theoretical costs, which are not recognized by the Accounting system. ( )
   (a) Past (b) Explicit
   (c) Implicit (d) Historical
4. _____cost is the additional cost to produce an additional unit of output. ( )
   (a) Incremental (b) Sunk

(c) Marginal (d) Total

5. _____ costs are the costs, which are varies with the level of output. ( )
   (a) Fixed (b) Past
   (c) Variable (d) Historical
6. _____ costs are those business costs, which do not Involve any cash payment. ( )
   (a) Past (b) Historical
   (c) Implicit (d) Explicit
7. The opposite of Past cost is _____. ( )
   (a) Historical (b) Fixed cost
   (c) Future cost (d) Variable cost
8. _____ is a period during which the existing physical capacity of the Firm can be changed. ( )
   (a) Market period (b) Short period
   (c) Long period (d) Medium period
9. What is the formula for Profit-Volume Ratio? ( )

   (a) $\frac{\text{Sales}}{\text{Contribution}} \times 100$ (b) $\frac{\text{Variable cost}}{\text{Sales}} \times 100$

   (c) $\frac{\text{Contribution}}{\text{Sales}} \times 100$ (b) $\frac{\text{Fixed cost}}{\text{Sales}} \times 100$

10. _____ is a point of sales at which there is neither profit nor loss. ( )
    (a) Maximum sales (b) Minimum sales
    (c) Break-Even sales (d) Average sales
11. What is the formula for Margin of Safety? ( )
    (a) Break Even sales – Actual sales (b) Maximum sales – Actual sales
    (c) Actual sales – Break Even sales (d) Actual sales – Minimum sales
12. What is the formula for Break-Even Point in Units? ( )
    (a) $\frac{\text{Contribution}}{\text{Selling Price per unit}}$ (b) $\frac{\text{Variable cost}}{\text{Contribution per unit}}$
    (c) $\frac{\text{Fixed cost}}{\text{Contribution per unit}}$ (d) $\frac{\text{Variable cost}}{\text{Selling Price per unit}}$

Note: Answer is "C" for all the above questions

UNIT – 4

Introduction to financial accounting

INTRODUCTION OF FINANAL ACCOUNTING

INTRODUCITON

As you are aware, every trader generally starts business for purpose of earning profit. While establishing business, he brings own capital, borrows money from relatives, friends, outsiders or financial institutions. Then he purchases machinery, plant , furniture, raw materials and other assets. He starts buying and selling of goods, paying for salaries, rent and other expenses, depositing and withdrawing cash from bank. Like this he undertakes innumerable transactions in business. Observe the following transactions of small trader for one week during the month of July, 1998**.**

1998		Rs.
July 24	Purchase of goods from Sree Ram	12,000
July 25	Goods sold for cash	5,000
July 25	Sold gods to Syam on credit	8,000
July 26	Advertising expenses	5,200
July 27	Stationary expenses	600
July 27	Withdrawal for personal use	2,500
July 28	Rent paid through cheque	1,000
July 31	Salaries paid	9,000
July 31	Received cash from Syam	5,000

The number of transactions in an organization depends upon the size of the organization. In small organizations, the transactions generally will be in thousand and in big organizations they may be in lakhs. As such it is humanly impossible to remember all these transactions. Further, it may not by possible to find out the final result of the business without recording and analyzing these transactions.

Accounting came into practice as an aid to human memory by maintaining a systematic record of business transactions.

Concepts and conventions of accounting:

BASIC ACCOUNTING CONCEPTS:

Accounting has been evolved over a period of several centuries. During this period, certain rules and conventions have been adopted. They serve as guidelines in identifying the events and transactions to be accounted for measuring, recording, summarizing and reporting them to the interested parties. These rules and conventions are termed as **Generally Accepted Accounting Principles.** These principles are also referred as standards, assumptions, concepts, conventions doctrines, etc. Thus, the accounting concepts are the fundamental ideas or basic assumptions underlying the theory and practice of financial accounting. They are the broad working rules for all accounting activities developed and accepted by the accounting profession.

Basic accounting concepts may be classified into two broad categories.

1. Concept to be observed at the time of recording transactions.(Recording Stage).
2. Concept to be observed at the time of preparing the financial accounts (Reporting Stage)

FINAL ACCOUNTS

INTRODUCTION:

The main object of any Business is to make profit. Every trader generally starts business for the purpose of earning profit. While establishing Business, he brings his own capital, borrows money from relatives, friends, outsiders or financial institutions, then purchases machinery, plant, furniture, raw materials and other assets. He starts buying and selling of goods, paying for salaries, rent and other expenses, depositing and withdrawing cash from Bank. Like this he undertakes innumerable transactions in Business.

The number of Business transactions in an organization depends up on the size of the organization. In small organizations the transactions generally will be in thousands and in big organizations they may be in lacks. As such it is humanly impossible to remember all these transactions. Further it may not be possible to find out the final result of the Business with out recording and analyzing these transactions.

Accounting came in practice as an aid to human memory by maintaining a systematic record of Business transactions.

BOOK KEEPING AND ACCOUNTING:

According to G.A.Lee the Accounting system has two stages. First stage is Book keeping and the second stage is accounting.

[A]. *BOOK KEEPING*:

Book keeping involves the chronological recording of financial transactions in a set of books in a systematic manner

"Book keeping is the system of recording Business transactions for the purpose of providing reliable information to the owners and managers about the state and prospect of the Business concepts".

Thus Book keeping is an art of recording business transactions in the books of original entry and the ledges.

[B]. *ACCOUNTING*: Accounting begins where the Bookkeeping ends

1. SMITH AND ASHBUNNE: Accounting means "measuring and reporting the results of economic activities".

2. *R.N ANTHONY*: Accounting is a system of "collecting, summarizing, Analyzing and reporting in monster terms, the information about the Business".

3. *ICPA:* Recording, classifying and summarizing is a significant manner and in terms of money transactions and events, which are in part at least, of a financial character and interpreting the results there.

Thus accounting is an art of recording, classifying, summarizing and interpreting business transactions of financial nature. Hence accounting is the "Language of Business".

ADVANTAGE OF ACCOUNTING

The following are the advantages of Accounting……

1. *PROVIDES FOR SYSTEMATIC RECORDS*: Since all the financial transactions are recorded in the books, one need not rely on memory. Any information required is readily available from these records.
2. *FACILITATES THE PRPARATION OF FINANCIAL STATEMENTS*: Profit and Loss account and balance sheet can be easily prepared with the help of the information in the records. This enables the trader to know the

net result of Business operations (i.e. profit/loss) during the accounting period and the financial position of the business at the end of the accounting period.

3. *PROVIDES CONTROL OVER ASSETS*: Book keeping provides information regarding cash in hand, cash at hand, stack of goods, accounts receivable from various parties and the amounts invested in various other assets. As the trader knows the values of the assets he will have control over them.
4. *PROVIES THE REQUIRED INFORMATION*: Interested parties such as owners, lenders, creditors etc, get necessary information at frequent intervals.
5. *COMPARITIVE STUDY*: One can compare present performance of the organization with that of its past. This enables the managers to draw useful conclusions and make proper decisions.
6. *LESS SCOPE FOR FRAUD OR THEFT*: It is difficult to conceal fraud or theft etc. because of the balancing of the books of accounts periodically. As the work is divided among many persons, there will be check and counter check.
7. TAX MALTERS: Properly maintained Book keeping records will help in the settlement of all tax matters with the tax authorities.
8. *ASCERTAINING VALUE OF BUSINESS*: The accounting records will help in ascertaining the correct value of the Business. This helps in the event of sale or purchase of a business.
9. *DOCUMENTARY EVIDENCE*: Accounting records can also be used as evidence in the court of substantial the claim of the Business. Thus records are based on documentary proof. Authentic vouchers support every entry. As such, courts accept these records as evidence.

10.*HELPFUL TO MANAGEMENT*: Accounting is useful to the management in various ways. It enables the management to assess the achievement of its performance. The weaknesses of the business can be identified and corrective measures can be applied to remove them with the help of accounting.

LIMITATIONS OF ACCOUNTING

The following are the limitations of accounting……..

1.*DOES NOT RECORD ALL EVENTS*: Only the transactions of a financial character will be recorded under book keeping. So it does not reveal a complete picture about the quality of human resources, locational advantages, business contacts etc.

2.*DOES NOT REFLECT CURRENT VLAUES*: The data available under book keeping is historical in nature. So they do not reflect current values. For instance we record the values of stock at cost price or market price, which ever is less. In case of building, machinery etc., we adapt historical case as the basis. Infact, the current values of Buildings, plant and machinery may be much more than what is recorded in the balance sheet.

3. *ESTIMATES BASED ON PERSONAL JUDGEMENT*: The estimates used for determining the values of various items may not be correct. For example, debtors are estimated in terms of collectibles, inventories are based on marketability and fixed assets are based on useful working life. These estimates are based on personal judgment and hence sometimes may not be correct.

4. *INADEQUATE INFORMATION ON COSTS AND PROFITS*: Book keeping only provides information about over all profitability of the business. No information is given about the cost and profitability of different activities of products or divisions.

Accounting is a system evolved to achieve a set of objectives. In order to achieve the goals, we need a set of rules or guidelines. These guidelines are termed here as "BASIC ACCOUNTING ONCEPTS". The term concept means an idea or thought. Basic accounting concepts are the fundamental ideas or basic assumptions underlying the theory and profit of FINANCIAL ACCOUNTING. These concepts help in bringing about uniformity in the practice of accounting. In accordance following concepts are evolved

1. *BUSINESS ENTITY CONEPT*: In this concept "Business is treated as separate from the proprietor". All the Transactions recorded in the book of Business and not in the books of proprietor. The proprietor is also treated as a creditor for the Business.

2. *GOING CONCERN CONCEPT*: This concept relates with the long life of Business. The assumption is that business will continue to exist for unlimited period unless it is dissolved due to some reasons or the other.

3. *MONEY MEASUREMENT CONCEPT*: In this concept "Only those transactions are recorded in accounting which can be expressed in terms of money, those transactions which can not be expressed in terms of money are not recorded in the books of accounting".

4. *COST CONCEPT*: Accounting to this concept, can asset is recorded at its cost in the books of account. i.e., the price, which is paid at the time of acquiring it. In balance sheet, these assets appear not at cost price every year, but depreciation is deducted and they appear at the amount, which is cost, less classification.

5. *ACCOUNTING PERIOD CONCEPT*: every Businessman wants to know the result of his investment and efforts after a certain period. Usually one-year period is regarded as an ideal for this purpose. This period is called Accounting Period. It depends on the nature of the business and object of the proprietor of business.

6. *DUAL ASCEPT CONCEPT*: According to this concept "Every business transactions has two aspects", one is the receiving benefit aspect another one is giving benefit aspect. The receiving benefit aspect is termed as "DEBIT", where as the giving benefit aspect is termed as "CREDIT". Therefore, for every debit, there will be corresponding credit.

7. *MATCHING COST CONCEPT*: According to this concept "The expenses incurred during an accounting period, e.g., if revenue is recognized on all goods sold during a period, cost of those good sole should also Be charged to that period.

8. *REALISATION CONCEPT*: According to this concept revenue is recognized when a sale is made. Sale is Considered to be made at the point when the property in goods posses to the buyer and he becomes legally liable to pay.

ACCOUNTING CONVENTIONS

Accounting is based on some customs or usages. Naturally accountants here to adopt that usage or custom. They are termed as convert conventions in accounting. The following are some of the important accounting conventions.

1.*FULL DISCLOSURE*: According to this convention accounting reports should disclose fully and fairly the information. They purport to represent. They should be prepared honestly and sufficiently disclose information which is if material interest to proprietors, present and potential creditors and investors. The companies ACT, 1956 makes it compulsory to provide all the information in the prescribed form.

2.*MATERIALITY*: Under this convention the trader records important factor about the commercial activities. In the form of financial statements if any unimportant information is to be given for the sake of clarity it will be given as footnotes.

3.*CONSISTENCY*: It means that accounting method adopted should not be changed from year to year. It means that there should be consistent in the methods or principles followed. Or else the results of a year Cannot be conveniently compared with that of another.

4. *CONSERVATISM*: This convention warns the trader not to take unrealized income in to account. That is why the practice of valuing stock at cost or market price, which ever is lower is in vague. This is the policy of "playing safe"; it takes in to consideration all prospective losses but leaves all prospective profits.

KEY WORDS IN BOOK-KEEPING:

1. *TRANSACTIONS*: Any sale or purchase of goods of services is called the transaction.

Transactions are two types.

[a]. cash transaction: cash transaction is one where cash receipt or payment is involved in the exchange.

[b]. Credit transaction: Credit transaction will not have cash, either received or paid, for something given or received respectively.

2.*GOODS*: Fill those things which a firm purchases for resale are called goods.

3.*PURCHASES*: Purchases means purchase of goods, unless it is stated otherwise it also represents the Goods purchased.

4.*SALES*: Sales means sale of goods, unless it is stated otherwise it also represents these goods sold.

5.*EXPENSES*: Payments for the purchase of goods as services are known as expenses.

6.*REVENUE*: Revenue is the amount realized or receivable from the sale of goods or services.

7.*ASSETS*: The valuable things owned by the business are known as assets. These are the properties Owned by the business.

8.*LIABILITIES*: Liabilities are the obligations or debts payable by the enterprise in future in the term Of money or goods.

9*. DEBTORS*: Debtors means a person who owes money to the trader.

10.*CREDITORS*: A creditor is a person to whom something is owned by the business.

11.*DRAWINGS*: cash or goods withdrawn by the proprietor from the Business for his personal or Household is termed to as "drawing".

12.*RESERVE*: An amount set aside out of profits or other surplus and designed to meet contingencies.

13.*ACCOUNT*: A summarized statements of transactions relating to a particular person, thing, Expense or income.

14.*DISCOUNT*: There are two types of discounts..

a. cash discount: An allowable made to encourage frame payment or before the expiration of the period allowed for credit.
b. Trade discount: A deduction from the gross or catalogue price allowed to traders who buys them for resale.

CLASSIFICATION OF BUSINESS TRANSACTIONS

All business transactions are classified into three categories:

1.Those relating to persons

2.Those relating to property(Assets)

3.Those relating to income & expenses

Thus, three classes of accounts are maintained for recording all business transactions. They are:

1.Personal accounts

2.Real accounts

3.Nominal accounts

1.*Personal Accounts* :Accounts which are transactions with persons are called "Personal Accounts" .

A separate account is kept on the name of each person for recording the benefits received from ,or given to the person in the course of dealings with him.

E.g.: Krishna's A/C, Gopal's A/C, SBI A/C, Nagarjuna Finanace Ltd.A/C, ObulReddy & Sons A/C , HMT Ltd. A/C, Capital A/C, Drawings A/C etc.

2.*Real Accounts*: The accounts relating to properties or assets are known as "Real Accounts" .Every business needs assets such as machinery , furniture etc, for running its activities .A separate account is maintained for each asset owned by the business .

E.g.: cash A/C, furniture A/C, building A/C, machinery A/C etc

3.*NominalAccounts*:Accounts relating to expenses, losses, incomes and gains are known as "Nominal Accounts". A separate account is maintained for each item of expenses, losses, income or gain.

E.g.: Salaries A/C, stationery A/C, wages A/C, postage A/C, commission A/C, interest A/C, purchases A/C, rent A/C, discount A/C, commission received A/C, interest received A/C, rent received A/C, discount received A/C.

Before recording a transaction, it is necessary to find out which of the accounts is to be debited and which is to be credited. The following three different rules have been laid down for the three classes of accounts….

1.*Personal Accounts*: The account of the person receiving benefit (receiver) is to be debited and the account of the person giving the benefit (given) is to be credited.

> ***Rule***: "Debit----The Receiver
> Credit---The Giver"

2.*Real Accounts*: When an asset is coming into the business, account of that asset is to be debited .When an asset is going out of the business, the account of that asset is to be credited.

> ***Rule***: "Debit----What comes in
> Credit---What goes out"

3. *Nominal Accounts*: When an expense is incurred or loss encountered, the account representing the expense or loss is to be debited . When any income is earned or gain made, the account representing the income of gain is to be credited.

> ***Rule***: "Debit----All expenses and losses
> Credit---All incomes and gains"

Preparation of journal ,ledger and trail balance:

Journal:

The first step in accounting therefore is the record of all the transactions in the books of original entry viz., Journal and then posting into ledges.

JOURNAL: The word Journal is derived from the Latin word 'journ' which means a day. Therefore, journal means a 'day Book' in day-to-day business transactions are recorded in chronological order.

Journal is treated as the book of original entry or first entry or prime entry. All the business transactions are recorded in this book before they are posted in the ledges. The journal is a complete and chronological(in order of dates) record of business transactions. It is recorded in a systematic manner. The process of recording a transaction in the journal is called "JOURNALISING". The entries made in the book are called "Journal Entries".

The proforma of Journal is given below.

Date	Particulars	L.F. no	Debit RS.	Credit RS.
1998 Jan 1	Purchases account to cash account(being goods purchased for cash)		10,000/-	10,000/-

ledger:

All the transactions in a journal are recorded in a chronological order. After a certain period, if we want to know whether a particular account is showing a debit or credit balance it becomes very difficult. So, the ledger is designed to accommodate the various accounts maintained the trader. It contains the final or permanent record of all the transactions in duly classified form. "A ledger is a book which contains various accounts." The process of transferring entries from journal to ledger is called "POSTING".

Posting is the process of entering in the ledger the entries given in the journal. Posting into ledger is done periodically, may be weekly or fortnightly as per the convenience of the business. The following are the guidelines for posting transactions in the ledger.

1. After the completion of Journal entries only posting is to be made in the ledger.
2. For each item in the Journal a separate account is to be opened. Further, for each new item a new account is to be opened.
3. Depending upon the number of transactions space for each account is to be determined in the ledger.
4. For each account there must be a name. This should be written in the top of the table. At the end of the name, the word "Account" is to be added.
5. The debit side of the Journal entry is to be posted on the debit side of the account, by starting with "TO".
6. The credit side of the Journal entry is to be posted on the debit side of the account, by starting with "BY".

Proforma for ledger: ***LEDGER BOOK***

Particulars account

Date	Particulars	Lfno	Amount	Date	Particulars	Lfno	amount

sales account

Date	Particulars	Lfno	Amount	Date	Particulars	Lfno	amount

cash account

Date	Particulars	Lfno	Amount	Date	Particulars	Lfno	amount

Trail balance:

The first step in the preparation of final accounts is the preparation of trail balance. In the double entry system of book keeping, there will be credit for every debit and there will not be any debit without credit. When this principle is followed in writing journal entries, the total amount of all debits is equal to the total amount all credits.A trail balance is a statement of debit and credit balances. It is prepared on a particular date with the object of checking the accuracy of the books of accounts. It indicates that all the transactions for a particular period have been duly entered in the book, properly posted and balanced. The trail balance doesn't include stock in hand at the end of the period. All adjustments required to be done at the end of the period including closing stock are generally given under the trail balance.

*DEFINITIONS: SPICER AND POGLAR :*A trail balance is a list of all the balances standing on the ledger accounts and cash book of a concern at any given date.

J.R.BATLIBOI:

A trail balance is a statement of debit and credit balances extracted from the ledger with a view to test the arithmetical accuracy of the books.

Thus a trail balance is a list of balances of the ledger accounts' and cash book of a business concern at any given date.

PROFORMA FOR TRAIL BALANCE:

Trail balance for MR…… as on ……

NO	NAME OF ACCOUNT (PARTICULARS)	DEBIT AMOUNT(RS.)	CREDIT AMOUNT(RS.)

Specimen of trial balance

1	Capital	Credit	Loan
2	Opening stock	Debit	Asset
3	Purchases	Debit	Expense
4	Sales	Credit	Gain
5	Returns inwards	Debit	Loss
6	Returns outwards	Debit	Gain
7	Wages	Debit	Expense
8	Freight	Debit	Expense
9	Transport expenses	Debit	Expense
10	Royalities on production	Debit	Expense
11	Gas, fuel	Debit	Expense
12	Discount received	Credit	Revenue
13	Discount allowed	Debit	Loss
14	Bas debts	Debit	Loss
15	Dab debts reserve	Credit	Gain
16	Commission received	Credit	Revenue
17	Repairs	Debit	Expense
18	Rent	Debit	Expense
19	Salaries	Debit	Expense
20	Loan Taken	Credit	Loan
21	Interest received	Credit	Revenue
22	Interest paid	Debit	Expense
23	Insurance	Debit	Expense
24	Carriage outwards	Debit	Expense
25	Advertisements	Debit	Expense
26	Petty expenses	Debit	Expense
27	Trade expenses	Debit	Expense
28	Petty receipts	Credit	Revenue
29	Income tax	Debit	Drawings
30	Office expenses	Debit	Expense
31	Customs duty	Debit	Expense
32	Sales tax	Debit	Expense
33	Provision for discount on debtors	Debit	Liability
34	Provision for discount on creditors	Debit	Asset
35	Debtors	Debit	Asset
36	Creditors	Credit	Liability
37	Goodwill	Debit	Asset
38	Plant, machinery	Debit	Asset
39	Land, buildings	Debit	Asset
40	Furniture, fittings	Debit	Asset
41	Investments	Debit	Asset
42	Cash in hand	Debit	Asset
43	Cash at bank	Debit	Asset

44	Reserve fund	Credit	Liability
45	Loan advances	Debit	Asset
46	Horse, carts	Debit	Asset
47	Excise duty	Debit	Expense
48	General reserve	Credit	Liability
49	Provision for depreciation	Credit	Liability
50	Bills receivable	Debit	Asset
51	Bills payable	Credit	Liability
52	Depreciation	Debit	Loss
53	Bank overdraft	Credit	Liability
54	Outstanding salaries	Credit	Liability
55	Prepaid insurance	Debit	Asset
56	Bad debt reserve	Credit	Revenue
57	Patents & Trademarks	Debit	Asset
58	Motor vehicle	Debit	Asset
59	Outstanding rent	Credit	Revenue

Preparation of financial statements:

FINAL ACCOUNTS

In every business, the business man is interested in knowing whether the business has resulted in profit or loss and what the financial position of the business is at a given time. In brief, he wants to know (i)The profitability of the business and (ii) The soundness of the business.

The trader can ascertain this by preparing the final accounts. The final accounts are prepared from the trial balance. Hence the trial balance is said to be the link between the ledger accounts and the final accounts. The final accounts of a firm can be divided into two stages. The first stage is preparing the trading and profit and loss account and the second stage is preparing the balance sheet.

TRADING ACCOUNT

The first step in the preparation of final account is the preparation of trading account. The main purpose of preparing the trading account is to ascertain gross profit or gross loss as a result of buying and selling the goods.

TRADING ACCOUNT

The first step in the preparation of final account is the preparation of trading account. The main purpose of preparing the trading account is to ascertain gross profit or gross loss as a result of buying and selling the goods. , profit and loss account and later in balance sheet generally". The following are some of the important adjustments to be made at the time of preparing of final accounts:-

Trading account of MR……. for the year ended ……

Particulars	Amount	Particulars	Amount
To opening stock	Xxxx	By sales xxxx	
To purchases xxxx		Less: returns xxx	Xxxx
Less: returns xx	Xxxx	By closing stock	Xxxx
To carriage inwards	Xxxx		
To wages	Xxxx		
To freight	Xxxx		
To customs duty, octroi	Xxxx		
To gas, fuel, coal, Water	Xxxx		
To factory expenses			
To other man. Expenses	Xxxx		
To productive expenses	Xxxx		
To gross profit c/d	Xxxx		Xxxx
	Xxxx		
	Xxxx		

Finally, a ledger may be defined as a summary statement of all the transactions relating to a person , asset, expense or income which have taken place during a given period of time. The up-to-date state of any account can be easily known by referring to the ledger.

PROFIT AND LOSS ACCOUNT

The business man is always interested in knowing his net income or net profit.Net profit represents the excess of gross profit plus the other revenue incomes over administrative, sales, Financial and other expenses. The debit side of profit and loss account shows the expenses and the credit side the incomes. If the total of the credit side is more, it will be the net profit. And if the debit side is more, it will be net loss.

PROFIT AND LOSS A/C OF MR…….FOR THE YEAR ENDED……

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
TO office salaries	Xxxxxx	By gross profit b/d	Xxxxx
TO rent,rates,taxes	Xxxxx	Interest received	Xxxxx
TO Printing and stationery	Xxxxx	Discount received	Xxxx
TO Legal charges		Commission received	Xxxxx
Audit fee	Xxxx	Income from	
TO Insurance	Xxxx	investments	
TO General expenses	Xxxx	Dividend on shares	Xxxx
TO Advertisements	Xxxxx	Miscellaneous	Xxxx
TO Bad debts	Xxxx	investments	
TO Carriage outwards	Xxxx	Rent received	xxxx
TO Repairs	Xxxx		
TO Depreciation	Xxxxx		
TO interest paid	Xxxxx		
TO Interest on capital	Xxxxx		
TO Interest on loans	Xxxx		
TO Discount allowed	Xxxxx		
TO Commission	Xxxxx		
TO Net profit-------→	Xxxxx		
(transferred to capital a/c)			
	xxxxxx		Xxxxxx

BALANCE SHEET

The second point of final accounts is the preparation of balance sheet. It is prepared often in the trading and profit, loss accounts have been compiled and closed. A balance sheet may be considered as a statement of the financial position of the concern at a given date.

DEFINITION: A balance sheet is an item wise list of assets, liabilities and proprietorship of a business at a certain state.

J.R.botliboi: A balance sheet is a statement with a view to measure exact financial position of a business at a particular date.

Thus, Balance sheet is defined as a statement which sets out the assets and liabilities of a business firm and which

statement, the liabilities and the capital are shown. On the right-hand side all the assets are shown. Therefore, the two sides of the balance sheet should be equal. Otherwise, there is an error somewhere.

BALANCE SHEET OF …… AS ON …….

Liabilities and capital	Amount	Assets	Amount
Creditors	Xxxx	Cash in hand	Xxxx
Bills payable	Xxxx	Cash at bank	Xxxx
Bank overdraft	Xxxx	Bills receivable	Xxxx
Loans	Xxxx	Debtors	Xxxx
Mortgage	Xxxx	Closing stock	Xxxx
Reserve fund	Xxxx	Investments	Xxxx
Capital xxxxxx		Furniture and fittings	Xxxx
Add:		Plats&machinery	
Net Profit xxxx		Land & buildings	Xxxx
-------		Patents, tm ,copyrights	Xxxx
xxxxxxx		Goodwill	Xxxx
--------		Prepaid expenses	
		Outstanding incomes	Xxxx
Less:			Xxxx
Drawings xxxx	Xxxx		Xxxx
---------	XXXX		XXXX

Advantages: The following are the advantages of final balance .

1. It helps in checking the arithmetical accuracy of books of accounts.
2. It helps in the preparation of financial statements.
3. It helps in detecting errors.
4. It serves as an instrument for carrying out the job of rectification of entries.
5. It is possible to find out the balances of various accounts at one place.

FINAL ACCOUNTS -- ADJUSTMENTS

We know that business is a going concern. It has to be carried on indefinitely. At the end of every accounting year. The trader prepares the trading and profit and loss account and balance sheet. While preparing these financial statements, sometimes the trader may come across certain problems .The expenses of the current year may be still payable or the expenses of the next year have been prepaid during the current year. In the same way, the income of the current year still receivable and the income of the next year have been received during the current year. Without these adjustments, the profit figures arrived at or the financial position of the concern may not be correct. As such these adjustments are to be made while preparing the final accounts.

The adjustments to be made to final accounts will be given under the Trial Balance. While making the adjustment in the final accounts, the student should remember that "every adjustment is to be made in the final accounts twice i.e. once in trading

1. *CLOSING STOCK* :-

(i)*If closing stock is given in Trail Balance*: It should be shown only in the balance sheet "Assets Side".

(ii)*If closing stock is given as adjustment* :

1. First, it should be posted at the credit side of "Trading Account".

2. Next, shown at the asset side of the "Balance Sheet".

2.*OUTSTANDING EXPENSES* :-

(i)*If outstanding expenses given in Trail Balance*: It should be only on the liability side of Balance Sheet.

(ii)*If outstanding expenses given as adjustment* :

1. First, it should be added to the concerned expense at the debit side of profit and loss account or Trading Account.
2. Next, it should be added at the liabilities side of the Balance Sheet.

3.*PREAPID EXPENSES* :-

(i)*If prepaid expenses given in Trial Balance*: It should be shown only in assets side of the Balance Sheet.

(ii)*If prepaid expense given as adjustment* :

1. First, it should be deducted from the concerned expenses at the debit side of profit and loss account or Trading Account.
2. Next, it should be shown at the assets side of the Balance Sheet.

4.*INCOME EARNED BUT NOT RECEIVED [OR] OUTSTANDING INCOME [OR] ACCURED INCOME* :-

(i)*If incomes given in Trial Balance*: It should be shown only on the assets side of the Balance Sheet.

(ii)*If incomes outstanding given as adjustment*:

1. First, it should be added to the concerned income at the credit side of profit and loss account.
2. Next, it should be shown at the assets side of the Balance sheet.

5. *INCOME RECEIVED IN ADVANCE: UNEARNED INCOME*:-

(i)*If unearned incomes given in Trail Balance* : It should be shown only on the liabilities side of the Balance Sheet.

(ii)*If unearned income given as adjustment* :

1. First, it should be deducted from the concerned income in the credit side of the profit and loss account.
2. Secondly, it should be shown in the liabilities side of the Balance Sheet.

6.*DEPRECIATION*:-

(i)*If Depreciation given in Trail Balance*: It should be shown only on the debit side of the profit and loss account.

(ii)*If Depreciation given as adjustment*

1. First, it should be shown on the debit side of the profit and loss account.
2. Secondly, it should be deduced from the concerned asset in the Balance sheet assets side.

7.*INTEREST ON LOAN [OR] CAPITAL* :-

(i)*If interest on loan (or) capital given in Trail balance* :It should be shown only on debit side of the profit and loss account.

(ii)*If interest on loan (or)capital given as adjustment* :

1. First, it should be shown on debit side of the profit and loss account.
2. Secondly, it should added to the loan or capital in the liabilities side of the Balance Sheet.

8.*BAD DEBTS*:-

(i)*If bad debts given in Trail balance* :It should be shown on the debit side of the profit and loss account.

(ii)*If bad debts given as adjustment*:

1. First, it should be shown on the debit side of the profit and loss account.
2. Secondly, it should be deducted from debtors in the assets side of the Balance Sheet.

9.*INTEREST ON DRAWINGS* :-

(i)*If interest on drawings given in Trail balance*: It should be shown on the credit side of the profit and loss account.

(ii)*If interest on drawings given as adjustments*

1. First, it should be shown on the credit side of the profit and loss account.
2. Secondly, it should be deducted from capital on liabilities side of the Balance Sheet.

10.*INTEREST ON INVESTMENTS* :-

(i)*If interest on the investments given in Trail balance* :It should be shown on the credit side of the profit and loss account.

(ii)*If interest on investments given as adjustments* :

1. First, it should be shown on the credit side of the profit and loss account.
2. Secondly, it should be added to the investments on assets side of the Balance Sheet.

Note: Problems to be solved on final accounts

SUBSIDIARY BOOKS

In a small business concern, the numbers of transactions are limited. These transactions are first recorded in the journal as and when they take place. Subsequently, these transactions are posted in the appropriate accounts of the ledger. Therefore, the journal is known as "Book Of Original Entry" or "Book of Prime Entry" while the ledger is known as main book of accounts.

On the other hand, the transactions in big concern are numerous and sometimes even run into thousands and lakhs. It is inconvenient and time wasting process if all the transactions are going to be managed with a journal. Therefore, a convenient device is made. Smaller account books known as subsidiary books or subsidiary journals are disturbed to various sections of the business house. As and when transactions take place, they are recorded in these subsidiary books simultaneously without delay. The original journal (which is known as Journal Proper) is used only occasionally to record those transactions which cannot be recorded in any of the subsidiary books.

TYPES OF SUBSIDIARY BOOKS:-- Subsidiary books are divided into eight types. They are,

1.Purchases Book
2.Sales Book
3.Purchase Returns Book
4.Sales Returns Book
5.Cash Book
6.Bills Receivable Book
7.Bills Payable Book
8.Journal Proper

1. *PURCHASES BOOK* :- This book records all credit purchases only. Purchase of goods for cash and purchase of assets for cash. Credit will not be recorded in this book. Purchases book is otherwise called Purchases Day Book, Purchases Journal or Purchases Register.

2. *SALES BOOK* :-This book is used to record credit sales only. Goods are sold for cash and sale of assets for cash or credit will not be recorded in this book. This book is otherwise called Sales Day Book, Sales Journal or Sales Register.

3.*PURCHASE RETURNS BOOK* :- This book is used to record the particulars of goods returned to the suppliers .This book is otherwise called Returns Outward Book.

4.*SALES RETURNS BOOK* :- This book is used to record the particulars of goods returned by the customers. This book is otherwise called Returns Inward Book.

5.*CASH BOOK* :- All cash transactions , receipts and payments are recorded in this book. Cash includes cheques, money orders etc.

6.*BILLS REECEIVABLE BOOK* :- This book is used to record all the bills and promissory notes are received from the customers.

7.*BILLS PAYABLE BOOK* :- This book is used to record all the bills or promissory notes accepted to the suppliers.

8.*JOURNAL PROPER* :- This is used to record all the transactions that cannot be recorded in any of the above mentioned subsidiary books.

FORMAT FOR PURCHASE BOOK

Date	Name of supplier	Invoice No	Lf no	Details	Amount(Rs.)

FORMAT FOR SALES BOOK

Date	Name of customer	Invoice No	Lf no	Details	Amount(Rs.)

FORMAT FOR PURCHASE RETURNS BOOK

Date	Name of supplier	Debit note No	Lf no	Details	Amount(Rs.)

FORMAT FOR SALES RETURNS BOOK

Date	Name of supplier	Credit note No	Lf no	Details	Amount(Rs.)

CASH BOOK

Cash book plays an important role in accounting. Whether transactions made are in the form of cash or credit, final statement will be in the form of receipt or payment of cash. So, every transaction finds place in the cash book finally.

Cash book is a principal book as well as the subsidiary book. It is a book of original entry since the transactions are recorded for the first time from the source of documents. It is a ledger in a sense it is designed in the form of

cash account and records cash receipts on the debit side and the cash payments on the credit side. Thus, a cash book fulfils the functions of both a ledger account and a journal.

Cash book is divided into two sides. Receipt side (debit side) and payment side (credit side). The method of recording cash sample is very simple. All cash receipts will be posted on the debit side and all the payments will be recorded on the credit side.

Types of cash book: cash book may be of the following types according to the needs of the business.

- Simple cash book
- Double column or two column cash book
- Three column cash book
- Petty cash book

SINGLE COLUMN CASH BOOK: The simple cash book is a record of only cash transactions. The model of the cash book is given below.

CASH BOOK

TWO

Date	Particulars	Lf no	Amount	Date	Particulars	Lf no	Amount

COLUMN CASH BOOK: This book has two columns on each side one for discount and the other for cash. Discount column on debit side represents loss being discount allowed to customers. Similarly, discount column on credit side represents gain being discount received.

Discount may be two types.

(i)Trade discount

(ii)cash discount

TRADE DISCOUNT: when a retailer purchases goods from the wholesaler, he allows some discount on the catalogue price. This discount is called as Trade discount. Trade discount is adjusted in the invoice and the net amount is recorded in the purchase book. As such it will not appear in the book of accounts.

CASH DISCOUNT: When the goods are purchased on credit, payment will be made in the future as agreed by the parties. If the amount is paid early as promptly a discount by a way of incentive will be allowed by the seller to the buyer. This discount is called as cash discount. So cash discount is the discount allowed by the seller to encourage prompt payment from the buyer. Cash discount is entered in the discount column of the cash book. The discount recorded in the debit side of the cash book is discount allowed. The discount recorded in the credit side of the cash book is discount received.

CASH DISCOUNT COLUMN CASH BOOK

Date	particulars	Lf no	Disc. Allo wed	cash	Date	Particulars	Lf No	Disc Recei Ved.	cash

PETTY CASH BOOK: We have seen that all the cash receipts and payments will be recorded in the cash book. But in the case of big concerns if all transactions like postage, cleaning charges, etc., are recorded in the cash book, the cash book becomes bulky and un wieldy. So, all petty disbursement of cash is recorded in a separate cash book called petty cash book.

Note: Problems to be solved on subsidiary books

FINANCIAL STATEMENT ANALYSIS THROUGH RATIOS:

Ratio Analysis

Absolute figures are valuable but they standing alone convey no meaning unless compared with another. Accounting ratio show inter-relationships which exist among various accounting data. When relationships among various accounting data supplied by financial statements are worked out, they are known as accounting ratios.

Accounting ratios can be expressed in various ways such as:

1. a pure ratio says ratio of current assets to current liabilities is 2:1 or
2. a rate say current assets are two times of current liabilities or
3. a percentage say current assets are 200% of current liabilities.

Each method of expression has a distinct advantage over the other the analyst will selected that mode which will best suit his convenience and purpose.

Uses or Advantages or Importance of Ratio Analysis

Ratio Analysis stands for the process of determining and presenting the relationship of items and groups of items in the financial statements. It is an important technique of financial analysis. It is a way by which financial stability and health of a concern can be judged. The following are the main uses of Ratio analysis:

(a) Useful in financial position analysis: Accounting reveals the financial position of the concern. This helps banks, insurance companies and other financial institution in lending and making investment decisions.

(ii) Useful in simplifying accounting figures: Accounting ratios simplify, summaries and systematic the accounting figures in order to make them more understandable and in lucid form.

(iii) Useful in assessing the operational efficiency: Accounting ratios helps to have an idea of the working of a concern. The efficiency of the firm becomes evident when analysis is based on accounting ratio. This helps the management to assess financial requirements and the capabilities of various business units.

(iv) Useful in forecasting purposes: If accounting ratios are calculated for number of years, then a trend is established. This trend helps in setting up future plans and forecasting.

(v) Useful in locating the weak spots of the business: Accounting ratios are of great assistance in locating the weak spots in the business even through the overall performance may be efficient.

(vi) Useful in comparison of performance: Managers are usually interested to know which department performance is good and for that he compare one department with the another department of the same firm. Ratios also help him to make any change in the organisation structure.

Limitations of Ratio Analysis:

These limitations should be kept in mind while making use of ratio analyses for interpreting the financial statements. The following are the main limitations of ratio analysis.

1. False results if based on incorrect accounting data: Accounting ratios can be correct only if the data (on which they are based) is correct. Sometimes, the information given in the financial statements is affected by window dressing, i. e. showing position better than what actually is.
2. No idea of probable happenings in future: Ratios are an attempt to make an analysis of the past financial statements; so they are historical documents. Now-a-days keeping in view the complexities of the business, it is important to have an idea of the probable happenings in future.
3. Variation in accounting methods: The two firms' results are comparable with the help of accounting ratios only if they follow the some accounting methods or bases. Comparison will become difficult if the two concerns follow the different methods of providing depreciation or valuing stock.
4. Price level change: Change in price levels make comparison for various years difficult.
5. Only one method of analysis: Ratio analysis is only a beginning and gives just a fraction of information needed for decision-making so, to have a comprehensive analysis of financial statements, ratios should be used along with other methods of analysis.
6. No common standards: It is very difficult to by down a common standard for comparison because circumstances differ from concern to concern and the nature of each industry is different.
7. Different meanings assigned to the some term: Different firms, in order to calculate ratio may assign different meanings. This may affect the calculation of ratio in different firms and such ratio when used for comparison may lead to wrong conclusions.
8. Ignores qualitative factors: Accounting ratios are tools of quantitative analysis only. But sometimes qualitative factors may surmount the quantitative aspects. The calculations derived from the ratio analysis under such circumstances may get distorted.
9. No use if ratios are worked out for insignificant and unrelated figure: Accounting ratios should be calculated on the basis of cause and effect relationship. One should be clear as to what cause is and what effect is before calculating a ratio between two figures.

Ratio Analysis: Ratio is an expression of one number is relation to another. It is one of the methods of analyzing financial statement. Ratio analysis facilities the presentation of the information of the financial statements in simplified and summarized from. Ratio is a measuring of two numerical positions. It expresses the relation between two numeric figures. It can be found by dividing one figure by another ratios are expressed in three ways.

1. Jines method
2. Ratio Method
3. Percentage Method

Classification of ratios: All the ratios broadly classified into four types due to the interest of different parties for different purposes. They are:

1. Profitability ratios
2. Turn over ratios
3. Financial ratios
4. Leverage ratios

1. Profitability ratios: These ratios are calculated to understand the profit positions of the business. These ratios measure the profit earning capacity of an enterprise. These ratios can be related its save or capital to a certain margin on sales or profitability of capital employ. These ratios are of interest to management. Who are responsible for success and growth of enterprise? Owners as well as financiers are interested in profitability ratios as these reflect ability of enterprises to generate return on capital employ important profitability ratios are:

   Profitability ratios in relation to sales: Profitability ratios are almost importance of concern. These ratios are calculated is focus the end results of the business activities which are the sole eritesiour of overall efficiency of organisation.

UNIT – 5

Capital management and capital budgeting

CAPITAL MANAGEMENT AND CAPITAL BUDGETING:

Classification or kinds of working capital:

Working capital may be classified in two ways:

a. On the basis of concept.
b. On the basis of time permanency

On the basis of concept, working capital is classified as gross working capital and net working capital is discussed earlier. This classification is important from the point of view of the financial manager. On the basis of time, working capital may be classified as:

1. Permanent or fixed working capital
2. Temporary of variable working capital

1. **Permanent or fixed working capital**: There is always a minimum level of current assets, which is continuously required by the enterprise to carry out its normal business operations and this minimum is known as permanent of fixed working capital. For example, every firm has to maintain a minimum level of raw materials, work in process; finished goods and cash balance to run the business operations smoothly and profitably. This minimum level of current assets is permanently blocked in current assets. As the business grows, the requirement of permanent working capital also increases due to the increases in current assets. The permanent working capital can further be classified into regular working capital and reserve working capital. Regular working capital is the minimum amount of working capital required to ensure circulation of current assets from cash to inventories, from inventories to receivables and from receivable to cash and so on. Reserve working capital is the excess amount over the requirement for regular working capital which may be provided for contingencies that may arise at unstated period such as strikes, rise in prices, depression etc.
2. **Temporary or variable working capital**: Temporary or variable working capital is the amount of working capital, which is required to meet the seasonal demands and some special exigencies. Thus the variable working capital can be further classified into seasonal working capital and special working capital. While seasonal working capital is required to meet certain seasonal demands, the special working capital is that part of working capital which is required to meet special exigencies such as launching of extensive marketing campaigns, for conducting research etc.

   Temporary working capital differs from permanent working capital in the sense that it is required for short periods and cannot be permanently employed gainfully in the business. Figures given below illustrate the different between permanent and temporary working capital.

Meaning of capital budgeting:

Capital budgeting – the long – term investment decision – is probably the most crucial financial decision of a firm. It relates to the selection of an assent or investment proposal or course of action that benefits are likely to be available in future over the lifetime of the project.

The long-term investment may relate to acquisition of new asset or replacement of old assets. Whether an asset

the worth of the investment proposals is, therefore, a major element in the capital budgeting exercise. The second element of the capital budgeting decision is the analysis of risk and uncertainty as the benefits from the investment proposals pertain the future, which is uncertain. They have to be estimated under various assumptions and thus there is an element of risk involved in the exercise. The return from the capital budgeting decision should, therefore, be evaluated in relation to the risk associated with it.

The third and final element is the ascertainment of a certain norm or standard against which the benefits are to be judged. The norm is known by different names such as cut-off rate, hurdle rate, required rate, minimum rate of return and so on. This standard is broadly expressed in terms of the cost of capital is, thus, another major aspect of the capital; budgeting decision. In brief, the main elements of the capital budgeting decision are:

1. The total assets and their composition
2. The business risk complexion of the firm, and
3. concept and measurement of the cost of capital.

Importance of working capital:

Working capital is refereed to be the lifeblood and nerve center of a business. Working capital is as essential to maintain the smooth functioning of a business as blood circulation in a human body. No business can run successfully with out an adequate amount of working capital. The main advantages of maintaining adequate amount of working capital are as follows:

1. **Solvency of the business**: Adequate working capital helps in maintaining solvency of the business by providing uninterrupted flow of production.
2. **Good will**: Sufficient working capital enables a business concern to make prompt payment and hence helps in creating and maintaining good will.
3. **Easy loans**: A concern having adequate working capital, high solvency and good credit standing can arrange loans from banks and others on easy and favorable terms.
4. **Cash Discounts**: Adequate working capital also enables a concern to avail cash discounts on the purchases and hence it reduces costs.
5. **Regular supply of raw materials**: Sufficient working capital ensures regular supply of raw materials and continuous production.
6. **Regular payments of salaries wages and other day to day commitments**: A company which has ample working capital can make regular payment of salaries, wages and other day to day commitments which raises the morale of its employees, increases their efficiency, reduces wastage and cost and enhances production and profits.
7. **Exploitation of favorable market conditions**: The concerns with adequate working capital only can exploit favorable market conditions such as purchasing its requirements in bulk when the prices are lower.
8. **Ability to face crisis:** Adequate working capital enables a concern to face business crisis in emergencies.
9. **Quick and regular return on Investments**: Every investor wants a quick and regular return on his investment. Sufficiency of working capital enables a concern to pay quick and regular dividends to its investors, as there may not be much pressure to plough back profits. This gains the confidence of its investors and creates a favorable market to raise additional funds in the

10. **High morale:** Adequacy of working capital creates an environment of security, confidence, and high morale and creates overall efficiency in a business. Every business concern should have adequate working capital to run its business operations. It should have neither redundant excess working capital nor inadequate shortage of working capital. Both, excess as well as short working capital positions are bad for any business. However, out of the two, it is the inadequacy of working capital which is more dangerous from the point of view of the firm.

Methods of capital budgeting:

Capital budgeting Techniques:

The capital budgeting appraisal methods are techniques of evaluation of investment proposal will help the company to decide upon the desirability of an investment proposal depending upon their; relative income generating capacity and rank them in order of their desirability. These methods provide the company a set of norms on the basis of which either it has to accept or reject the investment proposal. The most widely accepted techniques used in estimating the cost-returns of investment projects can be grouped under two categories.

1. Traditional methods
2. Discounted Cash flow methods

1. Traditional methods

These methods are based on the principles to determine the desirability of an investment project on the basis of its useful life and expected returns. These methods depend upon the accounting information available from the books of accounts of the company. These will not take into account the concept of 'time value of money', which is a significant factor to determine the desirability of a project in terms of present value.

A. Pay-back period method: It is the most popular and widely recognized traditional method of evaluating the investment proposals. It can be defined, as 'the number of years required to recover the original cash out lay invested in a project'.

According to Weston & Brigham, "The pay back period is the number of years it takes the firm to recover its original investment by net returns before depreciation, but after taxes".

According to James. C. Vanhorne, "The payback period is the number of years required to recover initial cash investment.

The pay back period is also called payout or payoff period. This period is calculated by dividing the cost of the project by the annual earnings after tax but before depreciation under this method the projects are ranked on the basis of the length of the payback period. A project with the shortest payback period will be given the highest rank and taken as the best investment. The shorter the payback period, the less risky the investment is the formula for payback period is

$$\text{Pay-back period} = \frac{\text{Cash outlay (or) original cost of project}}{\text{Annual cash inflow}}$$

Merits:

1. It is one of the earliest methods of evaluating the investment projects.
2. It is simple to understand and to compute.
3. It dose not involve any cost for computation of the payback period

4. It is one of the widely used methods in small scale industry sector
5. It can be computed on the basis of accounting information available from the books.

Demerits:

1. This method fails to take into account the cash flows received by the company after the pay back period.
2. It doesn't take into account the interest factor involved in an investment outlay.
3. It doesn't take into account the interest factor involved in an investment outlay.
4. It is not consistent with the objective of maximizing the market value of the company's share.
5. It fails to consider the pattern of cash inflows i. e., the magnitude and timing of cash in flows.

B. Accounting (or) Average rate of return method (ARR):

It is an accounting method, which uses the accounting information repeated by the financial statements to measure the probability of an investment proposal. It can be determine by dividing the average income after taxes by the average investment i.e., the average book value after depreciation.

According to 'Soloman', accounting rate of return on an investment can be calculated as the ratio of accounting net income to the initial investment, i.e.,

$$ARR = \frac{\text{Average net income after taxes}}{\text{Average Investment}} \times 100$$

$$\text{Average net income after taxes} = \frac{\text{Total Income after Taxes}}{\text{No. Of Years}}$$

$$\text{Average investment} = \frac{\text{Total Investment}}{2}$$

On the basis of this method, the company can select all those projects who's ARR is higher than the minimum rate established by the company. It can reject the projects with an ARR lower than the expected rate of return. This method can also help the management to rank the proposal on the basis of ARR. A highest rank will be given to a project with highest ARR, where as a lowest rank to a project with lowest ARR.

Merits:

1. It is very simple to understand and calculate.
2. It can be readily computed with the help of the available accounting data.
3. It uses the entire stream of earning to calculate the ARR.

Demerits:

1. It is not based on cash flows generated by a project.
2. This method does not consider the objective of wealth maximization
3. IT ignores the length of the projects useful life.
4. It does not take into account the fact that the profits can be reinvested.

II: Discounted cash flow methods:

The traditional method does not take into consideration the time value of money. They give equal weight age to the present and future flow of incomes. The DCF methods are based on the concept that a rupee earned today is more worth than a rupee earned tomorrow. These methods take into consideration the profitability and also time value of money.

A. Net present value method (NPV)

The NPV takes into consideration the time value of money. The cash flows of different years and valued differently and made comparable in terms of present values for this the net cash inflows of various period are discounted using required rate of return which is predetermined.

According to Ezra Solomon, "It is a present value of future returns, discounted at the required rate of return minus the present value of the cost of the investment."

NPV is the difference between the present value of cash inflows of a project and the initial cost of the project.

According the NPV technique, only one project will be selected whose NPV is positive or above zero. If a project(s) NPV is less than 'Zero'. It gives negative NPV hence. It must be rejected. If there are more than one project with positive NPV's the project is selected whose NPV is the highest.

The formula for NPV is

NPV= Present value of cash inflows – investment.

$$NPV = \frac{C1}{(1+K)} + \frac{C2}{} + \frac{C3}{} + \frac{Cn}{}$$

Co- investment …; C1, C2, C3… Cn = cash inflows in different years.

K= Cost of the Capital (or) Discounting rate; D= Years.

Merits:

1. It recognizes the time value of money.
2. It is based on the entire cash flows generated during the useful life of the asset.
3. It is consistent with the objective of maximization of wealth of the owners.
4. The ranking of projects is independent of the discount rate used for determining the present value.

Demerits:

1. It is different to understand and use.
2. The NPV is calculated by using the cost of capital as a discount rate. But the concept of cost of capital. If self is difficult to understood and determine.
3. It does not give solutions when the comparable projects are involved in different amounts of investment.
4. It does not give correct answer to a question whether alternative projects or limited funds are available with unequal lines.

B. Internal Rate of Return Method (IRR)

The IRR for an investment proposal is that discount rate which equates the present value of cash inflows with the present value of cash out flows of an investment. The IRR is also known as cutoff or handle rate. It is usually the concern's cost of capital.

According to Weston and Brigham "The internal rate is the interest rate that equates the present value of the expected future receipts to the cost of the investment outlay.

When compared the IRR with the required rate of return (RRR), if the IRR is more than RRR then the project is accepted else rejected. In case of more than one project with IRR more than RRR, the one, which gives the highest IRR, is selected.

The IRR is not a predetermine rate, rather it is to be trial and error method. It implies that one has to start with a discounting rate to calculate the present value of cash inflows. If the obtained present value is higher than the initial cost of the project one has to try with a higher rate. Like wise if the present value of expected cash inflows obtained is lower than the present value of cash flow. Lower rate is to be taken up. The process is continued till the net present value becomes Zero. As this discount rate is determined internally, this method is called internal rate of return method.

$$IRR = L + \frac{P1 - Q}{P1 - P2} \times D$$

L- Lower discount rate

P1 - Present value of cash inflows at lower rate.

P2 - Present value of cash inflows at higher rate.

Q- Actual investment D- Difference in Discount rates.

Merits:

1. It consider the time value of money
2. It takes into account the cash flows over the entire useful life of the asset.
3. It has a psychological appear to the user because when the highest rate of return projects are selected, it satisfies the investors in terms of the rate of return an capital
4. It always suggests accepting to projects with maximum rate of return.
5. It is inconformity with the firm's objective of maximum owner's welfare.

Demerits:

1. It is very difficult to understand and use.
2. It involves a very complicated computational work.
3. It may not give unique answer in all situations.

C. Probability Index Method (PI)

The method is also called benefit cost ration. This method is obtained cloth a slight modification of the NPV method. In case of NPV the present value of cash out flows are profitability index (PI), the present value of cash inflows are divide by the present value of cash out flows, while NPV is a absolute measure, the PI is a relative measure.

It the PI is more than one (>1), the proposal is accepted else rejected. If there are more than one investment proposal with the more than one PI the one with the highest PI will be selected. This method is more useful incase of projects with different cash outlays cash outlays and hence is superior to the NPV method.

The formula for PI is

$$\text{Probability index} = \frac{\text{Present Value of Future Cash Inflow}}{\text{Investment}}$$

Merits:

1. It requires less computational work then IRR method
2. It helps to accept / reject investment proposal on the basis of value of the index.
3. It is useful to rank the proposals on the basis of the highest/lowest value of the index.
4. It is useful to tank the proposals on the basis of the highest/lowest value of the index.
5. It takes into consideration the entire stream of cash flows generated during the useful life of the asset

Demerits:

1. It is some what difficult to understand
2. Some people may feel no limitation for index number due to several limitation involved in their competitions
3. It is very difficult to understand the analytical part of the decision on the basis of probability index.

QUESTIONS

1. What do you understand by working capital cycle and what is its importance.
2. Describe the institutions providing long-term finance.
3. What do you understand by NPV method of appeasing long-term investment proposal? Explain with the help of a proposal of your choice.
4. What is ARR and Payback period? Compare and count ran-the two methods.
5. What are the components of working capital? Explain each of them/ explain the factors affecting the requirements of working capital.
6. What are the merits & limitations of Pay back period? How does discounting approach overcome the limitation of payback period?
7. Give various examples of capital budgeting decisions classify them into specific kinds.
8. What is the importance of capital budgeting? Explain the basic steps involved in evaluating capital budgeting proposals.
9. What is NPV & IRR Compare and contrast the two methods of evaluating capital budgeting proposals.
10. What are major sources of short-term finance?
11. What is meant by discounting and time value of money? How is it useful in capital budgeting

QUIZ

1. Financing decision refers as _____ ( )
   (a) Investment decision (b) Utilization of funds
   (c) Acquisition of funds (d) Dividend policy decision
2. Excess of current assets over current liabilities is known as_____ ( )
   (a) Long run capital (b) Fixed capital
   (c) Net working capital (d) Net worth
3. Long term investment of funds is called _____ ( )
   (a) Working capital (b) Revolving capital
   (c) Capital budgeting (d) Operational capital
4. A rate at which N.P.V = 0, then the rate is called_____ ( )
   (a) Minimum Rate of Return (b) Required Rate of Return
   (c) Internal Rate of Return (d) Average Rate of Return
5. _____ is the life blood of the business. ( )
   (a) Price (b) Cost
   (c) Finance (d) Production
6. Which method takes into consideration "The Time Value of Money"? ( )
   (a) Traditional Method (b) Pay Back Period Method
   (c) Discounted Cash Flow Method (d) Average Rate of Return Method
7. Under Capital budgeting, only _____ Proposals are considered ( )
   (a) Very short-term (b) Short-term
   (c) Long-term (d) Mid-term
8. The investment in short-term assets is known as____ ( )
   (a) Capital Budgeting (b) Fixed Investment
   (c) Working capital management (d) Fixed capital management
9. Which assets yield a return over a period of time in future? ( )
   (a) Short-term assets (b) Current assets
   (c) Long-term assets (d) Fictious assets
10. The process of evaluating the relative worth of long-term investment
    Proposals are called_____. ( )
    (a) Working capital management (b) Current liabilities management
    (c) Capital Budgeting (d) Current assets management
11. What is the formula of Net Present Value (NPV)? ( )
    (a) Present value of cash inflow / Present value of cash outflow (b) Original cost of the project / Avg. annual earnings
    (c) Present value of cash inflow – Present value of cash outflow

Avg. earnings

12. What is the formula for profitability index? ( )
    (a) Present value of cash inflow – Present value of cash outflow
    (b) Original cost of the project / Avg. annual earnings
    (c) Present value of cash inflow / Present value of cash outflow
    (d) Avg. Investment / Avg. earnings
13. What is the current asset from the following? ( )
    (a) Creditors (b) Bills payable
    (c) Debtors (d) Bank over draft
14. What is the formula for Pay Back period? ( )
    (a) Avg. Investment / Avg. earnings (b) Annual earnings / Cost of the product
    (c) Cost of the project / Annual earnings (d) Cash inflow / Cash outflow
15. _____ decision relates to the selection of assets in which funds will be invested by a firm. ( )
    (a) Finance (b) Dividend
    (c) Investment (d) None

Note: Answer is "C" for all the above questions.