LECTURE NOTES

ON

MANAGERIAL ECONOMICS

I MBA I SEMESTER

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UNIT -I

INTRODUCTION TO MANAGERIAL ECONOMICS

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Imagine for a while that you have finished your studies and have joined as an engineer in a manufacturing organization. What do you do there? You plan to produce maximum quantity of goods of a given quality at a reasonable cost. On the other hand, if you are a sale manager, you have to sell a maximum amount of goods with minimum advertisement costs. In other words, you want to minimize your costs and maximize your returns and by doing so, you are practicing the principles of managerial economics.

Managers, in their day-to-day activities, are always confronted with several issues such as how much quantity is to be supplied; at what price; should the product be made internally; or whether it should be bought from outside; how much quantity is to be produced to make a given amount of profit and so on. Managerial economics provides us a basic insight into seeking solutions for managerial problems.

Managerial economics, as the name itself implies, is an offshoot of two distinct disciplines: Economics and Management. In other words, it is necessary to understand what these disciplines are, at least in brief, to understand the nature and scope of managerial economics.

INTRODUCTION TO ECONOMICS:

Economics is a study of human activity both at individual and national level. The economists of early age treated economics merely as the science of wealth. The reason for this is clear. Every one of us in involved in efforts aimed at earning money and spending this money to satisfy our wants such as food, Clothing, shelter, and others. Such activities of earning and spending money are called

"Economic activities". It was only during the eighteenth century that Adam Smith, the Father of Economics, defined economics as the study of nature and uses of national wealth'.

Dr. Alfred Marshall, one of the greatest economists of the nineteenth century, writes "Economics is a study of man's actions in the ordinary business of life: it enquires how he gets his income and how he uses it". Thus, it is one side, a study of wealth; and on the other, and more important side; it is the study of man. As Marshall observed, the chief aim of economics is to promote 'human welfare', but not wealth. The definition given by AC Pigou endorses the opinion of Marshall. Pigou defines Economics as "the study of economic welfare that can be brought directly and indirectly, into relationship with the measuring rod of money".

Prof. Lionel Robbins defined Economics as "the science, which studies human behavior as a relationship between ends and scarce means which have alternative uses". With this, the focus of economics shifted from 'wealth' to human behavior'.

Lord Keynes defined economics as 'the study of the administration of scarce means and the determinants of employments and income".

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 economic activity in a country is called *macroeconomics*. It studies the flow of economics resources or factors of production (such as land, labor, capital, organization 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 behavior, 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.

MEANING AND NATURE:

Managerial Economics is economics applied in decision-making. It is that branch of economics which serves as a link between abstract theory and managerial practice. It is based on economic analysis for identifying problems, organising information and evaluating alternatives. Economics as a science is concerned with the problem of allocation of scarce resources among competing ends. These problems of allocation are regularly confronted by individuals, households, firms as well as economies.

DEFINITION

In the words of Spencer and Siegelman: *"Managerial economics...is the integration of economic theory with business practice for the purpose of facilitating decision-making and forward planning by management."*

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".

FEATURES

➢ Managerial economics is concerned with decision-making of economic nature. This implies that managerial economics deals with identification of economic choices and allocation of scarce resources.

➢ Managerial economics is goal-oriented and prescriptive. It deals with how decisions should be made by managers to achieve the organisational goals.

➢ Managerial economics is pragmatic. It is concerned with those analytical tools which are useful in improving decision-making.

➢ Managerial economics is both "conceptual and metrical". An intelligent application of quantitative techniques to business presupposes considered judgement and hard and careful thinking about the nature of the particular problem to be solved.

➢ Managerial economics provides necessary conceptual tools to achieve this. Moreover, it helps the decision-maker by providing measurement of economic entities and their relationships. This metrical dimension of managerial economics is complementary to its conceptual framework.

➢ In a sense, managerial economics provides a link between traditional economics and the decision sciences for managerial decision-making, as shown below
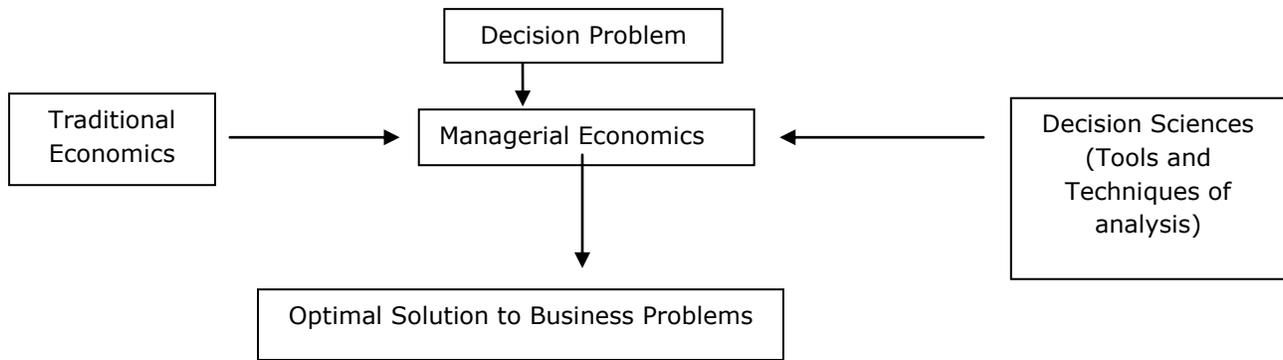
Fig: *Managerial economics & Business Decision-making*

NATURE OF MANAGERIAL ECONOMICS

Managerial economics is concerned with the business firm and the economic problems that every business management need to solve.

MACRO-ECONOMIC CONDITIONS

We know that the decisions of the firm are made almost always within the broad framework of economic environment within the firm operates, known as macro-economic conditions. With regard to these conditions, we may stress three points:

➢ The economy in which the business operates is predominantly a free enterprise economy using prices and market.

➢ The present day economy is the one undergoing rapid technological and economic changes.

➢ The intervention of government in economic affairs has increased in recent times and there is no likelihood that this intervention will stop in future.

MICRO-ECONOMIC ANALYSIS

The micro-economic analysis deals with the problems of a individual firm, industry, consumer, etc. In the case of managerial economics, micro-economics helps in studying what is going on within the firm; how

best to use the available scarce resources between various activities of the firm; how to be technically as well as economically efficient.

Managerial economics also uses some of the well-accepted models in price theory, such as the model for monopoly price, kinked demand model, the model of price discrimination and the behavioural and managerial models.

POSITIVE *VS* NORMATIVE APPROACH

Whether one is using micro-economic analysis or macro-economic analysis, one can take recourse to positive approach or normative approach or both.

Positive approach concerns with what is, was, or will be, while normative approach concerns with what ought to be. The statement ' a government deficit will reduce unemployment and cause an increase in prices' is a hypothesis in positive economics, while the statement ' in setting policy, unemployment ought to matter more than inflation' is a normative hypothesis.

INTEGRATION OF ECONOMIC THEORY & BUSINESS PRACTICE

(a) With the help of economic theory one can understand the actual business behaviour. This does not mean that in economics there is always a theoretical construct present for every business behaviour. nIn fact, economic theory is based on certain assumptions, and sometimes very simplified assumptions.

Economists have developed a theory of firm which fundamentally centres on the assumption of profit maximisation and the assumption that the firms act rationally in pursuit of their objectives. Rationality is usually taken as implying that the firm has perfect knowledge of all relevant variables when making decisions.

(b) Managerial economics attempts to estimate and predict the economic quantities and relationships. The estimation of elasticity's of demand , production relation etc., are all necessary for the purposes of forecasting by the firm. Similarly, predicting about the demand, cost, pricing, etc., is needed for decision-making.

(c) Decision-making and forward planning is done with the help of estimated economic quantities and relationships. Economic forecasting suggests the various outcomes with their respective probabilities for the managers to choose from.

(d) The managers cannot ignore the environment within which the operate. They must understand and adjust to the eternal factors, like government intervention in business, taxation, business cycle fluctuations, etc.,

CHIEF CHARACTERISTICS OF MANAGERIAL ECONOMICS

The main features of managerial economics help in appreciating the subject in its true perspective. These characteristics features are the following:-

- Managerial economics is micro-economics in character as it concentrates only on the study of the firm and not on the working of the economy.

- Managerial economics takes the help of macro-economics to understand and adjust to the environment in which the firm operates.

- Managerial economics in normative rather than positive in character. It is prescriptive rather than descriptive. That is, it is concerned with the type of decisions that the firm should take in order to prosper, which involves value judgments and not a mere description of behaviour of the firm.

- It is both conceptual and metrical. It takes the help of conceptual framework to understand and analyse the decision problems and takes the help of quantitative techniques to measure the impact of different factors and policies.

- The contents of managerial economics are based mainly on the ' theory of firm'. It is only for the analysis of profits that help is taken of the 'theory of distribution'.

- Knowledge of managerial economics helps in making wise decisions. Managers continue to face the problem of scarcities and consequently, must continue to make choices.

SCOPE OF MANAGERIAL ECONOMICS

Managerial economics has a close connection with economic theory (micro-economics as well as macro-economic) operations research, statistics, mathematics and the theory of decision-making. Managerial

economics also draws together and relates ideas from various functional areas of management like production, marketing, finance and accounting, project management, etc. A professional managerial economist has to integrate concepts and methods from all these disciplines and functional areas in order to understand and analyse practical managerial problems.

In so far as managerial economics is concerned, the following aspects constitute its subject-matter:

- ➢ Objectives of a business firm
- ➢ Demand analysis and Demand forecasting
- ➢ Production and Cost
- ➢ Competition
- ➢ Pricing and Output
- ➢ Profit
- ➢ Investment and Capital Budgeting and
- ➢ Product Policy, Sales Promotion and Market Strategy.

ROLE OF A MANAGERIAL ECONOMIST IN BUSINESS

Making decisions and processing information are the two primary tasks of managers. While we separate these two tasks for analytical purposes, in reality they are practically inseparable. That is, in order to make intelligent decisions, managers must be able to obtain process and use information.

The task of organising and processing information and then making an intelligent decision based upon this information and the basic theory can take two general forms:

- Task of making specific decisions by managers and
- General task of managers to use readily available information to make a decision or carry out a course of action that furthers the goals of the organisation.

i) Specific decisions:

There are several specific decisions that managers might have to take Eg., whether or not to close down a branch of a firm that has recently been unprofitable ; whether or not a store should stay open more hours a day; or whether to pay for outside computing or copying services rather than install an in-house computer or copier. After conducting a survey of British industry, Alexander and Kemp came to the conclusion that the managerial economist undertakes the following specific functions:

i. Production scheduling

ii. Demand forecasting

iii. Market research

iv. Economic analysis of the industry

v. Investment appraisal

vi. Security management analysis

vii. Advice on foreign exchange management

viii. Advice on trade

ix. Pricing and the related decisions and

x. Analysing and forecasting environmental factors.

ii) General tasks:

Economic theory helps decision makers to know what information is necessary to make an intelligent decision to find the correct solution to a problem and to learn how to process and use that information.

We find that business is influenced by two sets of decision factors:

- External factors and
- Internal factors.
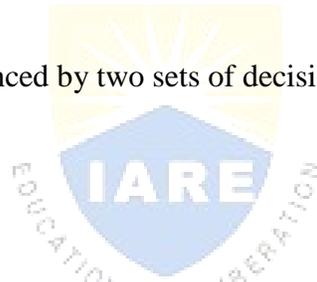
Business is influenced not only by decisions are taken within the firm but also by the general business environment. While the internal factors are within its control, the external factors lie outside its sphere of control. The firm can make only timely adjustments to these external factors. The role of the managerial economist is to understand these external factors and to suggest policies which the firm should follow to make the best use of these external and internal factors.

(a) External factors:

The most important external factor is the general economic condition of the economy, such as the level and rate of growth of national income, regional income distribution, influence of international factors on the domestic economy, the business cycle etc.,

The second important external factor for a firm is the prospects of demand for the product. Is there a change occurring in the purchasing power of the public in general or in some particular regions?

Thirdly, the managerial economist also tries to find out if there is anything which is influencing the input cost of the firm. For example, what about the cost of labour in different regions and for different operations? What about the credit conditions in the market? Is there going to be some change in the government credit policies? How different inputs can be combined to minimise the cost of production? And so on.

Fourthly, the market conditions of raw material and finished product is also a subject of study by the managerial economist. He has to understand the nature of the markets from which the firm is buying its raw materials and of the market where it is selling its output. This understanding helps the managerial economist to recommend a pricing policy for successful management of the firm.

Next, managerial economist can also help in the expansion of the firm's share in the market. He is to find out the opportunities and the policies which help in the expansion of the firm's share in the local and internal markets. This he can do y understanding the nature and trend of demand.

(a) Internal factors

The role of managerial economist in internal management is as important as his contribution towards the management of external factors. He helps in deciding about the production, sales and inventory schedules of the firm. He not only provides information regarding their present level but also forecasts their future trend.

In short, the first role of a manager is to recognise a problem or to see a possible way to further the goal of the organisation, and then to obtain and process information in order to make decision or reach a solution. His second task is to use readily available information to make a decision or carry out a course of action that furthers the goals of the organisation. Successful managers know how to pick out the useful information from the vast amount of information they receive. In all these roles of a manager, the knowledge of managerial economics is extremely helpful.

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 relationship with other disciplines.

1. RELATIONSHIP WITH ECONOMICS:

The relationship between managerial economics and economics theory may be viewed from 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 managerial economics.

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.

THE FUNDEMENTAL CONCEPTS

Economic theory provides a number of concepts and analytical tools which can be of considerable help to a manager in taking scientific decisions and business planning.

The basic concepts which form the basis of managerial economics are the following:

- Incremental reasoning
- Opportunity cost

- Contribution
- Time perspective
- Time value of money- Discounting principle and
- Risk and uncertainty

THE CONCEPT OF INCREMENTAL REASONING

The incremental reasoning involves estimating the impact of decision alternatives. The two basic concepts in the incremental analysis are: *incremental cost* and *incremental revenue.*

Incremental cost may be defined as the change in total cost as a result of change in the level of output, investment, etc.

Incremental revenue is a change in total revenue resulting from a change in the level of output, price etc.

To illustrate, let us take a case where a firm gets an order which can get it additional revenue of Rs. 2,000. The normal cost of production of this order is:

Labour	Rs.600
Materials	800
Overheads	720
Selling and administration expenses	280
Full cost	2,400

Comparing the additional revenue with the above cost will suggest that the order is unprofitable. But in case of order is accepted it would need the use of some of the existing facilities and underutilised capacity of the firm. It would, add to cost much less than Rs. 2,400. May be, only a marginal addition is required on overheads, some labour which was partially idle is better utilised and there is no addition to selling and administration expenses, i.e., the addition to cost due to this new order is ,say, the following:

Labour	Rs.400
Materials	800
Overheads	200
Total increment cost	Rs. 1,400

In the above case, the firm would earn a net profit of Rs. 2,000 − Rs. 1,400= Rs.600, while at first it appeared that the firm would make a loss of Rs.400 by accepting the order.

A variant of incremental reasoning is the concept of marginal equivalency which takes into account the change in dependent variable due to a unit change in independent variable.

CONCEPT OF OPPORTUNITY COST

Resources being scarce, we cannot have everything we want. We are, therefore, forced to make a choice. If we want to choose to have more of one thing, it will be necessary to have less of the other thing.

For ex:- id the firm wants to produce more of good X then(given resources) it will produce less of good Y. Thus, producing a greater amount of X has opportunity cost of producing less Y.

Opportunity cost of a decision is the *sacrifice of alternatives* required by that decision. Sacrifice of alternatives is involved when carrying out a decision requires using a resource that is limited in supply with the firm. *Opportunity cost, therefore, represents the benefits or revenue forgone by pursing one course of action rather than another.* When a choice is made in favour of a particular alternative that appears to be most desirable of all the given alternatives, it obviously implies that the best alternatives which has been sacrificed due to the best alternative is known as opportunity cost of the best alternative.

   (a) The opportunity cost of the funds employed one's own business is the amount of interest which could have been earned had these funds been invested in the next best channel of investment.
   (b) When a product X rather than a product Y is produced by using a machine which can produce both the opportunity cost of producing X is the amount of Y sacrificed as a result.
   (c) The opportunity cost of using an idle machine is zero, as its use needs no sacrifice of opportunities.
   (d) The opportunity cost of one's labour in one's own business is the income one could have earned by accepting a job outside.

Thus it is clear that opportunity cost requires that sacrifices must be clearly ascertained. If there are no sacrifices there is no opportunity cost. These sacrifices may be monetary or real. Monetary costs can be expressed as explicit, while real costs are implicit. Explicit costs are recognised in accounts eg., the payments for labour, raw materials etc.. Implicit costs are sacrifices that are not recorded in accounts, eg, cost of capital supplied by owners of business. Since opportunity cost includes both the explicit and implicit costs the opportunity cost of alternative therefore is generally higher than its accounting cost.

CONCEPT OF CONTRIBUTION

This concept takes help from both the principles of incremental reasoning and opportunity cost.

The concept of contribution that tells about the contribution of a unit of output to overheads and profit. It helps in determining the best product mix when allocation of scarce resources is involved. It also indicates whether or not it is advantageous to accept a fresh order, to introduce a new product, to shut down, to continue with the existing plant, etc.

Unit contribution is the per unit difference of incremental revenue from the incremental cost. In case of firm with excess capacity, a new product can be introduced easily as it is likely to contribute very little to cost but significantly to revenue. And, some contribution is better than none.

TIME PERSPECTIVE

Economists often make a distinction between short run and long run. They use these terms with a precision that is often missed in ordinary discussion. By short run they mean that period within which some of inputs(called fixed inputs) cannot be altered, while in the long run all the inputs can be changed (i.e., there are no fixed inputs). Thus, in the short run, change in output can be achieved by changing the intensity of use of fixed inputs, while the same can be achieved in the long run by adjusting the scale of output, size of the firm, etc., Economists try to study the effect of policy decisions on variables like prices, costs, revenue, etc., in the light of these time distinctions.

THE DISCOUNTING PRINCIPLE

This concept is, in a way, an extension of the concept of time perspective. Since future is unknown and incalculable, there is a lot of risk and uncertainty about future. Moreover, the return in future is less attractive than the same return today. The future must, therefore, be discounted both for the elements of delay and risk of future.

The concept of discounting future is based on the fundamental fact that a rupee now is worth more than a rupee earned a year after.

Suppose an investor wants to invest Rs.100, assuming that the bank rate of interest is 10%. Now, had he not invested he would have earned at least this rate of interest and his money would have grown from Rs.100 to Rs. 110 next year. In other words, Rs.110 next year has a present worth, of Rs.100, i.e., to him Rs.110 next year are equal to Rs.100 today. Thus, in case of present worth, we bring all of the future rupees up to today's rupees.

Suppose a sum of Rs.100 is due after 1 year. Let the rate of interest be 10%. Then, we can determine the sum to be invested now so as to produce the return (R) of Rs.100 at the end of 1 year. The present value or the discounted value of Rs.100 will then be,

$$v_1 = \frac{R}{(1+i)} = \frac{100}{1.10} = Rs.90.90$$

The same reasoning can be used to find the present value of longer periods. A present value of Rs.100 due two years later would be,

$$v_2 = \frac{Rs.100}{(1+i)^2} = \frac{Rs.100}{(1.10)^2} = \frac{Rs.100}{1.21} = Rs.82.64$$

We can thus write the present worth of a stream of income spread over n years (i.e., R_1, R_2.....R_n) as

$$\frac{R_1}{(1+i)}, \frac{R_2}{(1+i)^2}, \frac{R_3}{(1+i)^3}, ...,\frac{R_n}{(1+i)^n}$$

The sum of present values of returns for n years would thus be

$$V = \frac{R_1}{(1+i)} = \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + ... + \frac{R_n}{(1+i)^n} = \sum_{k=1}^{n} \frac{R_k}{(1+i)^k}$$

RISK AND UNCERTAINTY

Economic theory of the firm generally assumes that the firm has perfect knowledge of its cost and demand relationships and or its investment.

Uncertainty is not allowed to influence the decisions of the firm: the firm proceeds to maximise the profits after it has acquired the relevant information on costs and revenue. Yet, we know that in the real world, uncertainty influences the estimation of costs and revenues, and hence the decisions of the firm.

Management deals with decisions which have long –term bearing, and since future conditions are not perfectly predictable, there is always a sense of risk and uncertainty about the outcome of such decisions. Moreover, when a firm is operating in a market along with the rest of firms, there is generally an element of uncertainty regarding the actions and reactions of the competitors.

UNIT -II
THEORY OF DEMAND

MEANING OF DEMAND

Demand for a commodity refers to the quantity of the commodity which an individual consumer or a household is willing to purchase per unit of time at a particular price. Demand for a commodity implies-

(a)   Desire of the consumer to buy the product,

(b)   His willingness to buy the product, and

(c)   Sufficient purchasing power in his possession to buy the product.

The demand may arise form an individual, a household as well as a market. There are certain commodities which are generally demanded by individual consumers.

Eg: - demand for cigarettes, footwear, etc,

On the other hand, there are commodities which are demanded by households, like a refrigerator, a house, etc. When we are dealing with a good demanded by an individual we call it an individual demand, while if the good is demanded by a household we call it a household demand. When we consider the demand for a commodity by all the individuals/households in the market taken together, we call it market demand or aggregate demand.

DETERMINATION OF DEMAND

We have mentioned above that an individual household's demand for a commodity depends on the household's desire for the commodity and its capacity to purchase it. The desire to purchase is revealed by tastes and preferences of the individuals/households. The capability to purchase depends upon his purchasing power which, in turn, depends upon his income and price of the commodity. Since a household purchases a number of commodities, how much quantity of a particular commodity the household chooses to purchase depends upon the price of that particular commodity and prices of the other commodities, besides his income, in addition, certain demand determinants are specific to a specific to a specific category of goods. These determinants are called the explanatory variables, and the quantity demanded is called the explained variable. Understanding the relationship between these two kinds of variables is essential for successful management of business. The important demand determinants are as follows:

PRICE OF THE COMMODITY

We often find that a consumer buys more of a commodity when its price declines, and vice-versa. Thus, we can say that for a normal good the price of a commodity and its demand vary inversely, determinants

other than the price of the commodity remaining constant. A fall in the price of a normal good leads to rise in consumer's purchasing power. He can, therefore, buy more of it (*Substitution effect*). Similarly, an increase in price will reduce his purchasing power and, thereby reducing demand for the commodity (*Income effect*).

INCOME OF THE CONSUMER

With an increase in income, a household buys increased amount of most of the commodities in his consumption bundle though the extent of the increase may differ between commodities. Normally both the quantity demanded of a good and income of the household move in the same direction (shown as Oa curve in below Fig) However, in case of certain commodities like foods, fruits, vegetables, etc., the amount demanded increases with an increase in income, but beyond a certain level of income thee amount demanded of the good remains unchanged even when income changes (Ob curve in fig). There are still some other commodities in whose case, beyond a point, the amount demanded even starts decreasing with further increases in income (Oc in below fig) Such commodities in case of which amount demanded decreases with an increases in income and increases with a decrease in income after a particular level of income, are called *inferior goods*. The term inferior is not used here in the context of the quality of the commodity; it simply refers to the case of an exception to the normal income-demand relationship.

Engel was the first person to study the relationship between income and quality demanded for the normal and inferior goods. The curve reflecting the relationship between income and demand (other thing remaining constant) is, therefore, known as *Engle's Curve*. For inferior goods, the Engel curve would be downward sloping because with an increase in income the consumer buys less of the inferior goods.

PRICES OF RELATED GOODS

When a change in the price of one commodity influences the demand of the other commodity, we say that the two commodities are related. These related commodities are of two types: *substitutes and complements*. When the price of one commodity and the quantity demanded of the other commodity move in the same direction (i.e., both increase together or decrease together) , the two goods are called substitutes,

Eg: apple and pears, tea and coffee, rail and road transport services, etc.

Commodity move in opposite direction, then the two commodities are said to be complementary to each other.

Eg: - bread and butter, pen and ink. Petrol and automobiles, tea and sugar, etc.

TASTE AND PREFERENCES

We know it quite well that the change in tastes and preferences of a consumer in favour of a commodity results in greater demand for the commodity, while if this change is against the commodity it results in smaller demand for the commodity.

eg:- if jeans catch the fancy of consumers, the firms selling jeans will have greater demand now than before.

Opposite will be case if jeans go out of fashion. Modern business firms not only try to adjust to changes in market trends and fancies, they also try to influence the market demand with the help of their sales campaigns.

ADVERTISEMENT

A lot of money is spent on advertisement to influence the tastes and preferences of the consumers in their favour. This increases their sales.

EXPECTATIONS

The consumers make two kinds of expectations:

- Related to their future income and
- Related to future prices of the goo and its related goods.

In case the consumer expects a higher income in future, he spends more at present, and thereby the demand for the good increases, Opposite will be the case, if he expects lower income in future. Similarly, if the consumer expects future prices of the good to increase, he would rather like to buy the commodity now than later. This will increase the demand for the commodity Opposite holds good when it is expected that prices in future will come down.

Having known the demand determinants, we can express them in terms of demand functions

DEMAND FUNCTION

A mathematical expression of the relationship between quantity demanded of the commodity and its determinants is known as the demand function. When this relationship relates to the demand by an individual consumer it is known as *individual's demand function*, while if it relates to the market it is called **market demand function.**

Mathematically expressed, these two demand functions would be as follows:

Individual Demand Function

$$Q_{dx} = f(P_X, Y, P_1, \ldots\ldots P_{n-1}, T, A, E_y, E_p, u)$$

Where:

Q_{dx}

Q_{dx} refers to the quantity demanded of the product X, eg., ice-cream ban

P_x refers to the price of the product X

Y   refers to the level of household income

$P_{1,\ldots,}P_{n-1}$ refer to the price of all the other 'related' products in economy (related products include substitute and complements)

T   refer to the tastes of the consumer

A   refer to advertising

E_y refer to consumer's expected future income

E_p refers to consumer's expectations about future prices

U   refers to all those determinants which are not covered in the list of determinants given above.

Market Demand Function

$$Q_{dx} = f(P_X, Y, P_1, \ldots\ldots P_{n-1}, T, A, E_y, E_p, P, D, u)$$

Where:

All are the same as in the individual's demand function.

While,

P   refers to population (which reflects the size of the market)

D   refers to distribution of consumers in various categories depending upon income, age, sex, etc

DEMAND DISTINCTIONS

Demand may be defined as the quantity of goods or services desired by an individual, backed by the ability and willingness to pay.

TYPES OF DEMAND

1. **Direct and indirect demand:** (or) Producers' goods and consumers 'goods: demand for goods that are directly used for consumption by the ultimate consumer is known as direct demand (example: Demand

for T-shirts). On the other hand demand for goods that are used by producers for producing goods and services. (example: Demand for cotton by a textile mill)

2. **Derived demand and autonomous demand:** when a produce derives its usage from the use of some primary product it is known as derived demand. (Example: demand for tyres derived from demand for car) Autonomous demand is the demand for a product that can be independently used. (Example: demand for a washing machine)

3. **Durable and non durable goods demand:** durable goods are those that can be used more than once, over a period of time (example: Microwave oven) Non durable goods can be used only once (example: Band-aid)

4. **Firm and industry demand:** firm demand is the demand for the product of a particular firm. (Example: Dove soap) The demand for the product of a particular industry is industry demand (example: demand for steel in India)

5. **Total market and market segment demand:** a particular segment of the markets demand is called as segment demand (example: demand for laptops by engineering students) the sum total of the demand for laptops by various segments in India is the total market demand. (Example: demand for laptops in India)

6. **Short run and long run demand**: short run demand refers to demand with its immediate reaction to price changes and income fluctuations. Long run demand is that which will ultimately exist as a result of the changes in pricing, promotion or product improvement after market adjustment with sufficient time.

7. **Joint demand and Composite demand:** when two goods are demanded in conjunction with one another at the same time to satisfy a single want, it is called as joint or complementary demand. (Example: demand for petrol and two wheelers) A composite demand is one in which a good is wanted for several different uses. (Example: demand for iron rods for various purposes)

8. **Price demand, income demand and cross demand:** demand for commodities by the consumers at alternative prices is called as price demand. Quantity demanded by the consumers at alternative levels of income is income demand. Cross demand refers to the quantity demanded of commodity 'X' at a price of a related commodity 'Y' which may be a substitute or complementary to X.

Price Demand:

The ability and willingness to buy specific quantities of a good at the prevailing price in a given time period.

Income Demand:

The ability and willingness to buy a commodity at the available income in a given period of time.

Market Demand:

The total quantity of a good or service that people are willing and able to buy at prevailing prices in a given time period.

It is the sum of individual demands..

Cross Demand:

The ability and willingness to buy a commodity or service at the prevailing price of the related commodity i.e. substitutes or complementary products. For example, people buy more of wheat when the price of rice increases.

ELASTICITY OF DEMAND:

Elasticity of Demand (ε_d) is defined as the percentage change in quantity demanded caused by one percent change in demand determinant under consideration, while other determinants are held constant. The general equation for the measurement of elasticity of demand is:

$$\varepsilon = \frac{Percentage\ change\ in\ quantity\ demanded\ of\ good\ X}{Percentage\ change\ in\ determinant\ Z}$$

Symbolically, it may be stated as:

$$\varepsilon = \frac{\Delta Q / Q}{\Delta Z / Z} = \frac{\Delta Q}{\Delta Z} \cdot \frac{Z}{Q}$$

Where refers to elasticity of demand

Refers to change

q Refers to quantity demanded, and

Z refers to demand determinant which may be one of the following;

- ➢ Current price of the commodity
- ➢ Current price of related good
- ➢ Current income
- ➢ The expected price of the commodity , and
- ➢ Advertisement expenditure ,etc.

The larger the (absolute) value of this elasticity, the more responsive is quantity demanded to changes in the determinant under consideration. If we look at the demand function, we can notice that certain determinants of the demand are completely beyond the control of the firm. The firm cannot possibly make any significant difference to average annual income of the consumers, the numbers of consumers or the prices of the related goods. Yet the managers are certainly interested in knowing hoe the changes in these variables affect the demand for their product. On the other hand, advertising expenses and the price set for the firm's product are the variables which are under complete control of the firm. It is for this reason that managers are found to have preference for the price elasticity of demand and advertising elasticity of demand.

While it is conceptually possible to measure elasticity of demand with respect to each of the demand determinants, there are certain insurmountable problems in qualifying certain variable. For example , a scientific quantitative measure of tastes and preferences does not exist , which makes it makes it virtually impossible to measure its elasticity .Sometimes similar problems do rise in case of 'expectations' also , yet a somewhat approximate measure of expectations is possible . We will, therefore, consider the following elasticity measures:
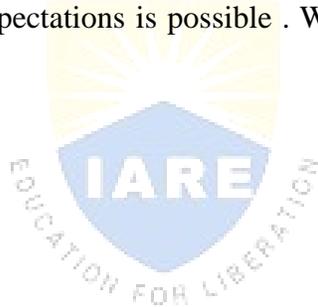
1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

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.

Proportionate change in the quantity demand of commodity

Price elasticity =   ---

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=∞
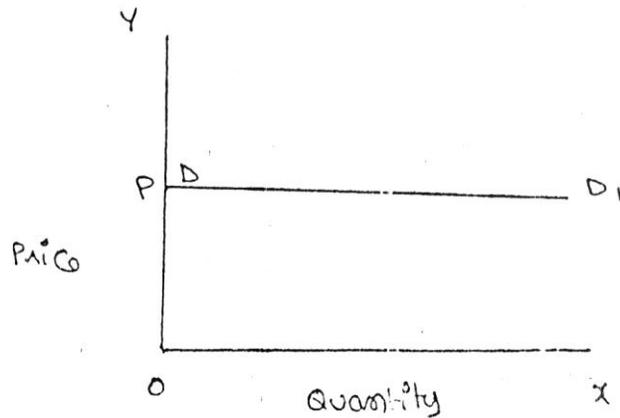
The demand curve DD1 is horizontal straight line. It shows the at "OP" price any amount is demand and if price increases, the consumer will not purchase the commodity.

B. Perfectly Inelastic Demand

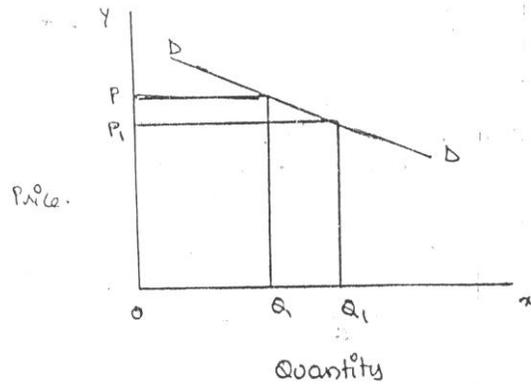In this case, even a large change in price fails to bring about a change in quantity demanded.
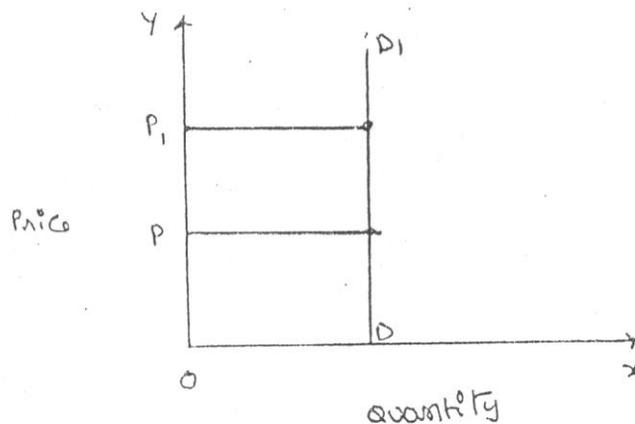
When price increases from 'OP' to 'OP', the quantity demanded remains the same. In other words the response of demand to a change in Price is nil. In this case 'E'=0.

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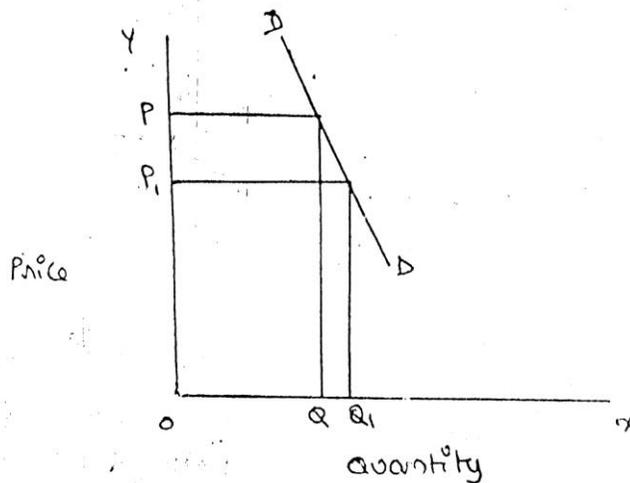
When price falls from "OP' to 'OP1 amount demanded increases from OQ to OQ1, which is smaller than the change in price.

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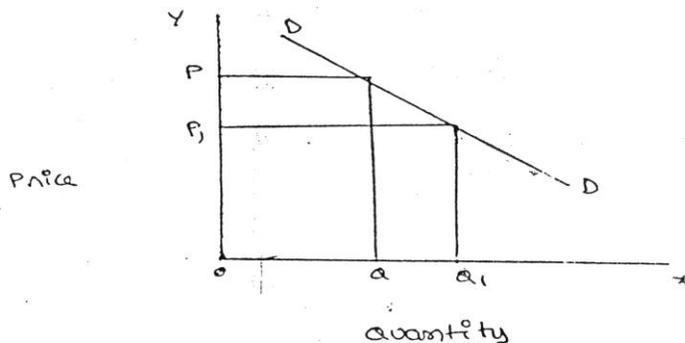
When price falls from 'OP' to 'OP1' quantity demanded increases from 'OP' to 'OP1', quantity demanded increases from 'OQ' to 'OQ1'. Thus a change in price has resulted in an equal change in quantity demanded so price elasticity of demand is equal to unity.

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.

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

Income elasticity of demand can be classified in to five types.
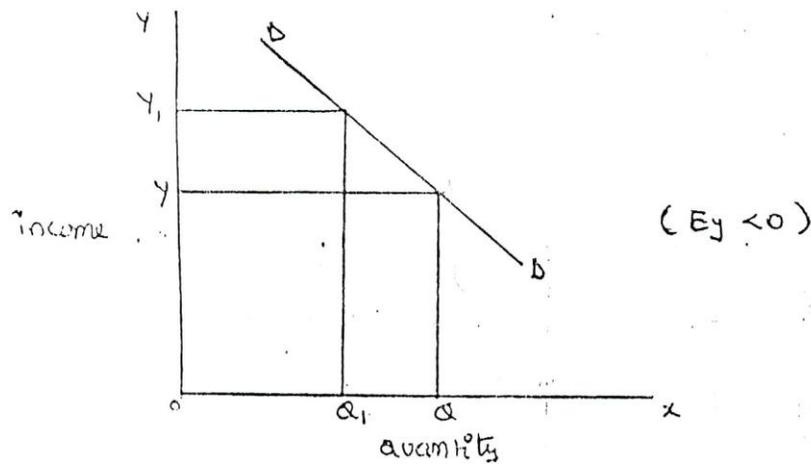
A. Zero income elasticity:

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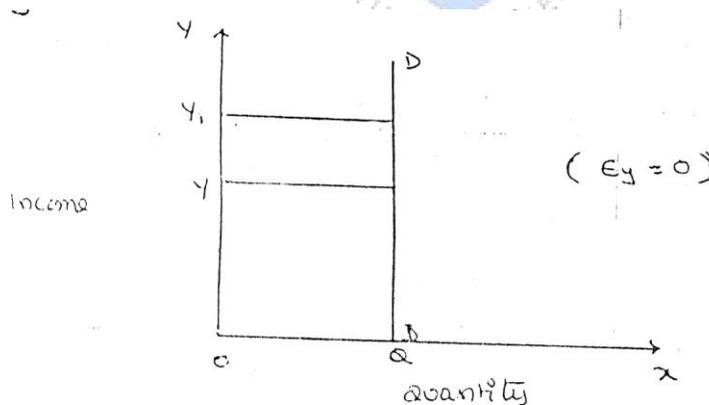
As income increases from OY to OY1, quantity demanded never changes.

B. Negative Income elasticity:

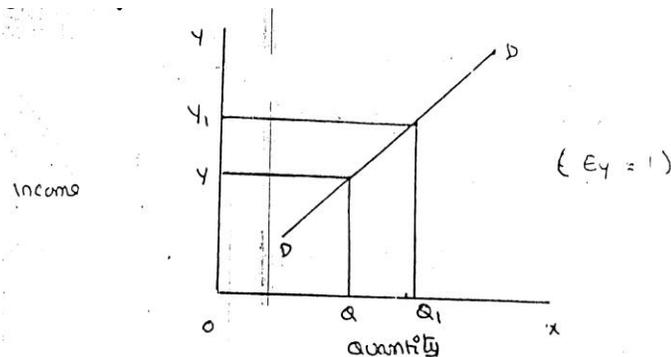When income increases, quantity demanded falls. In this case, income elasticity of demand is negative. i.e., Ey < 0.

When income increases from OY to OY1, demand falls from OQ to OQ1.
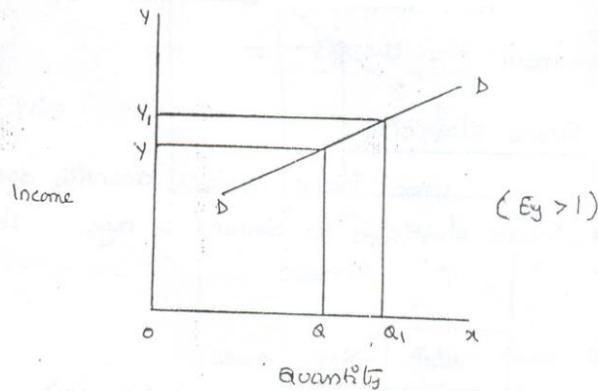
c. Unit income elasticity:

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.
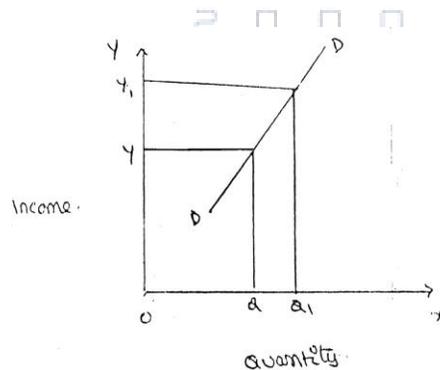
It shows high-income elasticity of demand. When income increases from OY to OY1, Quantity demanded increases from OQ to OQ1.

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:

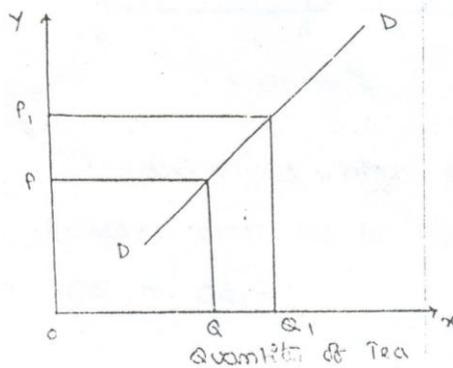**Cross elasticity** = $\dfrac{\text{Proportionate change in the quantity demand of commodity "X"}}{\text{Proportionate change in the price of commodity "Y"}}$
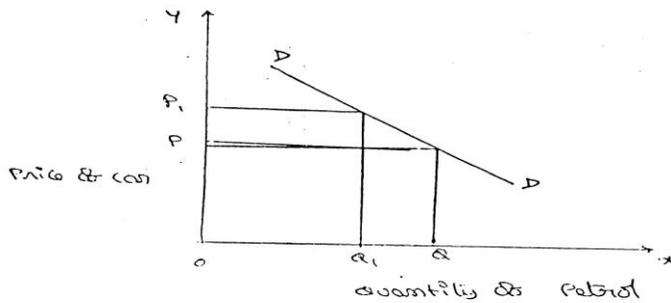
a. In case of substitutes, cross elasticity of demand is positive. Eg: Coffee and Tea.

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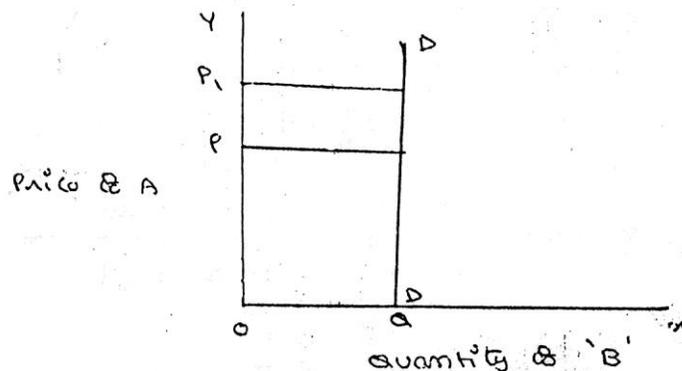
Price of Coffee

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.

$$E_c = \frac{\%\ \Delta Q_1}{\%\ \Delta P_1}\ (Negative)$$

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.

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.

Price & A

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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.

ARC AND POINT ELASTICITY MEASUREMENTS:

There are two kinds of elasticity measurement:

> ➢ **Point elasticity**
> ➢ **Arc elasticity**

Point elasticity of demand relates to the elasticity at a particular point on the demand curve, while arc elasticity of demand is the average elasticity over a segment of the demand curve, i.e., average of the elasticity of the range on the demand curve.

POINT ELASTICITY:

The formula of elasticity of demand for point elasticity is already given as equation;

$$\varepsilon = \frac{\Delta Q}{\Delta Z} \cdot \frac{Z}{Q}$$

In ΔZ is taken as very small, $\Delta Q / \Delta Z$ approximates to the slope of the demand curve in the neighborhood of original z and q. In other words, when ΔZ approaches its limit of zero, then $\lim\limits_{\Delta Z \to 0} \frac{\Delta Q}{\Delta Z}$ becomes, $\frac{dQ}{dZ}$. Thus

$$\varepsilon = \frac{dQ}{dZ} \cdot \frac{Z}{Q}$$

For example, for a demand function q=10 -3p, the elasticity for p=2 would be:

$$\varepsilon = \frac{dQ}{dP} \cdot \frac{P}{Q} = (-3)\frac{2}{4} = -1.5$$

In case the demand function contains a number of variables that affect demand, then the point elasticity for each of these demand determinants, z p can be found with the help of partial derivatives q/z.

ARC ELASTICITY:

If instead of measuring elasticity by taking z -> 0 (as we do in case of point elasticity) we measure it over larger segment of the demand curve, we get arc elasticity measure .The arc elasticity is the measure of the demand curve. In the figure the end points of the arc are (p1, q1) and (q2, q2).

Coordinates of the mid-point would, therefore, be $\left(\frac{P_1 + P_2}{2}, \frac{Q_1 + Q_2}{2} \right)$. The changes between the end points would be ΔP and ΔQ. The elasticity at the mid- point of the arc (i.e., arc elasticity) would be:

$$E = \frac{\Delta Q}{\left(\dfrac{Q_1 + Q_2}{2} \right)} \div \frac{\Delta P}{\left(\dfrac{P_1 + P_2}{2} \right)} = \frac{\Delta Q}{\Delta P} \cdot \frac{P_1 + P_2}{Q_1 + Q_2}$$

PRICE ELASTICITY OF DEMAND

Meaning: law of demand states that quantity demanded and price of the good are inversely related. If price falls quantity demanded increases quantity demanded falls. But decision – makers are frequently interested in the effect that changes in the changes in price and quantity demanded have on total revenue

(which equals price *quantity demanded). Note that changes in price and quantity demanded tend to have the offsetting effects. The change in total revenue will, therefore, depend upon which offsetting effect dominates –The increase in the price or the demanded .if the percentage increase in price exceeds the percentage decrease in quantity demanded, total revenue will increase. On the other hand, if the percentages increase in price is less that the percentage decrease in quantity demanded, total revenue will decrease. Similarly, if the percentage decrease in price is less than the percentage increase in quantity demanded total revenue increase, while if the former is more than the latter the total revenue falls. We, thus, see that the effect of a price change depends upon the relative responsiveness of quantity demanded to price along demand curve.

The measure of relative responsiveness of quantity demanded curve is known as price elasticity of demand. It can be represented mathematically as, price elasticity of demand.

$$= \frac{\text{Proportionate change in quantity demanded of good X}}{\text{Proportionate change in price of good X}} = -\frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

(Minus sign is put to make the value of ε absolute)

Where q1 and p1 are original quantity and price respectively, and q2 and p2 are the new quantity and price respectively. The above equation can be written as

$$\varepsilon = -\frac{\Delta Q / Q_1}{\Delta P / P_1} = -\frac{\Delta Q}{Q_1} \cdot \frac{P_1}{\Delta P} = -\frac{\Delta Q}{\Delta P} \cdot \frac{P_1}{Q_1}$$

DD is the demand curve of a consumer for good. At price =Rs 10, 4 units of good X are demanded .When price goes down to Rs.8 quantity demanded increases to 6. So ΔP =8-10=-2: and ΔQ =6-4 =2, and

$$\left(\frac{2}{-2}\right)\left(\frac{10}{4}\right) = 2.5$$

Higher the elasticity of demand, greater will be the percentage change in quantity demanded for every percentage change in price. For example, if E=2 , it means that 1% change in price will change the quantity demanded by 2% ;and if E=0.5 ,this implies the quantity demanded will change by 0.5 when price of the good changes by 1% .when a business wants to decide about price change of his commodity ,he will use the information one of his commodity . in the above example, in the first case it will benefit him to reduce to the price as it will increase the quantity demanded by twice the amount and thereby increase total revenue (TR); while in the second case, it will be beneficial for him to increase the price, as 1% increase in price reduces the quantity demanded by only 0.5 %, thus providing higher TR.

Since the elasticity of demand is linked to the law of demand, the coefficient of price elasticity of demand E will always have a negative sign – negatively (or, downward) sloping demand curve. In order to avoid of confusion in interpretation, only the absolute value of E is taken that is the sign is ignored.

TYPES OF ELASTICITY

Different commodities respond difficulty to change in their price. a price change has relativity much less impact on quantity demanded of a necessity than it has on the quantity demanded for a luxury .in fact , it is the nature of a commodity which is responsible for differing elasticity's of a demand in case of different commodities .Conceptually price elasticity's of demand is generally classified into the following categories

1. **Perfectly elastic demand ($\varepsilon = \infty$).** Where no reduction in price is needed to cause an increase in quantity demanded.
2. **Absolutely inelastic demand ($\varepsilon = 0$).** Where a change in price, however large, causes no change in quantity demanded
3. **Unit elasticity of demand ($\varepsilon = 1$).** Where a given proportionate change in price causes an equally proportionate change in quantity demanded (in this case the demanded curves takes the form a rectangular hyperbola).
4. **Relatively elastic demand ($\varepsilon > 1$).** where a change in price causes amore the proportionate change in quantity demanded
5. **Relative in elastic demand ($\varepsilon < 1$).** where the change in price cause a less proportionate change in the quantitative demanded.

It should, however, be noted that the perfectly elastic and perfectly inelastic demands are very rare situations in actual life. Actually, changes in price do induce changes in the quantity demanded; although the magnitude of such changes may be different products. Perfectly elastic and perfectly inelastic demands are both of theoretical interest only.

THE DETERMINANTS OF PRICE ELASTICITY OF DEMAND

A question normally arises as to what makes the demand for one commodity elastic and demand for another inelastic, or the demand for the same commodity elastic at one price and inelastic at another price. The following reasons may be pointed out in this connection.

- The number and closeness of the substitutes
- The share of the commodity in buyer's budget

- Nature of the commodity
- Number of uses a commodity can be put to
- Habit forming characteristic
- Time period.

INCOME ELASTICITY OF DEMAND

Meaning: So far we have been discussing price elasticity of demand .under the demand function we have seen that consumer's income is also one determinants of demand. income elasticity of demand for a commodity shows the extent to which a consumer's demand for the commodity changes as a result of a change in his income .like price elasticity of demand, the income elasticity of demand may be a defined as a ratio of percentage change in the quantity demand of a good, say x, to the percentage change income of the consumer .symbolically,

$$E_y = \frac{Percentage\,change\,in\,the\,quantity\,demanded\,of\,good\,X}{Percentage\,change\,in\,income\,of\,the\,consumer}$$

$$= \frac{\Delta q_x}{q_x} / \frac{\Delta Y}{Y}$$

Where   q = quantity demand; and

Y = income level of consumer.

Illustration: if a consumer demand for a commodity increases from 100 units per week to 200 units per week when his income rises from Rs. 2,000 to Rs.3,000, find his income elasticity of demand .

Solution: we know

$$E_y = \frac{\Delta q_x}{\Delta Y} \cdot \frac{Y}{q_x}$$

In our illustration q =100 units,=200-100 = 100 units;

Y= Rs 2,000; and Y=Rs (3000-2000)=Rs 1,000

$$E_y = \frac{100}{1000} \cdot \frac{2000}{100} = 2$$

The income elasticity of demand is positive for all normal goods, because the consumers demand for good changes in the direction of the change in his income. In this case of an interior good, the demand for the good varies inversely income, as a result the income of the elasticity of demand inferior goods is stated to be negative. The example of a inferior good is the coarse cereals which are reduced in the consumption bundle as the consumer's income rises

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TYPES OF INCOME ELASTICITY:

The five possible income demand curves are shown in figure each of them shows a different type of income of elasticity. These are discussed below:

High income elasticity: this is shown in figure. Here the values of the coefficient E is greater than unity, which implies that quantity demanded of good X increases by a larger percentage than the income of the consumer.

Unitary income elasticity: Panel (b) of the figure shows an income-demand curve having this property. It indicates that the percentage change in quantity demand is equal to the percentage change in money income.

Low income elasticity: Income elasticity is elasticity is low if the relative change in quantity demanded is less than the relative change in money income is shown in figure.

Zero income elasticity: Here, a change in income will have no effect on the quantity demanded, like in case of salt .so; the value of the coefficient is equal to zero .such a demand curve is shown in figure.

Negative income elasticity: As pointed out above, inferior goods have negative income elasticity of demand. This is shown in figure it explains that less is bought at lower incomes. The value of the coefficient is less than zero or negative in this case.

CROSS ELASTICITY OF DEMAND

In actual situations, commodities have definite groups of substitutes and complements. In the demand function it was mentioned that the demanded for a commodity is not only a function of its own price but also a function of the prices of related goods. Hence, the concepts of elasticity of demand can also applied in a situation where two commodities are related to each other. The elasticity in this case is called cross elasticity of demand. The concept of cross elasticity of demand is useful in handling inter-commodity demand relations. Cross elasticity of demand is defined as the ratio of the percentage change in demand for one good to the percentage change in the price of some other related to good comes about. This change in the demand for one good due to a change in the price of some other good comes about because of the fact that the two goods may be either substitutes or complements to each other. Once we assume that two commodities x and y are related the expression of cross-elasticity of demand would be,

$$e_{XY} = \frac{\Delta qx}{qx} + \frac{\Delta py}{py} = \frac{\Delta qx}{\Delta py} \times \frac{py}{qx}$$

The same formula is used to find cross elasticity of demand, irrespective of they being substitutes or complements. Their differences are reflected in the sign of gross elasticity (e_{xy}).

Cross elasticity (e_{xy}) will have positive sign if two goods are substitutes.

Cross elasticity (e_{xy}) will have negative sign if two goods are complements. .

Let us consider two goods: Coca-Cola and Pepsi. If the price of coca cola increases, many of its customers will start drinking Pepsi. The cross elasticity in such a case would ,thus, be positive because the change in the demand for Pepsi and the change in the price of coca cola move in the same direction .the closer are the commodities as substitutes for each other, the greater is the size of the cross elasticity coefficient. When two commodities are poor substitutes for each other, their elasticity is low. If two goods are complementary products, such as sugar and tea, their cross elasticity will be negative. If price of sugar goes up its demand will reduce, and simultaneously the demand for tea will also fall. Since the price of the sugar and demand for tea move in the opposite direction, their cross elasticity will be negative.

It is also possible that the two goods, x and y, are neither substitutes nor complements in such a situation their cross-elasticity of demand will be zero.

In shortly, we can say that for the perfectly substitutable products the cross-elasticity of demand is highly positive and generally tends to infinity. And, for the perfectly complementary goods the goods the cross-elasticity of demand will be highly negative, tending to infinity. In brief,

For substitutes, $\quad 0 < e_{XY} < \infty$

For complements, $\quad -\infty < e_{XY} < 0$

PROMOTIONAL (OR, ADVERTISING) ELASTICITY OF DEMAND

Meaning: advertisement occupies an important place in a competitive or a partially competitive market economy. Its consists of visual and oral activities with an aim to create or expand for the product of the service. The salient features of the relationship between advertising and sales are the following:

➤ Some sales are possible even if there is no advertisement that is at minimum levels of sales, no advertising is needed.

➤ Beyond the minimum level of sales, there is a direct relationship between advertising expenditure and sales (other things remaining the same) ; sales increases in advertisement expenditure and decrease with decrease in advertisement expenditure.

➤ Consumers generally need a minimum level of advertisement before they notice of the presence of the product. So sales do not respond to the same extent as advertisement expenditure. Beyond this

initial stage of advertisement expenditure, the resulting increase in sales will be more than proportionate to the increase in advertisement expenditure is continued to increase, it will eventually result In less than proportionate increase in sales, and later a stage comes when no future increase in sales is possible with the help of advertisement. If we plot the amount of advertisement expenditures and corresponding sales level, we get an *S-shaped curve.*

How far the demand for a product will be influenced by advertisement and other promotional activities may be measured by advertising elasticity of demand. Some goods are more response to advertising e.g.: cosmetics.

Advertising elasticity of demand measures the response of quantity demand to change in expenditure on advertising and other sales promotion activities. The point formula for advertising elasticity of demand is:

$$\varepsilon_A = \frac{\Delta Q}{\Delta A} \cdot \frac{A}{Q}$$

Where q =quantity of good X soled, and A = units of advertising expenditure on good X.

FACTORS INFLUENCING ADVERTISING ELASTICITY OF DEMAND

Sale of different goods reacts differently to the same doses of advertisement expenditure. As pointed out above, even the same commodity may not respond the same way to different levels of advertising expenditure. This implies that advertising of elasticity of demand differs between products and also between different levels of sales of the product. The advertising elasticity of demand is affected by a number of factors. Of these the main ones are:

- ❖ **Stage of product market:** The advertising elasticity is different for new and old products, and also for products with an established market and a growing market.

- ❖ **Effect of advertising in terms of time:** The time lag in response varies. It may be delayed in the some cases, depending upon the general economic environment and the media chosen. It also depends upon the type of product. It is likely to take longer in the case of durable goods because of the buyers will go for purchase only after the existing article has been used up. Also, the advertising through various media and by various firm may have a cumulative effect after

sometimes. Thus, the difference in time lag of response for various commodities also makes the advertising elasticity of demand different for different products.

❖ **Influence of advertising by rivals:** The advertising elasticity of demand depends upon the effectiveness of advertising. The latter, in turn, depends upon how the other competitors react to the advertising campaign of this firm. The firm may resort to advertising to defend itself against other competitor's efforts to promote the sales of their products. The importance of rivals more (In response to advertising by this firm) will depend a great deal upon the advertising campaign by rivals done in the present and in the past. How much additional output this firm can sell by reporting to advertisement depends upon its own media and level of advertisement vis-a-vis those of its rivals.

DEMAND FORECASTING

Demand forecasting involves techniques including both informal methods, such as educated guesses, and quantitative methods, such as the use of historical sales data or current data from test markets. Demand forecasting may be used in making pricing decisions, in assessing future capacity requirements, or in making decisions on whether to enter a new market.

— According to Cundiff and Still, "Demand Forecasting is an estimate of Demand during a specified period. Which estimate is tied to a proposed marketing plan and which assumes a particular set of uncontrollable and competitive forces."

— In the words of Prof. Philip Kotler. The company (sales) forecast is the expected level of company sales based on a chosen marketing plan and assumed marketing environment"

— According to Evan J. Douglas, "Demand forecasting may be defined as the process of finding values for demand in future time periods."

Demand Forecasting The cost should be controlled by producing correct level of goods in the firm and also according to the demand for those goods in the market. For the estimation of demand, demand forecasting is to be done by the firm.

➢ Forecasting = estimation of future situations.
➢ Forecasting reduces or minimizes the uncertainty.

- ➤ By forecasting effective decisions can be taken for tomorrow.
- ➤ Demand forecasting is based on the determinants of the demand.
- ➤ Demand for goods increases and gives sales.
- ➤ Sales are the primary source of the income for a firm.

STEPS INVOLVED IN DEMAND FORECASTING

1. Identification of business objectives:

   In the first stage we should know what is the aim of forecasting? What we get or know from the forecasting? Estimation of factors like quantity and composition of demand for goods, price to be quoted, sales planning and inventory control etc., are done in the first stage.

2. Determining the nature of goods under consideration:

   Different category of goods has their own distinctive demand. Example capital goods, consumer durables and non-durables goods in which category our goods fall we should estimate.

3. Selecting a proper method of forecasting:

   There are different methods for demand forecasting. Which is best suited method that we should select for doing demand forecasting?

4. Interpretation of results:

   The forecasting which is done by the managerial economist should be interpreted in detailed manner. That means it should be easy to understand by the top management.

DEMAND FORECASTING TECHNIQUES

To invest money and others factors in business; we require a reasonable accurate forecast of demand. Starting with qualitative methods like survey of collective opinions, buyers' intention, Delphi approach and its variant, a number of quantitative methods are used for computing demand forecasts as detailed below:

Opinion polling method

a) Collective opinion Survey:

   Sales personnel are closest to the customers and have an intimate feel of the market. Thus they are most suited to assess consumer's reaction to company's products. Here each salesperson makes an estimate of the expected sales in their area, territory, state and/or region, These estimates are

collated, reviewed and revised. Taking in to account product design, features and price is decided and made. Thus, "collective opinion survey forms the basis of market Analysis and demand forecasting. Although this method is simple, direct, first hand and most acceptable, it suffers from following weaknesses.

1. Demand estimates by individual salespersons to obtain total demand of the country may be risky as each person has knowledge about a small portion of market only
2. Salesperson may not prepare the demand estimation with the seriousness and care
3. Limited experience in their employment, salesperson may not have the required knowledge and experience

b) Survey of Customers Intention

Another method of demand forecasting is to carry out a survey of what consumers prefer and intend to buy. If the product is sold to a few large industrial buyers, survey would involve interviewing them.

If it is a consumer durable product, a sample survey is carried out about what they are planning or intending to buy. It is not east to query all consumers through direct contact or through printed questionnaire by mail.
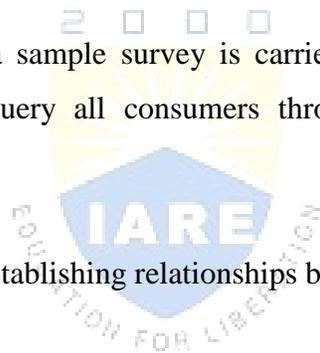
These surveys serve useful purpose in establishing relationships between

a) Demand and price
b) Demand and income of consumers
c) Demand and expenditure on advertisement etc.

This method is preferred when bulk of the sales made to institutions and industrial buyers and only a few of them have to be contacted. Disadvantages are. Survey method is not useful for households - interviewing them is not only difficult but also expensive. They are not able to give precise idea about their intentions particularly when alternative products are available in the market.

c) Delphi Method:

The Delphi technique was developed at RAND Corporation in the 1950s. Delphi method is a group (members) process and aims at achieving a `single opinion of the members on the subject. Herein experts in the field of marketing research and demand forecasting are engaged in

- ➢ Analyzing economic conditions
- ➢ Carrying out sample surveys of market
- ➢ Conducting opinion polls

Based on the above, demand forecast is worked out in following steps:

1. Administrator sends out a set of questions in writing to all the experts on the panel, who are requested to write back a brief predication.
2. Written predictions of experts are collected and combined, edited and summarized together by the administrator.
3. Based on the summary, administrator designs a new set of questions and gives them to the same experts who answer back again in writing.
4. Administrator repeats the process of collecting, combining, editing and summarizing the responses.
5. Steps 3 and 4 are repeated by the administrator to experts with diverse backgrounds until they come to one single opinion.

If there is divergence of opinions and hence conclusions, administrator has to sort it out through mutual discussions. Administrator has to have the necessary experience and background as he plays a key role in designing structured 'questionnaires and synthesizing the data.

d) Nominal Group Technique:

This technique was originally developed by Delbecq and VandeVen. This is a further modification of Delphi method of forecasting. A panel of 3-4 groups of up to 10 experts are formed and allowed to interact, discuss 'and rank all the suggestions in descending (highest to lowest) order as per the following procedure:

Experts sit around a table in full view of one another and are asked to speak to each other. An administrator hand over copies of questionnaire needing a forecast and each expert is expected to write down a list of ideas about the questions. After everyone has written down their ideas, administrator asks each expert to share one idea, out of own list. The idea shared is written on the `flip chart' which everyone can see. Experts give ideas in rotation until all of them are written on the `flip chart'. No discussion takes place in this phase and usually 15 to 25 ideas emerge from this format.

In the next phase, experts discuss ideas presented by them. Administrator ensures that all ideas have been adequately discussed. During discussions similar ideas are combined. This reduces the number of ideas. After completing group discussions, experts are asked to give in writing ranks to ideas according to their perception of priority.

Statistical methods

- Trend projection method

   This technique assumes that whatever past years demand pattern will be continued in the future also. Basing on the historical data that means previous year's data is used to predict the demand for the future. In this trend projection method, previous year's data is presented on the graph and future demand is estimated.

Year	Sales in lakhs
2005	2
2006	2.2
2007	2.3
2008	2.2
2009	2.3
2010	2.2/ 2.3/2.4
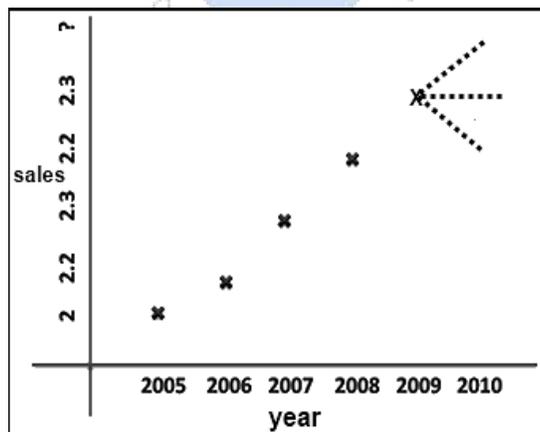
REGRESSION ANALYSIS

Past data is used to establish a functional relationship between two variables. For Example, demand for consumer goods has a relationship with income of Individuals and family; demand for tractors is linked to the agriculture income and demand for cement, bricks etc. are dependent upon value of construction contracts at any time. Forecasters collect data and build relationship through co-relation and regression analysis of variables

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UNIT-III

PRODUCTION ANALYSIS

PRODUCTION FUNCTION:

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 Junt wicksell 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

ISOQUANTS

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.

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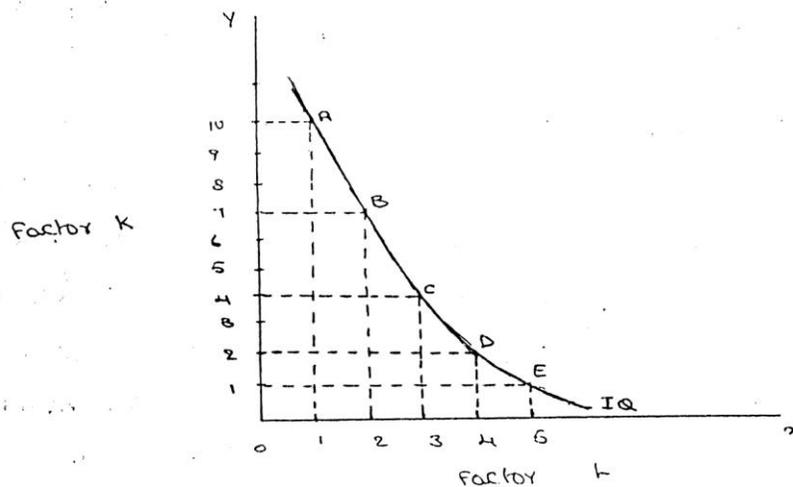
Labour is on the X-axis and capital is on the Y-axis. IQ is the ISO-Product curve which shows all the alternative combinations A, B, C, D, E which can produce 50 quintals of a product.

Producer's Equilibrium:

The tem producer's equilibrium is the counter part of consumer's equilibrium. Just as the consumer is in equilibrium when be secures maximum satisfaction, in the same manner, the producer is in equilibrium when he secures maximum output, with the least cost combination of factors of production.

The optimum position of the producer can be found with the help of iso-product curve. The Iso-product curve or equal product curve or production indifference curve shows different combinations of two factors of production, which yield the same output. This is illustrated as follows.

Let us suppose. The producer can produces the given output of paddy say 100 quintals by employing any one of the following alternative combinations of the two factors labour and capital computation of least cost combination of two inputs.

L Units	K Units	Q Output	L&LP (3Rs.) Cost of labour	KXKP(4Rs.) cost of capital	Total cost
10	45	100	30	180	210
20	28	100	60	112	172
30	16	100	90	64	154
40	12	100	120	48	168
50	8	100	150	32	182

It is clear from the above that 10 units of 'L' combined with 45 units of 'K' would cost the producer Rs. 20/-. But if 17 units reduce 'K' and 10 units increase 'L', the resulting cost would be Rs. 172/-. Substituting 10 more units of 'L' for 12 units of 'K' further reduces cost pf Rs. 154/-/ However, it will not be profitable to continue this substitution process further at the existing prices since the rate of substitution is diminishing rapidly. In the above table the least cost combination is 30 units of 'L' used with 16 units of 'K' when the cost would be minimum at Rs. 154/-. So this is they stage "the producer is in equilibrium".

LAW OF PRODUCTION:

Production analysis in economics theory considers two types of input-output relationships.

1. When quantities of certain inputs, are fixed and others are variable and
2. When all inputs are variable.

These two types of relationships have been explained in the form of laws.

i)   Law of variable proportions
ii)   Law of returns to scale

I. 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.
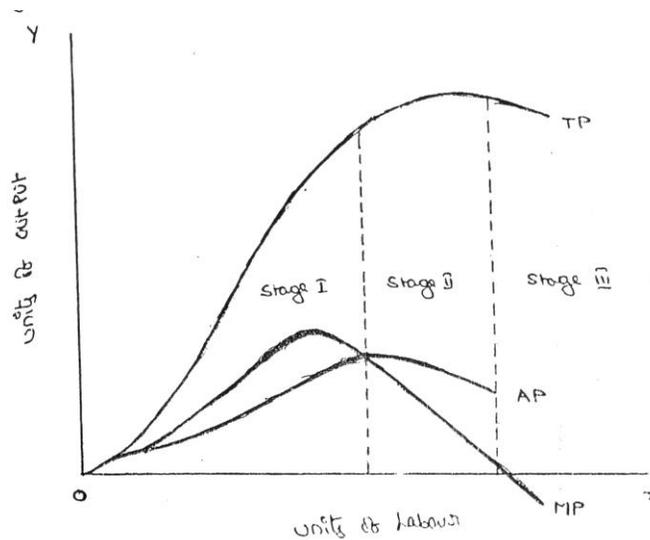iii)   All units of the variable factors are homogenous.

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 proportions first stage, increasing this stage resulting in a The average stage average product. The operation at diminishing above graph the law of variable operates in three stages. In the total product increases at an rate. The marginal product in increases at an increasing rate greater increase in total product. product also increases. This continues up to the point where product is equal to marginal law of increasing returns is in this stage. The law of 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.

II. Law of Returns of Scale:

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.

ECONOMIES 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.

DISECONOMIES OF LARGE SCALE PRODUCTION

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.

COST ANALYSIS

Profit is the ultimate aim of any business and the long-run prosperity of a firm depends upon its ability to earn sustained profits. Profits are the difference between selling price and cost of production. In general the selling price is not within the control of a firm but many costs are under its control. The firm should therefore aim at controlling and minimizing cost. Since every business decision involves cost consideration, it is necessary to understand the meaning of various concepts for clear business thinking and application of right kind of costs.

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. Explicit and implicit costs:

Explicit costs are those expenses that involve cash payments. These are the actual or business costs that appear in the books of accounts. These costs include payment of wages and salaries, payment for raw-materials, interest on borrowed capital funds, rent on hired land, Taxes paid etc.

Implicit costs are the costs of the factor units that are owned by the employer himself. These costs are not actually incurred but would have been incurred in the absence of employment of self – owned factors. The two normal implicit costs are depreciation, interest on capital etc. A decision maker must consider implicit costs too to find out appropriate profitability of alternatives.

3. Historical and Replacement costs:

Historical cost is the original cost of an asset. Historical cost valuation shows the cost of an asset as the original price paid for the asset acquired in the past. Historical valuation is the basis for financial accounts.

A replacement cost is the price that would have to be paid currently to replace the same asset. During periods of substantial change in the price level, historical valuation gives a poor projection of the future cost intended for managerial decision. A replacement cost is a relevant cost concept when financial statements have to be adjusted for inflation.

4. 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.

5. Out-of pocket and books costs:

Out-of pocket costs also known as explicit costs are those costs that involve current cash payment. Book costs also called implicit costs do not require current cash payments. Depreciation, unpaid interest, salary of the owner is examples of back costs.

But the book costs are taken into account in determining the level dividend payable during a period. Both book costs and out-of-pocket costs are considered for all decisions. Book cost is the cost of self-owned factors of production.

6. 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.

7. Post and Future costs: Post costs also called historical costs are the actual cost incurred and recorded in the book of account these costs are useful only for valuation and not for decision making.

Future costs are costs that are expected to be incurred in the futures. They are not actual costs. They are the costs forecasted or estimated with rational methods. Future cost estimate is useful for decision making because decision are meant for future.

8. Traceable and common costs:

Traceable costs otherwise called direct cost, is one, which can be identified with a products process or product. Raw material, labour involved in production is examples of traceable cost.

Common costs are the ones that common are attributed to a particular process or product. They are incurred collectively for different processes or different types of products. It cannot be directly identified with any particular process or type of product.

9. Avoidable and unavoidable costs:

Avoidable costs are the costs, which can be reduced if the business activities of a concern are curtailed. For example, if some workers can be retrenched with a drop in a product – line, or volume or production the wages of the retrenched workers are escapable costs.

The unavoidable costs are otherwise called sunk costs. There will not be any reduction in this cost even if reduction in business activity is made. For example cost of the ideal machine capacity is unavoidable cost.

10. Controllable and uncontrollable costs:

Controllable costs are ones, which can be regulated by the executive who is in change of it. The concept of controllability of cost varies with levels of management. Direct expenses like material, labour etc. are controllable costs.

Some costs are not directly identifiable with a process of product. They are appointed to various processes or products in some proportion. This cost varies with the variation in the basis of allocation and is independent of the actions of the executive of that department. These apportioned costs are called uncontrollable costs.

11. 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.

*12. Total, average and marginal costs:*Total cost is the total cash payment made for the input needed for production. It may be explicit or implicit. It is the sum total of the fixed and variable costs. Average cost is the cost per unit of output. If is obtained by dividing the total cost (TC) by the total quantity produced (Q)

TC

Average cost = ------

Q

Marginal cost is the additional cost incurred to produce and additional unit of output or it is the cost of the marginal unit produced.

13. Accounting and Economics costs:

Accounting costs are the costs recorded for the purpose of preparing the balance sheet and profit and ton statements to meet the legal, financial and tax purpose of the company. The accounting concept is a historical concept and records what has happened in the post.

Economics concept considers future costs and future revenues, which help future planning, and choice, while the accountant describes what has happened, the economics aims at projecting what will happen.

COST-OUTPUT RELATIONSHIP

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.

$$C = f(S, O, P, T \dots.)$$

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.

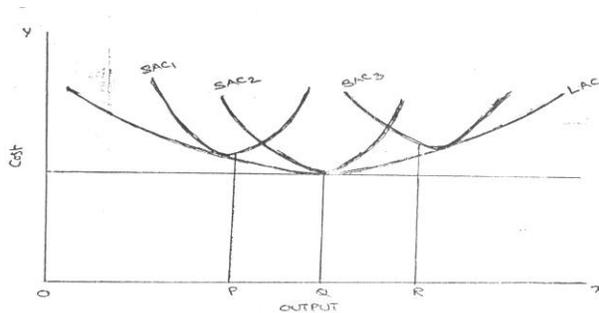The relationship between 'AVC', 'AFC' and 'ATC' can be summarized up as follows:

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.

BREAKEVEN ANALYSIS

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** $\dfrac{\text{Profit}}{\text{P. V. ratio}}$

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, $\dfrac{\text{Contribution}}{Sales} \text{ X } 100$

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) = $\dfrac{\text{Fixed Expenses}}{\text{Contribution per unit}}$

2. Break Even point (In Rupees) = $\dfrac{\text{Fixed expenses}}{\text{Contribution}} \times \text{sales}$

UNIT -IV

COST THEORY AND ESTIMATION

TYPES OF COST

Actual cost (outlay cost or acquisition cost or absolute cost): cost which is incurred by the firm while producing the goods. eg: cost of raw material, labour, power.

sunk cost:

Sunk costs are unrecoverable past expenditures. These should not normally be taken into account when determining whether to continue a project or abandon it, because they cannot be recovered either way. It is a common instinct to count them, however.

for eg: when TATA MOTORS had set up the nano plant in west best Bengal .it was welcome by protests by the farmers of the nearby area since it may pose a threat to their farmland so at last they had to shift the nano plant to Gujarat after bearing a huge loss.

Implicit cost or imputed cost:

(cost that is implied but not reflected in the financial reports of the firm). Cost which belong to owners or to the owners himself. Cost which does not include cash payments to the outsiders, it will remain in the form but showed as cost to the firm Eg: Rent on own building, interest on own capital.

Explicit or paid out cost:

Cost which are actually paid by firm to the outsiders. Expense that is contractual in nature and definite in amount, such as rent, salaries, wages.

Book Cost:

Cost which does not require any cash payments to the outsiders, but is treated as cost to the firm.

Eg: Depreciation on assets.

Economic cost or future cost:

These costs relate to the future. Expected to be incurred in some future period.

Eg: Cost may incur by introduction of new products in future or expansions of firm

Social cost:

Cost which is happened for the aspects like pollution control, cleaning purpose, cost incurred for the welfare of the people**.**

Indirect Cost:

Cost which are not easily traceable in the production process

Eg: Wastage of Raw material, Electricity bills.

Controllable Cost:

Cost which can control eg: Usage of raw material, Human Resources.

Uncontrollable Cost:

Cost which cannot be control eg: Obsolescence of machinery, repairs of the machinery.

Original or Historical Cost:

Cost of equipment at the time of purchase.

Replacement Cost:

The Cost incurred for replacing the new machinery in the place of old machinery in the firm.

Abandonment Cost:

Cost incurred for disposal of asset or machinery is called abandonment Cost.

Shutdown Cost:

Cost which would be incurred in the event of suspension of plant.

eg: Storage of plant or machinery, construction of buildings, training the employees.

Urgent Cost:

Must be incurred so that the production goes on.

eg: Raw material cost fuel, power and wages for the labour.
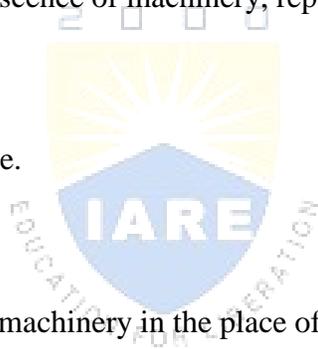
Postpone able Cost:

Cost whose postponement does not effect at least for some time on the firm and on production process and this coast can be paid after sometime.

eg: Transportation charges, rent, interest.

Business Cost:

Payment of the taxes.

Out of stock Cost:

Loss of sale by shortage of goods in the market.

Fixed Cost:

Cost which does not change when there is change in the production. It remains constant.

eg: Rent of the building, interest on capital, salaries, and wages.

Variable cost:

Cost which changes in accordance with production change.

Eg: Raw material, power, fuel.

Average Cost:

Cost incurred for single unit of production in the total production.

Marginal Cost:

Additional cost incurred by the firm by producing one more units extra.

Long run Cost:

Cost incurred for the expansion of plant, for increase in the production of goods.

Short run Cost:

Cost incurred for the production of extra units with the existing plant capacity without purchasing new machinery.
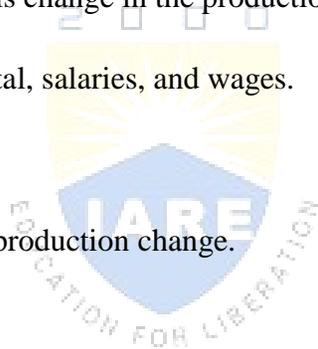
Fixed Cost :

The much we produce the goods, fixed cost will not change, it will be constant (not change). If we close the production also fixed cost must be faced by the firm.

eg: (Rent, salaries, Interest on capital) these are to paid by the firm, if there is production are not.

Illustration:-

Cost schedule table

No. of Units produced	Total fixed cost (eg: salaries)
0	1000
1000	1000
2000	1000
3000	1000
4000	1000
5000	1000
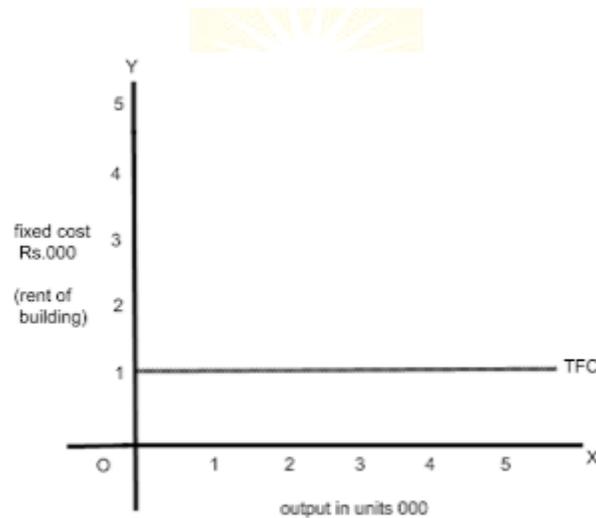
Average fixed cost:

Fixed cost spends towards single unit of output or production is called Average fixed cost.

Total fixed cost (Rent) TFC   = 1000/-

No. of units produced   TQ   = 1000

The more he produces, per unit cost will be decreased {per unit cost of fixed cost is average fixed cost}

Cost schedule table:

| No. of Units produced	Total fixed cost	Average fixed cost
0	1000	-
1000	1000	1.00
2000	1000	0.50
3000	1000	0.33
4000	1000	0.25
5000	1000	0.20
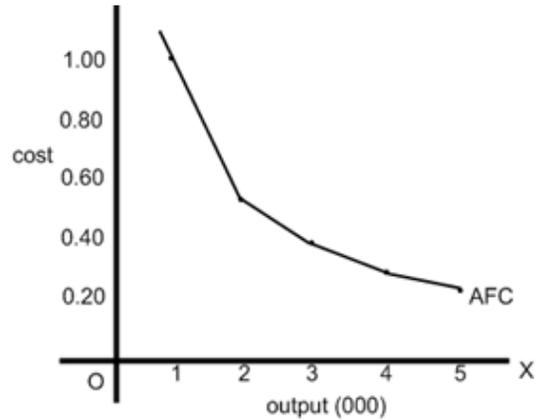
Variable Cost:

The cost which rises with increase in production and decreases with fall in production is called variable cost. Variable cost incur for total goods produced is called total variable cost.

Eg: Raw materials, power, fuel and labour. The more the firm produces the goods the firm should incur more.
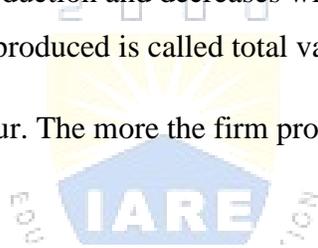
Cost schedule table:

No. of Units produced	Total Variable cost
0	0
1000	1000
2000	1800
3000	2600
4000	3500
5000	5000
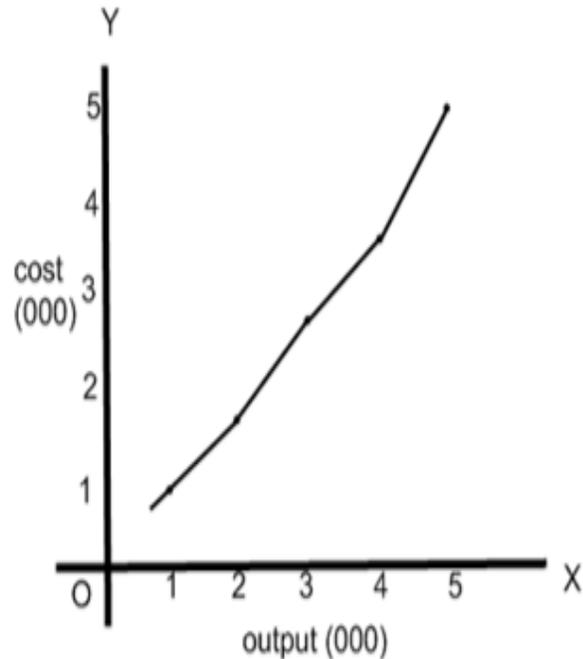
Average variable Cost

Variable cost spent on single unit on goods is called Average variable Cost. By dividing the total variable cost with number of units of production we get Average Variable Cost.

$$Average\ Variable\ Cost = \frac{TVC}{TQ}$$

Per unit variable cost on production is called Average Variable Cost.

Cost Schedule Table

No. of Units produced	Total Variable cost (TVC)	Average Variable Coast (AVC)
0	0	0
1000	1000	1.00
2000	1800	0.90
3000	2600	0.87
4000	3500	0.88
5000	5000	1.00
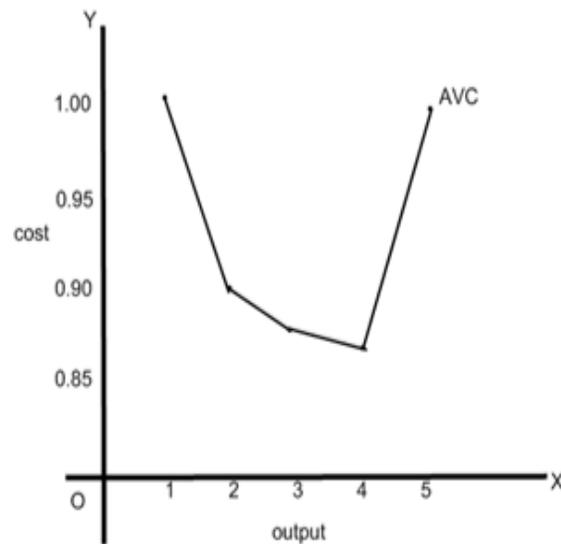
It is common when production is raised, variable cost (raw material & electricity) per unit will come down. Then after certain limit again the cost per unit will raise. The reason behind this situation is as follows. More the raw material is purchased to raise the production, the cost will be charged low by the supplier. But in the case of the power more the production the cost of the power will be raise by slab rate. When these two variable cost power and raw material combines together, cost will be coming down to certain limit, the cost raises gradually

Total Cost

Total cost includes {Total Cost = total fixed cost + Total Variable cost}

Cost Schedule Table

No. of Units produced	Total fixed cost	Total Variable Cost	TFC + TVC =total cost
0	1000	0	1000
1000	1000	1000	2000
2000	1000	1800	2800
3000	1000	2600	3600
4000	1000	3500	4500
5000	1000	5000	6000
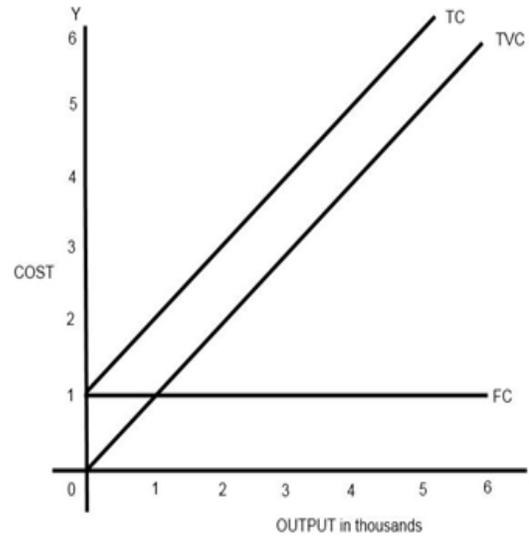
Average total cost (ATC)

{Per Unit total cost of production is called Average total cost}

$$Average\ Total\ Cost = \frac{Total\ cost}{Total\ Quantity}$$

Cost Schedule Table

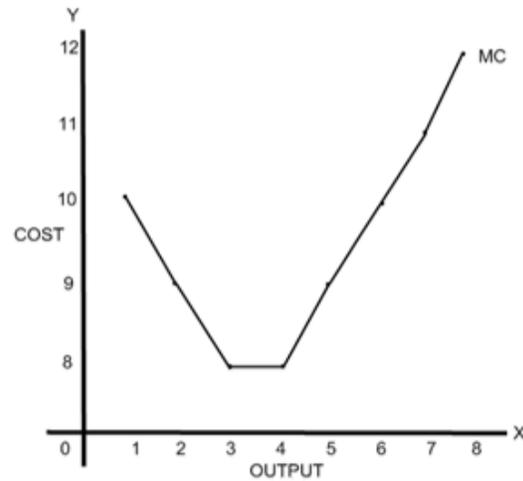| No. of Units produced	Total cost	Average Total Cost
0	1000	--
1000	2000	2.00
2000	2800	1.40
3000	3600	1.20
4000	4500	1.13
5000	6000	1.20
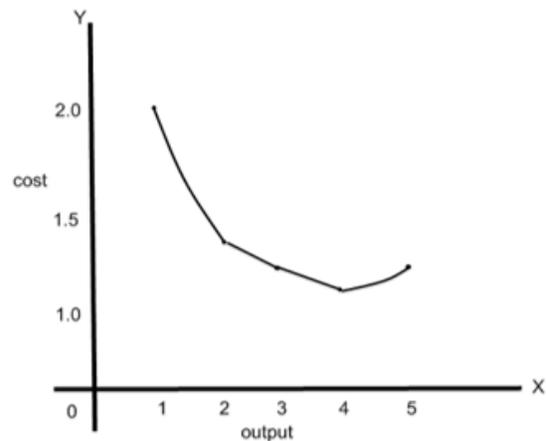
Marginal Cost (MC)

Marginal Cost is the additional cost incurred by producing one more unit extra.

Cost Schedule Table

No. of Units produced (a)	Total cost (b)	Average Total Cost b/a = ATC	Marginal Cost
1	10	10	10
2	19	9.50	9
3	27	9	8
4	35	8.75	8
5	44	8.80	9
6	54	9.0	10
7	65	9.30	11
8	77	9.60	12

COST-OUTPUT RELATIONSHIP

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 (1) short-run cost function and (2) 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.

1. Cost-Output Relationship 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 Costs 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 labor, 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=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 C0st. Hence change in total cost implies change in Total Variable Cost only.
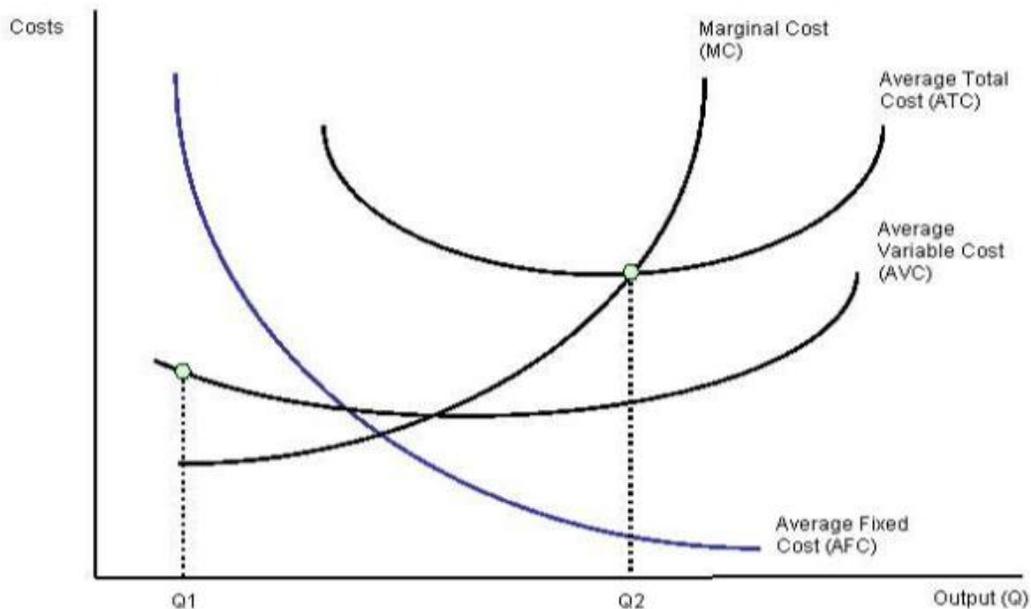
Units of Output Q	Total fixed cost TFC	Total variable cost TVC	Total cost (TFC + TVC) TC	Average variable cost (TVC / Q) AVC	Average fixed cost (TFC / Q) AFC	Average cost (TC/Q) AC	Marginal cost MC
0	–	–	60	–	–	–	–
1	60	20	80	20	60	80	20
2	60	36	96	18	30	48	16
3	60	48	108	16	20	36	12
4	60	64	124	16	15	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 relationship. 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.

The relationship between ‗AVC', ‗AFC' and ‗ATC' can be summarized up as follows:

 1. If both AFC and ‗AVC' fall, ‗ATC' will also fall. 2. When ‗AFC' falls and ‗AVC' rises o ‗ATC' will fall where the drop in ‗AFC' is more than the raise in ‗AVC'. o ‗ATC' remains constant is the drop in ‗AFC' = rise in ‗AVC' o ‗ATC' will rise where the drop in ‗AFC' is less than the rise in ‗AVC'
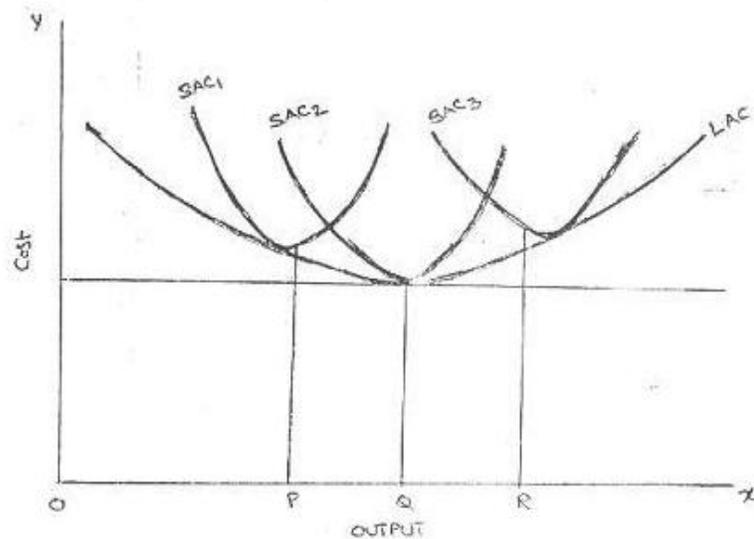
2. Cost-output Relationship in the Long-Run

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.

SHORT RUN VS. LONG RUN COSTS

In the short run, the shape of the average total cost curve (ATC) is U-shaped. The, short run average cost curve falls in the beginning, reaches a minimum and then begins to rise. The reasons for the average cost to fall in the beginning of production are that the fixed factors of a firm remain the same. The change only takes place in the variable factors such as raw material, labor, etc.   As the fixed cost gets distributed over

the output as production is expanded, the average cost, therefore, begins to fall. When a firm fully utilizes its scale of operation (plant size), the average cost is then at its minimum. The firm is then operating to its optimum capacity. If a firm in the short-run increases its level of output with the same fixed plant; the economies of that scale of production change into diseconomies and the average cost then begins to rise sharply.

LONG RUN AVERAGE COST CURVE:

In the long run, all costs of a firm are variable. The factors of production can be used in varying proportions to deal with an increased output. The firm having time-period long enough can build larger scale or type of plant to produce the anticipated output. The shape of the long run average cost curve is also U-shaped but is flatter that the short run curve as is illustrated in the following diagram:

Diagram/Figure:

Fig. 13.7   Output
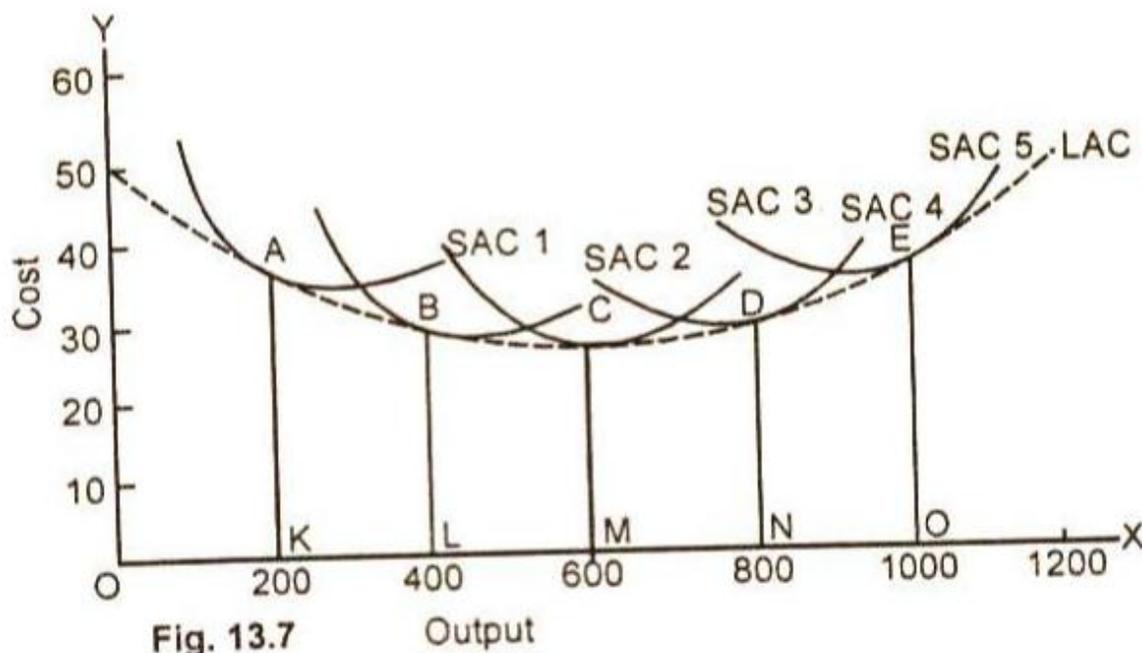
In the diagram 13.7 given above, there are five alternative scales of plant SAC1 SAC2, SAC3, SAC4 and, SAC5. In the long run, the firm will operate the scale of plant which is most profitable to it.   For example, if the anticipated rate of output is 200 units per unit of time, the firm will choose the smallest plant It will build the scale of plant given by SAC1 and operate it at point A. This is because of the fact that at the output of 200 units, the cost per unit is lowest with the plant size 1 which is the smallest of all the four plants. In case, the volume of sales expands to 400, units, the size of the plant will be increased and the desired output will be attained by the scale of plant represented by SAC2 at point B, If the anticipated

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output rate is 600 units, the firm will build the size of plant given by SAC3 and operate it at point C where the average cost is $26 and also the lowest The optimum output of the firm is obtained at point C on the medium size plant SAC3.   If the anticipated output rate is 1000 per unit of time the firm would build the scale of plant given by SAC5 and operate it at point E. If we draw a tangent to each of the short run cost curves, we get the long average cost (LAC) curve. The LAC is U-shaped but is flatter than tile short run cost curves.

Mathematically expressed, the long-run average cost curve is the envelope of the SAC curves.   In this figure 13.7, the long-run average cost curve of the firm is lowest at point C. CM is the minimum cost at which optimum output OM can be, obtained.

## Marginal and Average Total Cost Curves

Cost Curves

 The short-run marginal cost (MC) curve will at first decline and then will go up at some point, and will intersect the average total cost and average variable cost curves at their minimum points.

The average variable cost (AVC) curve will go down (but will not be as steep as the marginal cost), and then go up. This will not go up as fast as the marginal cost curve.

The average fixed cost (AFC) curve will decline as additional units are produced, and continue to decline.

The average total cost (ATC) curve initially will decline as fixed costs are spread over a larger number of units, but will go up as marginal costs increase due to the law of diminishing returns.

The graph below illustrates the shapes of these curves.
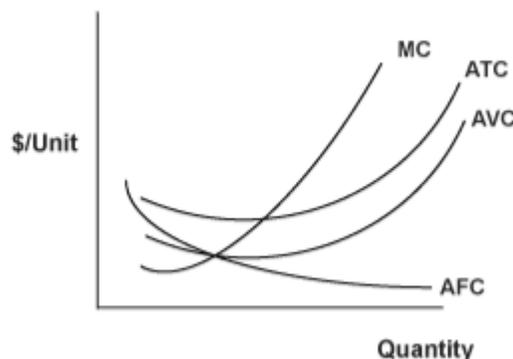
Diminishing Returns and Diminishing Marginal Product of Capital

The law of diminishing returns states that as one type of production input is added, with all other types of input remaining the same, at some point production will increase at a diminishing rate.

There may be levels of input where increasing inputs causes production to go up at an increasing rate. However, according to the law of diminishing returns, at some point production will go up at a decreasing rate.

The marginal product of capital is the increase in total output associated with an increase in capital, while holding the quantity of labor constant. Capital is also subject to the law of diminishing returns.

Economies of Scale

Economies of scale mean that goods can be produced at a lower cost per good, as the quantity produced increases. Large-scale factory operations can permit the most efficient specialization of machinery and labor. Average fixed costs will decline as costs such as advertising can be spread across more and more units.

Diseconomies of Scale

Diseconomies of scale occur when per unit costs go up as output is increased. A typical reason given is bureaucratic inefficiencies - more attention may be given to administrative rules as opposed to innovation. Worker motivation is also more difficult as the number of employees increases.

When economies of scale occur, the long-run average total cost (LRAC) curve will be declining; with diseconomies of scale, the LRAC curve will be rising.

Figure 3.9: Long Run Average Total Curve
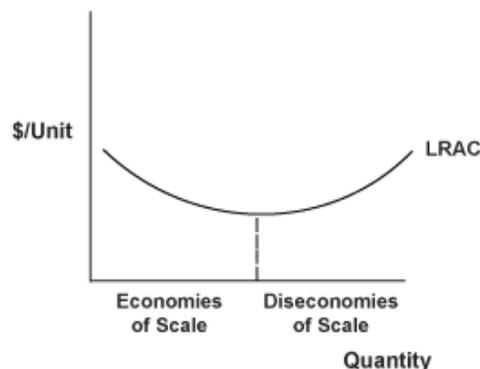
UNIT -V

MARKET STRUCTURE AND PRICING PRACTICES

MARKET:

Market is a place where buyer and seller meet, goods and services are offered for the sale and transfer of ownership occurs. A market may be also defined as the demand made by a certain group of potential buyers for a good or service. The former one is a narrow concept and later one, a broader concept. Economists describe a market as a collection of buyers and sellers who transact over a particular product or product class (the housing market, the clothing market, the grain market etc.). For business purpose we define a market as people or organizations with wants (needs) to satisfy, money to spend, and the willingness to spend it.

Broadly, market represents the structure and nature of buyers and sellers for a commodity/service and the process by which the price of the commodity or service is established. In this sense, we are referring to the structure of competition and the process of price determination for a commodity or service. The determination of price for a commodity or service depends upon the structure of the market for that commodity or service (i.e., competitive structure of the market). Hence the understanding on the market structure and the nature of competition are a pre-requisite in price determination.
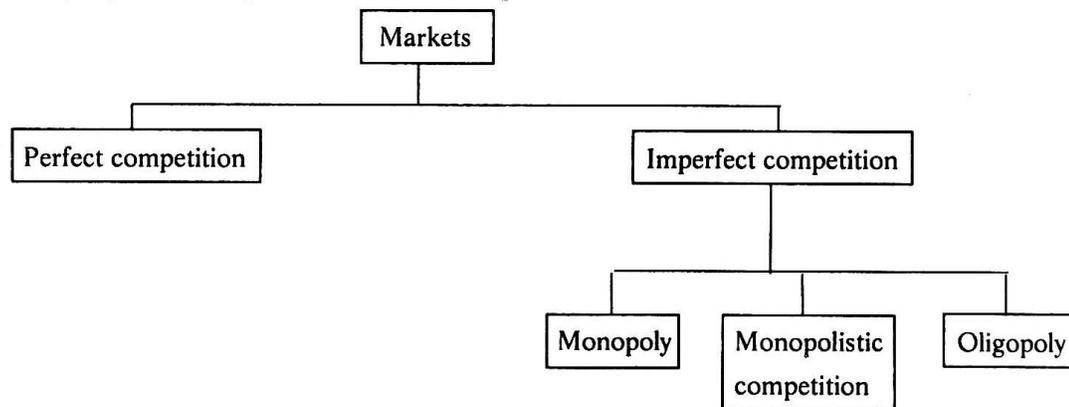
MARKET STRUCTURE:

Market structure describes the competitive environment in the market for any good or service. A market consists of all firms and individuals who are willing and able to buy or sell a particular product. This includes firms and individuals currently engaged in buying and selling a particular product, as well as potential entrants. The determination of price is affected by the competitive structure of the market. This is because the firm operates in a market and not in isolation. In marketing decisions concerning economic variables it is affected, as are all institutions in society by its environment.

Different Market Structures

Market structure describes the competitive environment in the market for any good or service. A market consists of all firms and individuals who are willing and able to buy or sell a particular product. This includes firms and individuals currently engaged in buying and selling a particular product, as well as potential entrants.

The determination of price is affected by the competitive structure of the market. This is because the firm operates in a market and not in isolation. In marking decisions concerning economic variables it is affected, as are all institutions in society by its environment.

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                            ┌──────────┐
                            │ Markets  │
                            └────┬─────┘
              ┌──────────────────┴──────────────────┐
    ┌──────────────────┐              ┌──────────────────────┐
    │ Perfect          │              │ Imperfect competition│
    │ competition      │              └──────────┬───────────┘
    └──────────────────┘           ┌─────────────┼─────────────┐
                             ┌──────────┐  ┌──────────────┐  ┌──────────┐
                             │ Monopoly │  │ Monopolistic │  │ Oligopoly│
                             └──────────┘  │ competition  │  └──────────┘
                                           └──────────────┘
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Perfect Competition

Perfect competition refers to a market structure where competition among the sellers and buyers prevails in its most perfect form. In a perfectly competitive market, a single market price prevails for the commodity, which is determined by the forces of total demand and total supply in the market.

Characteristics of Perfect Competition

The following features characterize a perfectly competitive market:

1. **A large number of buyers and sellers:** The number of buyers and sellers is large and the share of each one of them in the market is so small that none has any influence on the market price.
2. **Homogeneous product:** The product of each seller is totally undifferentiated from those of the others.
3. **Free entry and exit**: Any buyer and seller is free to enter or leave the market of the commodity.
4. **Perfect knowledge**: All buyers and sellers have perfect knowledge about the market for the commodity.
5. **Indifference:** No buyer has a preference to buy from a particular seller and no seller to sell to a particular buyer.
6. **Non-existence of transport costs**: Perfectly competitive market also assumes the non-existence of transport costs.
7. **Perfect mobility of factors of production**: Factors of production must be in a position to move freely into or out of industry and from one firm to the other.

Under such a market no single buyer or seller plays a significant role in price determination. One the other hand all of them jointly determine the price. The price is determined in the industry, which is composed of

all the buyers and seller for the commodity. The demand curve facing the industry is the sum of all consumers' demands at various prices. The industry supply curve is the sum of all sellers' supplies at various prices.

PERFECT COMPETITION

Perfect competition refers to a market structure where competition among the sellers and buyers prevails in its most perfect form. In a perfectly competitive market, a single market price prevails for the commodity, which is determined by the forces of total demand and total supply in the market. A market structure in which all firms in an industry are price takers and in which there is freedom of entry into and exit from the industry is called perfect competition. The market with perfect competition conditions is known as perfect market

Features of perfectly competition

1. A large number of buyers and sellers: The number of buyers and sellers is large and the share of each one of them in the market is so small that none has any influence on the market price.

2. There should be significantly large number of buyers and sellers in the market. The number should be so large that it should not make any difference in terms of price of quantity supplied even if one enters the market or one leaves the market.

3. Homogenous products or services: the products and services of each seller should be homogeneous. They cannot be differentiated from that of one another. It makes no difference to the buyer whether he buys from firm X or firm Z. in other words, the buyer does not have any particular preference to buy the goods from a particular trader or supplier

4. Freedom to enter or exit the market: there should not be restrictions on the part of the buyers and sellers to enter the market or leave the market. There should not be any barriers. The buyers can enter the market or leave the market whenever they want.

5. Prefect information available to the buyers and sellers: each buyer and seller has total knowledge of the prices prevailing in the market at every given point of time, quantity supplied, costs, demand, nature of product, and other relevant information. There is no need for any advertisement expenditure as the buyers and sellers are fully informed.

6. Perfect mobility of factors of production: there should not be any restrictions on the utilization of factors of production such as land, labour, capital and so on. In words, the firm or buyer should have free access to the factors of production. Whenever capital or labor is required, it should instantly be made available.

7. Each firm is a price taker: an individual firm can alter its rate of production or sales without significantly affecting the market price of the product, a firm in a perfect market cannot influence the market through its own individual actions. It has no alternative other than selling its products at the price prevailing in the market. It cannot sell as much as it wants at its own set price.

Pure competition and perfect competition

The term perfect competition is used in a wider sense. Pure competition has only limited assumptions. When the assumptions, that large number of buyers and sellers, homogeneous products, free entry and exit are satisfied, there exists pure competition. Competition becomes perfect only when all the assumptions (features) are satisfied. Generally pure competition can be seen in agricultural products.

Equilibrium of a firm and industry under perfect competition

Equilibrium is a position where the firm has no incentive either to expand or contrast its output. The firm is said to be in equilibrium when it earn maximum profit. There are two conditions for attaining equilibrium by a firm. They are:

Marginal cost is an additional cost incurred by a firm for producing and additional unit of output. Marginal revenue is the additional revenue accrued to a firm when it sells one additional unit of output. A firm increases its output so long as its marginal cost becomes equal to marginal revenue. When marginal cost is more than marginal revenue, the firm reduces output as its costs exceed the revenue. It is only at the point where marginal cost is equal to marginal revenue, and then the firm attains equilibrium. Secondly, the marginal cost curve must cut the marginal revenue curve from below. If marginal cost curve cuts the marginal revenue curve from above, the firm is having the scope to increase its output as the marginal cost curve slopes downwards. It is only with the upward sloping marginal cost curve, there the firm attains equilibrium. The reason is that the marginal cost curve when rising cuts the marginal revenue curve from below.
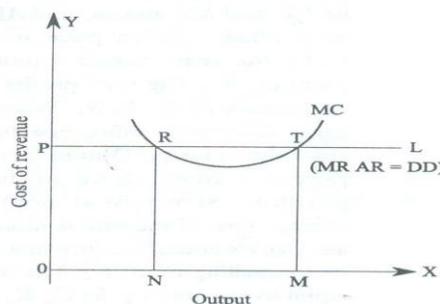

Fig. 6.2

The equilibrium of a perfectly competitive firm may be explained with the help of the fig. 6.2.

In the given fig. PL and MC represent the Price line and Marginal cost curve. PL also represents Marginal revenue, Average revenue and demand. As Marginal revenue, Average revenue and demand are the same in perfect competition, all are equal to the price line. Marginal cost curve is U- shaped curve cutting MR curve at R and T. At point R marginal cost becomes equal to marginal revenue. But MC curve cuts the MR curve fro above. So this is not the equilibrium position. The downward sloping marginal cost curve indicates that the firm can reduce its cost of production by increasing output. As the firm expands its output, it will reach equilibrium at point T. At this point, on price line PL; the two conditions of equilibrium are satisfied. Here the marginal cost and marginal revenue of the firm remain equal. The firm is producing maximum output and is in equilibrium at this stage. If the firm continues its output beyond this stage, its marginal cost exceeds marginal revenue resulting in losses. As the firm has no idea of expanding or contracting its size of out, the firm is said to be in equilibrium at point T.

Pricing under perfect competition

The price or value of a commodity under perfect competition is determined by the demand for and the supply of that commodity.

Under perfect competition there is large number of sellers trading in a homogeneous product. Each firm supplies only very small portion of the market demand. No single buyer or seller is powerful enough to influence the price. The demand of all consumers and the supply of all firms together determine the price. The individual seller is only a price taker and not a price maker. An individual firm has no price policy of it's own. Thus, the main problem of a firm in a perfectly competitive market is not to determine the price of its product but to adjust its output to the given price, So that the profit is maximum. Marshall however gives great importance to the time element for the determination of price. He divided the time periods on the basis of supply and ignored the forces of demand. He classified the time into four periods to determine the price as follows.

1. Very short period or Market period
2. Short period
3. Long period
4. Very long period or secular period

Very short period: It is the period in which the supply is more or less fixed because the time available to the firm to adjust the supply of the commodity to its changed demand is extremely short; say a single day or a few days. The price determined in this period is known as Market Price.

Short Period: In this period, the time available to firms to adjust the supply of the commodity to its changed demand is, of course, greater than that in the market period. In this period altering the variable

factors like raw materials, labour, etc can change supply. During this period new firms cannot enter into the industry.

Long period: In this period, a sufficiently long time is available to the firms to adjust the supply of the commodity fully to the changed demand. In this period not only variable factors of production but also fixed factors of production can be changed. In this period new firms can also enter the industry. The price determined in this period is known as long run normal price.

Secular Period: In this period, a very long time is available to adjust the supply fully to change in demand. This is very long period consisting of a number of decades. As the period is very long it is difficult to lay down principles determining the price.

Price Determination in the market period

The price determined in very short period is known as Market price. Market price is determined by the equilibrium between demand and supply in a market period. The nature of the commodity determines the nature of supply curve in a market period. Under this period goods are classified in to (a) Perishable goods and (b) Non-perishable goods.

Perishable Goods: In the very short period, the supply of perishable goods like fish, milk vegetables etc. cannot be increased. And it cannot be decreased also. As a result the supply curve under very short period will be parallel to the Y-axis or Vertical to X-axis. Supply is perfectly inelastic. The price determination of perishable goods in very short period may be shown with the help of the following fig. 6.5

Fig. 6.5
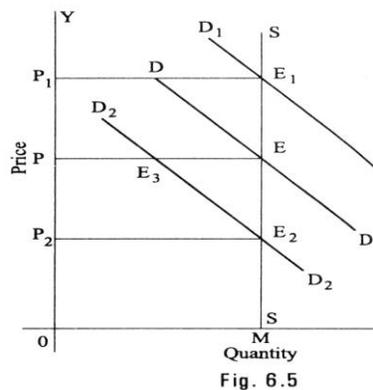
In this figure quantity is represented along X-axis and price is represented along Y-axis. MS is the very short period supply curve of perishable goods. DD is demand curve. It intersects supply curve at E. The price is OP. The quantity exchanged is OM. D1 D1 represents increased demand. This curve cuts the supply curve at E1. Even at the new equilibrium, supply is OM only. But price increases to OP1. So, when demand increases, the price will increase but not the supply. If demand decreases new demand curve will be D2 D2. This curve cuts the supply curve at E2. Even at this new equilibrium, the supply is OM only. But price falls to OP2. Hence in very short period, given the supply, it is the change in demand that influences price. The price determined in a very short period is called Market Price.

Non-perishable goods: In the very short period, the supply of non-perishable goods like cloth, pen, watches etc. cannot be increased. But if price falls, preserving some stock can decrease their supply. If

price falls too much, the whole stock will be held back from the market and carried over to the next market period. The price below, which the seller will refuse to sell, is called Reserve Price.

The Price determination of non-perishable goods in very short period may be shown with the help of the following fig 6.6.
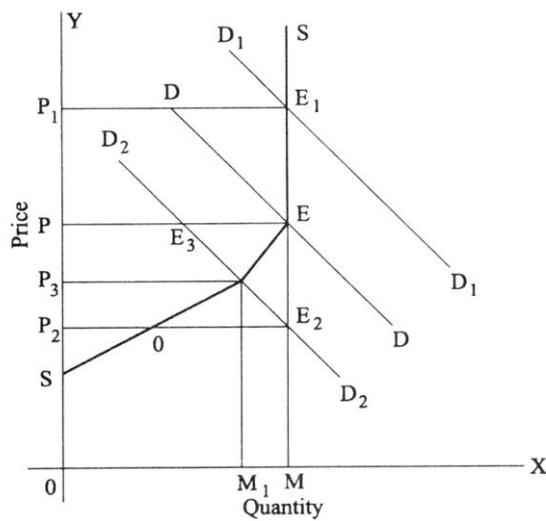

Fig. 6.6

In the given figure quantity is shown on X-axis and the price on Y-axis. SES is the supply curve. It slopes upward up to the point E. From E it becomes a vertical straight line. This is because the quantity existing with sellers is OM, the maximum amount they have is thus OM. Till OM quantity (i.e., point E) the supply curve sloped upward. At the point S, nothing is offered for sale.

It means that the seller with hold the entire stock if the price is OS. OS is thus the reserve price. As the price rises, supply increases up to point E. At OP price (Point E), the entire stock is offered for sale.

Suppose demand increases, the DD curve shift upward. It becomes D1D1 price raises to OP1. If demand decreases, the demand curve becomes D2D2. It intersects the supply curve at E3. The price will fall to OP3. We find that at OS price, supply is zero. It is the reserve price.

Price Determination in the short period
Short period is a period in which supply can be increased by altering the variable factors. In this period fixed costs will remain constant. The supply is increased when price rises and vice versa. So the supply curve slopes upwards from left to right.

The price in short period may be explained with the help of a diagram.
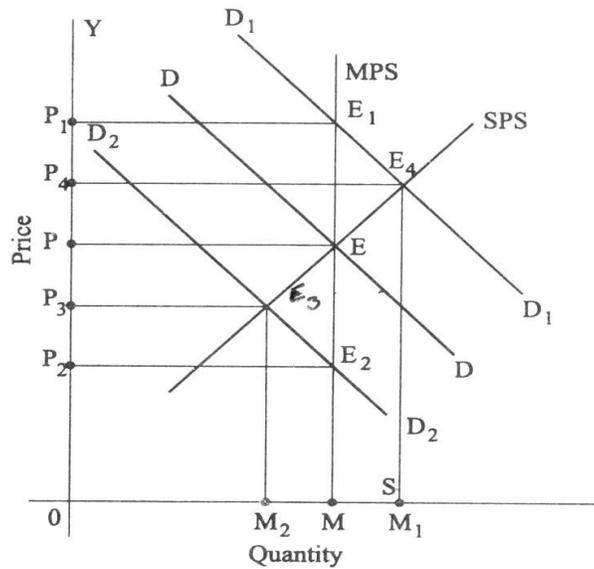
Fig. 6.7

In the given diagram MPS is the market period supply curve. DD is the initial demand curve. It intersects MPS curve at E. The price is OP and out put OM. Suppose demand increases, the demand curve shifts upwards and becomes D1D1. In the very short period, supply remains fixed on OM. The new demand curve D1D1 intersects MPS at E1. The price will rise to OP1. This is what happen in the very short-period.

As the price rises from OP to OP1, firms expand output. As firms can vary some factors but not all, the law of variable proportions operates. This results in new short-run supply curve SPS. It interests D1 D1 curve at E4. The price will fall from OP1 to OP4.

It the demand decreases, DD curve shifts downward and becomes D2D2. It interests MPS curve at E2. The price will fall to OP2. This is what happens in market period. In the short period, the supply curve is SPS. D2D2 curve interests SPS curve at E3. The short period price is higher than the market period price.

Price determination in the long period (Normal Price)

Market price may fluctuate due to a sudden change either on the supply side or on the demand side. A big arrival of milk may decrease the price of that production in the market period. Similarly, a sudden cold wave may raise the price of woolen garments. This type of temporary change in supply and demand may cause changes in market price. In the absence of such disturbing causes, the price tends to come back to a certain level. Marshall called this level is normal price level. In the words of Marshall Normal value (Price) of a commodity is that which economics force would tend to bring about in the long period.

In order to describe how long run normal price is determined, it is useful to refer to the market period as short period also. The market period is so short that no adjustment in the output can be made. Here cost of production has no influence on price. A short period is sufficient only to allow the firms to make only limited output adjustment. In the long period, supply conditions are fully sufficient to meet the changes in

demand. In the long period, all factors are alterable and the new firms may enter into or old firms leave the; industry.

In the long period all costs are variable costs. So supply will be increased only when price is equal to average cost.

Hence, in long period normal price will be equal to minimum average cost of the industry. Will this price be more or less than the short period normal price? The answer depends on the stage of returns to which the industry is subject. There are three stages of return on the stage of returns to which the industry is subject. There are three stages of returns.

1. Increasing returns or decreasing costs.
2. Constant Returns or Constant costs.
3. Diminishing returns or increasing costs.

1. **<u>Determination of long period normal price in decreasing cost industry:</u>**

   At this stage, average cost falls due to an increase in the output. So, the supply   curve at this stage will slope downwards from left to right. The long period Normal price determination at this stage can be explained with the help of a diagram.

Fig. 6.8
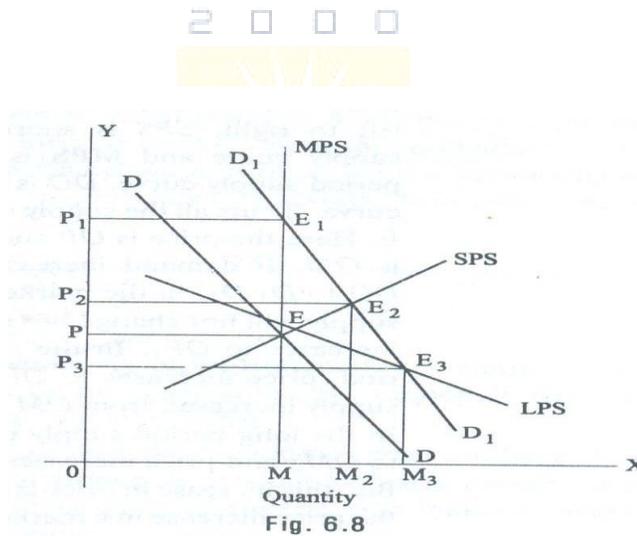
In the diagram, MPS represents market period supply curve. DD is demand curve. DD cuts LPS, SPS and MPS at point E. At point E the supply is OM and the price is OP. If demand increases from DD to D1D1 market price increases to OP1. In the short period it is OP2. In the long period supply increases considerably to OM3. So price has fallen to OP3, which is less than the price of market period.

2. **Determination of Long Period Normal Price in Constant Cost Industry:**

   In this case average cost does not change even though the output increases. Hence long period supply curve is horizontal to X-axis. The determination of long period normal price can be explained with the help of the diagram. In the fig. 6.9, LPS is horizontal to X-axis. MPS represents market

period supply curve, and SPS represents short period supply curve. At point 'E' the output is OM and price is OP. If demand increases from DD to D1D1 market price increases to OP1. In the short period, supply increases and hence the price will be OP2. In the long run supply is adjusted fully to meet increased demand. The price remains constant at OP because costs are constant at OP and market is perfect market.
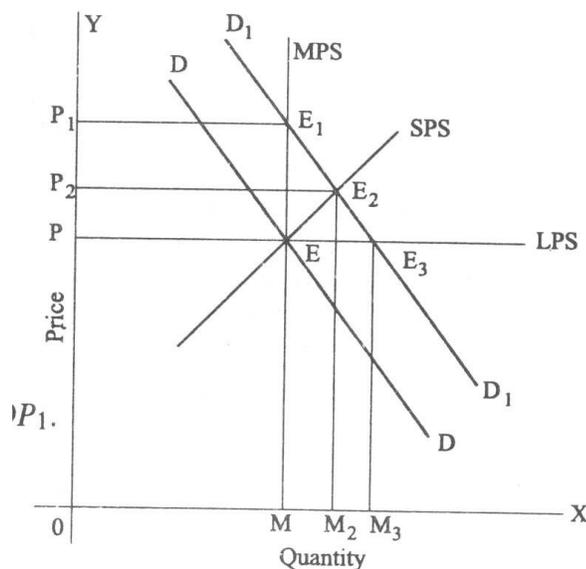

Fig. 6.9

3. Determination of long period normal price in increase cost industry:

If the industry is subject to increasing costs (diminishing returns) the supply curve slopes upwards from left to right like an ordinary supply curve. The determination of long period normal price in increasing cost industry can be explained with the help of the following diagram. In the diagram LPS represents long period supply curve. The industry is subject to diminishing return or increasing costs. So, LPS slopes upwards from left to right. SPS is short period supply curve and MPS is market period supply curve. DD is demand curve. It cuts all the supply curves at E. Here the price is OP and output is OM. If demand increases from DD to D1D1 in the market period, supply will not change but the price increases to OP1. In the short period, price increase but the price increases to OP1. In the short period, price increases to OP2 as the supply increased from OM to OM2. In the long period supply increases to OM3 and price increases to OP3. But this increase in price is less than the price increase in a market period or short period.
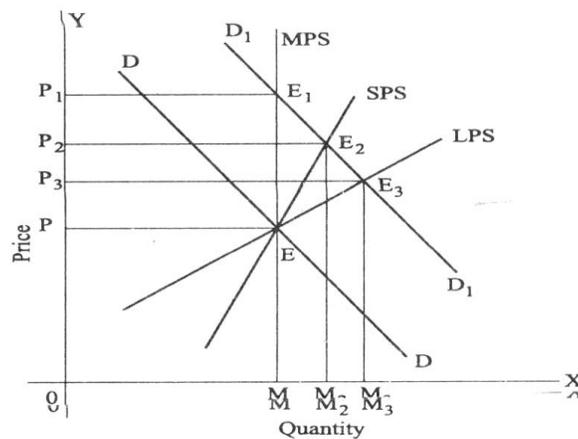
Fig. 6.10

Monopoly

The word monopoly is made up of two syllables, Mono and poly. Mono means single while poly implies selling. Thus monopoly is a form of market organization in which there is only one seller of the commodity. There are no close substitutes for the commodity sold by the seller. Pure monopoly is a market situation in which a single firm sells a product for which there is no good substitute.

Features of monopoly

The following are the features of monopoly.

1. **Single person or a firm:** A single person or a firm controls the total supply of the commodity. There will be no competition for monopoly firm. The monopolist firm is the only firm in the whole industry.
2. **No close substitute:** The goods sold by the monopolist shall not have closely competition substitutes. Even if price of monopoly product increase people will not go in far substitute. For example: If the price of electric bulb increase slightly, consumer will not go in for kerosene lamp.
3. **Large number of Buyers:** Under monopoly, there may be a large number of buyers in the market who compete among themselves.
4. **Price Maker:** Since the monopolist controls the whole supply of a commodity, he is a price-maker, and then he can alter the price.
5. **Supply and Price:** The monopolist can fix either the supply or the price. He cannot fix both. If he charges a very high price, he can sell a small amount. If he wants to sell more, he has to charge a low price. He cannot sell as much as he wishes for any price he pleases.
6. **Downward Sloping Demand Curve:** The demand curve (average revenue curve) of monopolist slopes downward from left to right. It means that he can sell more only by lowering price.

Types of Monopoly

Monopoly may be classified into various types. The different types of monopolies are explained below:

1. **Legal Monopoly:** If monopoly arises on account of legal support or as a matter of legal privilege, it is called Legal Monopoly. Ex. Patent rights, special brands, trade means, copyright etc.

2. **Voluntary Monopoly:** To get the advantages of monopoly some private firms come together voluntarily to control the supply of a commodity. These are called voluntary monopolies. Generally, these monopolies arise with industrial combinations. These voluntary monopolies are of three kinds (a) cartel (b) trust (c) holding company. It may be called artificial monopoly.

3. **Government Monopoly:** Sometimes the government will take the responsibility of supplying a commodity and avoid private interference. Ex. Water, electricity. These monopolies, created to satisfy social wants, are formed on social considerations. These are also called Social Monopolies.

4. **Private Monopoly:** If the total supply of a good is produced by a single private person or firm, it is called private monopoly. Hindustan Lever Ltd. Is having the monopoly power to produce Lux Soap.

5. **Limited Monopoly:** if the monopolist is having limited power in fixing the price of his product, it is called as 'Limited Monopoly'. It may be due to the fear of distant substitutes or government intervention or the entry of rivals firms.

6. **Unlimited Monopoly:** If the monopolist is having unlimited power in fixing the price of his good or service, it is called unlimited monopoly. Ex. A doctor in a village.

7. **Single Price Monopoly:** When the monopolist charges same price for all units of his product, it is called single price monopoly. Ex. Tata Company charges the same price to all the Tata Indiaca Cars of the same model.

8. **Discriminating Monopoly:** When a Monopolist charges different prices to different consumers for the same product, it is called discriminating monopoly. A doctor may take Rs.20 from a rich man and only Rs.2 from a poor man for the same treatment.

9. **Natural Monopoly:** Sometimes monopoly may arise due to scarcity of natural resources. Nature provides raw materials only in some places. The owner of the place will become monopolist. For Ex. Diamond mine in South Africa.

Pricing under Monopoly

Monopoly refers to a market situation where there is only one seller. He has complete control over the supply of a commodity. He is therefore in a position to fix any price. Under monopoly there is no distinction between a firm and an industry. This is because the entire industry consists of a single firm.
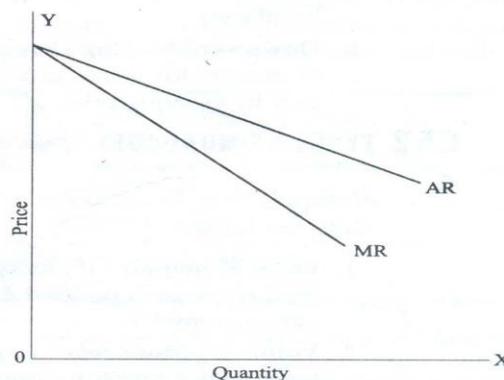

Fig. 6.11

Being the sole producer, the monopolist has complete control over the supply of the commodity. He has also the power to influence the market price. He can raise the price by reducing his output and lower the price by increasing his output. Thus he is a price-maker. He can fix the price to his maximum advantages. But he cannot fix both the supply and the price, simultaneously. He can do one thing at a time. If the fixes the price, his output will be determined by the market demand for his commodity. On the other hand, if he fixes the output to be sold, its market will determine the price for the commodity. Thus his decision to fix either the price or the output is determined by the market demand.

The market demand curve of the monopolist (the average revenue curve) is downward sloping. Its corresponding marginal revenue curve is also downward sloping. But the marginal revenue curve lies below the average revenue curve as shown in the figure. The monopolist faces the down-sloping demand curve because to sell more output, he must reduce the price of his product. The firm's demand curve and industry's demand curve are one and the same. The average cost and marginal cost curve are U shaped curve. Marginal cost falls and rises steeply when compared to average cost.

Price output determination (Equilibrium Point)

The monopolistic firm attains equilibrium when its marginal cost becomes equal to the marginal revenue. The monopolist always desires to make maximum profits. He makes maximum profits when MC=MR. He does not increasing his output if his revenue exceeds his costs. But when the costs exceed the revenue, the monopolist firm incur loses. Hence the monopolist curtails his production. He produces up to that point where additional cost is equal to the additional revenue (MR=MC). Thus point is called equilibrium point. The price output determination under monopoly may be explained with the help of a diagram.

In the diagram 6.12 the quantity supplied or demanded is shown along X-axis. The cost or revenue is shown along Y-axis. AC and MC are the average cost and marginal cost curves respectively. AR and MR curves slope downwards from left to right. AC and MC and U shaped curves. The monopolistic firm attains equilibrium when its marginal cost is equal to marginal revenue (MC=MR). Under monopoly, the MC curve may cut the MR curve from below or from a side. In the diagram, the above condition is satisfied at point E. At point E, MC=MR. The firm is in equilibrium. The equilibrium output is OM.

The above diagram (Average revenue) = MQ or OP

Average cost = MR

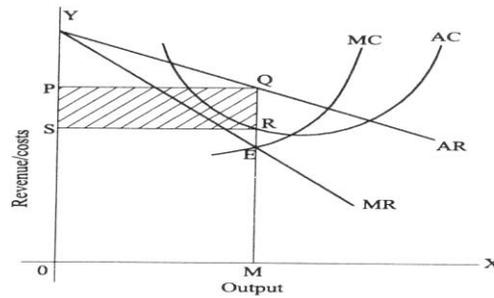Profit per unit = Average Revenue-Average cost=MQ-MR=QR

Total Profit = QRXSR=PQRS

Fig. 6.12

The area PQRS resents the maximum profit earned by the monopoly firm.

But it is not always possible for a monopolist to earn super-normal profits. If the demand and cost situations are not favorable, the monopolist may realize short run losses.

Through the monopolist is a price marker, due to weak demand and high costs; he suffers a loss equal to PABC.

If AR > AC -> Abnormal or super normal profits.

If AR = AC -> Normal Profit

If AR < AC -> Loss

In the long run the firm has time to adjust his plant size or to use existing plant so as to maximize profits.

Monopolistic competition

Perfect competition and pure monopoly are rate phenomena in the real world. Instead, almost every market seems to exhibit characteristics of both perfect competition and monopoly. Hence in the real world it is the state of imperfect competition lying between these two extreme limits that work. Edward. H. Chamberlain developed the theory of monopolistic competition, which presents a more realistic picture of the actual market structure and the nature of competition.

Characteristics of Monopolistic Competition

The important characteristics of monopolistic competition are:

1. **Existence of Many firms:** Industry consists of a large number of sellers, each one of whom does not feel dependent upon others. Every firm acts independently without bothering about the

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reactions of its rivals. The size is so large that an individual firm has only a relatively small part in the total market, so that each firm has very limited control over the price of the product. As the number is relatively large it is difficult for these firms to determine its price- output policies without considering the possible reactions of the rival forms. A monopolistically competitive firm follows an independent price policy.

2. **Product Differentiation:** Product differentiation means that products are different in some ways, but not altogether so. The products are not identical but the same time they will not be entirely different from each other. IT really means that there are various monopolist firms competing with each other. An example of monopolistic competition and product differentiation is the toothpaste produced by various firms. The product of each firm is different from that of its rivals in one or more respects. Different toothpastes like Colgate, Close-up, Forehans, Cibaca, etc., provide an example of monopolistic competition. These products are relatively close substitute for each other but not perfect substitutes. Consumers have definite preferences for the particular verities or brands of products offered for sale by various sellers. Advertisement, packing, trademarks, brand names etc. help differentiation of products even if they are physically identical.

3. **Large Number of Buyers:** There are large number buyers in the market. But the buyers have their own brand preferences. So the sellers are able to exercise a certain degree of monopoly over them. Each seller has to plan various incentive schemes to retain the customers who patronize his products.

4. **Free Entry and Exist of Firms:** As in the perfect competition, in the monopolistic competition too, there is freedom of entry and exit. That is, there is no barrier as found under monopoly.

5. **Selling costs:** Since the products are close substitute much effort is needed to retain the existing consumers and to create new demand. So each firm has to spend a lot on selling cost, which includes cost on advertising and other sale promotion activities.

6. **Imperfect Knowledge:** Imperfect knowledge about the product leads to monopolistic competition. If the buyers are fully aware of the quality of the product they cannot be influenced much by advertisement or other sales promotion techniques. But in the business world we can see that thought the quality of certain products is the same, effective advertisement and sales promotion techniques make certain brands monopolistic. For examples, effective dealer service backed by advertisement-helped popularization of some brands through the quality of almost all the cement available in the market remains the same.

7. **The Group:** Under perfect competition the term industry refers to all collection of firms producing a homogenous product. But under monopolistic competition the products of various firms are not identical through they are close substitutes. Prof. Chamberlin called the collection of firms producing close substitute products as a group.

Price – Output Determination under Monopolistic Competition

Since under monopolistic competition different firms produce different varieties of products, different prices for them will be determined in the market depending upon the demand and cost conditions. Each firm will set the price and output of its own product. Here also the profit will be maximized when marginal revenue is equal to marginal cost.

Short-run equilibrium of the firm:

In the short-run the firm is in equilibrium when marginal Revenue = Marginal Cost. In Fig 6.15 AR is the average revenue curve. NMR marginal revenue curve, SMC short-run marginal cost curve, SAC short-run average cost curve, MR and SMC interest at point E where output in OM and price MQ (i.e. OP). Thus the equilibrium output or the maximum profit output is OM and the price MQ or OP. When the price (average revenue) is above average cost a firm will be making supernormal profit. From the figure it can be seen that AR is above AC in the equilibrium point. As AR is above AC, this firm is making abnormal profits in the short-run. The abnormal profit per unit is QR, i.e., the difference between AR and AC at equilibrium point and the total supernormal profit is OR X OM. This total abnormal profits is represented by the rectangle PQRS. As the demand curve here is highly elastic, the excess price over marginal cost is rather low. But in monopoly the demand curve is inelastic. So the gap between price and marginal cost will be rather large.
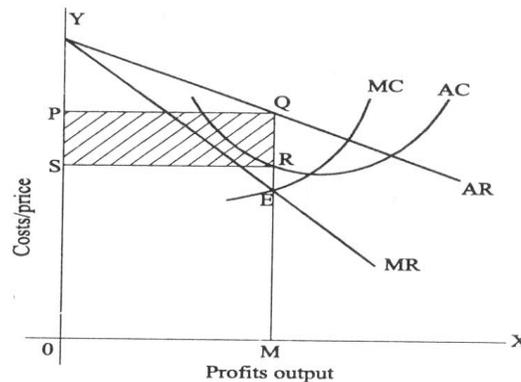

Fig. 6.15

If the demand and cost conditions are less favorable the monopolistically competitive firm may incur loss in the short-run fig 6.16 Illustrates this. A firm incurs loss when the price is less than the average cost of production. MQ is the average cost and OS (i.e. MR) is the price per unit at equilibrium output OM. QR is the loss per unit. The total loss at an output OM is OR X OM. The rectangle PQRS represents the total loses in the short run.
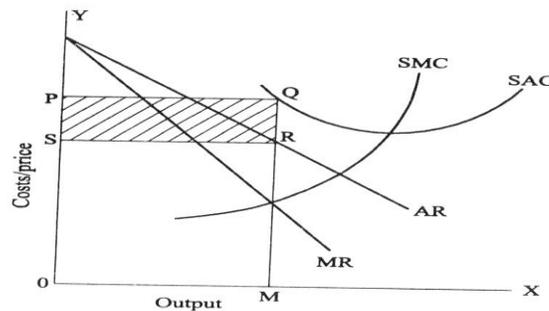

Fig. 6.16

Long – Run Equilibrium of the Firm:

A monopolistically competitive firm will be long – run equilibrium at the output level where marginal cost equal to marginal revenue. Monopolistically competitive firm in the long run attains equilibrium where MC=MR and AC=AR Fig 6.17 shows this trend.
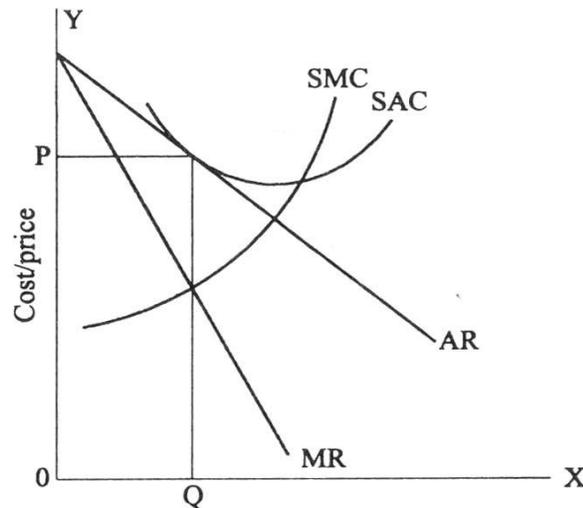

Fig. 6.17

Oligopoly

The term oligopoly is derived from two Greek words, oligos meaning a few, and pollen meaning to sell. Oligopoly is the form of imperfect competition where there are a few firms in the market, producing either a homogeneous product or producing products, which are close but not perfect substitute of each other.

Characteristics of Oligopoly

The main features of oligopoly are:

1. **Few Firms:** There are only a few firms in the industry. Each firm contributes a sizeable share of the total market. Any decision taken by one firm influence the actions of other firms in the industry. The various firms in the industry compete with each other.
2. **Interdependence:** As there are only very few firms, any steps taken by one firm to increase sales, by reducing price or by changing product design or by increasing advertisement expenditure will naturally affect the sales of other firms in the industry. An immediate retaliatory action can be anticipated from the other firms in the industry every time when one firm takes such a decision. He has to take this into account when he takes decisions. So the decisions of all the firms in the industry are interdependent.
3. **Indeterminate Demand Curve:** The interdependence of the firms makes their demand curve indeterminate. When one firm reduces price other firms also will make a cut in their prices. So he

firm cannot be certain about the demand for its product. Thus the demand curve facing an oligopolistic firm loses its definiteness and thus is indeterminate as it constantly changes due to the reactions of the rival firms.

4. **Advertising and selling costs:** Advertising plays a greater role in the oligopoly market when compared to other market systems. According to Prof. William J. Banumol "it is only oligopoly that advertising comes fully into its own". A huge expenditure on advertising and sales promotion techniques is needed both to retain the present market share and to increase it. So Banumol concludes "under oligopoly, advertising can become a life-and-death matter where a firm which fails to keep up with the advertising budget of its competitors may find its customers drifting off to rival products."

5. **Price Rigidity:** In the oligopoly market price remain rigid. If one firm reduced price it is with the intention of attracting the customers of other firms in the industry. In order to retain their consumers they will also reduce price. Thus the pricing decision of one firm results in a loss to all the firms in the industry. If one firm increases price. Other firms will remain silent there by allowing that firm to lost its customers. Hence, no firm will be ready to change the prevailing price. It causes price rigidity in the oligopoly market.

OTHER MARKET STRUCTURES
Duopoly

Duopoly refers to a market situation in which there are only two sellers. As there are only two sellers any decision taken by one seller will have reaction from the other Eg. Coca-Cola and Pepsi. Usually these two sellers may agree to co-operate each other and share the market equally between them, So that they can avoid harmful competition.

The duopoly price, in the long run, may be a monopoly price or competitive price, or it may settle at any level between the monopoly price and competitive price. In the short period, duopoly price may even fall below the level competitive price with the both the firms earning less than even the normal price.

Monopsony
Mrs. Joan Robinson was the first writer to use the term monopsony to refer to market, which there is a single buyer. Monoposony is a single buyer or a purchasing agency, which buys the show, or nearly whole of a commodity or service produced. It may be created when all consumers of a commodity are organized together and/or when only one consumer requires that commodity which no one else requires.

Bilateral Monopoly
A bilateral monopoly is a market situation in which a single seller (Monopoly) faces a single buyer (Monoposony). It is a market of monopoly-monoposy.

Oligopsony

Oligopsony is a market situation in which there will be a few buyers and many sellers. As the sellers are more and buyers are few, the price of product will be comparatively low but not as low as under monopoly.

PRICING METHODS

The micro – economic principle of profit maximization suggests pricing by the marginal analysis. That is by equating MR to MC. However the pricing methods followed by the firms in practice around the world rarely follow this procedure. This is for two reasons; uncertainty with regard to demand and cost function and the deviation from the objective of short run profit maximization.

It was seen that there is no unique theory of firm behavior. While profit certainly on important variable for which every firm cares. Maximization of short – run profit is not a popular objective of a firm today. At the most firms seek maximum profit in the long run. If so the problem is dynamic and its solution requires accurate knowledge of demand and cost conditions over time. Which is impossible to come by?

In view of these problems economic prices are a rare phenomenon. Instead, firms set prices for their products through several alternative means. The important pricing methods followed in practice are shown in the chart.

MONOPOLY

The word monopoly is made up of two syllables, Mono and poly. Mono means single while poly implies selling. Thus monopoly is a form of market organization in which there is only one seller of the commodity. There are no close substitutes for the commodity sold by the seller. Pure monopoly is a market situation in which a single firm sells a product for which there is no good substitute Features of monopoly

1. Single person or a firm: A single person or a firm controls the total supply of the commodity. There will be no competition for monopoly firm. The monopolist firm is the only firm in the whole industry.

2. No close substitute: The goods sold by the monopolist shall not have closely competition substitutes. Even if price of monopoly product increase people will not go in far substitute. For example: If the price of electric bulb increase slightly, consumer will not go in for kerosene lamp.

3. Large number of Buyers: Under monopoly, there may be a large number of buyers in the market who compete among themselves.

4. Price Maker: Since the monopolist controls the whole supply of a commodity, he is a price-maker, and then he can alter the price.

5. Supply and Price: The monopolist can fix either the supply or the price. He cannot fix both. If he charges a very high price, he can sell a small amount. If he wants to sell more, he has to charge a low price. He cannot sell as much as he wishes for any price he pleases.

6. Downward Sloping Demand Curve: The demand curve (average revenue curve) of monopolist slopes downward from left to right. It means that he can sell more only by lowering price.

MONOPOLISTIC COMPETITION

Monopolistic competition is said to exist when there are many firms and each one produces such goods and services that are close substitutes to each other. They are similar but not identical. Product differentiation is the essential feature of monopolistic. Products can be differentiated by means of unique facilities, advertising, brand loyalty, packaging, pricing, terms of credit, superior maintenance services, and convenient location and so on.

Features of Monopolistic:

1. Existence of Many firms:

Industry consists of a large number of sellers, each one of whom does not feel dependent upon others. Every firm acts independently without bothering about the reactions of its rivals. The size is so large that an individual firm has only a relatively small part in the total market, so that each firm has very limited control over the price of the product. As the number is relatively large it is difficult for these firms to determine its price- output policies without considering the possible reactions of the rival forms. A monopolistically competitive firm follows an independent price policy.

2. Product Differentiation:

Product differentiation means that products are different in some ways, but not altogether so. The products are not identical but the same time they will not be entirely different from each other. IT really means that there are various monopolist firms competing with each other. An example of monopolistic competition and product differentiation is the toothpaste produced by various firms. The product of each firm is different from that of its rivals in one or more respects. Different toothpastes like Colgate, Close-

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3. Large Number of Buyers:

There are large number buyers in the market. But the buyers have their own brand preferences. So the sellers are able to exercise a certain degree of monopoly over them. Each seller has to plan various incentive schemes to retain the customers who patronize his products.

4. Free Entry and Exist of Firms:

As in the perfect competition, in the monopolistic competition too, there is freedom of entry and exit. That is, there is no barrier as found under monopoly.

5. Selling costs:

Since the products are close substitute much effort is needed to retain the existing consumers and to create new demand. So each firm has to spend a lot on selling cost, which includes cost on advertising and other sale promotion activities.

6. Imperfect Knowledge:

Imperfect knowledge about the product leads to monopolistic competition. If the buyers are fully aware of the quality of the product they cannot be influenced much by advertisement or other sales promotion techniques. But in the business world we can see that thought the quality of certain products is the same, effective advertisement and sales promotion techniques make certain brands monopolistic. For examples, effective dealer service backed by advertisement-helped popularization of some brands through the quality of almost all the cement available in the market remains the same.

7. The Group:

Under perfect competition the term industry refers to all collection of firms producing a homogenous product. But under monopolistic competition the products of various firms are not identical through they are close substitutes. Prof. Chamberlin called the collection of firms producing close subset.

PRICE- OUTPUT DETERMINATION IN CASE OF PERFECT COMPETITION:

Short-Run:

The price and output of the firm are determined, under perfect competition, based on the   industry price and its own costs. The industry price has greater say in this process because the firm own sales are very small and insignificant. The process of price output determination in case of perfect competition The firm demand curve is horizontal at the price determined in the industry (MR = AR = price). This demand curve is also known as average revenue curve. This is because if all the units are sold at the same price, on an average, the revenue to the firm equals its price.
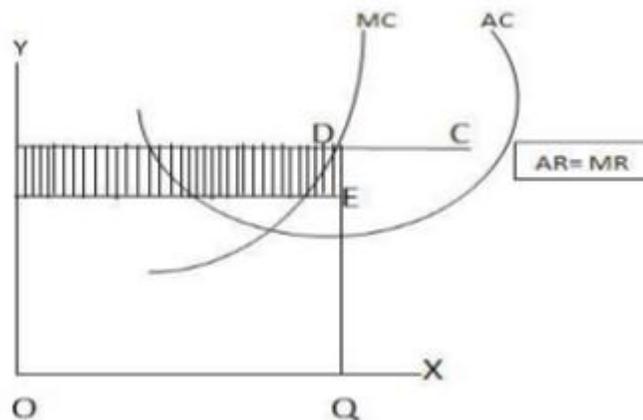

Long Run:

Having been attracted by supernormal profits, more and more firms enter the industry. With the result, there will be a scramble for scarce inputs among the competing firms pushing the input prices. Hence, the average cost increases. The entry of more and more firms will expand the supply pulling down the market price. The entry of the firms into the industry continues till the supernormal profit is completely eroded. In the long run, the firms will be in the position to enjoy only normal profits but not supernormal profit. Normal profits are the profit that is just sufficient for the firms to stay in the business.

PRICE -OUT PUT DETERMINATION IN MONOPOLY:

Under monopoly the average revenue curve for a firm is a downward sloping one. It is because, of the monopolist reduces the price of his product, the quantity demanded increase and vice versa. In monopoly,

marginal revenue is less than the average revenue. The monopolist always wants to maximize his profits. To achieve maximum profits, it is necessary that the marginal revenue should be more than the marginal cost.
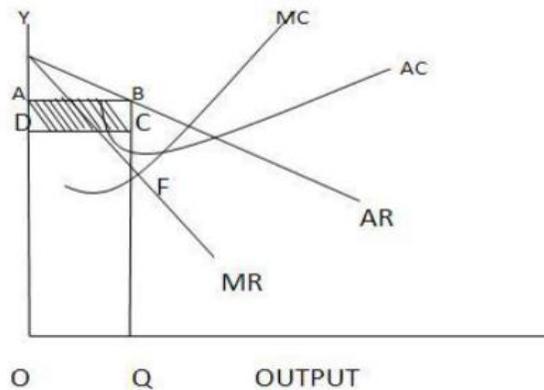
PRICING PHILOSOPHY

Cost – based pricing methods:

1. Cost plus pricing:

This is also called full cost or mark up pricing. Here the average cost normal capacity of output is ascertained and then a conventional margin of profit is added to the cost to arrive at the price. In other words, find out the product unit's total cost and add percentage of profit to arrive at the selling price. This method is suitable where the cost keep fluctuating from time to time. It is commonly followed in departmental stores and other retail shops. This method is simple to be administered but it does not consider the competition factor. The competitor may produce the same product at lower cost and thus offer it at a lower price.

2. Marginal cost pricing:

In marginal cost pricing, selling price is fixed in such a way that it covers fully the variable or marginal cost and contributes towards recovery of fixed costs fully or partly, depending upon the market situations. In times of stiff competition, marginal cost offers a guideline as to how far the selling price can be lowered. This is also called break – even pricing or target profit pricing. How break – even analysis helps in taking pricing decisions.