

MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTING

IV SEM

1

BASIC CONCEPTS

PREVIOUS YEARS QUESTIONS

PART-A

Q.1 Why do economic problems arise?

[R.T.U. Dec. 2019]

Ans. Economic Problems : Two major factors are responsible for the emergence of economic problems. They are: i) the existence of unlimited human wants and ii) the scarcity of available resources. The numerous human wants are to be satisfied through the scarce resources available in nature. Economics deals with how the numerous human wants are to be satisfied with limited resources. Thus, the science of economics centres on want - effort - satisfaction.

Q.2 Define the term GDP.

[R.T.U. 2019]

Ans. Gross Domestic Product (GDP) : It is a broad measurement of a nation's overall economic activity. GDP is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

GDP includes all private and public consumption, government outlays, investments, additions to private inventories, paid-in construction costs and the foreign balance of trade (exports are added, imports are subtracted). It may be contrasted with Gross National Product (GNP), which measures the overall production of an economy's citizens, including those living abroad, while domestic production by foreigners is excluded. Though GDP is usually calculated on an annual basis, it can be calculated on a quarterly basis as well (in the United

States, for example, the government releases an annualized GDP estimate for each quarter and also for an entire year).

Q.3 Define Macro Economics.

[R.T.U. 2018]

Ans. Macroeconomics : It is the branch of economics, which deals with the economic functioning and its performance, decision making and structure as a whole. However, there are some basic concepts of nature and scope of macroeconomics that makes it more interesting than any other.

Q.4 What do you mean by economics? Explain.

Ans. Economics: Economics is the science that deals with production, exchange and consumption of various commodities in economic systems. It shows how scarce resources can be used to increase wealth and human welfare. The central focus of economics is on scarcity of resources and choices among their alternative uses. The resources or inputs available to produce goods are limited or scarce. This scarcity induces people to make choices among alternatives, and the knowledge of economics is used to compare the alternatives for choosing the best among them. For example, a farmer can grow paddy, sugarcane, banana, cotton etc. in his garden land. But he has to choose a crop depending upon the availability of irrigation water.

Economic Problems : Refer to Q.1.

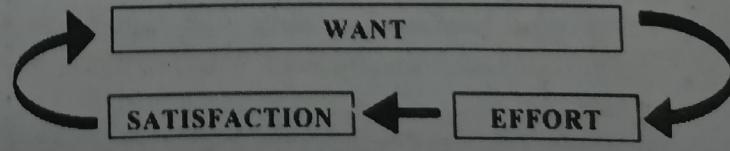


Fig.

Economics not only covers the decision making behaviour of individuals but also the macro variables of economies like national income, public finance, international trade and so on.

Q.5 Write a note on static and dynamic concepts.

Ans. Time element is very useful in studying the working of an economy. There are two main lines of approach. They are 1. static analysis and 2. dynamic analysis.

In the case of static analysis, we examine a problem at any given moment of time. Even in static analysis, sometimes we consider a short period rather than a single point. We assume that some changes take place during the short period. The method of approach where we take note of changes in the short period is known as comparative statics. For example, in comparative statics, we compare the state of economy at one moment to the state of the economy at another moment. Marshall's analysis of supply and demand is a good example of comparative statics. In dynamic analysis, we examine the path or process by which the economy moves from one state of equilibrium to another. Time element is an important factor in dynamic analysis. Change is the key word in dynamic analysis. For example, investment during a period may depend upon the rate of interest in the previous period. The study of the trade cycle may be given as a good example of dynamic analysis.

Q.6 Write down merits and demerits of Deductive method.

Ans. Merits of Deductive Method :

- (i) This method is close to reality. It is less time consuming and less expensive.
- (ii) The use of mathematical techniques in deducing theories of economics brings exactness and clarity in economic analysis.
- (iii) There being limited scope of experimentation, the method helps in deriving economic theories.
- (iv) The method is simple because it is analytical.

Demerits of Deductive Method:

- (i) The deductive method is simple and precise only if the underlying assumptions are valid. More often the assumptions turn out to be based on half truths or have no relation to reality. The conclusions drawn from such assumptions will, therefore, be misleading.
- (ii) Professor Learner describes the deductive method

as 'armchair' analysis. According to him, the premises from which inferences are drawn may not hold good at all times and places. As such deductive reasoning is not applicable universally.

- (iii) The deductive method is highly abstract. It requires a great deal of care to avoid bad logic or faulty economic reasoning.

Q.7 Write down merits and demerits of inductive method.

Ans. Merits of Inductive Method:

- (i) It is based on facts as such the method is realistic.
- (ii) In order to test the economic principles, method makes statistical techniques. The inductive method is, therefore, more reliable.
- (iii) Inductive method is dynamic. The changing economic phenomenon are analyzed and on the basis of collected data, conclusions and solutions are drawn from them.
- (iv) Induction method also helps in future investigations.

Demerits of Inductive Method :

- (i) If conclusions drawn from insufficient data, the generalizations obtained may be faulty.
- (ii) The collection of data itself is not an easy task. The sources and methods employed in the collection of data are different for each investigator. The results, therefore, may differ even with the same problem.
- (iii) The inductive method is time-consuming and expensive.

Q.8 Write down the main difference between inductive and deductive approach.

Ans.

- (i) The main difference between inductive and deductive approaches to research is that while a deductive approach is aimed at testing theory while an inductive approach is concerned with the generation of new theory emerging from the data.
- (ii) An inductive approach makes broad generalisations from specific observations.
- (iii) Inductive gives new knowledge whereas deductive doesn't as there is already a theory there.
- (iv) Although they seem very different from one another, they complement each other as when doing research, the researcher may need to use inductive and deductive to get where they want to.

PART-B

Q.9 Explain the deductive and inductive methods of constructing economic theory. [R.T.U. Dec. 2019]

OR

Discuss the methods of economic analysis.

Ans. 1. Deductive method : Deduction means interpretation or implication from general to the particular or from the universal to the individual. The deductive method develops new findings from elementary hypothesis or from truth recognized by other methods. It engrosses the process of analysis from certain laws or principles, which are supposed to be true to the analysis of facts. This involves four steps.

(i) **Selecting the Problem :** The problem which a researcher plumps for, for enquiry must be fixed clearly. It may be very broad like redundancy, scarcity, price rises etc. or tapered relating to an industry.

(ii) **Formulating Assumptions :** The next step in deduction is the outlining of postulations which are the basis of propositions. To be productive for survey, the assumptions must be general.

(iii) **Formulating Hypothesis :** The next step is to formulate a hypothesis on the basis of logical reasoning whereby conclusions are drawn.

(iv) **Testing and Verifying Hypothesis :** This is the final step of deductive method, to test and verify the hypothesis. For this purpose, economists use statistical and econometric methods. Verification consists in corroborating whether the hypothesis is in agreement with facts.

2. The Inductive Method : Induction is the process of way of thinking from a part of the intact, from details to general from the individual to the widespread. The inductive method involves the following steps.

(i) **The Problem :** In order to appear at a simplification relating to an economic occurrence, the dilemma should be correctly selected and clearly stated.

(ii) **Data :** The second step is the compilation, enumeration, categorization and investigation of data by using suitable statistical techniques.

(iii) **Observation :** Data are used to make surveillance about particular facts relating to the problem.

(iv) **Generalisation :** On the basis of inspection, generalised is logically derived which establishes a general truth from particular facts.

Q.10 What is circular flow of economic activity? Explain the circular flow in four sector model. [R.T.U. 2019]

Ans. Concept of circular flow of economic activity: The economy of any human society must involve the activities of production and consumption. To be noted here is the fact that firms are both producers and consumers in the circular flow chain while the household serves the consumption aspect of our economic chain. Production can be defined as any act of using available economic resources in the process of creating merchandise and services, which match the needs of the consumers. Consumption on the other side can be defined as the act of purchasing merchandise and services either for household use or for use in the process of making new merchandise and services. The latter is the reason behind the qualifying of firms as consumers. It is also to be noted that economic activities also include employment and earning generation. Employment is the acquisition of human resources for the benefits of realizing the production of merchandise and services by a firm. Earning generation as an economic activity includes all the costs incurred by the organization in the process of producing merchandise and services. Such could include costs for purchasing raw materials, labor wages and other expenses incurred by the firm during the production process.

Circular Flow of Economic Activity : The circular flow of economic activity is a model, showing the basic economic relationships within a market economy. It illustrates the balance between injections and leakages in the economy. The circular flow model shows where money goes and what it is exchanged for. The model includes household, businesses and governments.

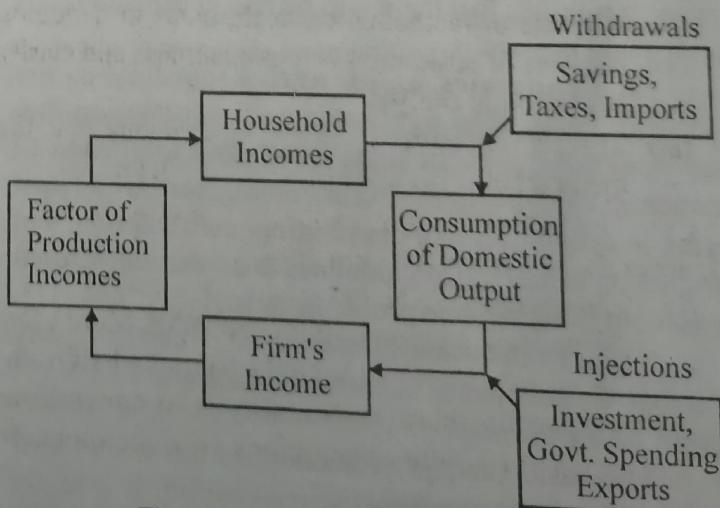


Fig. Circular Flow in four Sector Model

The four sectors are household, firm, government and foreign. The arrows denote the flow of income through the units in the economy. It also shows injections and leakages (withdrawals). In the four sector economy, international trade is added. International trade includes exports and imports.

Q.11 Discuss the nature and scope of economics.

Ans. Nature of Economics : When it comes to the nature of economics, there are several things that strike the doors of our mind, i.e. whether the economics is considered as a science or an art. This matter has always been in the great argument regarding various economists.

1. Economics as a science: Science is mainly defined as the systematic study that signifies the cause and effect relationship. In science, it is the collection of facts and figures that should be analyzed correctly. Economics, yet, is treated as a social science due to these following features of science.

(i) It depends on the systematic collection and analysis of facts and figures. Likewise, in economics, all the theories connected with micro and macroeconomics is examined carefully.

(ii) It is based on the formulation of theories and laws.

(iii) It believes in tracing the cause and effect relationship.

(iv) It can also make upcoming forecasts.

(v) It has a scale of measurement, as in economics, 'money' is considered as the measuring rod.

So, it can be clearly stated that the nature of economics is correlated to science. Alike in science, various economic theories are based on logical reasoning. Let's take an example to understand this. In science, there is Newton's law of gravitation and in economics; law of demand signifies that there will be rise in demand if it is decreasing in price.

2. Economics as an art: According to the Marshall, art is the application of information and knowledge. As, in economics, art acts as a solution to all economic complications. Furthermore, there are several terms in economics like distribution, consumption, and production that offer the guidelines to us, that can be used to sort out the economic problems in society.

Thus, from the above discussion, it can be clearly said that the economics is both a science and an art.

Scope of Economics

The basic concept of economics has a very vast scope and to understand this crucial aspect, it is really necessary to go through this concern very carefully.

Scope of economics can be classified broadly into two categories:

1. Microeconomics: Microeconomics is the study of examining every individual economic activity, industries, and their interactions. It mainly observes how a person earns and spends his income. Besides it, the nature of microeconomics has certain key areas that must be taken into consideration.

(i) Elasticity: Elasticity is used to determine the ratio of change in the proportion of one variable to the change in the proportion of another variable. Price elasticity of demand and the income elasticity of demand, the price elasticity of supply etc. are commonly used elasticities in the market.

(ii) Theory of production: In this study of production, the input is converted into output efficiently. Production can include storing, shipping, packaging, and manufacturing.

(iii) Cost of production: In this theory, it states that the object price is determined by the price of resources. The cost can be comprised of land, labor, capital and technology.

(iv) Monopoly: A monopoly can be defined as the state where a single firm is the one and only supplier of a specific commodity.

(v) Economics of information: Information economics is a kind of theory, which shows how information can affect economic decisions.

(vi) Oligopoly: It is termed as the situation where the small numbers of sellers dominate an industry or a market.

2. Macroeconomics : Refer to Q.3.

(i) Output and income: Output can be defined as the total income that generates from the sold commodity. It is usually measured by the Gross Domestic Product (GDP). Moreover, there are many reasons for the rise in output: technological advancement, human capital and better education.

(ii) Unemployment: It is typically measured by the overall employment rate, which means the ratio of workers without employment in the workforce. But the people who are pursuing their education and retired are excluded from this unemployment rate.

(iii) Inflation and deflation: In general terms, increase in price refers to inflation; while on the other hand, decrease in price refers to deflation in the economy. These fluctuations in the price can be easily measured by using price indexes.

Q.12 What do you mean by economic problems?

Ans. The Problem of Scarcity : We live in a world of scarcity. People want and need variety of goods and services. This applies equally to the poor and the rich people. It implies that human wants are unlimited but the means to fulfil them are limited. At any one time, only a limited amount of goods and services can be produced. This is because the existing supplies of resources are extremely inadequate. These resources are land, labour, capital and entrepreneurship.

These factors of production or inputs are used in producing goods and services that are called economic goods which have a price. These facts explain scarcity as the principal problem of every society and suggest the Law of Scarcity. The law states that human wants are virtually unlimited and the resources available to satisfy these wants are limited.

The Problem of Choice : Since we live in a world of scarcity, a society can produce only a small portion of goods and services that people want. Therefore, scarcity of resources gives rise to the fundamental economic problem of choice. As a society cannot produce enough goods and services to satisfy all the wants of its people, it has to make choices.

A decision to produce one good requires a decision to produce less of some other good. So choice involves sacrifice. Thus every society faces with the basic problem of deciding what it is willing to sacrifice to produce the goods it wants the most.

For instance, the more roads a country decides to construct the fewer resources will there be for building schools. So the problem of choice arises when there are alternative ways of producing other goods. The sacrifice of the alternative (school buildings) in the production of a good (roads) is called the opportunity cost.

There are a number of problems that can arise from choices that are made by people, whether they are individuals, firms or government. Choices or alternatives (or opportunity cost) are illustrated in terms of a production possibility curve.

A production possibility curve shows all possible combinations of two goods that a society can produce within a specified time period whose resources are fully and efficiently employed.

PP₁ is the production possibility curve in Fig. which shows the problem of choice between two goods X and Y in a country. Good X is measured on the horizontal axis and Good Y on the vertical axis. PP₁ curve shows all combinations of X and Y good that can be produced by the country with all its resources fully and efficiently employed.

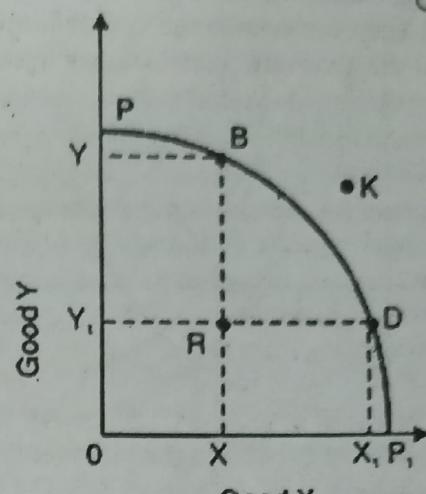


Fig.

If the country chooses to produce more of X good, it would have to sacrifice the production of some quantity of Y good. The sacrifice of some quantity of Y good is the opportunity cost of producing some extra quantity of good X.

The PP₁ curve is downward sloping because to produce more of good X involves producing less of good Y in a fully employed economy. Moving from point B to D on the PP₁ curve means that for producing XX₁, more quantity of good X, YY₁ quantity of good Y has to be sacrificed.

Both point's B and D represent efficient use of country's resources. Point R which is inside the boundary of PP₁ curve implies inefficient use of resources. Point K which is outside the boundary of PP₁ curve is an unattainable combination because the country does not possess sufficient resources to produce two combination of X and Y goods.

Q.13 What is comparative statics ?

Ans. Comparative Statics : In between statics and dynamics there comes comparative statics. For the benefit of students a reference will be enough. When two different situations at different points of time are compared, (or in other words, two static situations are compared) is called comparative statics. This can be seen from the figure.

At OM demand and supply the equilibrium price was PM but now demand and supply have changed to D₁D₁ and S₁S₁ and, therefore, equilibrium price also changed to P₁M₁. This should be noted that price PM was determined at certain point of time and price P₁M₁ is determined at some other point of time. When these 'two different points of time' are compared it is known as 'comparative statics'. Here we care comparing two different 'STILL' pictures. There can happen a series of

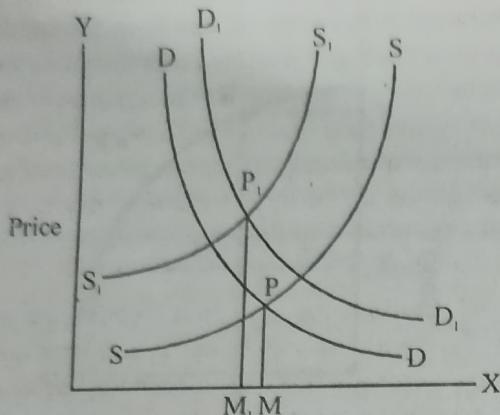


Fig. : Comparative Statics

PART-C

Q.14 What are the three methods of measuring national income? Elaborate. [R.T.U. Dec. 2019]

OR

Explain the various methods of measuring Nation Income. [R.T.U. 2019]

Ans. Methods of Measuring Nation Income

There are three methods of measuring Nation Income.

- (a) Product (or) Production Method
- (b) Income method
- (c) Expenditure Method

(a) Product (or) Production Method : It is also known as value added (or) output method. In this method the value added by various services and production goods are measured.

For the value added of the goods to be observed, the expenditure that is incurred on the intermediate goods is deducted from the goods itself.

These intermediate goods include unfinished goods which are purchased from enterprises, raw materials and the value of output produced by that enterprise.

(b) Income Method : To calculate income from distribution side, the income method is used. Thus, when the income is measured, during the time of distribution, it appears as the income paid (or) received by the people in that country.

In this method, the income is obtained by adding up all the incomes of the people in the country.

Services like land and capital which produces its own services are included in this method.

Thus, in this method, the payments done through transfer are not included in nation income. Smuggling money or hawala money is also not included.

(c) Expenditure Method : It includes all the expenditures done by the people in that country. The nation income is calculated based on the total expenditures made of goods and services during that year.

All types of expenditures are calculated in this method. This method is used mainly to calculate the incomes in the construction sector.

Some precautions in this method are it does not include the expenditure on second-hand goods, old bonds and shares.

Q.15 Explain the Principles of economics as explained by the circular flow of economic activities.

Ans. The economic progress and sustainability of any society is highly dependent on production and consumption. It is to be noted here that the production process is determined by the availability of economic resources such as physical facilities, labor and capital investment. Land is the physical resource required for the construction of the factory facilities and agricultural activities. It should also be noted that the land is the source of most of the economic resources required by firms in the production process. Such resources as electricity and minerals are found in the soil, making land a crucial factor in the production process.

The availability of qualified and reliable labor force is another basic requirement for sustainable production in any firm. It is the human resource that factors greatly in ensuring the efficient operation of any organization. It should also be noted that by providing employment, the firms are initiating the reciprocal factor of economic activities. With good wages, workers as consumers will increase their purchasing power for merchandise and services thus increasing the overall earnings margins for the firms. This will have the final result of increasing investment capacity for firms and thus ensuring a sustainable economic expansion in the nation.

Any investment requires capital. These are the durable merchandise and facilities which positively influence the production process. Such include setting up of factories and offices as well as investing in other

production supportive requirements. It is to be appreciated that capital investment is mainly in the form of loans from financial institution buyer gained earnings through purchase of the company's merchandise and services or from the investors own savings. It is due to this reason that financial institutions play an important role in the economic expansion of any society.

The concept of the circular flow of economic activities is found in the concept of stocks and flow. The decision making process pertaining to the economic position of any investment lies in its stock flow records. As a cycle of economic value reciprocation, it is worth noting that the use of economic resources in the production process requires demand for a return value to the firms. It is due to this that, the merchandise and services are usually purchased at a given marketplace price. Such earnings gained from the seller of the products will serve to pay wages for workers, rent to the landowners and contribute to the tax kit of the nation. With earnings, the workers will increase their purchasing power thus consequently increasing the overall economic potential of the firms. The government on the other side will invest in societal progress projects thus realizing a sustainable progress in the nation. It is this cycle of interaction from production, employment, capital generation and consumption, which leads to the circular flow of economic activities in the society.

It is still to be realized that it is the household which provides most of the economic resources needed by firms in the production process. Households are the owners of the land which they offer for a fee to the investors. Still to notice that the consumers are the source of the labor that serves to oversee the production of merchandise and services in the company. The investment capital is another thing, which proves the reciprocal nature of the economy of any society. It is to be understood that most investments rely on financial institutions for funding of their projects. Still to be appreciated that the financial institutions are heavily reliant on the consumer savings for their survival. This makes the economic expansion of a society thus a circular flow of earnings among the producers and the consumers.

Q.16 What is Economic statics? Explain.

Ans. Economic Statics : All economic phenomena under static analysis are considered without the time element. The most important aspect of static analysis is that most of the traditional theory in economics are based on static

analysis and at the same time dynamic analysis cannot be fully understood without having a basic understanding of static economic analysis. Static economic analysis studies the functional relationship between two or more variables at a point of time or for the same point of time. For instance, in a static market model, when the price equilibrium process is studied, all the three variables : price, demand and supply are related to the same point of time under certain assumptions.

Prof. Samuelson says that, "economic statics concerns itself with the simultaneous and instantaneous or timeless determination of economic variables by mutually interdependent relations." In the theory of product pricing the equilibrium price is achieved, under certain assumption, where demand and supply equate each other at the same point of time. This can be seen from the figure.

In the Figure PM is the price when quantity demanded and supplied is OM. Here it pertains to static analysis as the DD and SS are demand curve and supply curve respectively pertaining to the same point of time. This analysis is static only when demand and supply are influenced by, say time x. however, it should be explained here that if demand and supply is influenced by time $x+1$ or $x-1$ then the static analysis will not possible. If $x-1$ and $x+1$ have to be taken into account it is only possible when different time period or points of time are taken into consideration and this can be done only by dynamic analysis. Therefore,

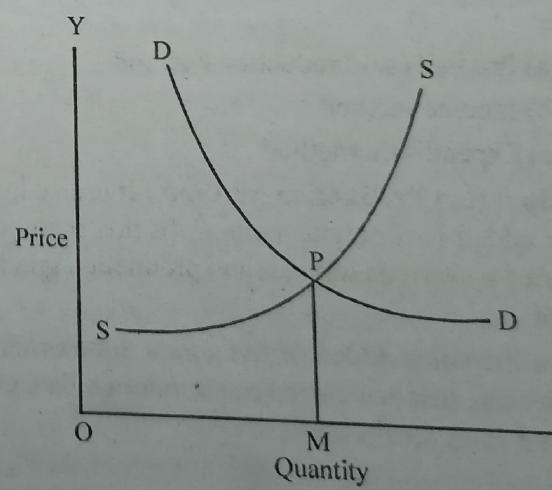


Fig. : Economic Statics

Changing situations (element of time being main factor) will make analysis more and more complex and we cannot depend on economic statics. Static method of analysis has also been known as the method of decreasing abstractions, successive approximations, or isolating one-at-a-time procedure.

Prof. Schumpeter says about economic statics is "when different economic variables which have same time subscript, that is to say, refer to the same point of time." Main areas relating to the static economic analysis are – demand and supply functions, the law of diminishing marginal utility, theory of rent, theory of firm, doctrine of comparative cost, general theory of distribution etc.

Problems of Economic Statics : Problems of economic statics arise from the problem of non recognition of time factor as an important variable in economic analysis. We all know that time cannot remain constant hence static analysis cannot hold good all the time. The greatest problem is that whatever analysed by way of economic statics appeals to be dull and stationary as if everything in the economic analysis is inert and inactive. However, there are certain merits of static economic analysis.

Merits of Economic Statics : Following are the merits of economic statics :

1. **Simple :** Economic statics is the most simple and clearly understandable by assuming other things being constant.
2. **Essential for Understanding Dynamics :** To understand the economic dynamics understanding of economic statics is a necessary condition and the fact is that stationary analysis can be understood better as a sequel to understand dynamics.
3. **Most Common :** It is most commonly used. We can move from common to complex (statics to dynamic) but it is difficult to move from complex to simple.



DEMAND AND DEMAND ANALYSIS

2

PREVIOUS YEARS QUESTIONS

PART-A

Q.1 What is demand forecasting? [R.T.U. Dec. 2019]

Ans. Demand forecasting is a combination of two words; the first one is demand and another forecasting. Demand means outside requirements of a product or service. In general, forecasting means making estimation in the present for a future occurring event.

Q.2 Define the Giffen Goods. [R.T.U. 2019]

Ans. Price effect is the composite effect of 'income effect' and 'substitution effect'. Giffen goods (most inferior goods) are those inferior goods for which 'income effect' of change in price is negative and is greater than the substitution effect. Therefore, the demand of Giffen goods increases with rise in price and decreases with fall in their price.

Q.3 What is the purpose of Demand Forecasting? [R.T.U. 2018]

Ans. Purposes of Forecasting

Forecasting, according to time may be two types—short term and long term. The purposes of forecasting may be different according to types of forecasting.

(a) Short-term Forecasting

- (i) Evolving suitable production policy so as to avoid the problem of over-production and under-production.

- (ii) Helping the firm in reducing cost of purchasing raw materials and controlling inventory by assuring regular supply of raw materials.

(b) Long-term Forecasting

- (i) **New unit planning or expansion of an existing unit :** A long term demand forecasting helps to plan for new units or at the same time existing units to expand their activities. A multi-product firm must determine total demand situation and the demand for different items.
- (ii) **Planning for long term financial requirements :** If the demand is more and it takes long time then such long term financial requirements could be planned and funds may be arranged and made available at the right time.

Q.4 Explain law of supply.

Ans. Law of supply explains the relationship between price of a commodity and its quantity supplied. Other things remaining the same, when price of a commodity falls the quantity supplied decreases and vice versa. Thus there is a positive relationship between price of a commodity and its supply. One thing should be understood here is that law of supply is only an indicative statement, not a quantitative statement. It means that when the price will change the quantity supplied will also change in the direction of price change but will not explain 'how much'. This quantitative relationship will be explained under the heading 'elasticity of supply'. For example, if the price of a commodity increases by 10% the quantity supplied, as per the law of supply, will also increase but will not explain how much the quantity supplied will increase.

Q.5 Explain Determinants of Elasticity of Supply.

MEFA.10

Ans. The elasticity of supply is determined by the following factors :

1. Time Period : Elasticity of supply depends upon the time which the seller requires to bring about adjustment in supply. In the very short period where the supply of commodity is limited to the existing stocks, the supply is perfectly inelastic. In the short period, the supply of the commodity can be changed by altering variable factors of production by having additional shifts or by using the existing plant and machinery more intensively. In the long period the supply has enough time to adjust itself to changes in demand. It is a time period in which all factors become variable. The elasticity of supply in the long period will be highly elastic.

2. State of Factors of Production : Supply of a commodity depends upon production factors. To increase production the seller will have to employ more units of the factors of production. If factors of production are scarce, they will have to be paid a higher price for the production of that particular commodity. The supply curve in such a case shall be less elastic. If the factors of production are available abundantly, cost of employing such factors will be less and, therefore, the supply will be more elastic.

3. Behaviour of Costs as Output Varies : If the cost of production rise rapidly as the output rises, then the incentive to expand production in response to a price will be limited due to increase in costs. In this case the supply will be inelastic. On the other hand, if the cost of production rises slowly as output increases, a rise in price that raises profits will bring forth a large increase in quantity supplied. In this case the supply will be more elastic.

Q.6 What is supply function ?

Ans. In economics, supply means the willingness and ability of a producer to produce the commodity during a particular time period. The supply of a commodity, say X, is a relationship between the price and the quantity supplied of commodity X, ceteris paribus. Here, we are assuming factors like there is no monopoly power by the producer, no change in the prices of substitute and complementary products, no change in government policy towards tax and subsidy for the product, no change in the goal of the firm, no change in the methods of production and state of technology, and no abnormal external forces (such as war, famine, draught, and flood).

If Q_{dx} and P_X denote the quantity supplied and price per unit of commodity X, respectively, then, other things remaining constant, the supply function will be written as $Q_{dx} = f(P_X)$. This means that any change in the price of commodity X will result in a corresponding change in the quantity supplied of commodity X.

PART-B

Q.7 Briefly discuss the price elasticity of demand.

OR

Explain the concept of elasticity of demand.

[R.T.U. Dec. 2019]

Ans. Price Elasticity of Demand : Demand elasticity measures the responsiveness of quantities demanded of an item relative to changes in its price. Supply elasticity gauges the responsiveness of quantities supplied of an item relative to changes in its price. Demand elasticity is usually called price elasticity of demand to distinguish it from measures of the sensitivity of amounts bought to changes in economic variables other than the item's price. Similarly, supply elasticity is commonly referred to as price elasticity of supply.

Price elasticity of demand is calculated by dividing the percentage change in the quantity demanded of an item by the percentage change in the price that caused it, other things being equal. The following formula can be used to calculate price elasticity of demand for small changes in price :

$$\text{Price elasticity of demand} = \frac{dQ/Q}{dP/P}$$

where Q is the initial quantity demanded, dQ is the change in quantity demanded caused by the change in price dP, and P is the initial price of the item.

Because the demand for a good is likely to fall as its price rises, the price elasticity of demand will be a negative number indicating the percentage change in the quantity demand of an item resulting from a 1 percentage change in its price. Price elasticity of demand is equal to the inverse of the negative slope of a demand curve (dQ/dP) multiplied by the ratio of the initial price of the item to its quantity demanded.

The absolute value of the price elasticity of demand can range from zero to infinite. When this value is between 0 and 1, demand is said to be inelastic; when it is greater than 1, demand is said to be elastic. The demand for an item is said to be of unitary elasticity if the absolute value of its price elasticity of demand is exactly equal to 1.

Q.8 What is Elasticity of Demand? What are the factors affecting the Elasticity of Demand?

[R.T.U. 2019]

Ans. "Elasticity of demand is the responsiveness for the quantity demanded of a commodity to changes in one of the variables on which demand depends. In other words, it is the percentage change in quantity demanded divided by the percentage in one of the variables on which demand depends."

Various factors which affect the elasticity of demand of a commodity are following :

1. Nature of Commodity : Elasticity of demand of a commodity is influenced by its nature. A commodity for a person may be a necessity, a comfort or a luxury.

- (i) When a commodity is a necessity like food grains, vegetables, medicines, etc., its demand is generally inelastic as it is required for human survival and its demand does not fluctuate much with change in price.
- (ii) When a commodity is a comfort like fan, refrigerator, etc., its demand is generally elastic as consumer can postpone its consumption.
- (iii) When a commodity is a luxury like AC, DVD player, etc., its demand is generally more elastic as compared to demand for comforts.
- (iv) The term 'luxury' is a relative term as any item (like AC), may be a luxury for a poor person but a necessity for a rich person.

2. Availability of Substitutes : Demand for a commodity with large number of substitutes will be more elastic. The reason is that even a small rise in its prices will induce the buyers to go for its substitutes. For example, a rise in the price of Pepsi encourages buyers to buy Coke and vice-versa.

Thus, availability of close substitutes makes the demand sensitive to change in the prices. On the other hand, commodities with few or no substitutes like wheat and salt have less price elasticity of demand.

3. Income Level : Elasticity of demand for any commodity is generally less for higher income level groups in comparison to people with low incomes. It happens because rich people are not influenced much by changes in the price of goods. But, poor people are highly affected by increase or decrease in the price of goods. As a result, demand for lower income group is highly elastic;

4. Level of Price : Level of price also affects the price elasticity of demand. Costly goods like laptop, Plasma TV, etc, have highly elastic demand as their demand is very sensitive to changes in their prices. However, demand for inexpensive goods like needle, match box, etc. is inelastic as change in prices of such goods do not change their demand by a considerable amount.

5. Postponement of Consumption : Commodities like biscuits, soft drinks, etc. whose demand is not urgent, have highly elastic demand as their consumption can be postponed in case of an increase in their prices. However, commodities with urgent demand like life saving drugs, have inelastic demand because of their immediate requirement.

6. Number of Uses : If the commodity under consideration has several uses, then its demand will be elastic. When price of such a commodity increases, then it is generally put to only more urgent uses and, as a result, its demand falls. When the prices fall, then it is used for satisfying even less urgent needs and demand rises.

For example, electricity is a multiple-use commodity. Fall in its price will result in substantial increase in its demand, particularly in those uses (like AC, Heat convector, etc.), where it was not employed formerly due to its high price. On the other hand, a commodity with no or few alternative uses has less elastic demand.

7. Share in Total Expenditure : Proportion of consumer's income that is spent on a particular commodity also influences the elasticity of demand for it. Greater the proportion of income spent on the commodity, more is the elasticity of demand for it and vice-versa.

Demand for goods like salt, needle, soap, match box, etc. tends to be inelastic as consumers spend a small proportion of their income on such goods. When prices of such goods change, consumers continue to purchase almost the same quantity of these goods. However, if the proportion of income spent on a commodity is large, then demand for such a commodity will be elastic.

8. Time Period : Price elasticity of demand is always related to a period of time. It can be a day, a week, a month, a year or a period of several years. Elasticity of demand varies directly with the time period. Demand is generally inelastic in the short period.

It happens because consumers find it difficult to change their habits, in the short period, in order to respond to a change in the price of the given commodity. However, demand is more elastic in long rim as it is comparatively easier to shift to other substitutes, if the price of the given commodity rises.

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9. Habits : Commodities, which have become habitual necessities for the consumers, have less elastic demand. It happens because such a commodity becomes a necessity for the consumer and he continues to purchase it even if its price rises. Alcohol, tobacco, cigarettes, etc. are some examples of habit forming commodities..

Finally it can be concluded that elasticity of demand for a commodity is affected by number of factors. However, it is difficult to say, which particular factor or combination of factors determines the elasticity. It all depends upon circumstances of each case.

Q.9 Following table exhibits demand and supply condition of a commodity at different price level -

Price (Rs.)	Demand ('000/month)	Supply ('000/month)
110	-	1000
100	40	900
90	80	800
80	120	700
70	160	600
60	200	500
50	240	400
40	280	300
30	320	200
20	360	100
10	400	-

- (a) Draw the demand and supply curves.
 (b) What is the equilibrium price and quantity?
 [R.T.U. 2019]

Ans.(a) Demand and Supply Curves

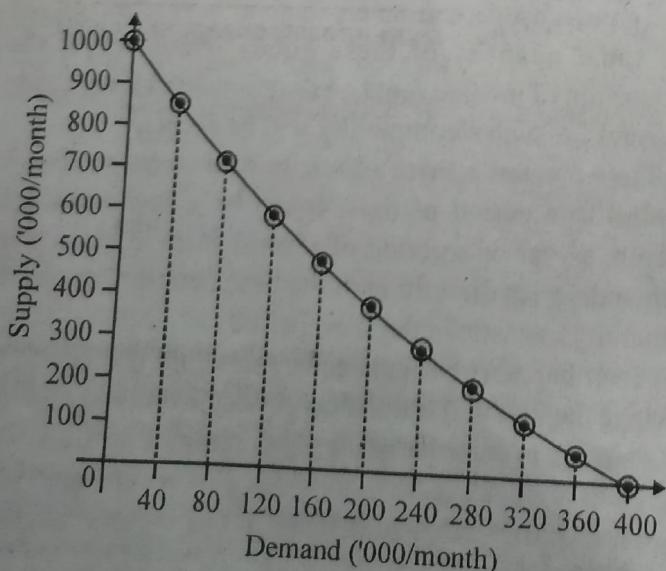


Fig. Supply-Demand Curve

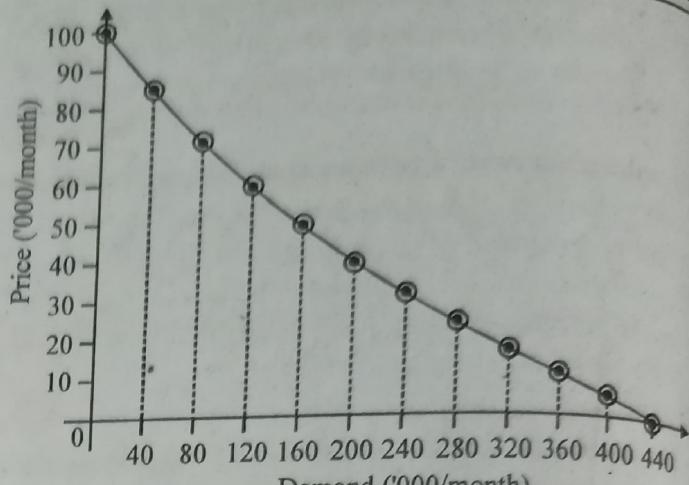


Fig. Demand Curve

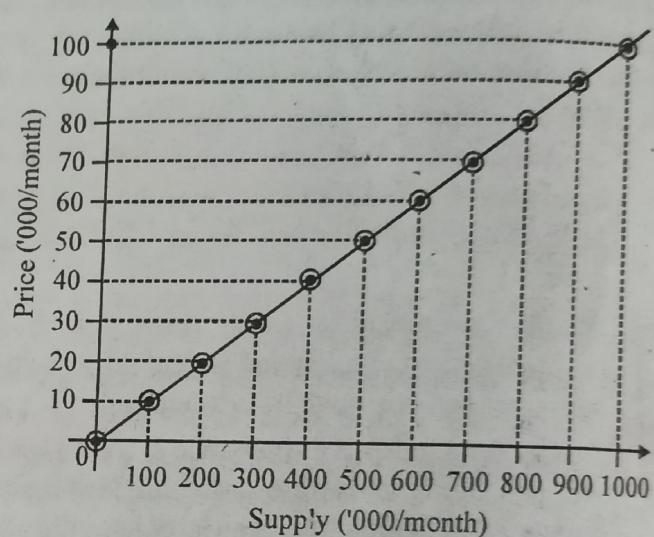


Fig. Supply Curve

Ans.(b) The equilibrium price is the market price where the quantity of goods supplied is equal to the quantity of goods demanded. This is the point at which the demand and supply curves in the market intersect.

So, from above figure we will calculate, equilibrium price and quantity.

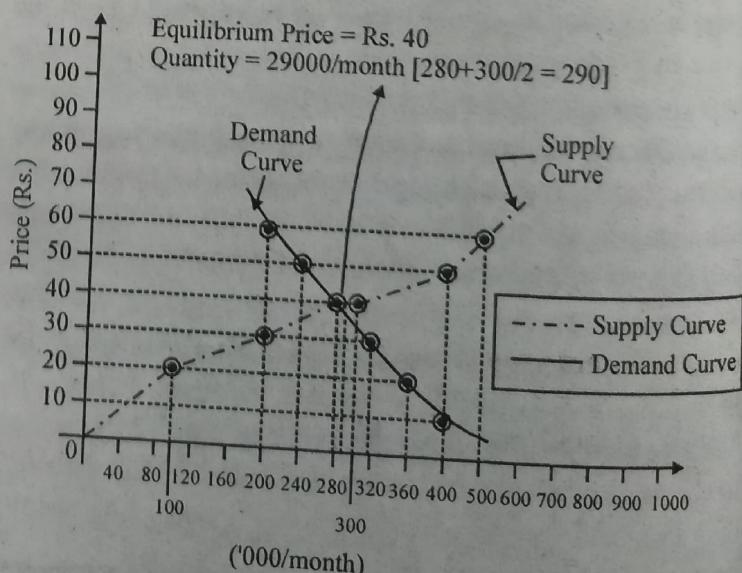


Fig. Equilibrium Price and Quantity

Q.10 What is demand function? How do you determine it?
 [R.T.U. 2018]

Ans. Demand function : In economics, demand means the willingness and ability of a consumer to have the commodity at a certain price during a particular time period. The quantity desired to be purchased may be different from the quantity of commodity actually purchased by the consumer. As quantity demanded is a flow concept⁶, the relevant time dimension has to be mentioned which will indicate the quantity demanded per unit of time. Demand for a commodity, say X, is a relationship between the price and the quantity demanded of commodity X, ceteris paribus. Here, other things mainly include income of the consumer, prices of substitute and complementary products, consumer's tastes, and preferences that influence the decision of the consumer to purchase the product.

If Q_{dx} and P_X denote the quantity demanded and the price per unit of commodity X, respectively, then, other things remaining constant, the demand function will be written as $Q_dX = f(P_X)$. This means that any change in the price of commodity X will result in a corresponding change in the quantity demanded of commodity X.

Determine Demand Function : Demand function with more than one independent variable at a time equation (1). In economic literature, it has become customary to distinguish between a demand function and the Law of Demand. The former includes the variables other than price too. A hypothetical example of the demand function is given below.

$$D_x = 10.0 - 2.0 P_x + 1.5 Y + 0.8 P_s - 3.0 P_c + 1.5 A \quad \dots(1)$$

where,

D_x = Quantity demanded of brand X tea (in millions of packets)

P_x = Price per packet of tea (in rupees)

Y = Personal disposable income (in crores of rupees per year)

P_s = Price per packet of other brands of tea (in rupees)

P_c = Price of a complement

A = Advertisement expenditure (in rupees)

(A) If the values of independent variables for the year 1999 are given as : $P_x = 20$, $Y = 40$, $P_s = 25$, $P_c = 10$ and $A = 1$, the demand for brand X tea can be estimated by replacing the values as follows :

$$D_x(1999) = 10 - 2(20) + 1.5(40) + 0.8(25) - 3(10) + 1.5(1) \\ = 21.5 \text{ million tea packets}$$

(B) Assuming the same values of independent variables, the demand function with each independent variable separately can also be estimated. For example :

$$1. D_x = f(P_x) \parallel Y, P_s, P_c, A \parallel (\text{i.e., Other variables remain unchanged}) \quad \dots(2)$$

$$D_x = 61.5 - 2P_x \quad \dots(3)$$

$$2. D_x = f(Y) \parallel P_x, P_s, P_c, A \parallel \\ = -38.5 + 1.5Y \quad \dots(4)$$

$$3. D_x = f(P_s) \parallel P_x, Y, P_c, A \parallel \\ = 1.5 + 0.8P_s \quad \dots(5)$$

$$4. D_x = f(P_c) \parallel P_x, Y, P_s, A \parallel \\ = 51.5 - 3.0P_c \quad \dots(6)$$

$$5. D_x = f(A) \parallel P_x, Y, P_s, P_c \parallel \\ = 20.0 + 1.5A \quad \dots(6)$$

Here, by replacing the values of the respective independent variables, the estimated demand for tea remains 21.5 million packets in all the cases.

Q.11 What do you mean by Income Elasticity of Demand? Distinguish its various types.

OR

Write short note on 'Income Elasticity of Demand'.

OR

Explain the concept of income elasticity of demand and explain its role in business decisions.

Ans. Income elasticity of demand is the ratio of proportionate change in quantity demanded of a commodity to proportionate change in income, other things being constant. It is measured by the following formula :

$$\text{Income Elasticity of Demand} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in income}}$$

$$ey = \frac{\Delta Q}{Q} \times \frac{Y}{\Delta Y} \text{ or } ey = \frac{\Delta Q \cdot Y}{\Delta Y \cdot Q}$$

Where :

ey = Income elasticity of demand

ΔQ = Change in quantity demanded.

ΔY = Change in income

Q = Quantity demanded at previous income

Y = Previous income or income before change.

Income elasticity of demand is, thus, the degree of responsiveness of demand to a change in income. Generally, the income elasticity of demand for most goods

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is positive, i.e., their demand increases with increase in income and decreases with decrease in income. Demand for inferior goods, however, shows a negative relation to changes in income.

Income elasticity of demand can be expressed in terms of change in expenditure on the commodity as a result of change in income. We know that :

$$\text{Expenditure} = PQ (\text{Quantity} \times \text{Price})$$

$$ey = \frac{\Delta Q}{Q} \times \frac{Y}{\Delta Y}$$

By multiplying both ΔQ and Q by P , we get :

$$ey = \frac{\Delta Q \cdot P}{Q \cdot P} \times \frac{Y}{\Delta Y}$$

If we denote expenditure incurred on the commodity by 'X', the above equation will become :

$$ey = \frac{\Delta X}{X} \times \frac{Y}{\Delta Y}$$

(because $Q \cdot P = X$ and $\Delta Q \cdot P = \Delta X$)

$$\text{Or } ey = \frac{Y \cdot \Delta X}{X \cdot \Delta Y}$$

Important Numerical Values of Income Elasticity Of Demand

The three numerical values of income elasticity of demand are very interesting. These are as follows :

- When the whole of any increase in income of consumer is spent on the commodity in question,

then income elasticity will be equal to $\frac{1}{KX}$. Where

KX is the proportion of the consumer's income spent on any good, X , whose income elasticity is being measured. When income elasticity (ey) = $\frac{1}{KX}$ then the entire increase in consumer's income is spent on increasing his purchases of commodity 'X'. Proof:

$$\text{We know that : } ey = \frac{Y \cdot \Delta X}{X \cdot \Delta Y}$$

When the whole of any increase in income of a consumer is spent on the commodity then $\Delta X = \Delta Y$. Substituting ΔY for ΔX in the above equation, we get :

$$ey = \frac{Y \cdot \Delta Y}{X \cdot \Delta Y} = \frac{Y}{X} = \frac{1}{X/Y} = \frac{1}{KX}$$

(Because $\frac{X}{Y}$ is the proportion of income spent on the commodity X)

- Another most interesting value of income-elasticity of demand is when it is equal to one. This means that the proportion of the consumer's income spent on the commodity in question is exactly the same both before and after income increases. If the $ey > 1$, it means that proportion of consumer's income spent on the commodity increase when he becomes richer. On the other hand, if $ey < 1$, the proportion of consumer's income spent on the commodity falls when income rises. Therefore, unit income elasticity of demand is an important dividing line. From this it seems reasonable to conclude that if $ey > 1$ then the commodity, in some sense, is a luxury. On the other hand if $ey < 1$ then the commodity is a necessity. One cannot, of course, give a precise definition of necessities or luxuries in terms of income elasticities of demand. But the notion is useful one.

- Zero income-elasticity of demand is also an interesting value. Income elasticity of demand is zero when the demand for a commodity remains unchanged even after increase in income. If the income elasticity of demand is less than zero, i.e., negative then the commodity is inferior. If income elasticity of demand is more than zero, i.e., positive then the commodity will be normal or luxury.

Income Elasticity of Demand and Business Decisions

- As most of the goods are superior goods, economic growth (means percentage growth in real GNP per capita) is closely associated with the increase in their sales. However, an individual businessman is interested in knowing whether the sale of his product will be responsive to the economic growth, and the income elasticity of demand for his product will enable him to get the answer. In this connection, there are two rules:

- If income elasticity is less than unity, the sales of his product will increase but at a slower rate than the rate of economic growth.
- If, on the other hand, income elasticity of the product is more than one, the sale of his product will increase faster than the rate of economic growth.

- Similarly, in times of recession, or times when the government squeezes the credit or reduces the level of economic activity, the sale of the firm's product will decline at a slower or faster rate than the fall in general economic activity depending upon whether income elasticity of demand is less than or more than unity.

3. As the study of income elasticity of demand is useful in forecasting the effect of changes in economic activity on demand, the managerial economist should regularly and periodically review the effects of change in income on the sale of the company's product. If the area of business of the firm is large enough, the managerial economist should study the income elasticity of demand separately for each region or state. The sale forecasting for each region/state depends upon such analysis.

Although income elasticity of demand helps the businessman to forecast the sale of his product for a given period or region, the forecasting is limited to several difficulties –

- The relation between changes in income and demand is not straight forward. Much depends upon the suddenness or permanence of a change in income. If the change in income is temporary no change in plan should be stipulated as it takes time to plan the change.
- Sales of a product are influenced not only by the changes in income but by several other factors as well.
- With the passage of time, the relationship between income and demand also changes.

Q.12 Define Cross Elasticity of Demand and give its importance.

OR

Write short note on Cross Elasticity of Demand and Substitution Elasticity of Demand.

Ans. The responsiveness of demand to change prices of related commodities is called cross elasticity of demand. Prof. Watson defines it as, "Cross elasticity of demand is the rate of change in quantity associated with a change in the price of related goods".

Thus, cross-elasticity of demand is the responsiveness of demand for commodity X to change in price of commodity Y and is represented as follows:

$$Ec = \frac{\text{Proportionate change in the quantity demanded of commodity X}}{\text{Proportionate change in the price of commodity Y}}$$

Symbolically :

$$Ec = \frac{\Delta q_X}{\Delta p_Y} \cdot \frac{p_Y}{q_X}$$

The relationship between X and Y commodities may be substitutive as in case of tea and coffee or

complementary as in the case of ball pens and refills. Main measures of cross elasticity with description are as follows:

- Cross elasticity = Infinity – Commodity X is nearly a perfect substitute for commodity Y
- Cross elasticity = Zero – Commodities X and Y are not related
- Cross elasticity = Negative – Commodities X and Y are complementary

Thus, if Ec approaches infinity, it means that commodity X is nearly a perfect substitute for commodity Y. On the other hand, if Ec approaches Zero it would mean that the two commodities in question are not related at all. Ec shall be negative when commodity Y is complementary to commodity X.

The two commodities may be substitutes or complementary to each other.

- Substitute Goods :** In case, the two commodities are substitutes to each other such as tea and coffee, the cross elasticity of demand will be positive. The fall in the price of one commodity may result in the increase of demand of that commodity or in other words, the demand of other competitive goods will decrease and vice versa. Thus, the relationship is positive. In a case, where two commodities are perfectly substitutes, the cross elasticity will be plus infinity. The demand curve in such cases goes upward.
- Complementary Goods :** Complementary goods are those goods which are used side by side. If two commodities are complementary, their demands will increase or decrease together. For example, if X and Y are complementary, a fall in the price of X commodity will increase the demand of X commodity, (with the operation of law of demand) and consequently the demand of Y will also increase without any change in prices of Y commodity. The cross elasticity in such case is negative. In the case of perfectly complementary goods, cross elasticity will be minus infinity. The demand curve in such cases goes downward.

Importance of Cross Elasticity of Demand

The knowledge of cross elasticity of demand is important for a businessman/managerial economist in pricing decisions. How the product should be priced, below or above the price of competitors product, is a decision of wide importance. The producer estimates the effect of price change of his product on the demand of competitive articles and consequently on the demand of his own product. He should therefore, adjust the price of his product in a way, it does not help shift the demand to other commodities. The businessman should also study the effect

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of price change of other commodities on the sale/demand of his product. By studying the cross elasticity of demand, he is to revise the price of his product. The study of cross elasticity reveals the relationship of two products i.e. whether they are competitive or complementary or they are not at all related. In a competitive market, the intensity of monopoly and degree of competition can be gauged with the help of the study of cross elasticity of demand.

Elasticity of Substitution

Elasticity of substitution measures the extent to which one goods (X) can be substituted for another goods (Y) as a result of goods X, becoming relatively cheaper when the level of satisfaction of the consumer remains the same. In other words, elasticity of substitution is a relative measure of substitution effect. The mathematical measure of elasticity of substitution (es) between any two goods X and Y can be given by the following formula :

$$es = \frac{\text{Relative increase in the ratio of two goods possessed } X/Y}{\text{Relative change in Marginal Rate of Substitution of } X \text{ for } Y (\text{MRS}_{XY})}$$

$$\text{Or} \quad es = \frac{\Delta \left(\frac{QX}{QY} \right)}{\frac{QX}{QY}} \div \frac{\Delta \left(\frac{\Delta Y}{\Delta X} \right)}{\frac{\Delta Y}{\Delta X}}$$

Where :

es = elasticity of substitution

$\frac{QX}{QY}$ = Original proportion between the

quantities of goods X and Y

$\Delta \left(\frac{QX}{QY} \right)$ = Change in the proportion of X and Y
goods

$\frac{\Delta Y}{\Delta X}$ = Original rate of substitution of goods X
for Y (MRS_{XY})

$\Delta \left(\frac{\Delta Y}{\Delta X} \right)$ = Change in MRS_{XY}

The following conclusions are drawn from elasticity of substitution :

1. The elasticity of substitution between perfect substitute goods is infinite. But in real life perfect

substitutes are not present and if present then the two goods are considered as one goods. Goods substitutes are found in real life.

2. In case of goods close substitutes, the elasticity of substitution is high because here marginal rate of substitution is quite high.
3. Elasticity of substitution is zero where no substitution is possible between two goods or two goods are perfect complement of each other. The perfect complements goods are used in fixed proportion. Therefore, in case of perfect complements the marginal rate of substitution is zero. But in real life perfect complement goods are rarely found because some substitution is always possible between the goods. Thus, when two goods are bad substitutes the elasticity of substitution is near to zero.

Q.13 Discuss the inter-relationship of Price Elasticity, Income Elasticity and Substitution Elasticity of demand.

Ans. Relationship Between Price Elasticity, Income Elasticity and Substitution Elasticity of Demand

We know that 'price effect' is the combination of 'income effect' and 'substitution effect'. Price elasticity of demand is a measure of price effect. Similarly, income elasticity of demand measures the income effect of change in price on the demand of a commodity and substitution elasticity of demand measures the substitution effect on demand of change in price. Thus, price elasticity of demand is a combination of income elasticity of demand and substitution elasticity of demand. In other words, price elasticity of demand is a compromise between income-elasticity and substitution-elasticity of demand. The relationship between three elasticities of demand can be expressed by the following equation :

$$ep = KX \cdot ey + (1 - KX) es.$$

Where :

ep = price elasticity of demand for goods, X

ey = income elasticity of demand

es = substitution elasticity of demand

KX = the portion of consumer's income spent on goods X in question.

$(1 - KX)$ = the proportion of income spent on other goods.

The first part of the equation, i.e., $KX \cdot ey$ shows the impact of income-effect on the price elasticity of demand. the income effect of change in price depends on two things: (a) the proportion of income spent on the commodity, and (b) co-efficient of income elasticity of demand for the commodity (a) the proportion of income

spent on the goods determines how much of consumer's income (previously spent on good X) will be spared as a result of fall in the price of goods in question. The spared income will be available for increasing the purchases of the goods whose price has fallen and of other goods also. The ey being, the greater the proportion of consumer's income spent on the goods whose price has decreased, the greater the amount of income is spared for the purchases that (X) and other goods and greater the resultant increase in demand for goods in question (b) The co-efficient of income elasticity of demand determines what proportion of income will be spent on the goods whose price has fallen and what proportion will be spent on other goods. Greater the co-efficient of elasticity of demand the greater the proportion of spared income will be spent on the goods whose price has fallen and larger will be the increase in the purchases of that goods.

The second part of the equation, i.e., $(1 - KX) es$, shows the impact of substitution effect on the demand of the goods whose price has fallen. The substitution effect depends on two things (a) co-efficient of elasticity of substitution and (b) proportion of income spent on other goods.

When elasticity of substitution is given the greater the proportion of consumer's income is spent on other goods, the greater is the possibility of substitution of relatively cheaper goods for other goods. The term, $1 - KX$ in the equation gives the proportion of consumer's income within which substitution of relatively cheaper goods for other goods is possible.

Therefore, price elasticity of demand depends on the following factors:

1. Proportion of income spent on goods.
2. Co-efficient of income elasticity of demand.
3. Co-efficient of elasticity of substitution
4. Proportion of income spent on other goods.

Example : Suppose that income elasticity of demand for goods X is 3, i.e., $ey = 3$, substitution elasticity of demand is 2 ($es = 2$), proportion of income spent on goods 'X' is $1/8$ ($KX = 1/8$). Now :

$$ep = KX \cdot ey + (1 - KX) es$$

Substituting the assumed values, we get :

$$ep = \frac{1}{8} \times 3 + \left(1 - \frac{1}{8}\right) \times 2$$

$$ep = \frac{3}{8} + \frac{7}{8} \times 2$$

$$ep = \frac{3}{8} + \frac{7}{4} = \frac{17}{8} = 2.12$$

Now we suppose that income-elasticity and substitution-elasticity for goods X are both equal to unit and proportion of income spent on goods 'X' by the consumer is the same i.e., $\frac{1}{8}$. Now :

$$ep = \frac{1}{8} \times 1 + \left(1 - \frac{1}{8}\right) 1 = 1 \text{ (one)}$$

If income elasticity and substitution elasticity both are equal to one then the price elasticity of demand shall equal to one whatever proportion of income may be spent on the commodity in question because $KX + (1 - KX)$ is always equal to one.

Therefore, it is clear from the discussion and examples that price elasticity of demand depends both on income elasticity and substitution of demand. The above discussion also throws light on the fact that the price elasticity of demand for a goods will be high or low. It depends upon the proportion of income spent on the goods, co-efficient of income elasticity of demand and co-efficient of substitution elasticity of demand for the goods in question.

Q.14 Explain in brief the approach to demand forecasting.

Ans. The following steps are necessary –

1. Identify and clearly state the objectives of forecasting – short-term or long-term market share or industry as a whole.
2. Select the appropriate method of forecasting.
3. Identify the variables affecting the demand for the product and express them in appropriate form.
4. Gather relevant data and approximations to relevant data to represent the variables.
5. Through the use of the statistical techniques determine the most probable relationship between the dependent and the independent variables.
6. Prepare the forecast and interpret the results. Interpretation is more important to the management.
7. For forecasting the company's share in the demand, two different assumptions can be made:
 - (a) The ratio of the company sales to the total industry's sales will continue as in the past.
 - (b) On the basis of an analysis of likely competition and industry trends the company may assume

a market share different from that of the past. As forecasts are based on certain assumptions they must be revised when improved information is available. In long term forecasts, the projections may be revised early. These are sometimes also known as rolling forecasts.

8. Forecasts may be made either in terms of physical units or in term of rupees of sales volumes.
9. Forecasts may be made in terms of product groups and then broken for individual products on the basis of past percentages. These product groups may be divided individual products in terms of size, brands, labels, colours etc.
10. Forecasts may be made on annual basis and then divided monthwise or weekwise on the basis of past records.
11. For determining the monthwise break-up of the forecast sales of a new product, either (i) use may be made of other firm's data if available or (ii) some survey may be necessary.

The following illustration shows how a sales forecast in terms of product group can be divided into individual products.

Sales of Product A as percent of Product Group Sales

Year	Product group sales	Product A sales	Sales of product A (in terms of percentage)
1972	Rs. 80,000	Rs. 16,000	20%
1973	Rs. 1,20,000	Rs. 26,400	22%
1974	Rs. 1,00,000	Rs. 24,000	24%
	Rs. 3,00,000	Rs. 66,400	22%

Suppose that the forecast of product group sales for 1975 are Rs. 50,000. For calculating the forecast sales of product A, we can take either percentage revealed by the trend (which in this case would be 26 assuming that the same growth trend continues) or the average percentage which would be 22. Sales forecast for product A on the basis of average percentage is Rs. 33,000 and on the basis of 26 percent is Rs. 39,000.

Q.15 Project the Trend Sales for the next five years:

Years	1969	1970	1971	1972	1973
Sales (in lakhs of Rs.)	120	140	150	140	170

Ans. Computation of trend values of sales.

Year	Sales (in lakhs of Rs.) (y)	Time deviations from 1971 (x)	Square of time deviations (x^2)	Product of x and y
1969	120	-2	4	-240
1970	140	-1	1	-140
1971	150	0	0	0
1972	140	+1	1	+140
1973	170	+2	4	+340
n = 5	$\Sigma y = 720$	$\Sigma x = 0$	$\Sigma x^2 = 10$	$\Sigma xy = +100$

Regression Equation of y on x :

$$y = a + bx$$

$$a \text{ (constant variable)} = \frac{\sum y}{n} = \frac{720}{5} = 144$$

$$b \text{ (Rate of growth)} = \frac{\sum xy}{\sum x^2} = \frac{100}{10} = 10$$

Hence, the regression equations is $y = 144 + 10x$.

Trend values of sales for the next years 1974, 75, 76, 77 and 1978 when the values of x are 3, 4, 5, 6 and 7 respectively = $(y = a + bx)$

$$\begin{aligned} y_{1974} &= 144 + (10 \times 3) \text{ or } 144 + 30 \\ &= 174 \text{ (lakhs Rs.)} \end{aligned}$$

$$\begin{aligned} y_{1975} &= 144 + (10 \times 4) \text{ or } 144 + 40 \\ &= 184 \text{ (lakhs Rs.)} \end{aligned}$$

$$\begin{aligned} y_{1976} &= 144 + (10 \times 5) \text{ or } 144 + 50 \\ &= 194 \text{ (lakhs Rs.)} \end{aligned}$$

$$\begin{aligned} y_{1977} &= 144 + (10 \times 6) \text{ or } 144 + 60 \\ &= 204 \text{ (lakhs Rs.)} \end{aligned}$$

$$\begin{aligned} y_{1978} &= 144 + (10 \times 7) \text{ or } 144 + 70 \\ &= 214 \text{ (lakhs Rs.)} \end{aligned}$$

Q.16 With the help of the following data project the trend of sales for the next five years:

Year sales (Rs. in lakhs)	1970	1971	1972	1973	1974	1975
60	70	75	85	95	100	

Ans.

Year	Sales (in lakhs of Rs.)	Time deviations from the middle of 1972 and 1973 assuming 5 year = 1	Square of time deviations	Product of deviations and sales
	(y)	(x)	(x ²)	(xy)
1970	60	-5	25	-300
1971	70	-3	9	-210
1972	75	-1	1	+75
1973	85	+1	1	+85
1974	95	+3	9	+285
1975	100	+5	25	+500
n = 6	$\Sigma y = 485$	$\Sigma x = 0$	$\Sigma x^2 = 70$	$\Sigma xy = 285$

Regression of y on x :

$$y = a + bx$$

To find the values of a and b,

$$y = \frac{\Sigma y}{x} = \frac{485}{6} = 80.83$$

$$b = \frac{\Sigma xy}{\Sigma x^2} = \frac{285}{70} = 4.07$$

Forecasting the sales for the next 5 years, i.e. from 1976 to 1980 :

$$y_{1976} = 80.83 + 4.07(7) \text{ or } 80.83 + 28.349 \\ = 109.32 \text{ (lakhs Rs.)}$$

$$y_{1977} = 80.83 + 4.07(9) \text{ or } 80.83 + 36.63 \\ = 117.46 \text{ (lakhs Rs.)}$$

$$y_{1978} = 80.83 + 4.07(11) \text{ or } 80.83 + 44.77 \\ = 125.60 \text{ (lakhs Rs.)}$$

$$y_{1979} = 80.83 + 4.07(13) \text{ or } 80.83 + 52.91 \\ = 133.74 \text{ (lakhs Rs.)}$$

$$y_{1980} = 80.83 + 4.07(15) \text{ or } 80.83 + 61.05 \\ = 141.88 \text{ (lakhs Rs.)}$$

This is calculated by direct method.

Q.17 Explain the factors affecting supply.

Ans. Factors affecting Supply : Following are the determinants of supply of a commodity :

1. Price of the commodity : Supply of a commodity is directly related with the change in the price of that commodity. As the price increases the producer, in the expectation of earning larger profits will enhance the

supply of the commodity and vice versa. In fact, the quantity supplied of a commodity is increasing function of its price

$$Q_s^x = f(P_x) > 0$$

Where

$$Q_s^x = \text{Quantity supplied of commodity } x$$

$$P_x = \text{Price of commodity } x$$

2. Price of factors of production : The firm producing the commodity takes into account the prices of factors of production, or the cost of production. Any rise in the price of any factor would jack up the cost of production. Thus the firm would increase the supply of a commodity only when the price of that commodity rises.

3. Price of related commodities : Price of related commodity also affects the supply. Suppose a producer is dealing in two commodities X and Y. If price of X rises then the producer would direct its resources for the production of X than Y. If the commodities are substitute commodities the producer, will take care more of the commodity whose demand had risen.

4. State of technology : Any improvement in technology reduces the overall cost of production and thus opens avenues for increasing profitability for the producer. Due to this supply tends to be increased in the market even at the same level of prices. Whether the same quantity can be produced at a lower cost or greater quantity can be produced at the same cost this is enough incentive to enhance supply to earn more profits.

5. Government Policy : Government's policy regarding taxes, subsidies etc., greatly affects the supply of goods and services. Any imposition of tax and provision of subsidies will make the goods costlier and cheaper respectively. This will also affect the profitability of the firm. Not only taxes and subsidies but other non-monetary measures also help determining the supply of goods. These may be price preferences, tax moratoria, captive marketing etc.

6. Operation of Return : The operation of laws of Returns and Returns to scale also affect the supply to which an industry or firm is subjected to. Any new industry which is subject to increasing returns and internal and external economies will have better chances to increase the supply. Opposite will happen when the industry is subject to diseconomies and laws of diminishing returns.

7. Time period : Time element has a great importance in determining the demand and supply both. Over a long period of time the supply does not behave as it does in short-term. In short term there are certain constraints in increasing the supply but such constraints can be taken care of in the long run. In case of perishable commodities supply time factor plays a big role.

Q.18 What is elasticity of supply.

Ans. Elasticity of supply expresses the degree of responsiveness of the supply for a commodity to a change in its price. It is the ratio of percentage change in quantity supplied to the percentage change in price. Elasticity of supply is a quantitative expression of Law of Supply.

$$E_s = \frac{\text{Percentage change in Quantity Supplied}}{\text{Percentage change in Price}}$$

$$\text{or } E_s = \frac{\frac{\text{Change in Quantity supplied}}{\text{Quantity supplied}}}{\frac{\text{Change in price}}{\text{Price}}}$$

$$= \frac{\Delta Q_s}{Q_s} \div \frac{\Delta P}{P}$$

$$\begin{aligned} \text{Therefore } &= \frac{\Delta Q_s}{Q_s} \times \frac{P}{\Delta P} \\ &= \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s} \end{aligned}$$

Where

E_s = Elasticity of Supply

Q_s = Quantity Supplied

ΔQ_s = Change in Quantity Supplied

P = Price

ΔP = Change in Price

There is a direct and positive relationship between quantity supplied and price. Supply curve slopes positively from left to right.

Q.19 What is demand function ?

Ans. Demand Function : Refer to Q.10.

Q.20 Discuss the concept of elastic and inelastic demand.

Ans. Concept of elastic and inelastic demand: Inelasticity and elasticity demand are the respective end ranges for the formulaic comparison of price and demand for a given product in an economy. If the change in demand for a given product corresponds closely to the change in price for that product, the demand is considered to be elastic. If the change in demand for a given product

does not correspond closely to a change in price for that product, the demand is considered to be inelastic.

Elasticity of demand is calculated by dividing the percent change in quantity demanded by the percent change in price. If the elasticity quotient is greater than or equal to 1, the demand is considered to be elastic. If the elasticity quotient is less than 1, the demand is considered to be inelastic. When the data is graphed, elasticity of demand has a negative slope. An elastic demand is displayed as a more horizontal, or flatter, slope. An inelastic demand is displayed as a more vertical, or steeper, slope.

The most utilized example of a product with inelastic demand is salt. The human body requires a specific amount of salt per pound of the body weight. Too much or too little salt could cause illness or even death. Therefore the demand for salt, changes very little with the price. Salt has an elasticity quotient close to zero and a steep slope on a graph.

A common example of an elastic product is gasoline. As the price of gas increases and falls with the international market, the demand (the distance driven by the population) rises and falls in near direct correlation. Gasoline has an elasticity quotient of 1 or greater and has a flatter slope on a graph.

PART-C**Q.21 How does the elasticity of supply is measured.**

OR

Explain how do you measure elasticity of demand.

[R.T.U. 2018]

Ans. As already stated, elasticity of supply measures the responsiveness of the quantity supplied to a change in the commodity's own price. It is defined as

$$E_s = \frac{\text{Percentage change in Quantity supplied}}{\text{Percentage change in price}}$$

$$E_s = \frac{\frac{\Delta Q_s}{Q_s}}{\frac{\Delta P}{P}}$$

$$E_s = \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

Elasticity of supply at any point of the supply curve can be measured. Where the supply curve is

conventionally a straight line curve it is measured by point method. This is explained with the help of figure 17.9. S is the supply curve and we need to measure elasticity of supply at point A. When the price increases from $O P_1$ to $O P_2$ the supply extends from $O X_1$ to $O X_2$. We extend the supply curve downwards till it intersects the X-axis at point D (Dotted line from A₁ to D)

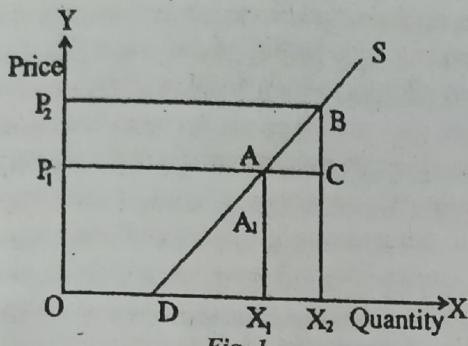


Fig. 1

Elasticity of Supply at point A is defined by formula :

$$E_s = \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

$$= \frac{X_1 X_2}{P_1 P_2} \times \frac{O P_1}{O X_1}$$

As $X_1 X_2 = AC$

$P_1 P_2 = BC$

$O P_1 = AX_1$

$$\text{We get } E_s = \frac{AC}{BC} \times \frac{AX_1}{OX_1}$$

Triangles ABC and DAX_1 are similar as :

$$\angle AX_1 D = \angle BCA$$

$$\angle DAX_1 = \angle ABC$$

$$\angle ADX_1 = \angle BAC$$

Therefore

$$\frac{AC}{BC} = \frac{DX_1}{AX_1}$$

Substituting $\frac{DX_1}{AX_1}$ for $\frac{AC}{BC}$ in the value of E_s on (1)

$$\text{We get } E_s = \frac{DX_1}{AX_1} \cdot \frac{AX_1}{OX_1}$$

$$= \frac{DX_1}{OX_1}$$

Since in figure 1 $DX_1 < OX_1$ elasticity of supply at point A, DX_1/OX_1 will be less than unity ($E_s < 1$). Thus if the supply curve cuts the quantity axis somewhere on the right of origin the elasticity of supply is inelastic. For a supply curve, intersecting the price axis, point D lies to

the left of the origin O, as shown in figure 2. In this case elasticity of supply at point A = $\frac{DX_1}{OX_1}$ and $DX_1 > OX_1$, therefore, $E_s > 1$. If the supply curve extended and the dotted straight line cuts the price axis, the supply is elastic.

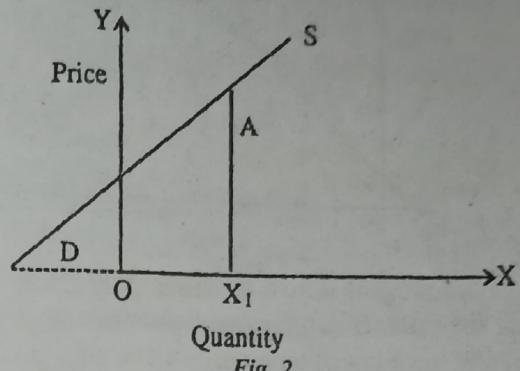


Fig. 2

For a straight line supply curve which passes through the point of origin, as shown in figure 3 elasticity of supply

will be equal to unity as $E_s = \frac{DX_1}{OX_1}$ and $DX_1 = OX_1$.

Therefore $E_s = 1$

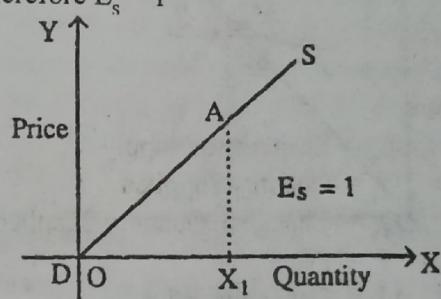


Fig. 3

In case the supply curve is curvilinear, the elasticity at any point on the supply curve can be measured by drawing a tangent to the supply curve at that point. If the tangent cuts the quantity axis (X-axis), the elasticity of supply at that point of tangency will be less than unity or inelastic. Elasticity at point A on the supply curve S, as shown in figure 4, is measured by drawing a tangent T₁ at point A which intersects the quantity axis at point D₁. Elasticity at point A is equal to $D_1 X_1 / OX_1$ and $D_1 X_1 < OX_1$, E_s is less than one.

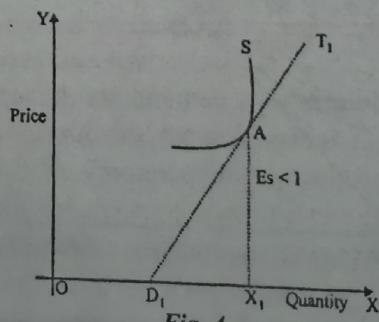


Fig. 4

If the tangent drawn to supply curve, intersects the price axis (Y-axis), as shown in figure 5, then elasticity at the point of tangency will be more than unity ($E_s > 1$).

$E_s = D_2 X_1 / OX_1$ and as $D_2 X_1 > OX_1$ and therefore, $E_s > 1$

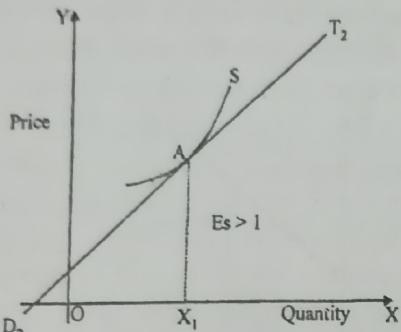


Fig. 5

If the tangent drawn to the supply curve passes through the point of origin (as shown in figure 6), the elasticity at the point of tangency will be equal to unity.

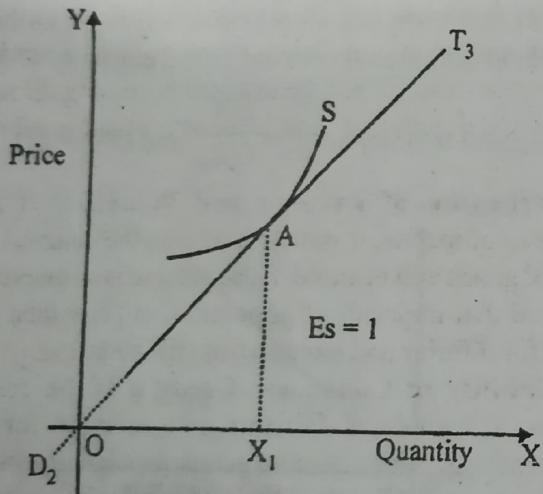


Fig. 6

Even on the same supply curve, the elasticity of supply varies from one point to another point. At a low price and for small quantities, supply is elastic. But as price increases, supply becomes less and less elastic. This is shown in figure 7.

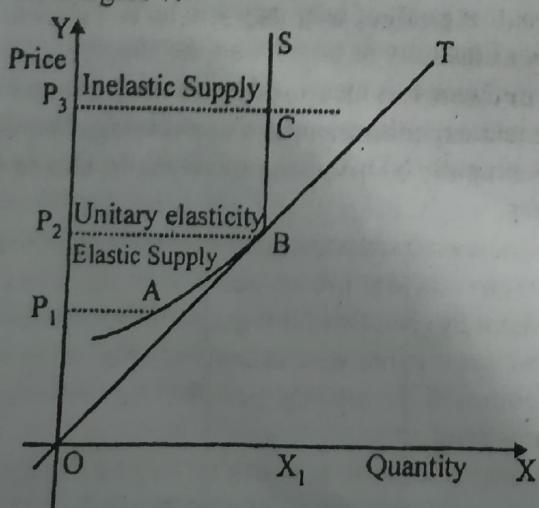


Fig. 7

At supply price P_1 at point A supply is elastic. At price P_2 at point B supply is unitary elastic. When price rises to P_3 supply becomes less elastic.

Q.22 What is meant by 'Demand Analysis'? What are the objects of demand analysis? Describe the determinants of demand.

Ans. Meaning of Demand Analysis : There are a large number of factors which have a direct impact on the demand of a commodity or service. Demand analysis means the study of factors which influence the demand of a commodity or service. It is only on the basis of these factors or determinants of demand one can forecast demand. Under demand analysis we study elasticity of demand and methods of its measurement, sales forecasts and different methods to forecast sales or demand, manipulating demand and appropriate change in allocation of resources. Analysis of demand enables the producer to adjust his production to the demand to maximize the objective function.

Objectives of Demand Analysis

Followings are the main objects of demand analysis:

- To study and analysis the determinants of demand.
- To measure the elasticity of demand.
- To prepare sales or demand forecasts.
- Manipulating demand
- To make appropriate changes in allocation of resources.

Determinants of Demand

A careful analysis of determinants of demand is very useful to a firm because it enables the firm to forecast demand or its sales and adjust production accordingly. The main determinants of demand are the following:

1. Price of the Product : The price of commodity or services directly affects its demand. According to the 'Law of Demand' the quantity demanded of a commodity changes in the opposite direction to change in its prices other things remaining unchanged. In other words the fall in the price of a commodity leads to rise in its demand and rise in price leads to fall in its demand when income, price of related goods, consumer's taste and preferences, etc. remain unchanged. Price is the only determinant of demand in the short-run. The impact of change in price, on demand can be ascertained with the help of 'price elasticity of demand'.

2. Price of Related Goods : Two or more goods can be complementary or substitutes of each other. The demand for a commodity is also affected by changes in price of its complementary or substitute goods.

If two goods are substitute for each other then the increase in price of one will result in increased demand for the other and vice-versa. Suppose A and B commodities are substitute of each other. The rise in the price of B increases demand for A and vice-versa.

Complementary goods are those which are jointly demanded to satisfy a particular demand. There is opposite relationship between price of one complementary commodity and the amount demand of the other complementary commodity. If price of one complimentary rises, the demand for the other complementary falls. The impact on the demand of a commodity as a result of change in the price of related commodity can be known by cross elasticity of demand.

3. Level of Income : Income determines the purchasing power of the consumer. Therefore, income is an important determinant of demand for a commodity, ordinarily, with an increase in income, demand for goods increase. However, it may not always be true. Increase in the level of income affect the demand of necessities, normal goods, luxuries and inferior goods differently.

- (i) A large share of income is spent on necessities when income of the consumer is low. The quantity demand of necessities increases with increase in consumer's income only upto a certain level of income.
- (ii) The demand for normal goods (clothing, furniture, automobiles, etc) increases rapidly upto a certain level of income but after this demand increases at a slower rate. For this income elasticity of demand is positive.
- (iii) Upto a certain level of income (when the income is low) there may not be any demand for luxuries and articles of distinction. As the income increases beyond a level, then demand for these goods increases with every increase in income.
- (iv) In case of inferior goods, the demand is inversely related to the level of income. When income of a person increases, he prefers to use better quality goods and gives up the use of inferior goods. At a very low level of income a consumer buys more quantity of inferior goods but beyond a certain level of income, he purchases lesser and lesser quantity of these goods with every increase in income.

While analyzing the demand of a commodity, demand analyst must keep this categorization of goods in mind. Impact of income on demand is measured by income elasticity.

4. Taste and Preferences of Consumer : The amount demanded also depends on consumer's taste and preferences. Taste and preferences change with fashion,

habits, customs and traditions and general life-style of the society. If the taste and preferences for a commodity increases, its amount demanded is more even at the same price.

5. Future trend of Prices : If it is expected that in future the price of a commodity will go up the demand for the commodity in the present also will go up. If the prices are expected to fall then the demand would fall.

6. Changes in Population : Generally the demand for a commodity increases with increase in size of population, other things being equal. It is not merely the change in the size of population but the changes in the composition of population also effect the demand for certain commodities. In a country of increasing population like India where hundreds of children are born daily in big cities there will naturally be demand for toys, baby food, feeding bottles and alike.

7. State of Business : If the country is passing through prosperity and boom conditions, there will be a marked increase in demand. When the country is passing through recession and depression then level of demand would go down.

8. Distribution of Income and Wealth : If the distribution of income is more equal then the demand for all normal goods will be more. If the income is so unevenly distributed that majority of population is poor then the demand for inferior and necessities will be larger.

9. Availability of Consumer Credit : If the credit facilities are available sufficiently to consumers for the purchase of high priced durable goods such as car, colour TV., scooters and alike, then their demand will increase. The business analyst should keep this factor in mind while forecasting demand durable goods.

10. Propensity to Save : Demand for goods is affected by change propensity to save. Increase in propensity save means less money is available for the purchase of goods. The demand, therefore, will decrease with increase in propensity to save.

11. Advertisement Expenditure : Increase in advertisement expenditure upto a certain stage, increase the demand rapidly by influencing consumers choice and preferences, and setting new fashion trends. To what extent the increased advertisement expenditure increases demand depends on the expenditure incurred on advertisement by rival firm. But generally advertisement expenditure leads to increase in demand by creating want for the commodity among people. Advertisement manipulates demand.

12. Others : There are other factors such as demonstration effect, product improvement, educational standard, etc. affect the demand.

Q.23 Explain the Law of Demand. Why do demand curves slope downward? Explain the circumstances in which demand curves slope upward.

OR

State the 'Law of Demand' and also explain 'Giffen's Paradox'.

Ans. Law of demand expresses the relationship between price and quantity demanded of a commodity. According to the law of demand, the demand of a commodity extends with fall in its price and contracts with rise in the price, other things being constant. 'Other things being constant' means that the other determinants of demand except price remain unchanged.

According to Marshall, "The amount demanded increases with a fall in the price and diminishes with a rise in price". Thus, the law of demand states that the quantity demanded has tendency to change inversely to change in price of the commodity.

Law of demand is a qualitative and not a quantitative statement. It simply explains the direction of change in demand with increase or decrease in the price of a commodity. It does not measure the quantum of change in demand. It holds goods when other thing remain unchanged.

The law of demand can be illustrated with the help of a demand schedule. The demand schedules at previous page shows that with the fall in the price of the commodity its demand is increasing. Similarly, the law of demand can be illustrated with the help of a demand curve. A demand curve is a curve which depicts the different quantities of a commodity that are demanded at different prices. Demand curve is the graphic representation of demand schedule.

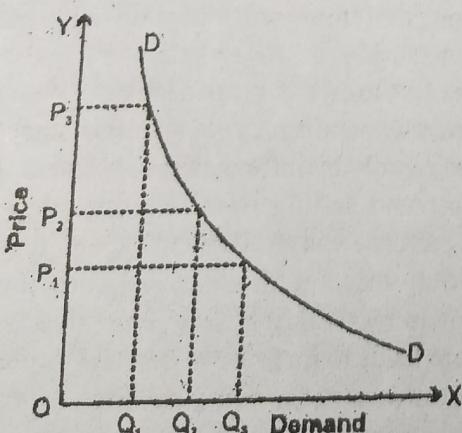


Fig.

In the above fig. DD is the demand curve of a commodity is sloping downward. Downward slope of the

demand curve implies that quantity demanded of the commodity in question change in opposite direction to its price. When price increase from OP_2 and OP_3 , demand falls from OQ_2 to OQ_1 quantity and when price falls from OP_2 to OP_1 , then demand increase from OQ_2 to OQ_3 quantity.

Reasons Underlying the Law of Demand or Reasons for the Downward Slope of Demand Curve

The downward slope of the demand curve implies inverse relationship between demand and price of a commodity. Following are the reasons for the downward or negative slope of the demand curves.

- 1. Law of Diminishing Marginal Utility :** The utility of an additional unit of a commodity is the Marginal Utility (MU). Utility is the basis of demand. Law of diminishing marginal utility states that marginal utility of a commodity diminishes when a consumer takes successive units of a commodity. In order to maximize satisfaction a consumer will stop the purchase of the commodity when MU equals its price ($MU_x = P_x$). When the price of the commodity falls the consumer will purchase more units of the commodity so that MU falls to equal the price. If the price rises, the opposite happens.
- 2. Income Effect :** As the price of a commodity falls, the real income or purchasing power of the buyer increases because he can purchase the same quantity of the commodity with lesser amount of money at a lower price. A part of the increase in his real income may be used to purchase more of the cheaper commodity while remaining part may be spent on other goods. This is the income effect of fall in price. Therefore, when price falls, the quantity demanded increases due to increased real income and vice-versa.
- 3. Substitution Effect :** When the price of a commodity falls, it becomes relatively cheaper in comparison to its substitutes. Therefore, the consumer would prefer to substitute this cheaper commodity for other goods whose prices remain unchanged. This is the substitution effect of price effect.
- 4. Different Uses :** When the price of a commodity is high, it will be used only in its more important use. As the price of the commodity falls it will be used even in less important uses. Thus, the demand increases will fall in price and vice-versa. Example of gram or electricity can be cited.
- 5. Change in the Number of Buyers :** With the fall in the price of a commodity the number of its

purchasers increase and vice-versa. Therefore, demand increases with fall in price and decreases with fall in price and decreases with rise in price.

The Law of Demand shows an inverse relationship between price and demand of a commodity. However, there are situations where this relationship does not hold good. In these situations the demand curve may slope positively. These situations are the exceptions of the law of demand. Followings are the exceptions of the law of demand:

1. **Articles of Distinction (Veblen goods)** : According to Prof. Veblen articles of distinction such as diamonds, gems, costly carpets, etc are in more demand when their prices are high. The reason is that rich people measure the desirability of these articles in terms of their prices alone and consider these goods as honour possession. Therefore, rich people demand more of articles of distinction when their prices are high.
2. **Giffen Goods** : Refer to Q.2.
3. **Ignorance of Buyers about Quality** : Many a times, buyers due inertia or out of sheer ignorance consider the price of the commodity as index of its quality. Due to this ignorance, a lower-price commodity may be considered inferior. Therefore, purchasers buy lesser quantity of the commodity at its lower price. But when the price of commodity is more, buyers consider it to be superior and thus buy more of it than before.
4. **Future Changes in Prices** : Purchaser also act as speculators. When the price has increased and is expected to rise further, buyers tend to purchase more quantities of the commodity out of the apprehension of rise in price in future. Likewise when prices are expected to fall further, a reduced price may not induce the buyers to purchase more of the commodity.
5. **Necessaries of Life** : We cannot reduce the consumption of necessities of life and conventional necessities even if their prices have increased sharply.

To understand the concept of 'Elasticity of Demand', we must know the meaning of the word 'elasticity'. Elasticity is the ratio of relative change in a dependent variable to the relative change in independent variable. There are three main determinants of demand, namely price of the commodity, income and price of related goods. Therefore, elasticity of demand refers to the degree of responsiveness of demand of commodity to a change in its price, income or price of related goods. Accordingly, there are three kinds of elasticity of demand-

(i) price elasticity of demand, (ii) income elasticity of demand and (iii) cross elasticity of demand.

Q.24 What is price elasticity of demand? Give its various types or degrees. How it can be measured?

Ans. The demand of a commodity is closely related to its price. Price elasticity of demand quantity change in demand as a result of change in price. The degree of responsiveness of demand for a commodity to a change in its price is known as price elasticity of demand or elasticity of demand as it is generally known. In other words, price elasticity of demand is the ratio of proportionate change in the quantity demanded of a commodity to proportionate change in its price. Thus, it represent the rate of change in demand as a result of change in price of the commodity. The price elasticity of demand can be expressed by the following formula :

$$\text{Elasticity of Demand} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in price}}$$

The price elasticity of demand, if other thing remain the same, is always negative, signifying the inverse relationship between price and demand. In practice, however, the minus sign is ignored as the inverse relationship is implied.

Types or Degrees of Price Elasticity of Demand

A small fall in the price of a product may lead to a considerable increase in the quantity demanded, but sometimes even a considerable fall in price may not lead to any increase in demand. The degree of responsiveness of demand to small change in price differ from commodity to commodity. Degrees of elasticity of demand is classified into five types:

1. **Unit Elasticity** : Demand is unit elastic when percentage change in quantity demand and percentage change in price are equal. In case of unit elastic demand, the demand curve is a Rectangular Hyperbola. In practice it is difficult to find such commodities as have a demand curve whose elasticity is unit throughout.
2. **Relatively elastic demand ($ed > 1$)** : The demand is relative elastic or more than unity when relative change in quantity demanded is more than the relative change in price. In such cases the demand curve is of less slope.
3. **Relatively inelastic demand ($ed < 1$)** : Demand is said to be relatively inelastic or less than unity when proportionate change in demand is less than proportionate change in price. In such cases the slope of demand curve falls rapidly.

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4. Perfectly inelastic demand ($ed = 0$) : When there is no change in demand as a result of increase or decrease in price then the demand is perfectly inelastic. The demand curve is vertical on OX axis.

5. Perfectly elastic demand ($ed = \infty$) : The demand is perfectly elastic when even a small change in price cause an infinite large change in amount demanded. A small rise in price on the part of a seller reduces the demand to zero. In such cases the demand curve is parallel to OX axis.

Measurement of Price Elasticity of Demand

Price elasticity of demand can be measured by four methods. These methods are as follows :

1. Proportionate Method : According to this method, price elasticity of demand is estimated by dividing the percentage change in quantity demand by the percentage change in the price of commodity. If the percentage change in quantity demanded is less than the percentage change in price, the elasticity of demand will be less than one. The formula is :

Price Elasticity of Demand (ep)

$$ep = \frac{\text{Percentage change in Quantity demanded}}{\text{Percentage change in price}}$$

$$ep = (-) \frac{\Delta Q}{Q} \div \frac{\Delta P}{P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{\Delta Q \cdot P}{\Delta P \cdot Q}$$

Where

ep = price elasticity of demand.

ΔQ = change in quantity demanded
 $(\Delta Q = Q_1 - Q)$.

Q = quantity demand before change in price and

Q_1 = quantity demanded after change in price.

ΔP = change in price ($\Delta P = P_1 - P$).

P = Initial price and P_1 = changed price.

Negative sign (-) symbolises the inverse relationship between price and demand. While calculating price elasticity of demand negative sign is ignored. Many a times the formula given above is modified as:

$$ep = \frac{\Delta Q}{Q + Q_1} \div \frac{\Delta P}{P + P_1}$$

or $ep = \frac{\Delta Q}{Q + Q_1} \times \frac{P + P_1}{\Delta P}$

In the above formula, to calculate price elasticity of demand, instead of taking Q and P as denominator, the average of Q and Q_1 and P and P_1 are taken as denominator. The modification is because of two reasons. Firstly, the modification ensure reversibility. Here

reversibility means that the coefficient of elasticity of demand will remain the same whether we take Q and P or Q_1 and P_1 as the base of calculating elasticity of demand. Secondly, the first formula point elasticity of demand and the second formula measures the elasticity of demand between two finite points on the demand curve. In other words the second formula gives us the 'Arch Elasticity of Demand'.

2. Total Expenditure Method : With the change in price of a commodity total expenditure incurred (total revenue received by firm) on the commodity may increase, decrease or remain constant. It depends upon the relative change in amount demanded of the commodity as a result or relative change in its price. If the proportionate increase in amount demanded is more than the proportionate fall in price then the total revenue (total expenditure on the commodity) of the firm will increase. But when the proportionate increase in amount demanded and proportionate fall in price are equal then the total revenue (total exp.) will remain same. On the other hand, when the percentage increase in amount demanded is less than percentage fall in price then the revenue (Total exp on the goods) of the firm will fall. Thus, this method gives three co-efficients of elasticity of demand which are as follows:

- (a) Greater than Unit Elastic Demand ($ep > 1$)
- (b) Unit Elastic Demand ($ep = 1$)
- (c) Less than Elastic Demand ($ep < 1$)

(a) Greater than unit elastic demand ($ep > 1$) : Elasticity of demand is greater than unit when total expenditure incurred by the buyers on the commodity and price changes in the opposite direction. it means elasticity of demand is greater than one when total expenditure on the commodity increases with a fall in price and decreases with a rise in price of the commodity. It is illustrated with the help of following example:

Demand Schedule of Sugar

Price (Rs.) per kg	Q (kg.)	Total Expenditure (Q.P)
10	15	150
9	20	180
8	25	200

(b) Unit elastic demand ($ep = 1$) : Demand is unit elastic when total expenditure remains the same with rise or fall in price. It is illustrated by the following example:

Demand Schedule of 'X' Commodity

Price (Rs.) per kg	Q (kg.)	Total Expenditure (Q.P)
2	100	200
4	50	200
8	25	200

(c) Less than unit elastic demand ($ep < 1$) : If price and total expenditure on the commodity change in the same direction then elasticity of demand is less than unit. In other words, if with a fall in the price of commodity total expenditure on it also falls or with an increase in price of the commodity total expenditure on it also increases, then elasticity of demand is less than unit. Example:

Demand Schedule of 'Y' Commodity

Price (Rs.) per kg	Q (kg.)	Total Expenditure (Q.P)
2	9	18
3	8	24
4	7	28

From the above discussion it follows that total expenditure incurred on the commodity and its price stand in an important relationship. This relationship is of vital importance to business firms to decide price policies.

3. Point Method or Geometric Method : This method measures the elasticity of demand on different points of a demand curve. It is a variant of 'proportionate method'. To measure elasticity of demand we take a straight line demand curve as shown in the fig. below. In the fig. AB is the demand curve.

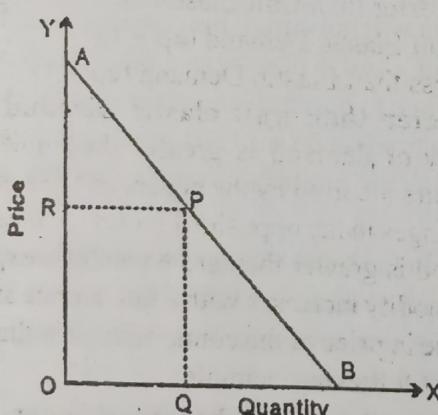


Fig.

We know that

$$ep = \frac{P \cdot \Delta Q}{Q \cdot \Delta P}$$

The term $\frac{\Delta Q}{\Delta P}$ is the reciprocal of the slope of demand curve. The slope of AB demand curve is PQ/QB in the fig. price is PQ and quantity demanded at PQ price is OQ and $\frac{\Delta Q}{\Delta P} = \frac{QB}{PQ}$.

Therefore:

$$ep = \frac{P \cdot \Delta Q}{Q \cdot \Delta P} = \frac{QB}{PQ} \times \frac{PQ}{OQ} = \frac{QB}{OQ}$$

$$\text{And } \frac{QB}{OQ} = \frac{QB}{RP} \quad \text{because } OQ = RP$$

Now ΔARP and ΔPQB are similar right angle triangles. Therefore part PB is the lower section and part PA is the upper section of the AB demand curve. Thus, the elasticity of demand at point P is equal to $\frac{PB}{PA}$. That is

$$\text{Point Elasticity of Demand} = \frac{\text{Lower segment of demand curve}}{\text{Upper segment of demand curve}}$$

Curved Demand Curve : Elasticity of demand can also be estimated on a curved demand curve. We shall have to draw a tangent to the demand curve at the point where elasticity of demand is to be measured. Elasticity shall be equal to the ratio of the lower part of the tangent and upper part of the tangent. In the fig. the point elasticity at H point is equal to HN/HR .

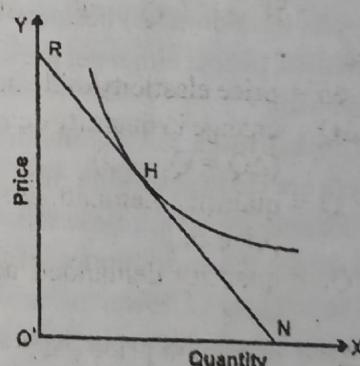


Fig.

4. Revenue Method : Revenue refers to the sale proceeds of a firm. Elasticity of demand can be estimated if average revenue and marginal revenue are known. Average revenue is the price per unit of the commodity. Marginal revenue is the addition to total revenue by the sale of an additional unit of the commodity. The following formula will give the elasticity of demand:

$$ep = \frac{A}{A - M}$$

where

ep stands for elasticity of demand

A stands for average revenue

M stands for marginal revenue

Q.25 What are the determinants of Price Elasticity of demand? Describe the importance of price elasticity of demand.

Ans. Followings are the main determinants of elasticity of demand:

1. Nature of Commodity : Commodities are classified as necessities, luxuries and comforts.

- (i) A necessity that has no close substitute (salt, newspaper, polish, etc.) will have an inelastic demand because its consumptions cannot be postponed. Moreover, consumers purchase almost a fixed amount of a necessity per unit of time whether the price is sameway higher or lower.
- (ii) Demand of luxuries is relatively more elastic because consumption of luxuries (T.V. sets, decoration items, etc.) can be dispensed with or postponed when their prices rise.
- (iii) Comforts have more elastic demand than necessities and less elastic demand in comparison to luxuries.

Commodities are also classified as durable and perishable. Demand for durable goods is more elastic than perishable goods (non-durable) because when the price of former increases, people either get the old one repaired or by a second hand.

2. Range of Substitutes : A commodity has elastic demand if there are close substitute of it. A small rise in the price of a commodity having close substitute will force the buyers to reduce the consumption of the commodity in favour of substitutes. A lower price will attract the buyers of the other substitutes to purchase the commodity. If no substitutes are available, demand for goods tends to be inelastic. Demand for salt is highly inelastic because it has no substitute.

3. Number of uses of a Commodity : Larger the number of uses of a commodity, the higher is its elasticity of demand. The demand in each single use of such commodities may be inelastic, but the demand in all uses taken together is elastic. For example, gram is used for money purposes. If its price rises, it will not be used in less important uses and the quantity demanded will fall appreciably. Contrary to this, the bangles for women has no other use and, therefore, their demand is relatively inelastic.

4. Possibility of Postponement of Purchase : If the use or purchase of a commodity can be postponed for

some times, then the demand of such commodity will be elastic. For example, if cement, bricks, wood and other building materials become costlier, people will postpone the construction of houses. Therefore, price elasticity of building materials will be high.

5. Importance of the Commodity in Consumers Budget :

The demand for such goods is inelastic on which a small portion of income is spent. The items like toothpaste, shoe polish, electric bulbs have inelastic demand as we items rise, the consumer budget is not affected much. On the other hand clothes and durable items take away a large portion of the income. Therefore, the demand for such commodities is elastic.

6. Range of Prices : At a very high or very low range of prices, demand tends to be inelastic. Demand for high priced commodities come from only the rich people who give little importance to price. A change in the price of high-priced commodities will not generally affect the demand of rich consumers. On the other hand low priced commodities are either necessities or a small a part of income is spent on them. Therefore, their demand is inelastic.

7. Income Level : People with high incomes are less affected by price changes than people with low incomes. A rich man will not curtail his consumption of vegetables, milk, fruits even if their prices rise significantly and he will continue to purchase the same amount as before. But a poor man cannot do so. Thus, the distribution of national income has an important bearing on the elasticity of demand.

8. Time : In the short-run the demand is inelastic while in the long-run demand is elastic. The reason is that is that in the long-run consumer can change their habits and consumption pattern.

9. Joint Demand : Elasticity of demand for a commodity is also influenced by the elasticity of its jointly demanded commodities. If the demand for pen is inelastic then the demand for ink will be inelastic. Generally, the elasticity of jointly demanded goods is inelastic.

Importance of Price Elasticity of Demand

The concept of price elasticity of demand (elasticity of demands) is of great significance to the producers or sellers, workers and government in formulating their policies. It has practical implication in managerial decision making. The practical importance of this concept will be clear from the following applications:

1. Determination of Price Policy : While fixing the price of this product, a businessman has to consider the elasticity

of demand for the product. He should consider whether a lowering of price will stimulate demand for his product, and if so to what extent and whether his profits will also increase as a result thereof. If the increase in his sales is more than proportionate to the reduction in price his total revenue will increase and his profits might be larger. On the other hand, if increase in demand is less than proportionate to fall in price, his total revenue will fall and his profits would be certainly less. Therefore, knowledge of elasticity of demand may help the businessman to make a decision whether to cut or increase the price of his product or to shift the burden of any additional cost of production on to the consumers by charging high price. In general, for items having inelastic demand, the producer will fix a higher price and items whose demand is elastic the businessman will fix a lower price.

2. Price Discrimination : Price discrimination refers to the act of selling the technically same product at different prices to different sections of consumers or in different sub-markets. The policy of price-discrimination is profitable to the monopolist when elasticity of demand for his product is different in different sub-markets. Those consumers whose demand is inelastic can be charged a higher price than those with more elastic demand.

3. Shifting of Tax Burden : To what extent a producer can shift the burden of indirect tax to the buyers by increasing price of his product depends upon the degree of elasticity of demand. If the demand is inelastic the larger part of the indirect tax can be shifted upon buyers by increasing price. On the other hand if the demand is elastic than the burden of tax will be more on the producer.

4. Taxation and Subsidy Policy : The government can impose higher taxes and collect more revenue if the demand for the commodity on which a tax is to be levied is inelastic. On the other hand, in case of a commodity with elastic demand high tax rates may fail to bring in the required revenue for the government. Govt. should provide subsidy on those goods whose demand is elastic and in the production of the commodity the law of increasing returns operates.

5. Importance in International Trade : The concept of elasticity of demand is of crucial importance in many aspects of international trade. The success of the policy of devaluation to correct the adverse balance of payment depends upon the elasticity of demand for exports and imports of the country. The policy of devaluation would be beneficial for exports and imports of the country. The

policy of devaluation would be beneficial when demand for exports and imports is price-elastic. A country will benefit from international trade when: (i) it fixes lower price for exports items whose demand is price elastic and high price for those exports whose demand is inelastic (ii) the demand for imports should be inelastic for a fall in price and inelastic for a rise in price. The terms of trade between the two countries also depends upon the elasticity of demand of exports and imports of two countries. If the demand is inelastic, the terms of trade will be in favour of the seller country.

6. Importance in the Determination of Factors Prices: A factor with an inelastic demand can always command a higher price as compared to a factor with relatively elastic demand. This helps the trade unions in knowing that where they can easily get the wage rate increased. Bargaining capacity of trade unions depend upon elasticity of demand for workers services.

7. Determination of Sale Policy for Super Markets: Super Markets is a market wherein a variety of goods are sold by a single organization. These items are generally of mass consumption. Therefore, the organization is supposed to sell commodities at lower prices than charged by shopkeepers in the other bazaars. Thus, the policy adopted is to charge a slightly lower price of items whose demand is relatively elastic and the costs are covered by increased sales.

8. Pricing of Joint Supply Products : The goods that are produced by a single production process are joint supply products. The cost of production of these goods is also joint. Therefore, while determining the prices of these products their elasticity of demand is considered. The price of a joint supply product is fixed high if its demand is inelastic and low price is fixed for that joint supply product whose demand is elastic.

9. Effect of use of Machines on Employment : Ordinarily it is thought that use of machines reduced the demand for labour. Therefore, trade unions often oppose the use of machines fearing unemployment. But this fear is not always true because use of machines may not reduce demand for labour. It depends on the price elasticity of demand for the products. The use of machines may reduce the cost of production and price. If the demand of the product is elastic then the fall in price will increase demand significantly. As a result of increased demand the production will also increase and more workers will be employed. In such cases concept of elasticity of demand

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help the management to pacify the trade unions. But if the demand of the product is inelastic than use of more machines will cause unemployment.

10. Public Utilities : The nationalization of public utility services can also be justified with the help of elasticity of demand. Demand for public utilities such as electricity, water supply, post and telegraph, public transportation etc. is generally inelastic in nature. If the operation of such utilities is left in the hand of private individuals, they may exploit the consumers by charging high prices. Therefore, in the interest of general public, the government owns and runs such services. The public utility enterprises decide their price policy on the basis of elasticity of demand. A suitable price policy for public utility enterprises is to charge from consumers according to their elasticity of demand for public utility.

11. Explanation of Paradox of Poverty : Exceptionally good harvest bring poverty to the farmers and this situation is called 'Paradox of Poverty'. This paradox is easily explained by the inelastic nature of demand for most farm products. Since the demand is inelastic, prices of farm product fall sharply as a result of large increase in their supply in the year of bumper crops. Due to sharp fall in prices, the farmers get less income even by selling larger quantity.

The paradox of poverty is the basis of regulation and control of farm products prices. Government fixes the minimum prices of farm products because the demand for farm products is inelastic. Thus, the concept of elasticity of demand helps the government in determining its agricultural policies.

12. Output Decisions : The elasticity of demand helps the businessman to decide about production. A businessman chooses the optimum product-mix on the basis of elasticity of demand for various products. The products having more elastic demand are preferred by the businessman. The sale of such products can be increased with a little reduction in their prices.

From the above discussion it is amply clear that price elasticity of demand is of great significance in making business decisions.

Q.26 Define Advertising Elasticity of Demand and state its importance.

OR

What is advertising elasticity of demand ? Explain the different approaches in determining advertising budget.

OR

Define advertising elasticity of demand and discuss the factors affecting it.

Ans. By advertising we mean the activities by which visual or oral messages are addressed to selected respondents with a view to induce them to buy the product, services or ideas. Advertising makes the respondents familiar with the qualities of the new product introduced in the market by the firm. In case of existing goods or services, advertising aims at (a) shifting the demand curve to the right, and (b) reducing the elasticity of demand. It will increase or maintain the demand of the product. However, advertising has a cost and involves payments to persons involved in it. The cost of advertising forms the part of costs of sales and increases the sale price of the product or service.

The following are salient features of advertising-sales relationship :

1. Other things like price, quality, channel of distribution, and other determinants affecting sales, remaining the same, there is a direct relationship between extent of advertising and volume of sales. Thus, the sales are likely to increase, if expenditure on advertising is increased.
2. A certain amount of sale is possible even when there is no advertising.
3. There is a positive correlation between the amount spent on advertising and amount of sale. Upto a point, an increase in advertising will lead to a more than proportionate increase in sales. Beyond this point, the increase in sales irrespective of amount spent on advertisement.

Advertising Elasticity of Demand : The expansion of demand by means of advertisement and other promotional efforts can be measured by advertising elasticity of demand also called promotional elasticity. The promotional elasticity measures the responsiveness of demand to change in advertising or other promotional expenses. The formula for its measurement is given below:

$$E_a = \frac{\text{Proportionate change in sales}}{\text{Proportionate change in Advertistment expenditure}}$$

$$= \frac{Q_2 - Q_1}{Q_2 + Q_1}$$

$$= \frac{A_2 - A_1}{A_2 + A_1}$$

Where Q and A stand for sales and advertisement outlay respectively.

The basic purpose of advertising is to create demand by information and persuasion and at times by the efforts made to change people's taste. There is little doubt that advertisement very often succeeds in its attempt.

Factors Affecting Advertising Elasticity of Demand

The important factors which affect advertising elasticity of demand are as follows:

1. The stage of the product's market development, that is, whether it is a new product or a product with a growing market or with an established market.
2. The extent to which competitors react to the Company's advertisement either by further advertising or by increased sales efforts.
3. The quality and quantity of the company's past and present advertising relative to that of competitors.
4. The influence of non-advertising determinants of demand such as growth trends, prices, income etc. and the extent to which these can be successfully determined with a view to eliminate their effect is demand analysis.
5. The time interval that elapses between the advertisement expenditure and unresponsiveness of sales to the expenditure which is difficult to predict because it depends upon the type of the product, the methods of advertisement etc.
6. The delayed effect of Company's past advertisement and the extent to which it affects current and future sales.

Determining Advertising Outlays

- (i) **Percentage of Sales Approach :** The budget for advertising is determined as a fixed percentage of sales in past, present or future. This method is not sound on economic ground as the future, past or present sales have no concern with the cost or value of expanding sales. Moreover, it discourages aggressive advertising policy. However, the method is too simple to calculate.
- (ii) **All you can Afford Approach :** The more profitable and more liquid the monetary position of the business, the more should be spent on

advertisement. The expenses on advertisement are fixed as a percentage of profits or cash funds. This method is subject to criticism of the ground that liquid assets can be used in many ways. As a rule they should be put to use where the yield is expected to give higher return and not merely for advertisement only.

- (iii) **Return on Investment Approach :** This approach recognizes that advertising increases immediate sales and at the same time, contributes to the good will of the business by increasing future earning power. The expected stream of future cash flows resulting from today's advertising expenditure, discounted at an appropriate rate of interest, enables its present value to be determined.
- (iv) **Comparative Parity Approach :** This approach bases the firm's advertisement outlay on what other firms in the industry are spending, e.g., the proportion of total industry advertising expenditure incurred by a particular firm would depend on its share of the total market. In such markets where rivals are more, this method would be helpful to give stability to market shares and prevent dangerous comparative retaliation.
- (v) **Objective and Task Approach :** The amount is first settled as to what will be spent on advertisement seeing the objectives determined before hand. Here three steps are taken>
 - (a) **Define the Objective :** The sales target is determined before hand.
 - (b) **Outline the Tasks :** Here the means and media of objectives are specified.
 - (c) The costs of accomplishing these tasks are determined. This method is in vogue in U.S.A.
- (vi) **Marginal Approach :** The basic principles of marginal analysis could be applied to the selling expenditure inclusive of advertisement, direct mailing and calls from salesman. In other words, the expenditure on advertisement will be kept increasing so long as the added cost of each increment of sales promotion offer is less than the additional gross profit, it adds.

Examples : We can explain the marginal approach with a simple example.

Selling expenses	Incremental cost	Units sold	Total Revenue	Production Cost	Total cost	Profit	Incremental Revenue from selling expenses
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
0	-	50	400	300	300	100	-
100	100	100	800	400	500	300	250
200	100	110	880	480	680	200	50
300	100	130	1040	430	730	310	100

We assume :

- (i) Price as fixed at Rs. 8 each
- (ii) Fixed cost at Rs. 100 and
- (iii) Marginal cost is fixed at Rs. 3 per unit

Thus Incremental Revenue will be determined as given below:

$$IR = (\text{Price per unit} \times \text{Additional units sold}) - (\text{Marginal cost} \times \text{Additional units sold})$$

$$\text{Or } IR = (8 + 50) - (3 \times 10) = 250 \quad \dots(i)$$

$$(8 \times 10) - (3 \times 10) = 50 \quad \dots(ii)$$

$$(8 \times 20) - (3 \times 20) = 100$$

In this way we can find out that when advertisement outlays are done to the extent of Rs. 200; profits increase and incremental revenue is more than incremental cost. But afterwards, the position is quite reverse.

Importance of Advertising Elasticity of Demand In Business

The study of advertising elasticity of demand is important for the businessman in the following ways:

- (i) The management decides whether advertising expenses should be increased or reduced or should remain at the present level. The increased expenditure on advertising can be justified if the advertising elasticity is more than unit i.e., if the profits on incremental revenue exceeds the incremental expenses, on advertising. If it is not so, the more expenses on advertising is not advisable.
- (ii) The management should observe the saturation point where advertising pays nothing or does not help in increasing the sales revenue. At this point expenditure on advertising should be stopped as the relationship between incremental expenses on advertising and incremental is negative.



THEORY OF PRODUCTION

PREVIOUS YEARS QUESTIONS

PART-A

Q.1 What does opportunity cost mean?

[R.T.U. Dec 2019]

Ans. The cost of production of any unit of a commodity 'A' is the value of the factors of production used in producing the unit. The value of these factors of production is measured by the best alternative use to which they might have been put had a unit of 'A' not been produced. This concept of cost has been popularized by the American writers. Opportunity costs are also known as alternative costs.

Q.2 Define the term Marginal Cost.

[R.T.U. 2019]

Ans. Marginal cost is the extra cost of producing one additional unit. It may at times be impossible to measure marginal cost, e.g. if a firm produces 10,000 metres of cloth, it can become impossible to determine the change in cost involved in producing 10,001 metres of cloth. The difficulty can be solved by taking units of significant size.

Q.3 Define Managerial Economics.

[R.T.U. 2018]

Ans. Managerial Economics : With the increase of the size of the firm, the efficiency of management usually increases as there can be greater specialization in managerial staff. In large concerns, experts can be appointed to look after various sections or divisions of the industry such as purchasing, sales, production, financing,

personnel etc. But a firm having small means cannot hope to have a full time employment to such experts. Normally the different aspects of the concern have to be looked by a few persons only who may not be experts.

Q.4 Define Marketing Economics.

Ans. Marketing Economies : As for its purchase and sale, a large concern can have more economies. It can buy its necessities in large amount and on better terms. Very often it gets quick and safe delivery, careful attention and special facilities from its suppliers. Similarly from the transport agencies special concessions are secured for bulk movement of goods and raw materials. Expert buyers can be appointed and so also with appointment of expert salesman, the business is bound to progress. A large scale concern can also afford to spread its advertisement costs over bigger output. These costs do not go up in proportion to a rise in sales.

Q.5 Write short note on private cost and social cost.

Ans. Private Cost and Social Cost : While private cost refers to the cost of production to an individual producer, social cost refers to the cost of producing commodity to society in form of resources that are used to produce it. From the social point of view, the economy has a certain volume of resources in the form of capital, land etc. which it would like to put to the best uses. This depends upon the efficient and full utilization of resources and also the specific list of commodities to be produced. If available irrigated area can be put under rice or sugarcane the social cost of producing rice is the amount of sugarcane which irrigated land could have produced instead. It would be ideal if the social cost coincided with the private costs of producing a commodity.

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PART-B

Q.6 Explain with the help of curves the relationship between total cost, total variable cost and total fixed cost. [R.T.U. Dec. 2019]

Ans. Total Fixed Cost (TFC) : The cost which does not change with the change in output, even when output is zero is the total fixed cost. In other words, fixed costs are the sum total expenditure on the purchase or hiring of fixed factors of production.

Total Variable Cost (TVC) : The cost which changes with the change in output. In other words, variable costs are the expenditure incurred on the use of variable factors of production.

Total Cost (TC) : It is the sum total of total fixed cost and total variable cost at various level of output.

Relation among TFC, TVC and TC :

Output	TFC	TVC	$TC = TFC + TVC$
0	15	0	15
1	15	5	20
2	15	12	27
3	15	20	35
4	15	28	43
5	15	35	50
6	15	42	57

- $TC = TFC + TVC$
- TFC is constant at all levels of output.
- TVC increases as output increases.
- TC is parallel to TVC.

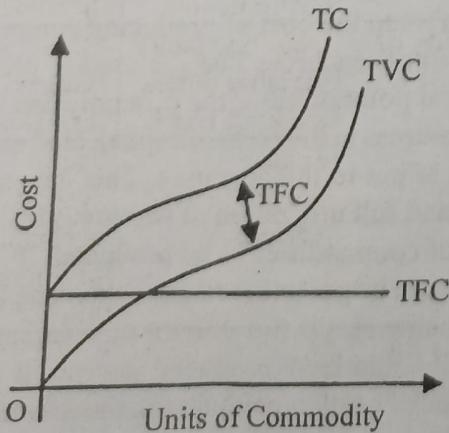


Fig.

Q.7 What is Isoquant? Explain with the help of diagram. [R.T.U. 2019]

Ans. Isoquants : Isoquants are similar to indifference curves of the theory of consumer behavior. An isoquant represents all those combinations of inputs which are capable of producing the same level of output. Isoquants are also called equal-product or iso-product curves. Since an equal-product curve represents all those combination of inputs which yield an equal quantity of output, the producer is indifferent between them. Therefore, another name for an isoquant is production-indifference curve. The concept of isoquant can be easily understood with the help of the following schedule.

Table : Various combinations of X and Y to produce a given level of output

Factor combination	Factor X	Factor Y
A	1	12
B	2	08
C	3	05
D	4	03
E	5	02

When we plot them, we get a curve IQ as shown in Figure 1.

Isoquants have properties similar to indifference curves, but there is one important difference between the two : where as in an indifference curve it is not possible to quantify the level of satisfaction acquired by the consumer, the level of production acquired by the producer is easily quantified. Thus, while isoquant IQ1 represents 100 units, curves IQ2, IQ3 etc. representing higher levels of production can be drawn. While a curve on the right represents a higher level of output, that on the left represents a lower level of output.

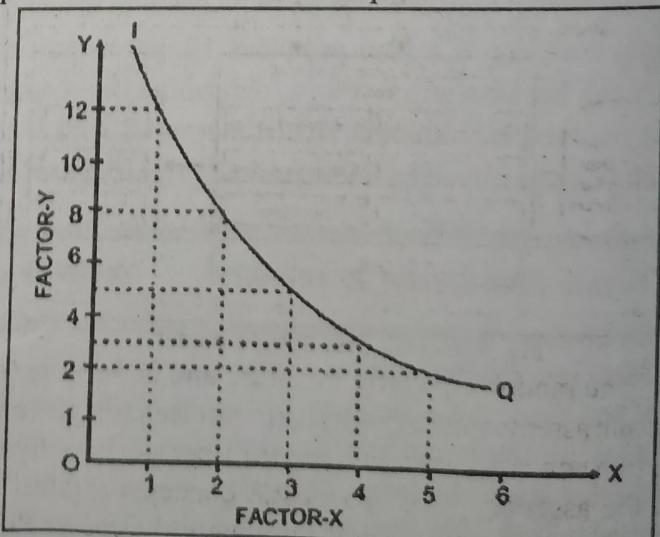


Fig. 1 : Equal Product Curve or Isoquant

Q.8 Explain a Civilian passenger aircraft lifecycle approach for Cost Benefit analysis. [R.T.U. 2018]

Ans. Aircraft Lifecycle Approach for Cost-Benefit Analysis : New technologies or concepts for the air transportation system need not only to lead to technological improvements, but also have to show economic advantages compared to the current system. Direct operating cost (DOC) is an established metric to perform economic valuation of existing aircraft or future aircraft concepts. DOC formulae use global technical, operational and economic parameters to come up with an average DOC value on a flight-cycle or flight-hour basis. When assessing technologies and processes with impacts on the air transportation system level, all phases of the life cycle and interdependencies with other system elements have to be considered. New maintenance concepts influence maintenance cost and aircraft availability. To capture time and cost aspects, the lifecycle cost-benefit model AIRTOBS (Aircraft Technology and Operations Benchmark System) was developed.

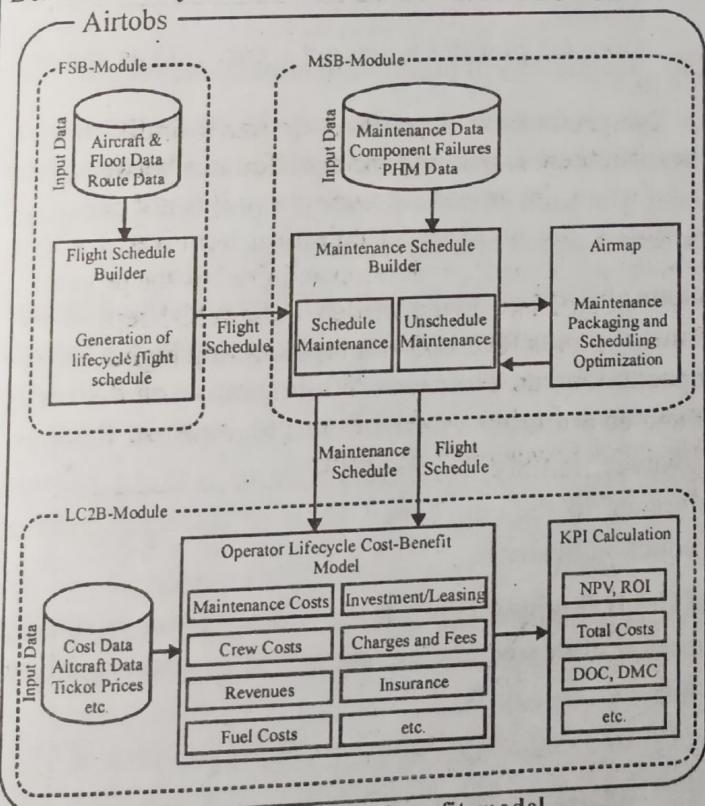


Fig. Lifecycle cost-benefit model

The model is generic in nature and is feasible for economic assessments of various aircraft technologies and operation concepts from an operator's perspective. Apart from the assessment of prognostic concepts (Hölzel et al., 2012), studies on aircraft with natural laminar flow (Wicke et al., 2012) or intermediate stop operation concepts

(Langhans et al., 2010) have been conducted. It models all economic relevant parameters along with the aircraft life cycle. The aircraft operational lifecycle is initiated by the acquisition of an aircraft and ends with the decommissioning. The model includes aircraft specific parameters (e.g. acquisition cost, fuel consumption, seating capacity, crew size and aircraft specific charges), operational aspects (e.g. route network, maintenance concepts and costs, and ticket prices), as well as global boundary conditions (e.g. fuel price trend, annual inflation rate). AIRTOBS focuses on the perspective of an aircraft operator and includes methods to account for costs and revenues. An overview of AIRTOBS is shown in Figure. It consists of three main modules. The Flight Schedule Builder (FSB) generates a generic aircraft lifecycle flight schedule based on airline route data assuming full aircraft availability (i.e. no maintenance). Routes are considered based on the aircraft cycle time including flight time, taxi and runway operation times and turnaround time. This provisional flight schedule serves as the fundamental for the Maintenance Schedule Builder (MSB). The MSB executes a simulation run of the flight operation and maintenance events over the aircraft lifecycle. The MSB uses input data from maintenance databases for the modeling of scheduled and unscheduled maintenance events, including airframe, engine and component maintenance.

Q.9 Give comparison between the Law of Variable Proportions and Return of Scale.

Ans. Distinction :

S. No.	Bases	Law of Variable Proportions	Law of Returns to Scale
1.	Time Period	Short run phenomenon	Long run phenomenon
2.	Variability of Factor	Only one factor variable others are kept fixed.	All factors are assumed to be variables
3.	Factor Proportion	Factor proportion is varied.	Factor proportion is constant, scale of operations is altered.
4.	Reasons for operation of law:		

(a) Phase I:	Stage of increasing returns due to under-utilisation of fixed factors, specialization of factors.	Increasing returns to scale due to economies of scale.
(b) Phase II :	Stage of diminishing returns : due to (i) Non-optimal factor proportional (ii) Imperfect elasticity of substitution of factors.	Stage of decreasing returns of scale: due to diseconomies of scale.
(c) Phase III :	Stage of Negative Returns, when variable factor is used more and more in relation to fixed factor.	Stage of Constant Returns to Scale, when economies stop to operate yet the diseconomies have not set in.

Q.10 Write a note on Production Function.

Ans. A production function explains the relationship between factor input and output in physical terms. The production function illustrates the technological relationship between input and output. In other words, it shows that with a given state of technology and during a particular period of time how much can be produced with give amount of inputs. It also explains how output changes with the change in the quantity of inputs. It can be written as:

$$Q_x = f(a, b, c, \dots, z)$$

Where Q_x is the quantity of a commodity say X and a, b, c, \dots, z are amounts of various inputs such as land, labour, capital, raw materials, etc. There is a positive function relationship implying that the output varies in the same direction as the inputs quantities. In other words, if all other inputs are held constant, the output will increase upto a limit if the quantity of one input is increased. It has

been observed that raw materials bears a constant relation to output at all levels of production. From industry angle land can be lumped together with capital. Therefore, the number of input used in a production function is reduced to two inputs labour (L) and capita (K).

Economic theory looks to two kinds of inputs-output relation in production function. One is the relation where quantities of some inputs are fixed while quantities of other inputs vary (as in short-run). In other relation, all inputs are variable (as in the long run for a firm). Therefore, a firm has two types of production function-short run production function and long run production function. Short-run production function, is expressed as:

$$Q = f(L)$$

The long-run production is expressed as,

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

Assumptions : The production function assumes that :

- (i) Inputs are outputs are perfectly divisible
- (ii) Substitution of one factor the other factors is possible.
- (iii) Technology of production remain unchanged.

A production function may be in the form of a schedule, a curve, an algebraic equation or a mathematical model. But each of these forms of a production function can be converted into the other forms.

Forms of Production Function : There are five different forms of production function understanding the form is important in the context of interpreting statistically estimated production function that is empirical situation. However, it may be worthwhile to make a passing reference to the conceptual basis of different types of production function.

(a) Cobb Douglas Type : It is a homogeneous production function of degree one i.e. subject to constant returns to scale.

$$Q = Q(K, L) AL^\alpha K^{1-\alpha}$$

Where A and Q are constants $1 > \alpha > 0$.

This means if factors K and L increased by λ proportion, the output Q will also increase by the same proportion. This means constant returns to scale. Interestingly, we may operate on this form of production function to review all the production concepts

(i) Total Product :

$$Q = AL^\alpha K^{1-\alpha}$$

(ii) Average Product :

$$AP_L = A \left(\frac{K}{L} \right)^{1-\alpha}$$

$$AP_K = A \left(\frac{L}{K} \right)^\alpha$$

(iii) Marginal Products :

$$MP_L = \alpha A \left(\frac{K}{L} \right)^{1-\alpha} = \alpha \frac{Q}{L}$$

$$MP_K = (1-\alpha) A \left(\frac{L}{K} \right)^\alpha = (1-\alpha) \frac{Q}{K}$$

(iv) Marginal Rate of Technical Substitution :

$$MRTS_{I,K} = \frac{MP_L}{MP_K} = \left[\frac{\alpha}{1-\alpha} \cdot \frac{K}{L} \right]$$

(v) Elasticity of Production :

For Labour

$$\frac{MP_L}{AP_L} = \alpha$$

For Capital

$$\frac{MP_K}{AP_K} = (1-\alpha)$$

(vi) Function Coefficient :

$$f = \alpha + (1-\alpha) = 1$$

(vii) Production Efficiency : It is measured by the term

A : The firm with higher 'A' produces larger output of Q; high level of 'A' signifies better organization and managerial efficiency.

(viii) Factor Intensity : This measures the relative factor proportion (or ratio) to produce a given level of output. Along the isoquant, factor intensity may vary or remain constant, depending upon the returns to a factor (short run) and the return to scale (long run).

$\frac{K}{L}$ measures capital intensity and $\frac{L}{K}$ measures labour intensity

(ix) Elasticity of Factor Substitution : Elasticity of factor substitution

$$= \frac{\text{Percentage change in } \left(\frac{K}{L} \right)}{\text{Percentage change in } MRTS_{KL}}$$

$$= \frac{\Delta \left(\frac{K}{L} \right)}{\frac{K}{L}}$$

$$= \frac{\frac{L}{\Delta(MRTS)}}{MRTS}$$

$$= \frac{\frac{\Delta(K/L)}{K}}{\frac{\Delta(\alpha, K)}{\frac{\alpha}{1-\alpha}, L}}$$

$$= \frac{\Delta \left(\frac{K}{L} \right)}{\frac{K/L}{\frac{\alpha}{1-\alpha} \cdot \Delta \left(\frac{K}{L} \right)}}$$

$$= 1$$

We may operate on other forms of production function to review the same set of concepts.

(b) CES Type : Constant elasticity of substitution production function (Cobb Douglas function is a special type of CES function)

(c) YES Type : It stands for variable elasticity of substitution production function, because here elasticity is allowed to vary.

(d) Leontief Type : In this type of production function, elasticity is assumed to be zero. This means factors are combined in fixed proportion such that there is no scope for factor substitution.

(e) Linear Type : At the other extreme, elasticity of substitution may assume to be infinity, meaning that there is no limit to factor substitution such that a multi-factor production function may turn out to be a single factor function like.

$$Q = Q(K, L) = Q(2L),$$

because K and L are Perfect substitutes.

Q.11 Discuss the various economies of scale.

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Ans. By scale of enterprise or size of plant, we mean the amount of investment in relatively fixed factors of production i.e. plant and fixed equipment. Generally the costs of production are lower in larger plants than smaller ones. This is because of a number of economies of large scale production.

Economies of Scale : According to Marshall, economies of large scale production fall under two types:

- (i) External economies
- (ii) Internal economies

(i) External Economies : These are those economies that are available to all the firms in an industry. The construction of a railway line in a certain region will reduce transport costs for all the firms. Discovery of new machine or technique that can be used by all the firms in the industry; emergence of repair industries, special technical institutes for the training of skilled labour and other research institutes. These economies arise from the expansion in the size of an industry – involving an increase in the number and size the firms engaged in it.

(ii) Internal Economies : Such economies that are available to a particular firm and give it an advantage over the firms engaged in the industry. These economies arise from the extension of the size of a particular firm. From the managerial point of view, internal economies are more important, as they can be effected by managerial decisions of an individual firm to change its size of scale or otherwise.

Types of Internal Economies

(i) Labour Economies : When the scale of industrial output is expanded the possibilities of division of labour are increased thus reduce the labour cost per unit. This economy through division of labour comes due to the following reasons:

- (i) increase in the skill of workers and
- (ii) saving of time involved in changing form one operation to another.

Besides, in many cases a large firm can find it economical to have a number of operations performed mechanically, rather than manually. These economies will be the greatest in the concerns where products are complex and the manufacturing processes are capable of being sub-divided.

(ii) Technical Economies : These economies are the results of the use of big size machines and such scientific processes as can be carried out in large production units. Small establishment cannot afford to utilities such machines or processes for their use. They will bring a saving only when they are used intensively.

(iii) Managerial Economies : Refer to Q.3.

(iv) Marketing Economies : Refer to Q.4.

(v) Economies of Vertical Integration : A large concern may decide to have vertical integration by joining a number of stages of production. This integration has the advantage that the flow of goods through various stages in production processes is more readily restrained. Continuous supplies of raw materials, on one side, and steady outlets for these raw materials on the other, make production planning more certain and less subject to erratic and unpredictable changes. It may also facilitate cost control. Transport costs may also be minimized by such planning. Transportation and cross hauling is reduced to the minimum.

(vi) Financial Economies : A large firm can offer better security and is, therefore, in a position to secure better and easier credit facilities both from its suppliers and its banks. Due to better image, it enjoys also easier approach to the capital market.

(vii) Reduction of Risks : The larger the size of the business, the greater is the scope for diversification and spreading of the risks. Diversification works on two lines:-

(a) Diversification of Output : If there are several products, the loss in the sales of one product may be overcome by the profits from the other. By diversifications the firm avoids what may be called ‘putting all the eggs in the same basket’.

(b) Diversification of market : Generally the larger producer is always in a position to sell his products in many different and even far off places. If he depends upon single market, he runs the risk of heavy losses, specially when the sales in the market decline for same reason or the other.

Q.12 What do you mean by return to scale? Explain the different stages of returns to scale with the help of iso-product curves.

Ans. Production Function : The laws of returns state out clearly the functional relationship between inputs and outputs. The words inputs and factors of productions are almost synonymous and are often used interchangeably in Economics. However, the term inputs carries a wider meaning. It refers to all those things which are used by the firm in the productive process. Output refers to the quantity of good produced by the firm with the help of various inputs. The relationship between the physical inputs and the physical output of the firm is generally referred to as the production

function. The production function shows for a given state of technological knowledge and managerial ability, the maximum rates of output that can be obtained from different combinations of the productive factors during a given period of time (or per unit of time). In brief, the production function is a catalogue of output possibilities. Mathematically, this relationship can be stated as:

$$P = f(a, b, c, \dots, n)$$

Where P is the rate of output of a given commodity and a, b, c, \dots, n , are the various factor services used per unit of time. The rate of output P is, thus a function of the input of factor services a, b, c, \dots, n employed by the firm per unit of time. If a small textile factory produces 5,000 meters of cloth per 8 hours shift, then its production function consists of the minimum quantities of raw cotton, power, labour, dyestuffs, flower space, machine time etc. that are required to produce 5000 metres of cloth. Putting it differently, the production function of the same textile factory consists of the maximum number of meters of cloth that can be produced with given quantities of raw cotton, power, labour, dyestuffs, flower space, machine time etc. the production function is always specified for a period of time etc. It is a flow of inputs resulting in a flow of output during a specified period of time (8-hour shift in the above example).

Production Function (With all Variable Inputs) or Return to Scale : The scale of the firm is determined by those factor inputs which it cannot change in the short period. The fixed factor inputs set the upper limit to the rate of output. But in the long period, the scale of the firm itself can be varied by changing all the inputs. The concept of return to scale, thus, becomes relevant only in the long period when all the inputs can be varied.

The law of variable proportions explains the behavior of output when changes are made in factor proportions. These factor proportions are changed by keeping the quantity of one or some factors fixed and varying the quantity of others. The changes in output as a result of the variations in factor proportions thus form the subject matter of the law of variable proportions. But the concept of returns to scale is different. This concept explains changes in output when all factors of inputs are increased in the same proportion. In other words, this concept deals with the behavior of output in response to changes in the scale of production. As increase in the scale implies that all inputs or factors are increased in the same proportion, it should be remembered that factor proportions do not change when the scale of production

changes. The study of changes in output as result of changes in the scale constitute the subject matter of "Returns of Scale".

(a) Increasing Returns to Scale : Increasing returns to scale refers to a situation where the total output increases in a greater proportion than the increase in units of factor-inputs. In other words, the increase in output is more than the proportionate increase in quantities of inputs, returns to scale are said to be increasing. The scale of production will also be increased with the increase in factors of production. The return to outlay will show an increasing tendency in the beginning because economies of scale will also be reaped. When the increasing return to scale operate, a firm will be required to increase the factor-proportion at a diminishing rate. Increasing return to scale can also be illustrated with the help of a diagram. (See fig. (a). From O three lines OS, OQ and OR are drawn cutting the iso-product curve 1, curve 2, curve 3 at various points. Increasing returns to scale is shown as :

$$\begin{aligned} & \text{OR} > RT > TG \\ \text{or} \quad & OR' > R'T' > T'G' \\ \text{or} \quad & O'R' > R'T' > T''G'' \end{aligned}$$

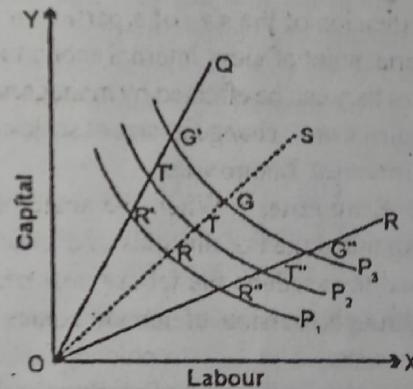


Fig. (a)

(b) Constant Returns to Scale : As the business firm continues to expand. It gradually exhausts the economies-internal and external which cause the operation of increasing returns of scale. Beyond this point, further increase in the scale of operations of the firms are accompanied by constant returns to scale over a substantial range of output. In other words, increases in all the inputs cause proportionate increase in output. For example, if all the inputs are doubled, the output will exactly be doubled. The main reason for the operation of constant returns to scale is, that beyond a certain point internal and external economies are neutralized the growing external and internal diseconomies of production.

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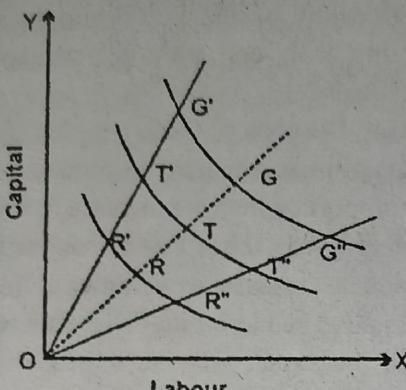


Fig. (b)

When external and internal economies are more powerful than the internal and external diseconomies, the result is increasing returns to scale. When internal and external economies are exactly balanced with the internal and external diseconomies, the result is constant returns to scale and when the internal and external economies are weaker than the internal and external discomfited, the result is diminishing returns to scale. The constant returns to scale sometimes referred to by economies in managerial language a production curve showing constant returns to scale is often called "Linear and homogeneous" or "homogeneous of the first degree". The Cobb-Douglas production function evolved by American economists Paul Douglas and C.W. Cobb is linear and homogeneous function. Fig. (b) illustrates constant returns to scale.

In Fig. (b)

$$OR = RT = TG$$

$$\text{or } O'R' = R'T' = T'G'$$

$$\text{or } O''R'' = R''T'' = T''G''$$

(c) Diminishing Returns to Scale : When business firm continues to expanded beyond the point of constant returns, a stage comes when diminishing return to scale set in. In other words, the economies of large scale production yield place to diseconomies of production. In other words, the economies internal and external are swamped by the diseconomies (internal and external) of production. The result is diminishing returns to scale. Diminishing returns to scale implies that for a given increase in output, larger increase in the amount of input factors is required. In other words, proportionate increased in input factors will be more than proportionate increase in output. Fig. (c) illustrates the application of diminishing returns to scale.

Here

$$OR < RT < TG$$

$$\text{or } O'R' < R'T' < T'G'$$

$$\text{or } O''R'' < R''T'' < T''G''$$

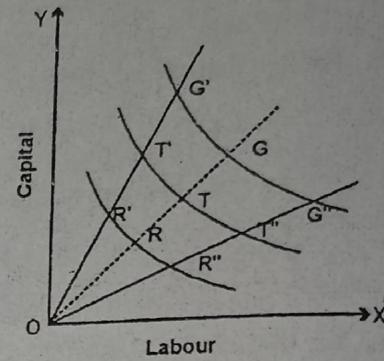


Fig. (c)

Q.13 Explain the relationship between Marginal cost, Average Total cost and Average Variable cost.

Ans. Both average cost and marginal cost are derived from total cost. Average cost is obtained by dividing total cost by the number of units produced. Marginal cost is the cost of producing one additional unit of output.

The total cost, in this reference, is the sum total of the total fixed cost plus total variable cost at a given level of output.

The marginal cost curve bears relationship to the average cost curve. It is very important to have a clear idea about this relationship as it plays an important role in the price theory. The various points of relationship between average cost and marginal cost can be summed up as follows:

- (i) When average cost falls with increase in output, marginal cost becomes less than average cost. Average cost goes on falling upto a certain level of output, marginal cost is less than average cost and beyond that point, marginal cost becomes more than average cost. In fig. (a) QQ is the level of normal capacity, till that point AC curve falls downward, MC curve lies below AC curve.
- (ii) MC begins to rise at a lesser level of output than AC. In Fig. (a) marginal cost curve begins to rise from OQ level of output.

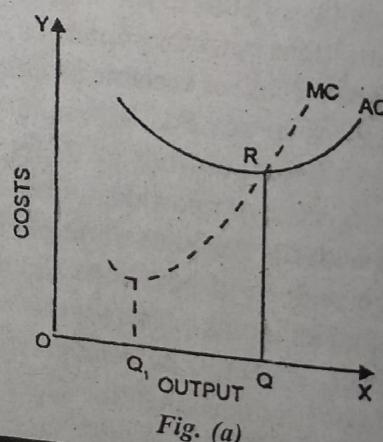


Fig. (a)

(iii) At the level of optimum output, average cost is minimum and constant. At this point marginal cost becomes equal to the average cost, the marginal cost curve cuts the average cost curve at point R. This point may be known as optimum point where average cost (AC) and (MC) will be equal and minimum.

- (iv) With increase in average cost, marginal cost rise at a faster rates. In fig. (a) beyond OQ level of output MC curve is above AC curve. The table below shows the relationship between different costs i.e. average cost. Marginal cost, and Total cost.

Table : Illustrating the Nature and Behaviour of Different Costs of a Firm

1 Total Output (units) (q)	2 Total Fixed costs (TFC)	3 Total variable costs (TVC)	4 Total cost (TC) 2 + 3 Re.	5 Average Fixed cost (AFC) (2-11) Rs.	6 Average variable cost (AVC) (3-1) Rs.	7 Average Cost (AC) (5 + 6) Rs.	8 Marginal Cost (MC) 3 Rs.
0	2,000	0	2,000	Infinity	-	-	-
1,000	2,000	1,000	3,000	2.00	1.00	3.00	1.00
2,000	2,000	1,600	3,600	1.00	0.80	1.80	0.60
3,000	2,000	1,800	3,800	0.66	0.60	1.26	0.20
4,000	2,000	2,000	4,000	0.50	0.50	1.00	0.20
5,000	2,000	2,300	4,300	0.40	0.46	0.86	0.30
6,000	2,000	2,760	7,760	0.34	0.46	0.80	0.46
7,000	2,000	3,360	5,360	0.28	0.48	0.76	0.60
8,000	2,000	4,160	6,160	0.25	0.52	0.77	0.80
9,000	2,000	5,300	7,300	0.22	0.59	0.81	1.14
10,000	2,000	6,600	8,600	0.20	0.66	0.86	1.30

A close study of the above table reveals the following points :

- Where marginal cost is falling total cost will be rising at a declining rate; on the other hand, where marginal cost is rising, total cost will be rising at an increasing rate.
- When marginal cost is lower than the average cost average cost would be falling. In other words, when marginal cost is greater than the average cost, the average cost would be rising.
- If the marginal cost first falls and then rises the marginal cost curve is U-shaped, the marginal cost will be equal to the average cost at a point where the average cost is the minimum.
- If the marginal cost is below the average variable cost, the latter must be falling and vice-versa.
- If the marginal cost first and then rises, it will be equal to the average variable cost at a point where the average variable cost is minimum.

Q.14 State the salient features of long run average cost curve (LAC) and discuss its usefulness in managerial decision-making.

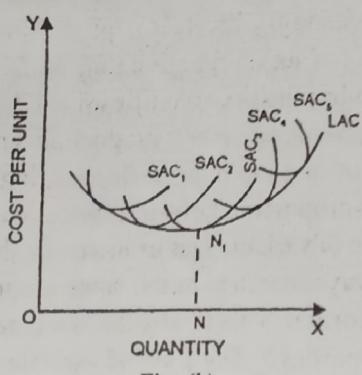
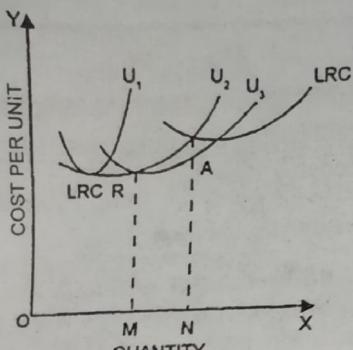
OR

Write short note on 'Long-run average cost (LAC) curve'.

Ans. The long-run cost-output relationship is depicted graphically by the long run cost curve-a curve depicting how costs will change when the scale of production is varied.

The concept of long-run costs be further elaborated with the help of an illustration. Assume that at a particular time, a firm operates under average total cost curve U_2 and produces OM output. Again, it is desired to produce ON amount. If the concern continues under the old scale, its average cost will be NT. If the scale of the firm is changed, the new cost curve will be U_3 . The average cost of producing ON will then be NA. NA is less than NT. So the new scale will be preferable to the old one and should be adopted.

In the long-run, the average cost of producing ON output is NA. This we can say as the long run cost of producing ON output. We must be careful here to note that we shall call NA as the long run cost only so long as the U_3 scale is in the planning stage and is not actually adopted. The moment the scale is adopted, the NA cost will be short run cost producing ON output. [See Fig. (a)].



To draw the long run cost curve we have to commence with a number of short run average cost curves (SAC curves), each such curve representing a particular scale or size of the plant including the optimum scale. One can now draw the long run cost that will be tangential to the entire family of SAC curves. It means that it will touch each SAC curve at one point.

Here, the assumption is that the number of possible short run curves is infinitely large i.e. a plant of virtually any size can be built. If, however, we suppose that only limited, say five, alternative sizes of plants are technically possible, the long-run cost curve will be scalloped i.e. a wavy solid line consisting of lowest segments of all the short-run average cost curves.

Characteristics of Lac Curve

The following characteristics of LAC curve should be noted:

- The LAC curve is tangential to the various SAC curves :** It is drawn to cover them and is often known as Envelope curve as no point on SAC curve can ever be below the LAC curve.
- The LAC curve is U-shaped or like a dish :** This U-shaped of the LAC curve implies lower and lower average costs in the beginning until the optimum scale of the enterprises is reached and successively higher average costs thereafter i.e.

with plants larger than that of the optimum scale. The tendency for the long run average costs to fall as the firm expands its operation scale is a reflection of cost economies available with the increase in size, while the ultimate size in the long-run curve is due largely to the eventual setting in of diseconomies of scale.

The SAC curve is also U-shaped but the difference is that LAC curve is flatter, that is U-shape of the LAC curve will be less pronounced. This is because in the long-run such economies are possible as cannot be had in the short run.

- The long run average cost curve can never cut a short run curve though they are tangential to each other.** This implies that for any given output, average cost cannot be higher in the long run than in the short run. This is because any adjustment that will reduce costs and which it is possible to make in the short-run can also be made in the long-run. On the other side, it is not always possible in the short run to produce a given output in the cheapest possible way.
- LAC curve will touch the optimum scale curve at the latter's least cost point i.e. N.**
- LAC curve will touch SAC curves lying of the left of the optimum scale curve at the left of their least cost points.**
- LAC curve will touch SAC curves lying at the right of the optimum scale curve at the right of their least cost points.**

Thus one will find the LAC curve is tangential to the minimum cost point in case of optimum scale SAC and not in case of other SAC curves.

Usefulness of Lac Curve

A firm is not interested in getting the minimum cost output for a given plant. On the other side, it is interested in producing a given output at the minimum cost. The LAC curve helps a firm to decide the size of the plant to be adopted for producing the given output. For outputs less than the low cost combination at the optimum scale, i.e. when the firm is working subject to increasing returns to scale, it is more economical to underuse a slightly large plant operating at less than its minimum cost output than to overuse a smaller plant. Conversely, at outputs beyond the optimum level that is when the firm experiences decreasing returns to scale, it is more economical to overuse a slightly smaller plant than to underuse a slightly larger one.

An example may make it simple to understand why a firm may choose to operate plants at other than their minimum cost output (optimum capacity) levels. Assume a firm has a choice to use any of the four plants A, B, C, D arranged in order of increasing size. The average cost curves for the plants are AA_1 , BB_1 , CC_1 , and DD_1 , respectively (Fig.c).

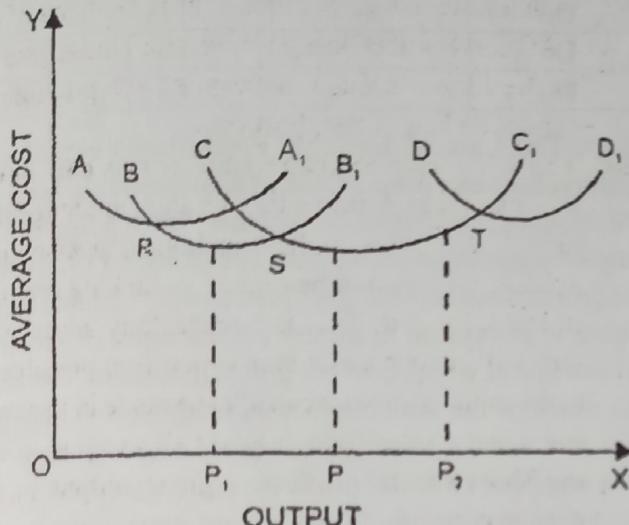


Fig. (c)

The firm's long run average cost curve will be the scalloped curve ARSTD₁. This curve consists of the lowest segments of all the short run average cost curves.

As will be clear from Fig. (c), output OP can be derived from plant C at the lowest cost. Still if the firm desires an output of OP₁, i.e. an amount less than the minimum unit cost Output OP, it can have either plant A or plant B, but it will find it cheaper to have plant B and undersize it rather than to have plant A. If the firm desires an output OP₂, i.e. an output more than the minimum unit cost output OP, it will had either plant C or plant D but it will find it more economical to have plant C and overuse it rather than to have plant D.

In this way, in managerial decision-making usefulness of the long run cost curve lies in its ability to keep the management in the determination of the best size of the plant to be constructed or when a new one is being built or an old one is being expanded. As the long run cost curve can help the enterprise to plant the best scale of plant or the best size of the firm for his purpose; for this reason it is also known as the planning curve. At the planning stage, management is faced with the problem of choosing one of the several possible sizes of plant.

PART-C

Q.15 Explain the Law of Variable Proportion.

OR

Using suitable diagrams explain the Law of variable proportions. [R.T.U. Dec. 2019]

Ans. In the short-run the level of production can be changed by changing the factor proportions. This law examine the production function with on factor variable, keeping the other factors quantities fixed. In other words this law explains the short-run production function. When the quantity of one input is varies, keeping other inputs constant, the proportion between factors changes. When the proportion of variable factors increases, the total output does not always increase in the same proportion, but in varying proportion. This is why the law is named 'Law of variable proportion'. The Law of variable proportion is the new name given to the famous 'Law of Diminishing Returns'. The 'law of variable proportion' or the law of diminishing returns has been defined by a number of economists. In the words of F. Benham, "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". This law explains return to a factor.

Thus, the law states that if more and more units of a variable factor are applied to a given quantity of fixed factor, the total output may initially increase at an increasing rate, but beyond a certain level total output, the rate of increase in total output eventually diminishes in the use of additional units of the variable factor. The volume of goods produced can be looked at form three different angles viz :

- (i) Total Product,
- (ii) Marginal Product,
- (iii) Average Product.

Total product refers to total volume of goods produced during a specified period of time. Total product can be raised only by increasing the quantity of variable factors employed in production. For instance, more shirts will be produced when more labour and capital are used. Total product, generally goes on increasing with an increase

in the quantity of the factor services employed. But there is a limit to which total product can increase with increase in the quantity of variable factors of production.

Marginal Product (MP) : The rate at which total product increases is known as marginal product. We also define marginal product as the addition to the total product resulting from a unit increase in the quantity of the variable factor. Initially marginal product rises, but ultimately it begins to fall down, it becomes zero and at last becomes negative. It would be seen that the total product is maximum when the marginal product is zero.

Average Product (AP) : Average product can be known by dividing total product by the total number of units of the variable factor.

$$AP = \frac{\text{Total Product}}{\text{Units of variable factor}}$$

It can be easily seen that the average product also shows almost the same tendency as does the marginal product. Initially, both the marginal product and the average product rise but ultimately both of these fall. However, marginal product may be zero. The output does not increase at a constant rate as more of any one input is added to the production process. For example on a small plot of land, we can improve the yield by increasing the fertilizer use to some extent. However, excessive use of fertilizer beyond the optimum quantity may lead to reduction in the output instead of any increase as per the law of Diminishing Returns (for instance, single application of fertilizers may increase the output by 50 percent, a second application by another 30 percent and the third by 20 percent. However, if we apply fertilizer five to six times in a year, the output may drop to zero).

The principle of diminishing marginal productivity (return) states that as additional units of a variable inputs are added to other inputs that are fixed in supply, the increment to output eventually decline (for a constant technology). This phenomenon has been widely observed and there is enough empirical evidence to support it. For business managers, marginal productivity of an input plays an important part in determining how much of that input will be employed.

A hypothetical production function is presented in the following table with the total, average and marginal products of the variable factor labour. Needless to say that the amount of other inputs, and the state of technology are fixed in this example.

Total Average and Marginal Product				
Fixed Input	No. of labour	Total output	AP	MP
X	0	0	-	-
Do	1	3	3	3
Do	2	8	4	5
Do	3	12	4	4
Do	4	15	3-3/4	3
Do	5	17	3-2/5	2
Do	6	17	2-5/6	0
Do	7	16	2-2/7	-1
Do	8	13	1-5/8	-3

The Law of Variable Proportions explains the relation between proportions of fixed variable inputs, on the one hand, and output on the other. When a firm expands output by employing more units of a variable factor, it alters the proportions between the fixed and the variable factors. There is always an optimum combination of factors of production at which cost per unit is minimum. Too less or too much of the variable factors leads to cost increases. The law speaks about three stages of production. The first stage goes from origin to the point where the average output is maximum. When a firm expands output by increasing the quantity of variable factors in proportion to fixed factors it moves towards optimum combination of factors of production. In this stage, the law of increasing return may be said to operate and marginal product begins to fall i.e. law of diminishing returns set in.

The second stage goes from the point where the average output is maximum to the point where the marginal output is zero. After having attained the optimum. Combination of the fixed inputs and the variable input, if the firm increases still further the quantity of the variable input, the per unit output of the variable input falls. In this stage, total output rises but only at a diminishing rate.

The third stage covers the range over which the marginal output is negative and total output naturally falls. No producer will operate at this stage, even if he can procure the variable input at zero price.

The first and the third stages are known as stages of economic absurdity or economic non-sense. A producer will always seek to operate in the second stage. At which point the producer will operate in this stage will depend upon the prices of the factor inputs. In the following figures we have drawn TP and units of variable inputs in one figure and AP and MP and units of variable inputs in the other figure. In both the table and the graphic representation, we see that both average and marginal products first increase, reach the maximum and eventually decline.

Note that $MP = AP$ at the maximum of average product function. This is always the case if $MP > AP$, the average will be pushed up by the incremental unit and if $MP < AP$, the average will be pulled down. It follows that the average product will reach its peak where $MP = AP$.

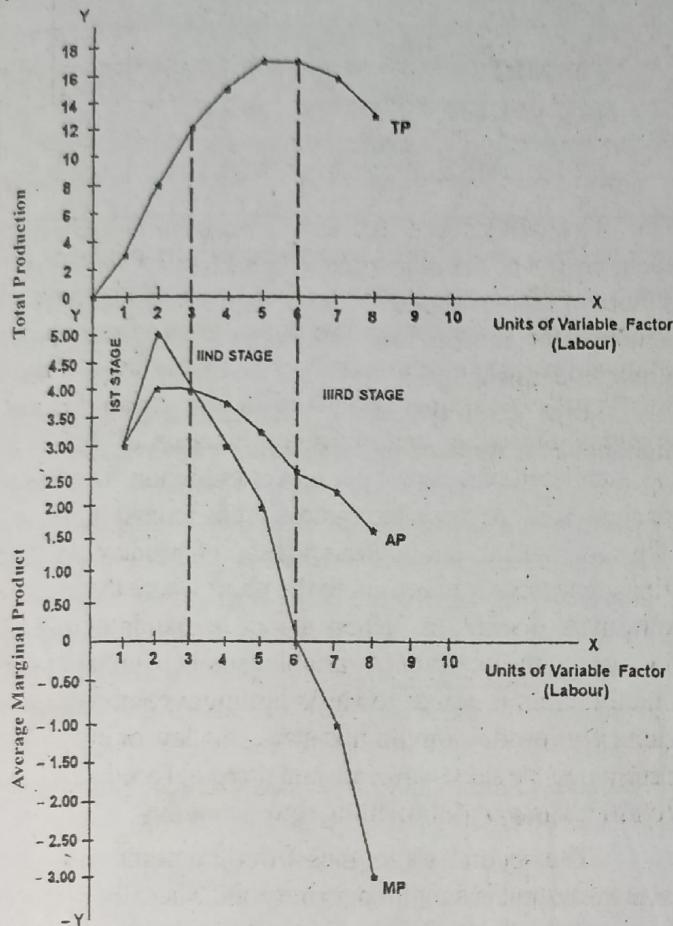


Fig.

Assumptions : The application of the law is subject to the following assumptions.

- Technique of production remain unchanged.
- Prices of inputs is given and do not change.
- Units of the variables factors are homogeneous.
- Factor proportion can be altered.

The diminishing return stage of the law is almost universal. This generally, applies to every productive activity.

Causes of The Operation of The Law

The following are the main causes :

- Fixed factors of production :** In the short-run, some factors are fixed. In the beginning, the quantity of variable factor is less in comparison to fixed factor. Therefore, fixed factor remain unutilized. When more and more units of variable factor are employed then fixed factor is used more intensively and effectively. This causes the total production to increase at an increasing rate. Total production increases at an increasing rate till optimum proportion between factors is achieved. But when the units

of variable factor are increased after optimum proportion, the total production begin to increase at a diminishing rate because now there is deficiency of fixed factor.

2. Indivisibility of same factor : Some factors are indivisible. Therefore, at least one unit of such factor is to be employed whether production is less or more.

3. Factors of production are not perfect substitutes : Factors of production are substitutes for each other only to a certain extent. Variable factors has to work with lesser and lesser quantity of fixed factor.

4. Internal economics is also a cause of the operation of the law.

Q.16 What is meant by production function? Explain the 3 stages of production with the help of diagram.

[R.T.U. 2019]

Ans. Production Function : The functional relationship between physical inputs (or factors of production) and output of a product is called production function. It assumes inputs as explanatory or independent variable and output as the dependent variable. Mathematically, it can be written as follows :

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

Here, 'Q' represents the output, whereas 'L' and 'K' are the inputs, representing labour and capital respectively. Note that there may be many other factors as well but here assume two-factor inputs only.

Production Stages : The 3 stages of production are characterized by the slopes, shapes and inter-relationships of the total, marginal and average product curves.

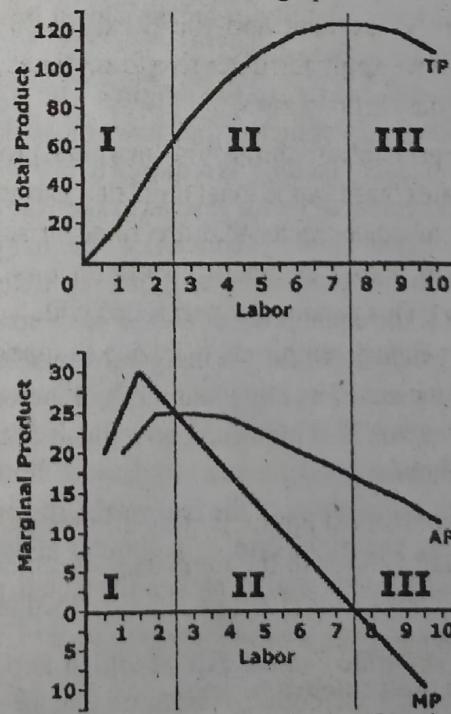


Fig. Three Stages of Production Function

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The first stage is characterized by a positive slope of the average product curve, ending at the intersection between the average product and marginal product curves; the second stage continues upto the point in which the marginal product becomes negative, at the peak of the total product curve; and the third stage exists over the range in which the total product curve is negatively sloped.

In stage I, average product is positive and increasing. In stage II, marginal product is positive, but decreasing. And in stage III, total product is decreasing.

Q.17 Give the meaning of ISO-Product curves, their properties and explain the producer's equilibrium (Least Cost Combination).

Ans. Isoquants are a geometric representation of the production function. The same level of output can be produced by various combinations of factor inputs. Assuming continuous variation in the possible combinations of labour and capital we can draw a curve by plotting all these alternative combinations for a given level of output. This curve which is the locus of all possible combinations yielding the same amount of production is called Isoquant or Isoproduct curve. Each isoquant corresponds to a specific level of output and shows different ways all technologically efficient, of producing that quantity of output.

Properties of Iso-Product Curves

1. ISO product curves slopes downwards from left to right : This is so because when the quantity of factor X is increased, the quantity of factor Y must be reduced so as to keep output constant.

2. Isoquants are convex to the origin : The convexity of equal product curves means that as we move down the curve less and less of factor Y is required to be substituted by a given increment of factor X so as to keep the level of output unchanged. Thus the convexity of equal product curves is due to the diminishing marginal rate of technical substitution. If the equal product curves were concave to the origin, it would mean that the marginal rate of technical substitution increased as more and more of factor Y was replaced by factor X. This could be valid if the law of increasing returns applied. Since it is the law of diminishing returns which is more true of the real world, the principle of diminishing marginal rate of technical substitution generally holds good and it makes the equal product curves convex to the origin. Marginal rate of technical substitution is defined as the rate at which two factors are substituted for each other. Assuming that 10 pairs of shoes can be produced in following three ways :

Q	K	L
10	8	2
10	4	2
10	2	8

$$\text{The MRTS} = \frac{-\Delta K}{\Delta L} = \frac{-4}{2} = -2 \text{ (i) and then}$$

$$\text{MRS} = \frac{\Delta K}{\Delta L} = \frac{-2}{4} = \frac{-1}{2}$$

The MRTS has decreased because capital and labour are not perfect substitutes for each other. Therefore, as more of labour is added, less of capital can be used (in exchange for another unit of labour) while keeping the output level unchanged.

Three general types of shapes that an isoquant might have are depicted in the following figures :

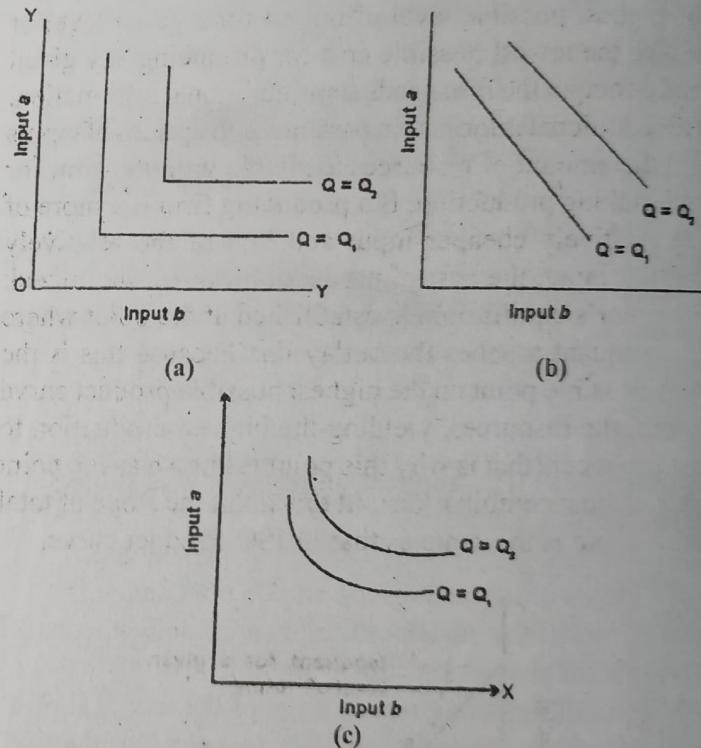


Fig. 1

In Fig 1(a), the isoquants are right angles implying that the two inputs a and b must be used in fixed proportion and they are not substitutable. For example, there is no substitution possible between the tyres and a battery in an automobile. The MRTS in all such cases would therefore, be zero. The other extreme case would be where the inputs a and b are perfect substitute (panel Fig. 1(b)). The isoquants in this category will be a straight line with constant slope or MRTS. A good example of this type would be natural gas and fuel oil which are close substitutes in energy production. The most common situation is presented in Fig. 1(c). The inputs are imperfect substitutes

in this case and the rate at which input a can be given up in return for one more unit of input b keeping the output constant, diminishes as the amount of input to increases.

3. There is a map of ISO-Product curves : A number of ISO-Product curves can be drawn at different levels of production. Higher the ISO-Product curve, higher will be the level of production.

4. No ISO- Product curves do not intersect each other : If two isoquants intersect or touch each other it will mean that there will be common point on the two curves. This will imply that the same amount of labour and capital can produce the two levels of output, which is meaningless.

Producer's Equilibrium (Least Cost Combination)

Isoquants show that any desired level of output can be normally produced by a number of different combinations of inputs. But our task is to determine the specific combination a producer should select. To attain the highest possible level of output for a given level of cost or the lowest possible cost for producing any given level of output the firm needs some additional information. This additional information pertains to the prices of inputs and the amount of resources available with the firm for undertaking production. If a producing firm use more of the relatively cheaper input and less of the relatively costlier input, the cost of production can be minimized. Producer's equilibrium is established at the point where the Isoquant touches the outlay line because this is the only possible point on the highest possible product curve within the resources, yielding the highest production to the producer (that is why this point is known as the point of least cost combination). At this point the slope of total outlay line is the same as that of ISO-Product curve.

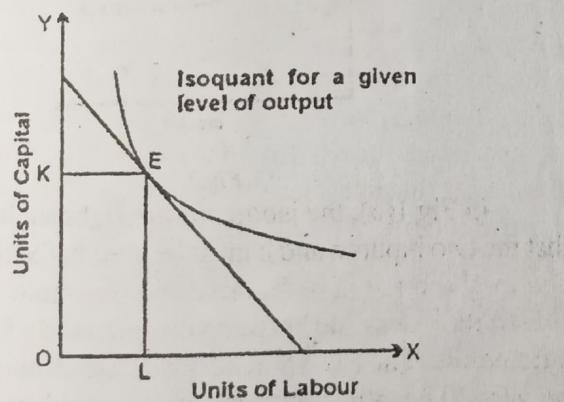


Fig. (d)

ISO-Product curve slope = MRTS

$-\Delta Y / \Delta X$ M Productivity of Y = $\Delta X / \Delta Y$ MP of X

$$\frac{M \text{ Productivity of } X}{M \text{ Productivity of } Y} = \frac{-\Delta Y}{\Delta X} = MRTS$$

$$\text{Slope of outlay line} = \frac{\text{Price of X Input}}{\text{Price of Y Input}}$$

At the equilibrium point

$$\frac{\text{Marginal Productivity of } X}{\text{Marginal Productivity of } Y} = \frac{\text{Price of X Input}}{\text{Price of Y Input}}$$

Or

$$\frac{\text{Marginal Productivity of } X}{\text{Price of X Input}} = \frac{\text{Marginal Productivity of } Y}{\text{Price of Y Input}}$$

$$= \frac{\text{Marginal Productivity of } Y}{\text{Price of Y Input}}$$

Law of Proportional holds good at the point of equilibrium. Thus to minimize cost subject to a given level of output (given input prices), the firm must purchase those amounts of the two inputs which equalize the MRTS L, K of the inputs to relative prices (w/r).

$$MRTS_{LK} = \frac{w}{r} = \frac{MP_L}{MP_K}$$

Equal Product curves help delineate ridge line or boundary lines for the economic region of production. Normally equal product curves slope downwards from left to right, they are convex to the origin ; they do not intersect; and the higher the Isoquant, the greater the level of output. But it is possible to visualize an isoquant may have all these properties but may exhibit one more feature also that is it may bend back upon itself or may slope upwards. The following figure illustrates such an Isoproduct curve.

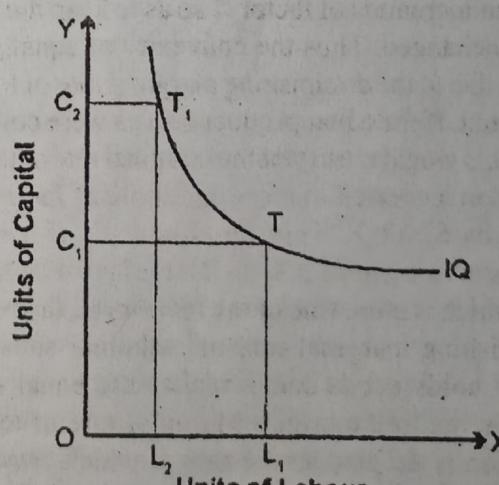


Fig. 2

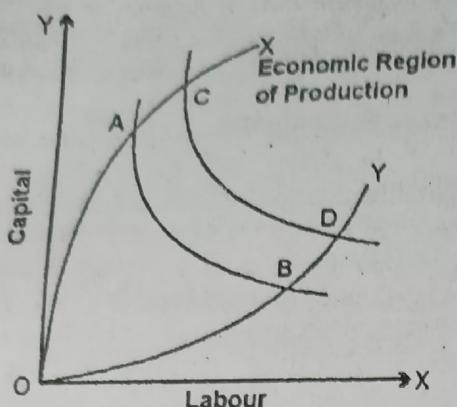


Fig. 3

The point T and T_1 are points at which the isoquant bends back upon itself. Consider first point T on IQ : Point T represent a combination of OC_1 units of capital and OL_1 units of labour. There are two interesting facts here. First it requires a minimum of OC_1 capital; less than OC_1 capital will mean that the firm cannot produce this level of output (IQ) at all. Second with OC_1 units of capital OL_1 units of Labour will have to be combined to produce IQ level of output. But with OC_1 units of capital, additional labour beyond OL_1 will yield a smaller output. That is, beyond OL_1 units of labour cannot be expanded; in case labour is expanded, total product will decline. At point T , marginal product of labour is zero and beyond T , it will become negative (and that is why additional units of labour reduce real output) and marginal rate of technical substitution of labour for capital is zero. Therefore point T on IQ represents the intensive margin of labour. Consider now point T_1 on IQ which shows that a minimum amount of OL_2 units is required to produce this level of output. Any combination of capital with less than OL_2 units of labour cannot produce IQ output. At point T_1 , the combination of capital and labour is $OC_2 + OL_2$. Suppose the amount of labour is kept constant at the minimum level required. Point T_1 is the intensive margin of capital beyond which capital cannot be used.

The economic line of production will be between T and T_1 . This concept of intensive margin with respect to the inputs can be explained by reference to a number of Isoquant maps.

In the long run, a firm should use only those combination of inputs which are economically efficient. A factor should not be used beyond a point, even if it is available free of cost, as it will result in negative marginal product for that factor. These input combinations are represented by the position of an Iso-quant curve which has a positive slope. A positively sloped Isoquant means that the farm will have to use of both the inputs to maintain

same level of production. As illustrated in the figure the point A on I_0 marks the spot where marginal productivity of capital is zero. Beyond this, the MP_K is negative. Similarly at point B on I_0 $MP_L = 0$ and it is negative thereafter. The lines OX and OY which we called ridge lines bound the economics region of production beyond which it is economically inefficient to produce.

The 'Least Cost Combination' is also given by the following equation

$$\frac{\text{MRP of Labour}}{P_L} = \frac{\text{MRP of Capital}}{P_K}$$

Where

MRP = Marginal revenue productivity,

P_L = Price of Labour

P_K = Price of capital

Q.18 Distinguish between internal and external economies. Show how the expansion of the scale of production secures both types of economies.

OR

Define 'internal economies' of large scale production. Explain how are the internal economies the result of indivisibilities and specialization. Discuss the various kinds of internal economies.

Ans. Economies of Scale : Economies of Scale broadly mean reductions in per unit cost of production or benefits derived by expanding the scale of business. These economies generally accrue to a firm in the long run. In the long run all factors of production are variable. A long run permits enough time to a firm to effect changes in its scale of production by installing a new plant or adding a new building to its existing structures etc. When a firm raises its scale of production, it finds itself using in an optimum way some of the resources that were previously underutilized. Likewise, with the growth of the industry, an individual constituent firm shall enjoy certain advantages that shall lead to reduction in its average cost of production. The former are known as internal economies and the latter as external economies.

Internal Economies

Internal economies accrue to individual firm. Each firm can effect reduction in its cost of production by expanding its scale of production to the optimum point. Expansion in the scale of production makes it possible for the firm to make better use of the hitherto underutilized resources. At the same time the large scale of production makes it convenient for the firm to introduce better division of labour. In the words of as per stonier and Hague, "These

are those economies in production-those reductions in the production costs- which can be carried within the firm itself when output increases". These economies are particular to the individual firms. They do not reach the whole of industry.

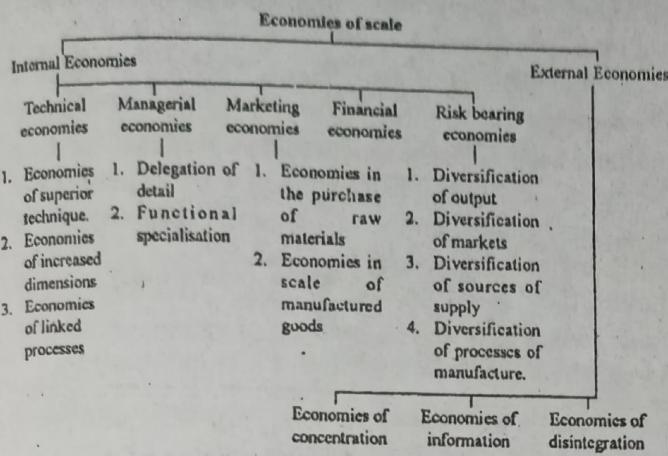


Fig.

Causes of International Economies : These are mainly two factors that give rise to internal economies. They are as follows:

- (i) Indivisibilities, and
- (ii) Specialization

(i) Indivisibilities : There are certain factors of production that cannot be used in parts. For example, operating cost of a 747 Jumbo jet will be the same irrespective of the number of passengers on board that may vary from zero to 350. Likewise a manager cannot be chopped in half and asked to produce 500 units of the commodity instead of 1,000 units. Apparently, cost of manager per unit of output shall be less if 1000 units are produced instead of 500 units. Similarly, a plant equipped to produce 1000 scooters as per month shall work at its maximum efficiency it is produces at its full capacity. Otherwise, the plant would turnout scooters at higher per unit cost, since its expenses on depreciation, cost towards maintenance of plant, rent of the building and the other factors contracted for employment shall remain the same whatever be the level of production. Larger scale of production makes it possible to make better use of the indivisible factors of production.

At small scale of production, factors remain unutilized without any corresponding advantage to the producer in terms of the expenses or the costs to be increased on those factors. Thus large scale production brings in economics of scale.

(ii) Specialisation : Large scale production makes it possible to introduce better division of labour. Through division of labour it is possible for a firm to have more units of output at a lesser average cost, that is to reap

economies of scale. Benefits or economies are reaped when a worker is given to do the same job again and again. It is a well known fact that practice makes a man perfect. A worker well versed in his special work will be responsible for more output. Thus, in the much celebrated Adam Smith's pin industry, every individual labourer engaged in producing whole of a pin by himself shall end up with a few dozen pins at the end of day's labour. But if the same individual works as a link in the whole process of manufacturing pins, it is possible (a) to save on time involved in shifting form one process to another and (b) to take advantages of the specialization and perfection reached by the individual at a particular process.

External Economies

External economies are not related to an individual firm's own cost reduction efforts. Rather, these economies are common to all the firms in the industry of all firm in an area. Whenever an area is developed, transport facilities are provided ; roads, railways etc. are built ; commercial services of all kinds- banking, warehousing, accounting , insurance, etc. – become available. Manufacturers are also to discuss problems of mutual interest and in this way or because of the appearance of the trade, commercial and technical journals, improvements and inventions are stipulated. Subsidiary industries spring up in the neighborhood, supplying accessories and parts of making use of waste matter by giving the shape of by products. All these advantages are jointly shared by each of the firm in an industry or all the industries in a group of industries. They find their cost per unit going down.

In short, in the words of Stonier and Hague, "External economies are those economies in production which depend on increase in the output of the whole industry rather than on increase in the output of the individual firm. Internal economies occur where an increase in the size of an industry leads to lower costs for the individual firms composing the industry."

These economies are not monopolized by any single firm. They are shared by all the firms in the industry or all the industries in a group of industries.

Causes of External Economies : External economies mainly arise because of the following two reasons.

- (a) Localisation of the industry, and
- (b) Specialisation.

(a) Localisation : By localization of industry we mean concentration of a number of firms belonging to a particular industry at a particular place. This concentration of firms, producing the similar products at a particular place, may be due to some natural advantages or acquired advantages that the place has for the production of a particular

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commodity. Thus we find heavy concentration of Jute industry in Bengal industry in Assam, cotton textile at Ahmedabad, sports goods at Meerut and woodwork at Saharanpur. The concentration of industry results in endowing certain advantages to the individual firms which are in the nature of external economies to an individual firm. Thus, to quote Prof. S.E. Thomas, "External economies are those which arise from the localization of industries and are at the disposal of all firms in same industry."

(b) Specialisation : A second source of external economies is specialization among centralized firms. Specialisation takes the form of division of labour among the different firms belonging to the same area and to the same industry. For example it may be observed that when an industrial area develops, it makes possible the growth of a number of firms that act as complements to each other, serving as consumers of waste products and suppliers of ancillaries for each other. Growth of a bicycle manufacturing firms in a particular area may induce the growth of a number of firm that may supply the various components to the bicycle manufacturing firm at a lower cost. Similarly growth of an area induce the emergence of firm supplying specialized services such as advertisement, legal consultation accountancy, distributorship, etc. These specialized agencies are in a position to provide these services to a firm at a cost lower than what that firm would have to incur if it decides to take up these services itself. Similarly, provision of common services and distribution of their costs among a number of firms shall work to reduce the cost of production of the different firms. To sum up, provision of the specialized services bring in reduction in the costs of those firms who decide to take advantage of these services. Prof. Stigler rightly puts it as, "the progressive specialization of firms as the industry grows in the major source of external economies".

Relationship between Internal and External Economies

We have defined internal economies as those which are particular to an individual firm; whereas external economies are advantages which are shared by all the firms in an industry together. However, as a broad spectrum, there is hardly any difference between the two of economies. What may be an external economy for firm X may turn out to be an internal economy for firm Y. Therefore, when we look at these economies in the background of the whole economy latter as one unit, they seem to be primarily internal economies. For example, any expansion in production capacity of steel industry shall bring in economies in the form of internal economies to

the steel producers. But consequent upon availability of cheaper steel, other firms that use steel as a raw material shall find reduction in their cost of production. These reductions shall be in the form of external economies for the steel users. But for the whole economy, reduction in cost either for steep producers or for steel users amounts to an internal economy.

Prof. Robertson visualizes a situation in which a firm realizes both internal and external-economies simultaneously. This he celebrates as 'Internal external economies'. These can be explained with the help of the earlier example. When the raw material costs less to the steel users, they try to change their scale of production whereby they again derive additional advantages. The former advantages was in the form of external economy, whereas the latter is in the form of internal economy.

In brief, internal and external economies are closely related and interdependent on each other.

Diseconomies of Scale

There is a point of 'optimum capacity' for all the firms and industries. The scale of production in these firms and industries. The scale of production in these firms and industries cannot be expanded indefinitely. If any individual firm grows beyond its scale of optimum capacity, it shall find to its regret that additional units are being produced only at a higher cost. This in our jargon means that beyond the point of optimum capacity a firm attracts diseconomies of scale. the diseconomies of scale again may be of two types- (i) Internal diseconomies, and (ii) External diseconomies. For example, beyond a point, a firm may be in a position to get raw materials only at a higher cost, or the firm may be compelled to pay more wages if it wants to attract more labour out of available labour. Likewise, heavy concentration in an area may lead to frequent traffic jams and serve bottlenecks etc.

Diseconomies of scale, in short, arise due to the following causes.

- (i) Managerial obstacles
- (ii) Market obstacles, and
- (iii) Financial obstacles.

Diseconomies and Cost of Production

Economies and diseconomies of scale affect the long run average cost schedule of a firm. For example, so long as a firm reaps economies of scale, its long run average cost curve will fall downwards with an increase in the scale of production. Beyond the point of optimum capacity, economies yield place to diseconomies, and in consequence thereof the LAO curve rises upwards. The average cost is lowest at the point of optimum capacity.

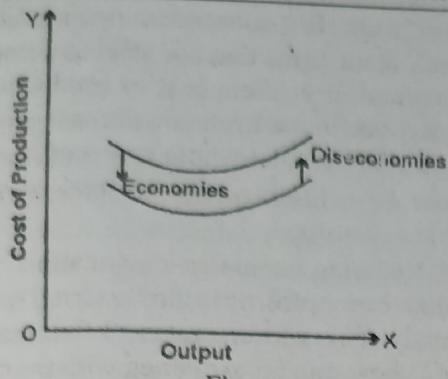


Fig.

In Fig. the LAO curve A moves downwards; it means that the firm derives economies of scale with increase in its scale of production. After a point of optimum capacity, the curve begins to move upwards.

Q.19 Distinguish between private cost and social cost, real cost and opportunity cost, past cost and future cost, explicit cost and implicit cost, short-run and long-run cost.

OR

Explain

- (a) Actual cost and opportunity cost.
- (b) Opportunity cost and out of pocket expenses.
- (c) Opportunity cost and sunk cost.
- (d) Differential and Incremental cost.

Ans.(a) Private Cost and Social Cost : Refer to Q.5.

(b) Actual Cost : Actual Costs mean the actual amount of expenses incurred for producing or acquiring a good or service. These are the costs which are generally recorded in the books of accounts for cost or financial purpose such as payment for wages, raw materials purchased, other expenses paid etc. These costs are also known as 'Outlay costs or Absolute costs'.

Opportunity Cost : Refer to Q.1.

(c) Past Costs and Future Costs : Actual costs or historical costs are records of past costs. Future costs on the other hand, are based on forecasts. The costs relevant for most managerial decisions are forecasts of future costs or comparative conjunctures concerning future situations. Forecasting of future costs is required for expenditure control, projection of future income statements, appraisal of capital expenditure, decision on new projects and on expansion programmes and pricing. The essence of expense control is to have a standard by which performance can be judged; it is therefore necessary to get scientific standards that will realistically reflect the operating conditions that will govern the level of costs during the future accounting period for which the budget is set. For policy decisions on price too, the business

enterprise depends upon future cost and not past cost. Past cost or historical cost is relevant only under the assumption that, the cost conditions of the previous period would be duplicated in the future too.

(d) Explicit Cost and Implicit Cost : The total cost of production of any particular goods can be said to include 'expenditure or explicit costs and non-expenditure or implicit costs'.

Expenditure or outlay costs are those which are paid by the employer to owners of the factor units which do not belong to the employer itself. These costs are in the nature of contractual payments and they consist of wages and salaries paid, payments for raw materials, interest on borrowed capital funds, rent on hired land and taxes paid to the government. Non-expenditure or implicit costs arise when factor units are owned by the employer himself. The employer is not obligated to anyone also in order to obtain these factors. The two normal non-expenditure costs are depreciation and an average or normal return on the money capital supplied by the shareholder; in the case of small business units the wages of the entrepreneur or organizer himself will have to be included in this category. Expenditure costs are explicit since they are paid to factors outside the firm, while, non-expenditure costs are implicit and hence they are imputed costs. But the latter are costs in the real sense of the term, since the factor units owned by the organizer himself can be supplied to other producers for a contractual sum if they are not used in the business of the organizer.

(e) Incremental Costs (Differential Costs) and Sunk Costs : Incremental cost is the additional cost due to change in the level or nature of business activity. The change may take several forms, e.g., addition of a new product line, changing the channel of distribution, adding a new machine, replacing a machine by a better one, expansion into additional markets, etc. The question of incremental or differential costs would not arise when a business has to be set up a fresh. It arises only when a change is contemplated in the existing business.

Sunk cost is one which is not affected or altered by a change in the level of nature of business activity. It will remain the same whatever the level of activity may be. The most important example of sunk cost is the amortization of past expenses e.g., depreciation. The distinction between the sunk cost and incremental costs assumes importance in evaluating alternatives. Hence incremental costs are relevant to the management in the analysis for decision making, Sunk Costs, on the other hand, will remain the same irrespective of the alternatives selected. Thus, it need not be considered by the management in costs evaluating the alternatives as they are common to all of them.

(f) Short-Run and Long-Run Costs : Short-run costs are costs that vary with output or sales when fixed plant and capital equipment remain the same. Long run costs are those which vary with output when all input factors including plant and equipment vary. Short-run costs become relevant when a firm has to decide whether to produce more or not in the immediate future and when setting up of a new plant is ruled out and the firm has to decide whether to set up a new plant or not. Long-run cost can help the businessman in planning the best scale of plant or the best size of the firm for his purposes. Thus long-run costs can be helpful both in the initiation of new enterprises as well as the expansion of existing ones.

(g) Fixed and Variable Costs : Fixed costs remain constant in total regardless of changes in volume of production and sales, upto a certain level of output. There is an inverse relationship between volume and fixed costs per unit. If volume of production increases, the fixed costs per unit decreases. Thus, total fixed costs do not change with a change in volume but vary per unit of volume inversely.

Variable costs vary in total in direct proportion increase in the volume. An increase in the volume means a proportionate increase in the total variable costs and a decrease in volume results in a proportionate decrease in volume and variable costs. They are constant per unit.

Many costs fall between these two extremes. They are called as semi-variable costs. They are neither perfectly variable nor absolutely fixed in relation to changes in volume. They change in the same direction as volume but not in direct proportion thereto. To take an example, electricity bills often include both a fixed charge and a charge based on consumption. This is known as two part tariff.

The distinction between fixed and variable cost is very important in forecasting the effect of short-run changes in volume upon costs and profits. This distinction has given rise to the concepts of Break-Even chart, Direct costing and Flexible Budgets.

(h) Direct and Indirect Costs (Traceable and Common Costs) : A direct or traceable cost is one which can be identified easily and indisputably with a unit of operation (costing unit/cost centre). Common or indirect costs are not traceable to any plant, department or operation, as well as those that are not traceable to indirect final products. The salary of a Divisional Manager when one of the divisions is a costing unit, would be an indirect cost. The distinction is important because in some situations important costs which can be traced to individual units of a product are never-the-less variable with output and are affected in complex ways by specific output decisions.

Costs of Multiple Products: In some manufacturing enterprises two or more different products emerge from a single raw material. For example a variety of petroleum products are derived from the refining of crude oil.

In a cigarette factory different parts of the tobacco leaves are used for different qualities and products. They are identifiable as separate products only at the conclusion of common processing generally known as the split off point. The costs incurred upto the split off point are common costs-costs which cannot be traced to the separate products in any direct or logical manner. Still for managerial analysis these costs should not be identified with individual products if it is not meaningful and useful to identify them. The identification of such costs, however, becomes meaningful in decisions like the discontinuance or otherwise of a product, addition of new product, modification or redesigning of existing products and selection of the most appropriate price differential among members of an existing product line.

Some common costs are unaffected by the change that had to be decided upon (e.g. cost of factory building). Fixed common costs need not be allocated since they are irrelevant for any decision, and will remain constant. Common costs that vary with the decision must be allocated to individual products.

For product costing, it is desirable to distinguish between two broad categories of common products i.e. joint product causes an increase in the output of another product, then the products and their costs are traditionally defined as joint. In contrast when an increase in the output of a product is accompanied by a reduction in other products, they may be called as alternatives products. Slag and steel are joint products, but steel rails and steel bars are alternative products.

For joint products cost problems relate commonly to the incremental effect of an increase in the output rate to meet new demand for one of the firm products. Such an increase involves higher output for all the products. This may call for reduction in the prices of some joint products to get rid of their increased output. Then the added revenue from one joint product must cover not only the added cost of the whole product package but also any loss of revenue from reduced prices of the other joint products.

(i) Sunk, Shut-Down And Abandonment Costs : A past cost resulting from a decision which can no more be revised is called a sunk cost. It is usually associated with the commitment of funds to specialized equipment or other facilities not readily adaptable to present or future, e.g. brewery plant in times of prohibition.

Shut-down costs may be defined as those costs which would be incurred in the event of suspension of the plant operation and which have been saved if the operations had continued e.g. cost of sheltering the plant and equipment and construction of sheds for storing exposed property. Further, additional expenses may have to be incurred when operations are restarted.

Abandonment costs are the cost of retiring altogether a plant from service. Abandonment arises when there is complete cessation of activities. These costs becomes important when management is faced with the alternatives of either continuing the existing plant or suspending its operation or abandoning it altogether.

(j) Out-Of-Pocket and Book Cost : Out of pocket costs refer to costs that involve current cash payments to outsiders. On the other hand, book costs such as depreciation, do not require current cash payments. Book costs can be converted into out-of-pocket costs by selling the assets and having them on hire. Rent would then replace depreciation and interest. While undertaking expansion, book costs do not come into the picture until the assets are purchased.

(k) Replacement And Historical Costs : Historical costs mean the cost of an asset or the price originally paid for it. Replacement cost means the price that would have to be paid currently for acquiring the same plant. The assets are usually shown in the conventional financial accounts at their historical costs. But during the period of changing price levels historical costs may not be correct basis for projecting future costs. Historical costs must be adjusted to reflect current or future price levels.

(l) Controllable and Non-controllable Costs : A controllable cost may be defined as one which is reasonably subject to regulation by the executive with whose responsibility that cost is being identified. A cost which is uncontrollable at one level of responsibility may be regarded as controllable at some other higher level. The controllability of certain costs may be shared by two or more executives. The distinction is important for controlling the expenses and efficiency.

(m) Average Cost, Marginal Cost and Total Cost: Average cost is the total cost divided by the total quantity produced. Marginal cost is the extra cost of producing one additional unit. It may at times be impossible to measure marginal cost, e.g. if a firm produces 10,000 metres of cloth, it can become impossible to determine the change in cost involved in producing 10,001 metres of cloth. The difficulty can be solved by taking units of significant size. In general, economist's marginal cost is cost accountant's differential cost. The total cost of a firm for various levels

of output are the sum of total fixed costs and total variable costs. Symbolically

Total cost

$$\text{or } TC = TFC + TVC$$

Average cost

$$\text{or } AC = \frac{TC}{TQ}$$

Marginal Cost

$$\text{or } MC = TC_m - TC_{m-1}$$

Q.20 Discuss briefly the forces which affect the cost behaviour in the long-run.

Ans. An entrepreneur had to take some very important decisions before setting up a new venture. These decisions have close bearing on the cost of production of the product in the long run. He has to decide the site of the works, the nature of production, scope and size of the market that will be served and the size of the plant. All these decisions are of such nature that once taken can not be altered time and again. All these decisions affect the cost of production in the long-run.

The entrepreneur, therefore, should study the various forces (factors) which may affect the cost behavior in the long run. Generally there are three types of factors which influence the cost of production e.g. I. Location, II. Scope, and III. Size. A complete analysis of these factors, will certainly help the entrepreneur to earn maximum profits by reducing the costs.

I. Location : Dr. M. Visvesvariya has pointed out to nine M's which must be taken into consideration before taking any decision in regard to location of the new unit. These are money, material, men, market, machinery, motive power, management, means of transport and momentum of early start. The success of the new enterprise very much rests on the selection of suitable site. In the selection of the site the following factors should be kept in view.

1. **Availability of Raw Materials :** The place selected should be such where the raw materials are available easily. There should be an easy approach to the place of raw materials. Iron and Steel industry in Bihar textile factories in Gujarat and Maharashtra, Jute works in Bengal owe their success on account of easy availability of raw materials. It reduces the cost of transportation.
2. **Nearness to the Market :** Manufacturing a things successfully is not sufficient. It is also necessary that the output should find ready market and that the product is sold at a price to yield reasonable profit. This is possible only when the market is not far away. Nearness of the market ensures transportation cost less and minimum wastage.

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3. **Nearness to source of Operating Power :** Every industry requires fuel for working the machinery and unless the region has rich fuel resources it can not develop an industrial area. Various sources of power now available are coal, hydro-electricity and oil etc. Coal is the cheapest source of power, but it is very bulky and involves high transportation costs.
4. **Labour Supplies :** For the successful and uninterrupted working of a factory, availability of adequate supply of labour of the right type at reasonable wages is also very essential. There are some industries in which the inherited skill of the workers is an important factor in the process of manufacturing. The development of the dying and printing industry in Farukhabad and the glass industry in Ferozabad have been mainly located there due to the availability of skilled labour in these towns.
5. **Transportation :** Every manufacturing industry requires cheap and efficient means of transportation for the movement of both raw materials from the source of supply to the factory and finished products from the factory to the markets or the centres of consumption. The location of the plant, should therefore, be at a place where adequate transport facilities are available at cheaper rate.
6. **Finance :** No productive activity is possible without the availability of adequate capital. Banks, Stock Exchanges and other similar institutions help in capital formation and expansion of industry by providing financial help to it from time to time.
7. **Climate :** Certain industries for their successful working require a special types of climate. For example, cotton textile industry requires humid climate while the photographic goods industry flourishes best in regions of dry climate. Climate also affects the efficiency of labour.
8. **Industrial Inertia or Momentum of Early Start :** There is tendency for an established industry to remain localized in a particular area in which it arose even after some of the original advantages possessed by that area for such work have lost their previous importance. If, however the entrepreneur acts rationally and has necessary knowledge, he will choose the location which offers the lowest cost per unit of output.
9. **Personal Preferences :** Location of any industry may sometimes be decided according to the personal preferences and prejudices of the industrial enterprises.
10. **Government Policy :** These days the government plays an important role in determining the location

of new industries. In addition to the factors discussed above, cost of land and building for setting up the factory, topography of the area, the possibilities of future expansion etc. are some other factors which influence the decision making regarding location of industry.

II. Scope : It is advisable to plan beforehand the scope of activities of the firm before hand. On the basis of further experience the plan may be revised from time to time in deciding about the scope. The following points should be taken into consideration in this regard -

- (i) What techniques have to be followed in production? What parts have to be manufactured in the factory itself and for what parts should depend on other firm?
- (ii) Should all the processes involved in the production be carried in the factory or some have to depend upon contracts?
- (iii) Has the firm to produce the raw materials itself or should it depend upon other firms?
- (iv) How far the firm should specialize in production or should it depend upon other firms?
- (v) Should all the connected goods with the main product be manufactured by the firm itself and the business scope expanded?
- (vi) Should the marketing of the product be organized by the firm itself or should it depend upon other agencies for marketing?
- (vii) Should the after-sale service to the consumers be undertaken by the firm itself or should firm enter into some agreement with other firm for this important responsibility?

The firm has to take decision on the above question and other allied problems finally setting up the unit keeping in view that the unit cost in producing and distributing of the product or service should be the lowest and chances of making maximum profits are the brightest.

III. Size : The success and efficiency of the firm also depends on its suitable size. The size of the firm should be optimum as to ensure maximum profitability. The optimum size of the firm is that point which results in the lowest production cost and maximum efficiency. At this optimum point of output all the technical, managerial marketing factors are well balanced. It should be noted that optimum size of the firm is not fixed but goes on altering with the improved techniques of production and managerial experience."

Q.21 Explain production optimization in brief.

Ans. Normally, a firm is interested to know what combination of factors of production (or inputs) would

minimize its cost of production. This can be known with the help of isoquants and iso-cost lines.

Isoquants : Refer to Q.7.

Iso-cost or Equal-cost Lines : Iso-cost line represents the prices of factors. It shows various combinations of two factors which the firm can buy with given outlay. Suppose a firm has Rs. 1,000 to spend on the two factors X and Y. If the price of factor X is Rs. 10 and that of Y is Rs. 20, the firm can spend its outlay on X and Y in various ways. It can spend the entire amount on X and thus buy 100 units of X and zero units of Y or it can spend the entire outlay on Y and buy 50 units of it with zero units of X factor. In between, it can have any combination of X and Y.

We can show iso-cost line diagrammatically also. The X-axis show the units of factor X and Y-axis the unit of factor Y. When entire Rs. 1,000 are spent on factor X we get OB and when entire amount is spent on factor Y we get OA. The straight line AB which joints points A and B will pass through all combinations of factors X and Y which the firm can buy with outlay of Rs. 1,000. The line AB is called iso-cost line.

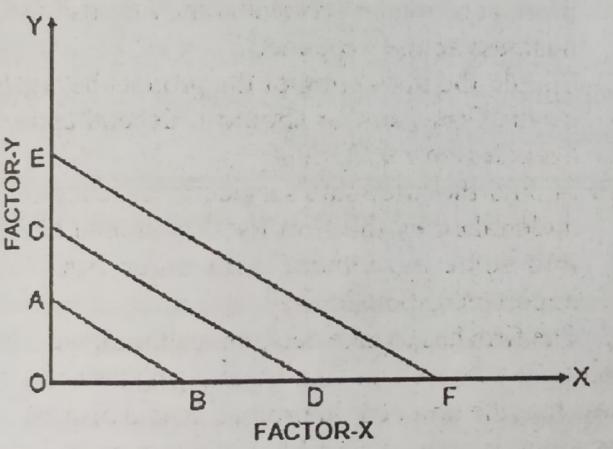


Fig. 2 : Iso-cost lines

Figure 2 shows various iso-cost lines representing different combinations of factors with different outlays. Iso-quants, which represent the technical conditions of production for a product and iso-cost lines which represent various 'levels of cost or outlay' (given the prices of two

factors) can help the firm to optimize its production. It may try to minimize its cost for producing a given level of output or it may try to maximize the output for a given cost or outlay. Suppose the firm has already decided about the level of output to be produced. Then the question is with which factor combination the firm should try to produce the pre-decided level of output.

The firm will try to use the least-cost combination of factors. The least cost combination of factors can be found by super-imposing iso-quant on iso-cost lines. This is shown in Figure 3

Suppose the firm has decided to produce 1,000 units (represented by iso-quant P). These units can be produced by any factor combination lying on P such as A, B, C, D, E etc. The cost of producing 1,000 units would be minimum at the factor combination represented by point C where the iso-cost line MM₁ is tangent to the given isoquant P. At all other points such as A, B, D, E the cost is more as these points lie on higher iso-cost lines than MM₁. Thus, the factor combination represented by point C is the optimum combination for the producer. It represents the least-cost of producing 1,000 units of output. It is thus clear that the tangency point of the given isoquant with an iso-cost line represents the least cost combination of factors for producing a given output.

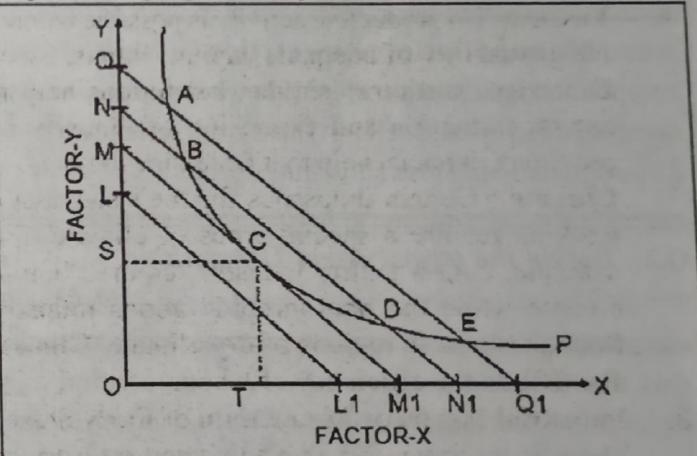


Fig. 3 : Least-cost Combination of Factors: Producer's Equilibrium



PRICE-OUTPUT DETERMINATION UNDER DIFFERENT CONDITIONS

4

PREVIOUS YEARS QUESTIONS

PART-A

Q.1 What is monopolistic competition?

OR

What do you mean by monopolistic competition?

[R.T.U. Dec. 2019]

Ans. Monopolistic competition : Monopolistic competition is a situation of market wherein there are large number of buyers and sellers (firms), the sellers are selling differentiated but close substitutes products.

Q.2 Define the term Perfect Competition.

[R.T.U. 2019]

Ans. Perfect competition : Perfect competition exists when there are large number of buyers and producers (sellers) of a homogeneous product and the price of such a product is determined by the industry. All producers sell the commodity at the price fixed by market forces and no one can change this price.

Q.3 Write short note on price discrimination.

Ans. Price Discrimination : The act of selling the same product by a producer at different prices to the different self-markets is called price discrimination. But it is very difficult to sell the same product at different prices. Therefore, the products are slightly differentiated by the

seller to successfully practice price discrimination. Thus, price discrimination means charging different prices for the technically similar products.

Q.4 What is perfect competition?

Ans. Perfect competition : Refer to Q.2.

According to Mrs. Joan Robinson, "Perfect competition prevails when demand for the output of each producer is perfectly elastic".

Q.5 Explain brief effect of change in demand on price.

Ans. Effect of a Change in Demand on Price : Change in demand conditions cause change in equilibrium price.

(i) **Increase in demand :** When there is increase in demand, the demand curve shifts upward to the right. As a result of increase in demand, supply conditions remaining same, the equilibrium price will rise. The increase in price will be more or less, it depends upon the elasticity of supply curve. If the supply is inelastic then the increase in price will be more for a given increase in demand. On the other hand if supply curve is elastic then increase in price will be less for a given increase in demand.

(ii) **Decrease in demand :** When demand decrease the demand curve shifts downwards to the left. As a result of decrease in demand, supply conditions remaining same, the equilibrium price would fall. The extent to which price falls depends upon the elasticity of supply curve. If the supply curve is elastic then the fall in price will be less and vice-versa.

PART-B**Q.6 How does perfect competition differ from monopoly? Discuss.**

[R.T.U. Dec. 2019]

Ans. The distinction between monopoly and perfect competition is only a difference of degree and not of kind. Following points make clear difference between both the competitions :

S. No.	Features	Monopoly	Perfect Competition
1.	Description	Extreme market situation, where there is only one seller. He has no competition and so controls supply and price.	A fair, direct competition between buyers and sellers : sellers and sellers and finally between buyers and sellers.
2.	Buyers and sellers	Only one seller and practically all buyers depend on him. Hence he has absolute control over the market.	Large number of buyers and sellers. Hence no sellers or buyers can alter the price in the market.
3.	Supply	Supply from only one seller, hence absolute control over the supply.	(i) Supply comes from large number of sellers. (ii) Individual supply is negligible.
4.	Demand	Demand is inelastic. Demand curve slopes downward.	Demand is perfectly elastic. Demand curve is a horizontal straight line.
5.	Product	Homogeneous product.	Homogeneous product.
6.	Nature of Competition	No competition at all. No price or product competition.	Pure and perfect competition in price.
7.	Price	Higher price higher than all competitive price $P > MR = MC$	Normal Price $P = MR = MC$
8.	Output	Small output fixed by the sole seller.	Large output fixed by $MR = MC$
9.	Profit	Excess profit monopoly gain.	Normal profit realized by price competition.
10.	Application	Pure monopoly is rare but elements of monopoly are there in markets.	Quite Unreal

Q.7 "In perfect competition a firm is price taker". Explain the statement with the help of a suitable illustration.

[R.T.U. 2019]

Ans. "In a perfect competition a firm is price taker". It means every firm is a price taker, setting their price at the market price of "P". Each firm's demand curve is perfectly elastic. This means they can sell as much as they want at the given market price. If one of the firms were to raise its price above P, their sales would fall to zero because the buyers would go to one of the other numerous firms selling the identical good at P. Each firm can sell as much as they want at price P.

As all the firms produce homogeneous products and moreover, consumers have perfect knowledge of producers who can supply goods at lower prices.

Q.8 Define oligopoly. What are its peculiar features?**OR****What is Oligopoly? Explain the features of Oligopoly Market.**

[R.T.U. 2018]

Ans. Oligopoly refers to a market situation wherein there are 'a few' (but more than two) sellers selling homogeneous or differentiated but close substitute products. Thus, there can be two types of oligopoly – (a) Oligopoly with product differentiation, and (b) oligopoly without product differentiation. Oligopoly is popularly known as 'competition among few'. An oligopoly situation may emerge in any industry when:

- (a) Economies of large scale production exist, as a result, a few firms are able to supply all or much of the total industry output (steel industry, automobiles)

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- cement, petroleum industries in India are good example).
- Most efficient entrepreneurs reduce the large number of firms into a few, through mergers and holding companies.
 - The exclusive ownership of patents and other right by a few firms or explanation of the advantage of product differentiation creates oligopoly market.
 - The controlling power of a few firms over the available national resources reduce competition to only a few.
 - The requirement of heavy investment of capital in some industries prevents the entering of a large number of firms in the market.

Generally in an oligopoly market, there are a few well established firms with goodwill of their products in the market. It might be really difficult for a new entrant to popular its new product against the already established brands in the market.

Features of Oligopoly :

The following prominent features of oligopoly will enable us to distinguish the nature of oligopoly easily from other market situations such as perfect competition, monopoly, etc.

1. A few sellers : In oligopoly market the number of sellers (firms) is small. Here small number of firms mean that every firm produces a significant fraction of the total output of the industry and each firm can exercise noticeable impact on the market conditions.

2. Interdependence : It is the unique feature of oligopoly. Every firm under oligopoly has to be conscious of the reaction of the rivals. As the number of firms is a few, any change in output, product, price, etc. by one firm will have a direct effect on the fortunes of other who will naturally, retaliate by changing their own prices, output, product, etc. Each firm will have to estimate, as best as it can, the nature of its rival's reaction to its product, price, output, etc. policies. Thus, there is very close interdependence in the decisions of firms in the oligopoly market. Every move in policies by one firm leads to countermoves by other firms.

3. Indeterminate demand curve : The oligopoly is characterized by interdependence. Under oligopoly the demand curve of each firm's product is indeterminate because the behavior of rivals is uncertain and unpredictable. The impact of change in price and advertisement cannot be ascertained accurately because of counter moves by rival firms. Thus demand curve cannot be drawn accurately. Since the traditional assumption of "other things being equal" does not apply here.

4. Aggressive and defensive marketing methods : Oligopoly firms resort to various aggressive or defensive marketing techniques to increase their share of the market or to maintain their share market. They resort to extensive advertisement and sales promotion. Prof W.J. Bannal has rightly said, "Under oligopoly advertising can become a life and death matter". The reason is that every oligopolistic faces a fierce competition.

5. Competition and combination : In oligopoly the competition is not perfect. There may be fierce, violent, cruel and cut throat competition on the one hand. But on the other hand oligopolist realize the disadvantage of competition and rivalry. Therefore, the oligopolist firms may work out some policy of collusion to avoid harmful competition.

6. Entry of New Firms : The ease of entry may be measured by Bain's concept of the 'condition of entry' which is given by the expression.

$$E = \frac{P_a - P_c}{P_c}$$

Where

E = condition of entry

P_c = Price under pure competition

P_a = Price actually charged by firms

The condition of entry is a measure of the amount by which established firms in an industry can raise price above P_c without attracting entry. In conclusion we can say that the theory of oligopoly is a study of group behavior not of mass or individual behavior, but of behavior of small group of firms. Here profit maximization behavior of firms is not a very valid assumption. There are a few firms in a group which are very much interdependent in their behavior. There is no single accepted theory of such a group behavior. Thus, there can be various models of oligopolistic behavior each based upon (a) degree of interdependence, and (b) ease of entry of new firms in the industry. The degree of interdependence of firms may be measured by an unconventional degree of cross elasticity of demand for the products of firm.

Q.9 Write short note on perfect competition.

Ans. Perfect competition : Refer to Q.2.

Conditions or features of perfect competition: Following are the main features of perfectly competitive market.

1. Large number of buyers and sellers : The number of buyers and sellers (firms) is so large that no buyer or seller can influence the market price by his independent action. The position of each buyers and seller in the market

is just like a drop in the ocean. Every buyer or seller purchases or sell a very insignificant amount of the total output. Individual firm a price taker and not price maker.

2. Homogeneous product : The products of all the firms are identical and buyers also accept the product of each firm homogeneous. Therefore, no firms can charge price higher than market price. Yes, firms can sell any amount at market price.

3. Free entry and exit of the firms : There is no legal, economic, natural or social restriction on the entry of new firms into the industry. Old firms are free to leave the industry. If industry is making profits new firms can enter the market to earn profits. Similarly, if the industry suffers losses, some individual firm may quit the market.

4. Perfect knowledge of market : Buyers and salve have full knowledge of the market price. Advertisement and selling techniques do not affect the buyer's preferences.

5. One price : At a particular time only one price of the commodity prevails in the whole market. This price is determined by market supply and demand, i.e. by industry. A firm cannot sell even a single unit above this price.

6. Perfect mobility of factors : Factors of production are perfectly mobile within different regions, industries and firm.

7. Absence of selling and transportation cost : For the uniformity of price it is assumed that there is no transport cost to transport the product from one segment of the market to other parts of the market. Since products of different firms are identical there is no expenditure on advertisement of the product.

Distinction Between Perfect and Pure Competition

Some economies distinguish between perfect and pure competition. Competition means absence of monopoly. The concept of pure competition is narrow than perfect competition. Pure competition has only three main characteristics viz.:

- (a) The large number of buyers and producers
- (b) Homogeneous product
- (c) Free entry and exit of firms

These three conditions ensure that there is competition in the market and monopoly is absent. But the difference between perfect and pure competition is very thin and therefore for managerial purposes, the two firms are used in the same sense.

Q.10 What do you mean by 'Perfect competition'. Discuss fully how the price is determined under perfect competition ?

Ans. Meaning of perfect competition : Refer to Q.2.

Price Determination : Under perfect competition, prices are determined by the market forces of supply and demand. Price will be determined at that level at which marked demand and supply are in equilibrium. At this price both buyers and sellers will be satisfied and there will be no tendency of change in equilibrium price till either demand or supply or both conditions do not change. The following table illustrates price determination :

Price (Rupees)	Demand of good X (kg)	Supply of Good X (in kg)
20	50	10
25	40	20
30 Equilibrium	30	30
35	20	40
40	20	50

From the table, it is clear that demand and supply are in equilibrium when price per kg is rupees 30/- . Therefore, equilibrium price is Rs 30/- per kg. Price determination is also illustrated in fig. (A) drawn below.

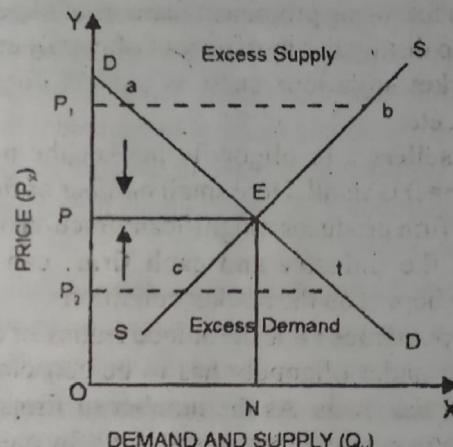


Fig.A

In the fig (A) DD and SS are demand curve and supply curve respectively. Demand curve and supply curve intersect each other at E point. Point E is equilibrium point and equilibrium price is OP. Price $O P_1$ cannot prevail in the market because at this price supply is in excess of demand. therefore, the price will fall to OP level. Similarly at price $O P_2$ demand is in excess of supply. Consequently, the price will increase to OP level.

Effect of a Change in Demand on Price : Refer to Q.5.

Effect of a Change in Supply on Price : Change in supply conditions, demand conditions remaining same, also affect the equilibrium price.

(i) Increase in supply : When supply increases the supply curve shifts downward to the right. When supply

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increases, demand conditions remaining unchanged, the extent to which price will fall depends upon the elasticity of demand curve. If the demand curve is elastic then the fall in price will be less, for a given increase in supply and vice-versa.

(ii) **Decrease in supply :** When supply decreases, the supply curve shifts upward to the left. When supply decreases, demand conditions remaining unchanged, the equilibrium price will increase. The extent of increase in price depends upon the elasticity of demand. If the demand curve is elastic then for a given decrease in supply, the increase in price will be less and vice-versa.

Effect of Simultaneous Change in Demand and Supply on Price

There can be three situations :

- If the increase or decrease in demand and supply are in equal proportion then equilibrium price will remain unchanged.
- When the proportionate increase in demand is more than the proportionate increase in supply then the equilibrium price would increase. On the other hand if proportionate increase in demand is less than the proportionate increase in supply then the equilibrium price would fall.
- When the proportionate decrease in demand is more than the proportionate decrease in supply then equilibrium price would fall and vice-versa.

Role of Time Element in Determination of Price

Time plays an important role in the theory of volume, i.e., price determination because supply and demand condition are affected by time. Price during the short-period can be higher or lower than the cost of production, but in the long-period price will have a tendency to be equal to the cost of production.

The relative importance of supply on demand in the determination of price depends upon the time given to supply to adjust itself to demand. To study the relative importance of supply or demand in price determination Prof. Marshall had divided time element into three categories :

- Very short period or market period
- Short period
- Long period

Now we shall discuss the price determinant in different period.

(a) **Very Short period (Determination of market price) :** Market period is a time period which is too short to increase production of the commodity in response to an increase in demand. In this period the supply cannot be more than existing stock of the commodity. The supply of perishable goods is perfectly inelastic during market period. But non-perishable goods (durable goods) can be stored. Therefore, the supply curve of non-perishable goods above reserve price has a positive slope at first but becomes perfectly inelastic after some price level. The reserve price depends upon – (i) cost of storing, (ii) future expected price, (iii) future cost of production, and (iv) seller's need for cash we will discuss the determination of market price by taking a perishable commodity and determination of market price is illustrated by fig. (B).

In fig. (B) DD is the original demand curve and SS is the market period supply curve. The demand curve DD (perfectly inelastic) cuts the supply curve SS at point E. Point E₁ is the equilibrium point and equilibrium price is determined at OP₁ level. Increase in demand shifts the demand curve to D₁D₁ and the price also increased to OP₂. Decrease in demand shifts the demand curve downward to D₂D₂ and the price too falls to OP. It is, thus, clear that in market period price fluctuates with change in demand conditions.

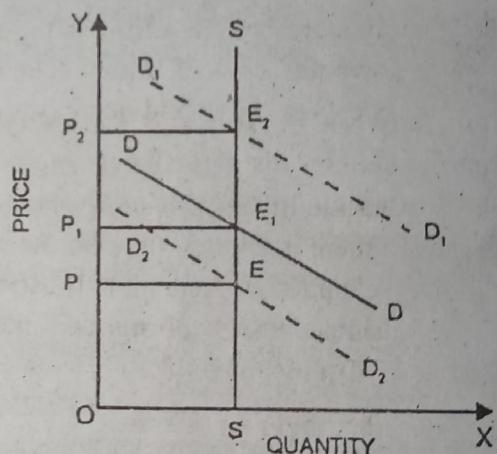


Fig. B

(b) **Price determination is short period :** In the short period fixed factors of production remain unchanged, i.e., productive capacity remains unchanged. However, in the short period supply can be affected by changing the quantity of variable factors.

In other words, during the short period supply can be increased to some extent only by an intensive use of the existing productive capacity. Therefore, the supply

curve in the short run slopes positively, but the supply curve is less elastic. Determination of price in the short-run is illustrated by fig. (C).

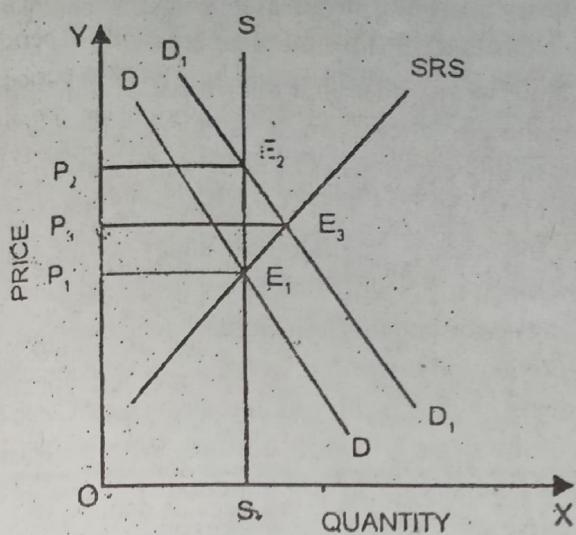


Fig. C

In fig. (C), SS is the market period supply curve and SRS is short run supply curve. The original demand curve DD cuts both the supply curve at E_1 points and thus OP_1 price is determined. Increase in demand shifts the demand curve upward to the right to D_1D_1 . Now with the increase in demand the market price (in market period) rises at once to OP_3 because supply remains fixed. But in the short run supply increases. Therefore, in the short run price will come down to fix at OP_2 where demand curve D_1D_1 cuts the SRS curve. If demand decreases opposite will happen.

(c) Price determination in long period (Normal Price) :
In the long period there is enough time for the supply to adjust fully to the changes in demand. In the long period all factors are variable. Present firms can increase or decrease the size of their plants (productive capacity). The new firms can enter the industry and old firms can leave the market. Therefore, long period supply curve has a positive slope and is more elastic than short period supply curve. The shape of supply curve of the industry depends upon the nature of the laws of returns applicable to the industry. Price determination in the long period is illustrated by Fig. (D).

In fig. (D), DD is the original demand curve and LS is the long period supply curve of the industry. Demand curve DD and supply curve LS both intersect each other at E point and OP price is determined. This price will be equal to minimum average cost (AC) of production

because in the long period firms under perfect competition can only earn normal profits. Suppose there is permanent increase in demand. With the increase in demand, the demand curve shifts to D_1D_1 . As a result of increase in demand the price in the market period and short period will rise. Due to increase in price present firms will earn above normal profit. therefore, new firms will enter into market in the long period. As a result of it supply will increase in the long period. In the long period price will be determined at OP_1 level because at this price demand curve D_1D_1 cuts the LS curve at E_2 point. Price OP_1 is greater than previous price OP , because the industry is an increasing cost industry. This new higher price will also be equal to minimum average cost of production.

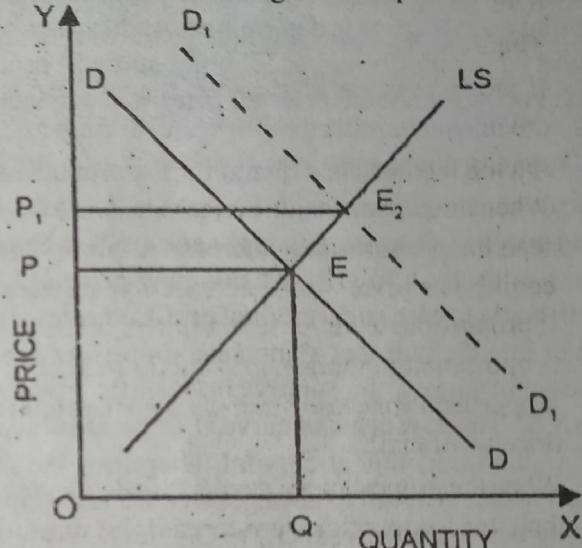


Fig. D

Q.11 How is long run normal price determined under various laws of returns?

OR

Discuss the price output determination under:
(a) Constant cost industry (b) Increasing cost industry and (c) Under decreasing cost industry.

Ans. The long period equilibrium of industry is different under different cost conditions. Price and cost adjustment depends upon whether the industry is operating under constant cost or increasing cost or decreasing cost conditions. It is explained below:

(a) Constant returns or constant cost industry:
Constant cost industry is that industry in which average cost remains constant irrespective of increase or decrease in its output. Firms in such an industry neither have external economies nor external diseconomies. Long period equilibrium under constant cost industry is illustrated by fig. (A) drawn below.

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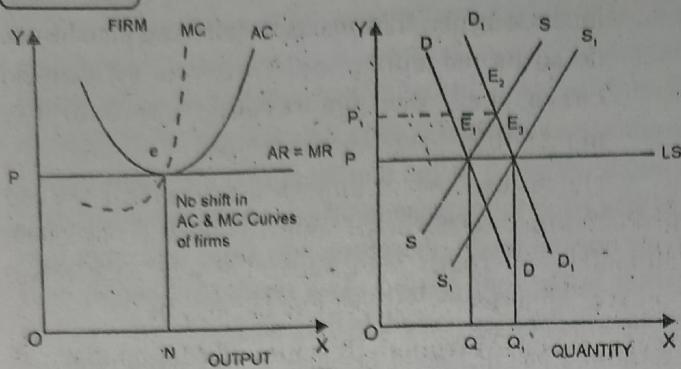


Fig. A

In fig. (A), DD is initial demand curve for an industry and SS is an initial supply curve of an industry. The demand curve DD and supply curve SS intersect each other at E_1 point. Therefore, the industry is in equilibrium at E_1 point and OP price is determined. At this price every firm will be in equilibrium at 'e' point and will produce ON level of output. At OP price all firms will earn normal profits.

With the increase in demand for the product of the industry, the demand curve shifts upward to D_1D_1 . The demand curve D_1D_1 cuts the supply curve SS at E_2 point and thus price rises to OP_1 . At this new price OP_1 , the firm will begin to earn super-normal profits, the new firms will enter into the industry to increase supply. As a result of increase in supply, the supply curve shifts downward right to S_1S_1 . The new demand curve D_1D_1 and new supply curve S_1S_1 cut each other at E_3 point. Therefore, the short period price OP_1 will fall to normal price OP and demand and supply will increase from OQ to OQ_1 level. We notice that there is no change in normal price OP because industry operates under constant returns (constant cost conditions). If we join long period equilibrium points E_1 and E_3 , we get long period supply curve LS.

(b) Diminishing returns or increasing cost industry: Increasing cost industry is that industry in which average cost increases with expansion of output. In this type of industries, external diseconomies exceeds external economies of scale when output increase. Long period equilibrium in such type of industries is illustrated by fig. (B) below.

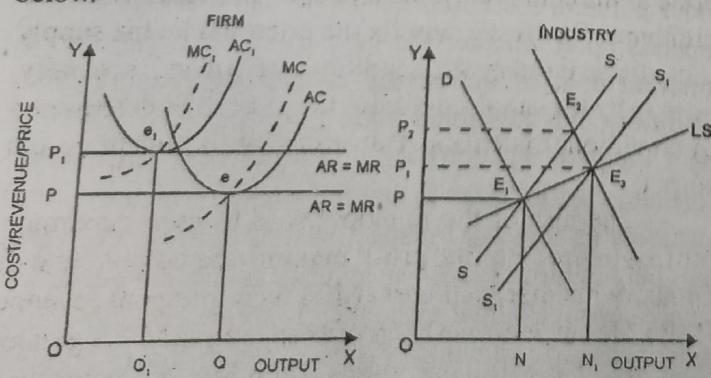


Fig. B

In fig. (B), initially the firms are in equilibrium at 'e' point and the industry is in equilibrium at E_1 point where demand curve DD and supply curve SS cut each other. When the industry is in equilibrium at E_1 point, the equilibrium output is ON and equilibrium price is OP.

Now we suppose that due to increase in demand the demand curve shifts to D_1D_1 . Demand curve D_1D_1 cuts the supply curve SS at E_2 point and the short period price rises to OP_1 . At increased price OP_1 the present firms of the industry begin to earn super-normal profits. Super normal profits will attract new firms in the industry in the long period and this will increase output and average cost of production in the industry. Since it is an increasing cost industry, with the entry of new firms the AC and MC curves of the firms will shift upward. With the entry of new firms the supply of the commodity increases and supply curve shifts to S_1S_1 . Now short period supply curve cuts the demand curve D_1D_1 at E_3 point. At the long period equilibrium point E_3 , the price is OP_1 and output is N_1 . Thus it is clear that due to increase in demand the long period normal price is increased to OP_1 and output is increased from ON to OQ_1 . Long period supply curve is obtained by joining E_1 and E_3 points. Now firms equilibrium position has also changed to E_3 point.

(c) Decreasing cost industry (increasing returns) : The long period supply curve of decreasing cost industry slopes negatively because external economies exceed external diseconomies. Thus, when total output of the industry increases the AC and MC curves of firms shift downward. The determination of equilibrium output and price in the long period is explained by fig. (c).

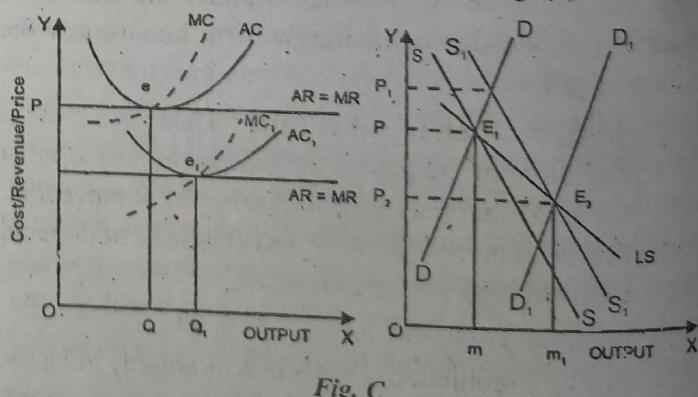


Fig. C

Initially industry is in equilibrium at E_1 point where demand curve DD and supply curve SS intersect each other and equilibrium price is OP. Initially the firms are in equilibrium at 'e' point. Suppose demand for the commodity increases and due to this demand curve shifts to D_1D_1 .

As a result of increase in demand the short period price rises to P_1 because demand curve $D_1 D_1$ cuts the supply curve ss at E_2 point. At this increased price OP_1 , present firm starts getting super normal profits. Due to super normal profits new firms enter into the industry and consequently the supply curve shifts to $S_1 S_1$. Now supply curve $S_1 S_1$ cuts the demand curve $D_1 D_1$ at E_3 point and price falls to OP_2 level. Since it is a decreasing cost industry, the AC and MC curves of firms shifts downward. It is clear that the new long period equilibrium price OP_2 is less than initial increases from Om to Om_1 .

From the above discussion it is clear that long period normal price is affected by the cost change in the long period.

PART-C

Q.12 What do you mean by monopoly? How is price determined under monopoly? Is monopoly price always higher than competitive price?

Ans. Monopoly is a market situation where there is a single producer (seller) of a product which has no close substitute. The concept of monopoly implies the following things:

- Single Seller :** There is a sole producer of a product. This single producer may be individual proprietorship partnership firm or a joint stock company, i.e. the product is under the control of single management. Single firm constitutes the industry.
- Absence of close substitute :** There is no close substitute of the product produced by monopolist because monopoly means absence of competition. In case of monopoly, the cross elasticity of demand for the product is very small.
- Strong barriers to entry :** It means that the new firms are prohibited to enter into monopoly industry. The barriers to entry may be economic, legal, organizational, huge investment, monopoly over raw material, etc.
- Independent price policy :** A monopolist is a price maker. He can increase or decrease price

independently. If he wants to sell more than he can do so by reducing price. Therefore, the demand curve, i.e., average revenue curve of the monopolists has a negative slope.

No one can be pure monopolist because in the end all producers compete for the limited income of consumers. Ultimately, all goods are competitive with each other, however imperfectly competitive they may be.

Average and Marginal Revenue of Monopolist : A monopolist faces a negatively falling demand curve. It means that more quantity can be sold at a lower price, that is why the average revenues (AR) curve of the monopolist falls downward. Similarly the slope of the marginal revenue (MR) curve is also negative. MR curve lies below AR curve and thus MR will be less than AR (price) at each level of output. How much below MR will be from AR, it depends on co-efficient of elasticity of demand (e). We know that AR and MR at a quantity are related to each other through elasticity of demand, by equation—

$$MR = AR \frac{(e-1)}{e}$$

Since the term $\frac{(e-1)}{e}$ will be less than one.

Therefore, MR will be less than AR (price). Thus, the extent to which MR curve lies below AR curve depends

on the value of $\frac{(e-1)}{e}$.

Another point to note is that monopolist demand curve (AR) and industry demand curve is the same as there is no difference between firm and industry in monopoly situation.

Price-output Determination : While determining the price of the commodity, the monopolist is faced with two problems. Firstly, he may fix the price and let the supply (output) be fixed by the conditions of demand. Secondly, he may fix the supply and leave the price to be determined by conditions of demand. But he cannot fix both price and output.

The aim of the monopolist is to earn maximum profits. In order to find profit maximizing output, he will compare his marginal cost (MC) with marginal revenue (MR). He can increase his profits so long as MR is greater than MC. He will incur losses when MC is greater than

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MR. Thus the monopolist will be in equilibrium when (i) $MC = MR$ and (ii) MC must be rising at the point of equality between $MC = MR$.

Price determination in short-run : In the short period a monopolist cannot change fixed factors of production. Price cut determination under monopoly is explained by fig. (A).

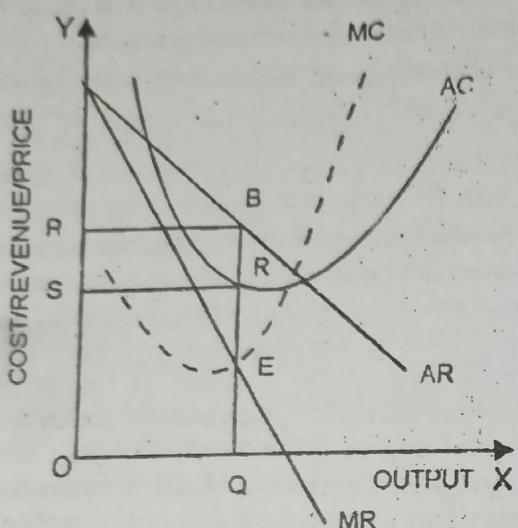


Fig. A

In fig (A), AC and MC are short run average and marginal cost curve respectively. AR and MR are average and marginal revenue curves of the monopolist. MC curve cuts the MR curve at E point. Therefore, the equilibrium output (profits maximizing output) is OQ and OP price is determined. At OQ level of output AC is QR (OS). Per unit super normal profits are RB ($QB - QR$) and total super-normal profits of the monopolist are equal to the area of the rectangle SRBP. In the short-period a monopolist may earn super-normal profits, normal profits or can even incur losses. If he stops production to avoid losses, he stops production to avoid losses, even in situation of losses he will continue production in the short-run so long as price is equal to or greater than his average variable cost of production to minimize his losses.

It is clear from the fig. (A) that price under monopoly is greater than MC. But under monopoly price stands in certain relation to MC. We know that :

$$\text{Price (AR)} = \text{MR} \frac{e}{(e-1)}$$

In equilibrium, $MR = MC$. Therefore, price

$(AR) = MC \frac{e}{(e-1)}$. The value of the term $\frac{e}{(e-1)}$ will be more than one for a given value of elasticity of demand.

Thus, it follows that under monopoly price is greater than marginal cost (Price $>$ MC). The extent to which monopoly price will be greater than his marginal cost is given by the

value of the term $\frac{e}{(e-1)}$. The smaller the co-efficient of elasticity of demand, the larger will be the value of the

term $\frac{e}{(e-1)}$ and hence the greater will be the difference

between price (AR) and MC. The monopoly price is, thus the function of MC and degree of elasticity of demand.

Another important point about monopolists equilibrium is worthy of note. A monopolist would always produce that level of output at which elasticity of demand for his product is greater than one. We know that when co-efficient of elasticity of demand is equal to one or less than one, then the MR of monopolist will be zero or negative, since MC can never be negative. Thus, the equality between MC and MR cannot be achieved at that level of output where elasticity of demand is negative, at the most it can be where elasticity of demand is equal to one. Thus a monopolist will be in equilibrium at that price output combination where elasticity of demand is greater than one.

Long-run equilibrium : In the long period a monopolist can make adjustment in the size of this plant to changed demand conditions. In the long-run a monopolist will be in equilibrium at that price output combination where $LMC = MR$ (LMC = long run marginal cost curve). Long run equilibrium is explained by fig. (B), drawn below:

In fig. (B) SAC and SMC are the short run average cost and marginal cost curves of the relevant plant. LAC and LMC are long run average cost and marginal cost curves respectively. The monopolist is in equilibrium at point E where $LMC = MR$ and equilibrium output is OM. At this equilibrium supply the equilibrium price is determined at OR level. Average cost of production on OM output is MT. Thus monopolist earns BTNR super normal profits. In the long period a monopolist earns super normal profits because he can adjust the size of his plant.

Is monopoly, price always higher than the competitive price. In order to maximize profits a monopolist must fix a higher price. A competitive price is always equal to MC. But monopoly prices are higher than the MC. Thus, we can say that monopoly prices are higher than perfectly competitive prices. But it is not always true. It is possible that, in some cases, under perfect competition cost of production may be higher than cost of production under monopoly. Monopolist is a large scale producer and as such he may have advantages of internal economies of

scale of production. He has large resources and can use most modern techniques of production. In all these situations a monopolist may produce at lower cost than competitive firms. Although his price is more than MC yet it may be lower than price under perfect competition.

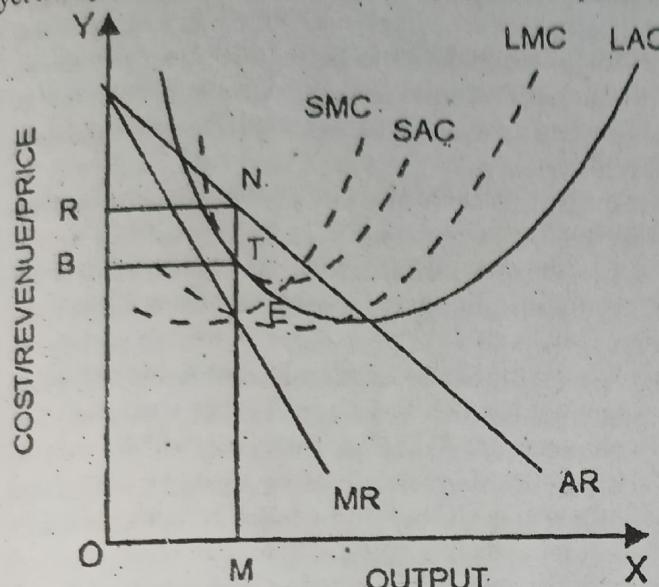


Fig. B

But in conclusion, we can say that even though the monopolist can produce at low cost, he fixes a higher price by restricting supply. But not very high price. He is afraid of the government intervention. The government might control the price of this product, if its priced high. Again consumer may boycotts the purchase of his commodity if they consider the behavior of the monopolist as anti-social. Fear of the discovery of some substitutes may be another limitation on the monopolist power of fixing very high price. Thus, in order to maintain goodwill the monopolist will not charge very high price. Thus, it is not always true that monopoly prices are necessarily higher prices.

Q.13 What is price discrimination? Give the degree and conditions of price discrimination. How are price and output determined under discriminatory monopoly?

OR

**What are the conditions of price discrimination?
Is price discrimination socially desirable?**

Ans. Price Discrimination : Refer to Q.3.

Kinds of Price Discrimination : There can be different kinds of price discrimination (i) Sale of doctor's services is an example, (ii) geographical price discrimination, (iii) discrimination according to the use of commodity. Examples are railways, transport services, supply of electricity, etc.

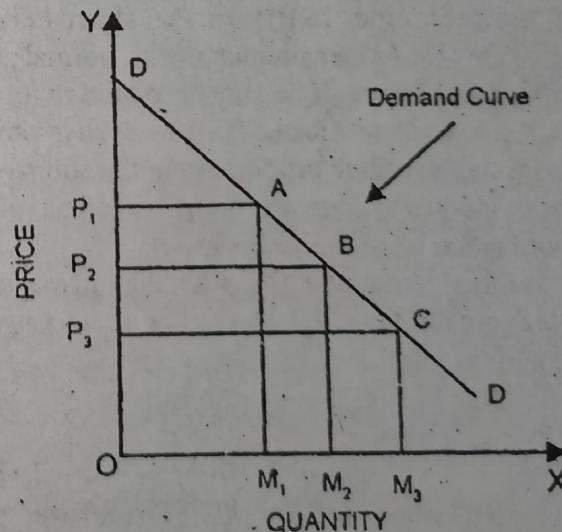
A monopolist who practice price discrimination is known as discriminating monopolist.

Degrees of Price Discrimination : Prof. A.C. Pagon has given three degrees of Price discrimination. Degree of price discrimination refers to the extent or limit to which a monopolist can charge different prices for his product to extract consumer's surplus.

- First Degree Price Discrimination :** It is that price discrimination where a monopolist charges as high price from each buyer as he is willing to pay for each unit of the commodity rather than to go without the commodity. Here the monopolist is in a position to know the price each buyer is willing to pay. In this type of price discrimination the consumer surplus is completely exhausted. In other words monopolist charge so high price from each buyer that his entire consumer is extracted by the seller. This is why it is known as perfect price discrimination. An example of limited price discrimination of this type can be a greedy doctor.
- Second degree price discrimination :** Second degree price discrimination aims at extracting the major part of the consumer's surplus and not the entire consumer's surplus.

Price discrimination of second degree occurs when monopolist divides the all buyers into different groups and from each group so much price is charged which the marginal buyer of that group is willing to pay. It is illustrated by fig.

Price monopolist sells OM_1 units at OP_1 price, M_1M_2 units at OP_2 price and M_2M_3 units at P_3 price.



- Price Discrimination of third degree :** Price discrimination of third degree means that the monopolist divides his whole market into two or

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more separate sub-markets on the basis of difference in elasticity of demand and fix different price for each sub-market. Price in different sub-market depends upon quantity supplied in a market and elasticity of demand in that sub-market. This type of price discrimination is common.

First and second degree price discriminations are difficult and not practiced.

Conditions of Price Discrimination

Price discrimination requires specific conditions in the market. These are as follows:

1. Market imperfection : The degree of price discrimination depends upon degree of imperfection in the market. But the likelihood of price discrimination is more when the producer is a monopolist.

2. Division of the market into sub-markets : To exercise price discrimination the monopolist shall divide total market of his product into different sub-markets and keep them separate. It should not be possible that the units of the commodity sold in cheaper market be transferred to dearer market. It means that there should not be any contact between the buyers of different sub-market. Similarly, the cost of keeping the different markets separate should not be more.

3. Difference in the elasticity of demand : Price discrimination is possible and profitable only when elasticity of demand is different in different sub-markets. He can charge lower price in the market where demand is elastic and higher price in the markets where demand is inelastic. Price discrimination is profitable when elasticity of demand is different in different sub-markets. It can be illustrated with an example.

Suppose elasticity of demand in A and B market is 1 and 4 respectively. Further it is supposed that monopolist fixes price at Rupees 12 in both markets. We know that

$$MR = AR \frac{(e-1)}{e}$$

By using above formula we get :

$$MRA = 12 \frac{2-1}{2} = 6 \text{ Rupees and}$$

$$MRB = 12 \frac{5-1}{2} = 9.6 \text{ Rupees}$$

Thus $MRB > MRA$ ($9.6 > 6$).

Now the monopolist can increase his profits by reducing supply in A market and increasing supply in B market. As a result of price in market A will increase and market B price will fall. He will maximize profits when marginal revenue in both markets is equal. Thus monopolist can increase his profits if sells at higher price in A market

and at low price in B market because elasticity of demand is different in the two market.

4. Legal sanction : In some cases government legally permits price discrimination such as public utilities.

5. Production by order : Producer can charge different prices from different consumers when they get the commodity prepared according to order.

6. Product differentiation : Price discrimination is possible when a product is differentiated by packing, label, design, etc.

Price output determination under discriminating monopoly

The aim of price discrimination is to earn maximum profits. A discriminating monopolist is confronted with three questions:

(i) What is profit maximizing output? A discriminating monopolist will be in equilibrium at that level of output at which his marginal cost (MC) is equal to his combined marginal revenue (CMR) from different markets of his product. That is when

$$MC = CMR$$

(ii) How much of the equilibrium output be sold in each sub-market? The discriminating monopolist will distribute his equilibrium output in different sub-markets in such a way that marginal revenue of each market is equal to the marginal cost of equilibrium output. By equation

$$MC = MRA = MRB = \dots$$

(iii) What price be fixed in each market? The price in each market is fixed by supply and demand conditions in each market.

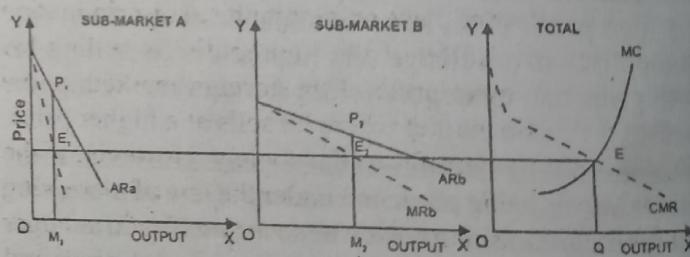


Fig. A

Suppose discriminating monopolist divides his total market into A sub-market and B sub-market. In 'A' market the demand is inelastic and in market B, the demand is elastic. The price output determination is illustrated by the fig. A drawn above.

In the above fig. A, ARa and ARb are the average revenue curves of sub-market A and sub-market B respectively. MRA and MRB are the marginal revenue curves of A and B sub market respective. MC is the marginal cost curves of the discriminating monopolist. CMR is the combined marginal revenue curve of the two markets which is obtained by horizontal summation of MRA

and MR_b. The discriminating monopolist is in equilibrium at E point where MC curve cuts the CMR curve and equilibrium output is OQ. The discriminating monopolist will sell OM₁ quantity in market A at M₁P₁ price because at this price the marginal revenue of market A is equal to marginal cost of equilibrium output. He will sell OM₂ quantity in market B because MR_b is equal to MC (QE) of equilibrium output. Thus it is clear that he will sell his product at higher price (M₁P₁) in market A where demand is inelastic and at lower price (M₂P₂) in market B where demand is inelastic.

Is Price Discrimination Beneficial to Society

Price discrimination may be useful to the society if the commodity or service cannot be supplied if price discrimination is not permitted. For example the services of a doctor or of Railways. If the monopolist is to charge a single price, he must fix price at a higher level and this might lower his sales and hence revenue. Moreover, the poor classes may be deprived of those services. On the other hand, if he charges so low a price from all as to suit the poor people, the production cost may not be covered. Thus the monopolist would not like to serve or produce the commodity. As a consequence the society as a whole would be devoid of these services or commodities. But when price discrimination is practiced the monopolist would charge less from poor and more from rich. Though it is a discrimination against the rich, but the poor will be benefited from the sale of such a service or commodity. But when the monopolist charges high prices from the rich, the society has nothing to regret as it would increase the social welfare of the commodity.

But in case of place or geographical discrimination the society may suffer if the monopolist is selling his commodity at lower price in the foreign markets at the cost of the home market where he sells at a higher price. This is certainly harmful to the society. However, if the commodity is being produced under the law of increasing returns (or diminishing costs) the society will gain as larger output will be obtained at a lower cost of production and this is likely to lower the price in the home market.

Dumping : A special case of price discrimination. A special case of price discrimination occurs when a monopoly firm has two markets. (a) a protected home market in which it has monopoly, and (b) a foreign market in which it is to face competition from others. A higher price in domestic market will not restrict his sales at home as higher price would restrict his sales abroad. As result a monopoly firm will find it most profitable to charge a higher price at home and a lower price abroad. This type of price discrimination is known as 'dumping'. The existence of two prices – a higher one at home and a lower one abroad–naturally

arouses the anger of competitors abroad, who complain that the monopolist is selling below cost price. Actually this is not true. The discriminating monopoly is actually following the simple objective of maximizing its profits by charging different prices according to the nature of the different market.

Objects of Price Discrimination

1. Through price discrimination, the monopolist aims a maximizing his profits by increasing sales. He tries to squeeze out the maximum from the society. Thus monopolist charges on 'what the traffic can bear' principle.
2. Another object of price discrimination may be to dispose of his surplus stock in foreign markets at lower prices.
3. He may want to derive out his rivals out of the market by offering goods at very low prices or at dumping prices (i.e., at a price much below the cost) and may charge higher prices in other markets to make up the losses. The main purpose behind this type of behavior is to capture the market.
4. The object of price discrimination may be to develop a new market. The monopolist charges rather low prices in order to establish in the new market and may charge somewhat higher price in already established market.
5. When a monopolist could not utilize the plant to its full capacity, he can increase the production of the commodity by utilizing the unutilized capacity and offer the commodity at lower prices in some new-national or international – markets.

Q.14 Discuss the main features of monopolistic competition. How are price and output determined under monopolistic competition?

OR

Write short note of monopolistic competition.

Ans. In real world neither perfect competition nor monopoly exists. In fact, almost every market seems to exhibit characteristics of both perfect competition and monopoly. Mrs. Joan Robinson called this situation a situation of 'imperfect competition' while Prof. Edward Chamberlin called it monopolistic competition.

Actually imperfect competition is a very loose term and may be referred to as a multitude of market situations such as monopoly, duopoly and oligopoly. Monopolistic competition is the main form of imperfect competition. Thus, imperfect competition is a market situation wherein one or more conditions of perfect competition is absent.

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Monopolistic competition is a situation of market wherein there are large number of buyers and sellers (firms), the sellers are selling differentiated but close substitutes products.

Features and Causes of Monopolistic Competition

1. Product are differentiated but close substitutes. The products of different firms are differentiated and are commonly known by brand names or trade marks. There may be difference of quality, packing and design. There will be competition between rival brands of each product. The consumers may come to acquire special preference for particular brand.

2. Monopolistic competition is characterized by **imperfections in the market which may arise** due to ignorance, inertia, cost of transport, irrational preferences of consumers and advertisement of dealers. Consumers may be ignorant about the availability and the prices of the different brands in the market. Similarly sellers to may not have equal knowledge about the market and the prices in the different sections of the market.

3. **A large number of sellers :** In a monopolist competitive market, the number of sellers is large(but not as many as in perfect competition) and they are not dependent on rival's action. They act quite independently without caring for their rivals.

4. **Competition :** As because each producer or seller is independent in his actions, but each one takes decisions, considering others actions and their effect on buyers behavior. This situation leads to competition among sellers. The producers or sellers never work in collusion with each other.

5. **Free entry and Exit :** Like perfect competitive situation there is perfect freedom for firms to enter or leave the industry at any time. They will have to face a number of problems in entering the market under monopolistic conditions as compared to perfect competition.

Thus, monopolistic competition is a market situation which substantially different from perfect competition or monopoly. The existence of such a market in any commodity can be found out from the presence of certain practices, such as trade names and trade marks, advertisement by rival firm to promote their product, ability of firm to change in quality as well as prices, and so on.

Price Determination Monopolistic Competition

Each firm under imperfect competition or monopolistic competition produces different commodities which are close substitutes. This makes the output and price policies of an individual firm's product partially dependent on the output and price policies of its rivals. In other words, the average revenue curve and the average

cost curve of each firm will be partially affected by the price and output policies of its rivals. Since each firm can also increase or decrease the price of its commodity by its own action, the average revenue curve of each firm slopes downwards. It should be remembered that under perfect competition the average revenue curve of each firm is a horizontal straight line. It is so because no firm by its individual action increases or decreases the price of its commodity.

Further in the case of perfect competition an monopoly a firm under imperfect competition will come to equilibrium where its marginal revenue equals its marginal cost or where

$$\text{Marginal Revenue} = \text{Marginal Cost}$$

Thus a firm will go on producing so long as its marginal revenue is higher than its marginal cost. It will stop increasing the scale at the point where marginal revenue and marginal costs are equal.

Short Period Equilibrium (or Price Determination) :

Let us first study determination in short period. In short period there is only partial equilibrium as out of the two conditions for full equilibrium only one is possible, viz: the individual firm will be producing equilibrium output or an output where marginal cost equals marginal revenue. The other condition viz., the existing firms will have no tendency to change their output in the short period. Thus in short period conditions, a firm may earn abnormal profits or suffer losses. It will earn abnormal profits because in the short period, the rival firms cannot cut the prices. Even price cutting by rival firms does not remove their abnormal profits. As a matter of fact, no firm would like to practice price cut method to attract the customers of the other firms. It is possible that through price-cut method, a firm might immediately attract some customers of other firms but there is the fear of retaliation. The other firms might have to lose some of its own customers. Thus each firm hesitates to adopt price-cut method and this enables each firm to earn some abnormal profits in the short period. We illustrate a firm earning abnormal profits in Fig. (A)

In fig. (A) along OX output is taken and along OY cost and revenue per unit is measured. AR and MR are short period average and marginal revenue curves of this firm AC and MC are its average cost and marginal cost curves. This firm will come to equilibrium at point K where $MR = MC$ (i.e., marginal revenue is equal to marginal cost). PM is the per unit sales price of the commodity. QM is the cost of production per unit. OS is the sale price of the commodity. PQ is the abnormal profit per unit to the firm. The total abnormal profit of the firm is illustrated in Fig. (A) by the shaded area PQRS.

Similarly in the short period, any one firm might suffer losses also. This would happen when this particular firm is having so little a share of the total demand (i.e., a very small number of customer) that its average revenue will be less than its average cost. Thus the average cost AC will be to the left of the average revenue curve AR as illustrated in Fig. (B) by the shaded area PQRS.

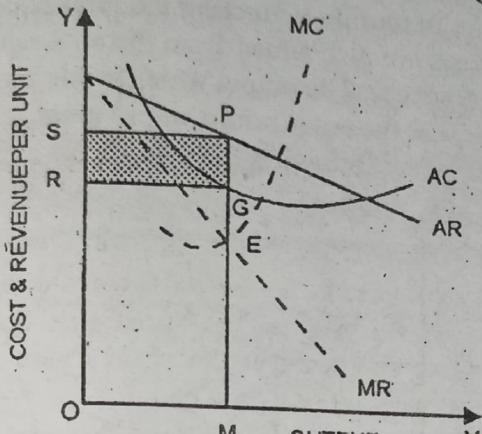


Fig. A

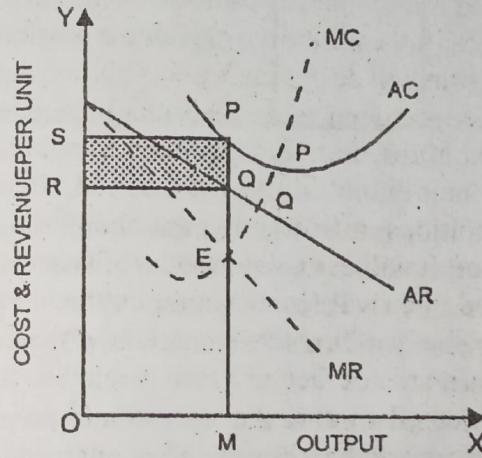


Fig. B

Long Period Equilibrium or Price Determination :
In the long period there will be full equilibrium i.e. each firm will be producing equilibrium output and that there will be no tendency for the new firms to enter the industry or old ones to leave the industry. Monopolistic competition resembles perfect competition since there is also free entry and exit of the firm from the industry.

In the long period each firm will have plenty of time to make efforts to attract the customers of its rivals. Publicity and advertisement, salesmanship are the useful devices used by each firm to attract the customers of the rival firms. There will be an intense competition among rival firms. It is possible that any one firm has introduced some new design or packing for its commodity and has attracted some of the customers of the rival firms. The rival firms will also copy such practices. This would increase the competition further. This competition among

rival firms would increase their output and as a result of this average cost will increase and the average cost will go to the higher position (or will shift to the right). If there are any abnormal profits, new firms will be attracted and they would share some demand with the firms already in existence. This will shift demand curves (or average revenue curves) facing the existing firms to lower (or shift them to the left) thereby reducing their profits. Free exit of firms from the industry signifies that no firms will earn profits less than normal profits. If any firm is earning less than normal profit, it can not stay in the long period. Either it must improve or commit suicide.

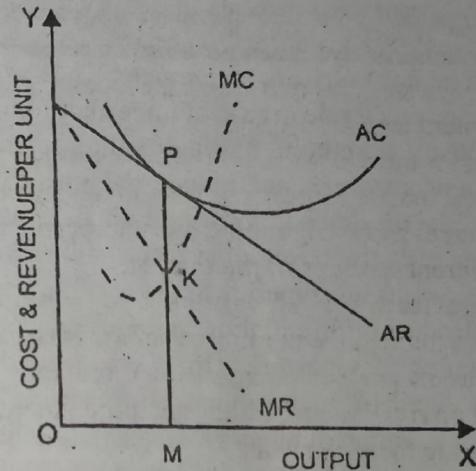


Fig. (C)

Thus the point of full equilibrium will be reached where every firm is producing optimum output (i.e., where $MR = MC$) and earning just the normal profit. Since each firm is earning normal profit, the competition among the firms will come to an end. The long period equilibrium is illustrated in Fig. (C). Along OX output is shown and along OY price and cost per unit is taken. This firm will come to equilibrium at point K and produce OM output. It will sell it at price PM per unit and here the marginal cost is equal to its marginal revenue. The average revenue curve AR just touches the average cost curve AC at P. This firm is now making only normal gain. The same will be the position of every other firm. This should be remembered that though different firms may be producing different amounts and charging different prices and earning different normal profits but each will have its marginal cost equal to its marginal revenue and its average revenue curve just touching the average cost curve. Thus each firm will earn normal profit because for each firm the price is equal to its average cost.

Relation of Selling Cost To Output :

Meaning of Selling Costs : Selling costs are those costs which are incurred by a firm on advertisement, publicity and salesmanship. A firm incurs such costs in order to

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persuade buyers to buy its product rather than the product of any other firm. Again, in order to attract more customers some firms give free subsidiary product or service, as for instance a buyer may be given a free electric press with every sewing machine or a cake of soap with every bottle of hair oil. The costs which are incurred on free distribution of subsidiary product or services are also included in selling cost since these costs are also a part of the advertisement costs.

Importance of Selling Costs : In a purely competitive economy or perfect competition where standard or identical products are sold and the buyers are well informed about their prices and quality, no selling costs are required. Also a monopolist need not incur selling costs because he has no rivals to compete. Thus selling costs play an important role in case of imperfect competition or monopolist competition. Through selling costs a firm can attract new customers and induce old ones to buy more and increase the demand for its commodity, it is through the selling costs that a particular firm convinces the buyers that its products are superior to those of its rivals. Since there is product differentiation in imperfect competition, so constant and vigorous efforts are needed to sell a product. Again it is through selling efforts that firm prejudices the mind of buyers for a particular product. So selling costs are liable to produce product differentiation.

Relation of Selling Costs to Output : Whenever a firm under imperfect competition or monopolistic competition wants to sell larger output at the same price or same output at higher price it has to incur high total selling costs. Thus high selling costs are incurred to sell more output. The presence of these selling costs creates a difficulty in determining the equilibrium output. It is obvious that selling costs will increase total costs. For example, take the case of the firm which gives one free comb with every bottle of hair oil. The total cost of the firm will increase by the cost of comb equal to the number of bottle of hair oil produced. Thus as the output is increased the average as well as the marginal cost per unit will be higher, by the

cost of one comb. This will happen when the selling costs are variable. But when we assume the selling costs to be fixed, they will not affect marginal cost after one unit but the effect on average will be that it will go on diminishing as the output increases. The equilibrium output of the firm will be determined where the firm will earn maximum net returns. The firm has to find out new returns for every size of the output by deducting the total costs in which selling costs are also added from the total sale proceeds (or total revenue). The output which yields maximum net returns will be the equilibrium output we can find out the net return by the following formula.

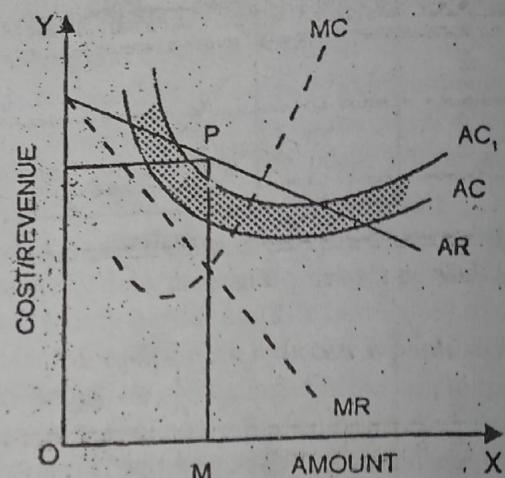


Fig. D

We illustrate in Fig. (d) the equilibrium output of the firm whose selling costs have been assumed as a fixed sum. Net return = (Price × Output) - (Cost of production + Selling costs) = (Total Revenue - Total costs including Selling costs)

In Fig (d) AR is the average revenue curve (or demand curve), MR in the marginal revenue curve. AC is the average cost before the selling costs are incurred, AC₁ is the average cost curve after the selling costs are incurred. The shaded area above AC₁ curve indicates selling costs. There are PQRS shows maximum net returns in this case and OM is therefore, equilibrium output.



FINAL ACCOUNTS

5

PREVIOUS YEARS QUESTIONS

PART-A

- Q.1 Explain Balance Sheet.** [R.T.U. 2018]
OR
What does a balance sheet depicts? [R.T.U. Dec. 2019]

Ans. Balance Sheet : A Balance Sheet is a statement which is prepared for the purpose of finding out the Assets and liability position of the concern for the particular period. A Balance Sheet is also described as "Statement showing the sources and application of funds". It is a statement and not an account and prepared from real and personal Accounts. It has two sides. The left side of the balance sheet describes the Liabilities and Capital position. The right hand side of the balance sheet describes all the assets and investments.

- Q.2 Define the Capital Budgeting.** [R.T.U. 2019]

Ans. Capital Budgeting : Accountants apply capital budgeting techniques as a method for evaluating the potential benefits and risks of large expenses. These include long-term ventures and assets, such as acquiring new land and equipment or building new facilities, with the central goal of yielding greater returns and increasing shareholder value.

- Q.3 Explain Break Even Point.** [R.T.U. 2018]

Ans. Break-Even Analysis : Break-even Analysis is a specific way of presenting and studying the inter-relationship between the costs, volume and profits. It is

an effective and efficient financial reporting system. It provides information to management in most lucid and precise manner.

The Break-even Analysis (or B/E Analysis) establishes a relationship between revenues and costs with respect to volume. It indicates the level of sales at which costs and revenues are in equilibrium. The equilibrium points is commonly known as Break-even point.

The break-even point is that point of sales at which total revenue is equal to total costs. It is not profit, no loss point.

- Q.4 How comparative statement is prepared?**

Ans. These statements refer to the statement of profit and loss and the balance sheet prepared by providing columns for the figures for both the current year as well as for the previous year and for the changes during the year, both in absolute and relative terms. As a result, it is possible to find out not only the balances of accounts as on different dates and summaries of different operational activities of different periods, but also the extent of their increase or decrease between these dates. The figures in the comparative statements can be used for identifying the direction of changes and also the trends in different indicators of performance of an organisation. The following steps may be followed to prepare the comparative statements:

Step 1 : List out absolute figures in rupees relating to two points of time (as shown in columns 2 and 3 of Table).

Step 2 : Find out change in absolute figures by subtracting the first year (Col.2) from the second year (Col.3) and indicate the change as increase (+) or decrease (-) and put it in column 4.

Step 3 : Preferably, also calculate the percentage change as follows and put it in column 5.

Absolute Increase or Decrease (Col. 4) $\frac{100}{}$
 First year absolute figure (Col. 2)

Table : Comparative Statement

Particulars	First Year	Second Year	Absolute Increase (+) or Decrease (-)	Percentage Increase (+) or Decrease (-)
1	2	3	4	5
	Rs.	Rs.	Rs.	%

Q.5 List out the tools of financial analysis.

Ans. There are various tools for financial analysis depending on the purpose. The important tools or techniques of financial analysis are as follows :

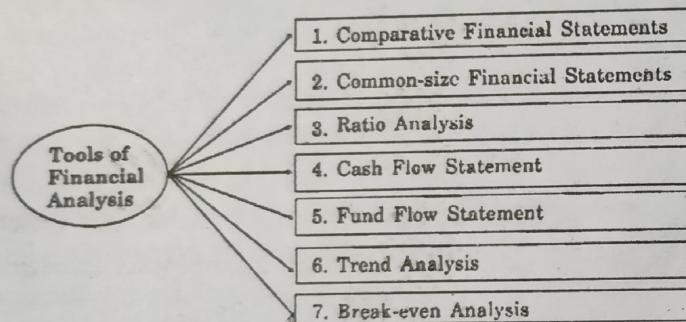


Fig.

Q.6 What is the Meaning of Analysis of Financial Statements?

Ans. The process of critical evaluation of the financial information contained in the financial statements in order to understand and make decisions regarding the operations of the firm is called 'Financial Statement Analysis'. It is basically a study of relationship among various financial facts and figures as given in a set of financial statements, and the interpretation thereof to gain an insight into the profitability and operational efficiency of the firm to assess its financial health and future prospects. The term 'financial analysis' includes both 'analysis and interpretation'. The term analysis means simplification of financial data by methodical classification given in the financial statements. Interpretation means explaining the meaning and significance of the data. These two are complimentary to

each other. Analysis is useless without interpretation, and interpretation without analysis is difficult or even impossible.

PART-B**Q.7 Discuss the concepts of assets and liabilities.**
[R.T.U. Dec. 2019]

Ans. Concept of Assets : An asset is something of value that is owned and can be used to produce something. For example, the cash you own can be used to pay your tuition. A home provides shelter and can be rented out to generate income. An asset is a resource owned or controlled by an individual, corporation, or government with the expectation that it will generate future cash flows. Common types of assets include: current, non-current, physical, intangible, operating, and non-operating. Correctly identifying and classifying the types of assets is critical to the survival of a company, specifically its solvency and associated risks. Examples of assets includes the followings :

- (i) Cash and cash equivalents
- (ii) Inventory
- (iii) Investments
- (iv) PPE (Property, Plant, and Equipment)
- (v) Vehicles
- (vi) Furniture
- (vii) Patents (intangible asset)
- (viii) Stock

Concept of Liabilities : A liability is a debt or something you owe. Many people borrow money to buy homes. In this case, the home is the asset, but the mortgage (i.e. the loan obtained to purchase the home) is the liability. Liabilities also include amounts received in advance for future services. Since the amount received (recorded as the asset cash) has not yet been earned, the company defers the reporting of revenues and instead reports a liability such as unearned revenues or customer deposits. Examples of liability accounts reported on a company's balance sheet includes the followings :

- (a) Notes payable
- (b) Accounts payable
- (c) Salaries payable

- (d) Wages payable
- (e) Interest payable
- (f) Other accrued expenses payable
- (g) Income taxes payable
- (h) Customer deposits
- (i) Warranty liability
- (j) Lawsuits payable
- (k) Unearned revenues
- (l) Bonds payable

Q.8 Write short notes on comparative financial statements. *[R.T.U. Dec. 2019]*

Ans. Comparative Statements: These are the statements showing the profitability and financial position of a firm for different periods of time in a comparative form to give an idea about the position of two or more periods. It usually applies to the two important financial statements, namely, balance sheet and statement of profit and loss prepared in a comparative form. The financial data will be comparative only when same accounting principles are used in preparing these statements. If this is not the case, the deviation in the use of accounting principles should be mentioned as a footnote. Comparative figures indicate the trend and direction of financial position and operating results. This analysis is also known as 'horizontal analysis'.

Q.9 Compute the Net Present Value of a project if it requires an initial investment of Rs. 2,25,000 and is expected to generate the following net cash inflows.

Year 1	Year 2	Year 3	Year 4
Rs. 95,000	Rs. 80,000	Rs. 60,000	Rs. 55,000

The minimum desired rate of return is 12%.

[R.T.U. 2019]

Ans.

$$\text{Net Present Value} = \sum_{t=0}^n \frac{R_t}{(1+i)^t}$$

R_t = Net cash inflow during a single period (t)

i = Discount rate (or) return that could be earned in alternative investments
t = No. of time periods.

$$\begin{aligned} \text{So, NPV} &= \frac{95000}{(1+0.12)^1} + \frac{80000}{(1+0.12)^2} + \frac{60000}{(1+0.12)^3} \\ &\quad + \frac{55000}{(1+0.12)^4} - 225000 \\ &= 84821.42 + 63775.51 + 42706.81 + 34953.49 - 225000 \\ &= 2,26,257.23 - 2,25,000 \\ &= ₹1,257.23 \end{aligned}$$

Ans.

Q.10 Airline XYZ has reported the following earnings to its shareholders for financial year 2017-2018, as given below :

- (a) Net profit before tax : ₹10000000/- (in words Rs. One crore only)
 - (b) Taxation at 50% of net profit
 - (c) Equity share capital (₹10/- per share) ₹1000000/- (in words Rs. One crore only)
- Calculate the earnings per share for the shareholders.

[R.T.U. 2018]

$$\text{Ans. } \text{EPS} = \frac{\text{NPAT}}{\text{Total No. of Equity Shares}}$$

NPAT is Net Profit After Tax

Calculation of NPAT

Net Profit Before Tax	10000000
Tax 50%	-5000000

Net Profit After Tax (NPAT)	5000000
-----------------------------	---------

Total No. of Equity Shares = Equity Shares

Capital/Face value per share

$$= \frac{10000000}{10} = 1000000$$

As we know

$$\begin{aligned} \text{EPS} &= \frac{\text{NPAT}}{\text{Total No. of Equity Shares}} \\ &= \frac{5000000}{1000000} \end{aligned}$$

EPS = Rs. 5 Per Share

Q.11 What do you understand by a Balance Sheet and its related concepts?

[R.T.U. 2018]

Ans. Balance Sheet : Refer to Q.1.

Balance Sheet Concepts : Trading, Profit & Loss Account disclose the financial results of the concern at the end of the year. But the Balance Sheet discloses the Assets and Liability Position of the concern as on the date.

Specimen form of Final Account Trading Account for the year ended31.3

Dr.

Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Opening Stock		xx	By Sales	xx	
To Purchase	xx		Less: Sales Return	xx	xx
Less: Purchase Return	xx		By Closing Stock		xx
To Wages		xx	By Goods destroyed by fire		xx
To Wages		xx	By Gross Loss		xx
To Carriage inward		xx	[Transferred to P&L A/c debit side]		
To Manufacturing Expenses					
To Fuel and Power		xx			
To Motive Power		xx			
To Coal, Water, Gas & Electricity		xx			
To Clearing Charges		xx			
To Import Duty		xx			
To Customs Duty		xx			
To Freight on Purchase		xx			
To Factory Rent and Insurance		xx			
To Works Managers Salary		xx			
To Gross Profit (B/f)		xx			
(Transferred to P&L A/c Credit Side)		xx			
					xx

Profit and Loss Account for the year ended 31.3

Dr.

Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Gross Loss		xx	By Gross Profit		
(Transferred from Trading A/c)			(Transferred from Trading A/c)		xx
To Advertisement Expenses		xx	By Rent received		xx
To Carriage outwards		xx	By Commission received		xx
To Bank Charges		xx	By Income from Investments		xx
To Salaries		xx	By Interest received		xx
To Rent and Taxes		xx	By Discount received		xx
To Stationeries		xx	By Income from another source		xx
To Insurance		xx	By Discount on Creditors		xx
To Trade Expenses		xx	By Interest on Drawings		xx
To Interest on Capital		xx	By All Business income other than that appeared in Trading Account credit side		xx

To Interest on Loan		xx	By Net Loss (Transferred to Balance sheet assets side)		xx
To Establishment Expenses		xx			
To Selling & Distribution Expn.		xx			
To Sundry Expenses		xx			
To Audit Fees		xx			
To Telephone Charges		xx			
To Depreciation		xx			
To Repair and Maintenance		xx			
To Bad Debts		xx			
To Bad Debts provision		xx			
To Loss on sale of fixed Assets		xx			
To Loss on stock by fire		xx			

Balance Sheet as on 31.3

Dr.				Cr.
Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.
Capital		xx	Cash in Hand	xx
Add : Net Profit		xx	Cash at Bank	xx
(-) Less : Drawings	xx	xx	Sundry Debtors	xx
+ Interest on Drawings	xx	xx	Investments	xx
		xx	Marketable Securities	xx
Add : Interest on Capital		xx	Bills Receivable	xx
Less : Income Tax		xx	Prepaid Expenses	xx
Sundry Creditors		xx	Machinery	xx
Bills payable		xx	Building	xx
Bank Overdraft		xx	Furniture and Fittings	xx
Outstanding expenses		xx	Loose tools	xx
Loan from Banks		xx	Motor Car	xx
Mortgage		xx	House & Carts	xx
Debenture		xx	Goodwill Patents & Trade Mark	xx
Reserve fund		xx	Preliminary Expenses	xx
Income Received in advance		xx	Profit & Loss A/c (Net Loss)	xx
			Closing stock	xx

Q.12 Explain capital budgeting technique in detail.

OR

What are various types of capital budgeting techniques? [R.T.U. 2018]

OR

Explain in brief the various capital budgeting techniques. [R.T.U. 2018]

Ans. Capital Budgeting : Refer to Q.2.

The following overview of capital budgeting techniques shows the benefits and drawbacks of each method.

Net present value

Determining the net present value is one of the most efficient capital budgeting techniques, both mathematically and in terms of a time value of money perspective. This method analyzes the forecasted cash flow of a project by

discounting the cash flows to the present, factoring in the time span of the project and the weighted average cost of capital.

If the net present value is positive, the business is encouraged to make the investment or undertake the new project; however, the opposite is true if the result turns out negative. Understanding the type of project to be evaluated is the first step to making decisions based on the net present value. Independent projects, which are not affected by other projects' cash flows should be accepted if the net present value is greater than \$0. Mutually exclusive projects represent projects where there are two ways of accomplishing the same ends and, in this case, the project with the greater net present value should be accepted. If the net present value of both projects is negative, then both should be rejected.

Payback Period

The simplicity of the payback period technique makes for a quick budgeting analysis, though there are several deficiencies businesses should be aware of. The payback period is the amount of time it takes for the initial investment of a project to be paid back. Businesses use this method to decide whether or not to invest in a capital project based on the length of time it takes to recoup their initial investment. If the payback period is too long, they will likely not purchase the asset or invest in the project. One of the main deficiencies of this method is that it does not account for the time value of money, which means cash inflows that will be received in the future hold the same weight as those received in the first year. It does provide a quick rough estimate of when an investment will be paid back and can be used as a jumping-off point before employing more advanced capital budgeting techniques.

Accounting Rate of Return (ARR)

The accounting rate of return signifies a percentage value showing the rate of benefits that an asset can generate over its lifespan. Accountants determine the figure by dividing a fixed asset's net income by its average book

value, then multiplying that number by 100. Management determines the ARR for an investment and if the result fits within the established value, then the asset or investment is accepted. Similar to the payback period method, the ARR does not factor in the time value of money and cash flow timing. Also, the ARR does not account for the impact a capital project may have on the business overall as well as increased risks and other variables associated with long-term investments.

Internal Rate of Return (IRR)

This application represents the discount rate resulting in a net present value of zero and is used to analyze actual or potential investments that have varied over time. The IRR is commonly used for project analysis to figure out whether or not managers or investors should embark on a specific project. It is often used in presentations for those without financial backgrounds because it is easier to understand. The limitation of this type of forecasting is that it is more conceptual and does not address scale, which is important for determining real dollar amounts.

Profitability Index

Another technique of capital budgeting involves comparing the value of costs and the value of the proposed project's benefits. This is known as the profitability index, which is calculated by dividing the initial investment by the current value of a project's future cash flows. If the profitability index is greater than 1.0, the profitability is positive and the project is likely a good investment. If it is less than 1.0, the proposed project will lose value. A profitability index equaling 1.0 indicates that the projects cash gains or losses will be minimal.

In order to advise business owners properly regarding undertaking capital projects, accountants must make use of a variety of budgeting methods. Knowing when to use these techniques is an integral part of their job. These and other capital budgeting techniques are necessary functions that accountants can use to identify and recommend profitable investments for organizations.

Q.13 Prepare Trading Account from the following Balances:

	Rs.
<i>Opening stock</i>	<i>80,000</i>
<i>Purchases</i>	<i>3,00,000</i>
<i>Sales</i>	<i>4,50,000</i>
<i>Purchase Returns</i>	<i>10,000</i>
<i>Sales Returns</i>	<i>20,000</i>
<i>Wages</i>	<i>5,000</i>
<i>Carriage & Freight</i>	<i>15,000</i>
<i>Freight on purchases</i>	<i>12,000</i>

Ans.

Trading Account

Dr.			Cr.		
Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Opening Stock		80,000	By Sales	4,50,000	
To Purchases	3,00,000		Less : Sales Returns	20,000	
Less : Purchase Returns	10,000				4,30,000
To Wages		5,000			
To Carriage & Freight		15,000			
To Freight on Purchase		12,000			
To Gross Profit		28,000			
		4,30,000			
					4,30,000

Q.14 From the following balances extracted at the close of trading period ended on 31.3.2003, prepare Profit and Loss Account as on that date.

	Rs.		Rs.
Gross profit	90,000	Discount Dr	1,000
Carriage outward	5,000	Apprentice Premium (Cr)	3,000
Salaries	11,000	Advertisement	1,000
Rent & Taxes	4,000	Travelling expenses	750
Fire insurance premium	3,000	Sundry Trade expenses	500
Bad debts	2,500		

Ans.

Profit and Loss Account

Dr.			Cr.	
Particulars	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Carriage outwards		By Gross Profit		90,000
To Salaries		By Apprentice Premium		3,000
To Rent & Taxes				
To Fire Insurance Premium				
To Bad Debts				
To Discount				
To Travelling Expenses				
To Sundry Trade Expenses				
To Advertisement				
To Net Profit				
				93,000

Q.15 From the following Trial balances of Mr. Ragunath for the year ending on 31.12.2003, prepare Final Accounts with the closing stock of Rs. 15,000.

Particulars	Debit Rs.	Credit Rs.
Stock (1.1.2003)	46,800	—
Returns inwards	10,000	—
Purchases	2,40,000	—
Rents & Rates	4,000	—

MEFA.78

Sales		—	3,21,900
Debenture		—	25,000
Reserve fund		—	45,000
Sundry Debtors		60,000	—
Salaries		3,000	—
Commission Received		—	4,900
Bad debts		2,000	—
Bad debts provision		—	6,000
Wages		6,000	—
Return outwards		—	2,000
Bills receivable		25,000	—
Investments		60,000	—
Sundry Creditors		—	20,000
Bank overdraft		—	5,000
Cash in hand		11,000	—
Goodwill		26,000	—
Capital		—	63,000
Furniture		15,000	—
General expenses		2,000	—
Discount (Cr)		—	18,000
		5,10,800	5,10,800

Ans.

Trading Account for the year ended 31.12.2003

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Opening Stock		46,800	By Sales		3,21,900
To Purchases	2,40,000		Less : Sales Returns		10,000
Less : Return Outwards	2,000	2,38,000	By Closing Stock		3,11,900
To Wages		6,000			15,000
To Gross Profit		36,100			3,26,900
		3,26,900			

Profit and Loss Account for the year ended 31.12.2003

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Rent & Rates		4,000	By Gross Profit		36,100
To Salaries		3,000	By Commission		
To Bad Debts		2,000	Received		4,900
To General Expenses		2,000	By Discount (Cr.)		18,000
To Net Profit		48,000			59,000
		59,000			

Balance Sheet as on 31.12.2003

Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Capital		63,000	Sundry Debtors		60,000
Debenture		25,000	Bills Receivable		25,000
Reserve Fund		45,000	Investments		60,000
Bad Debts Provision		6,000	Cash in Hand		11,000
Sundry Creditors		20,000	Goodwill		26,000
Bank Overdraft		5,000	Furniture		15,000
Profit Loss A/c		48,000	Closing Stock		15,000
		2,12,000			2,12,000

Q.16 How common size statement is prepared ?

Ans. Common Size Statement, also known as component percentage statement, is a financial tool for studying the key changes and trends in the financial position and operational result of a company. Here, each item in the statement is stated as a percentage of the aggregate, of which that item is a part. For example, a common size balance sheet shows the percentage of each asset to the total assets, and that of each liability to the total liabilities. Similarly, in the common size statement of profit and loss, the items of expenditure are shown as a percentage of the net revenue from operations. If such a statement is prepared for successive periods, it shows the changes of the respective percentages over a period of time. Common size analysis is of immense use for comparing enterprises which differ substantially in size as it provides an insight into the structure of financial statements. Inter-firm comparison or comparison of the company's position with the related industry as a whole is possible with the help of common size statement analysis. The following procedure may be adopted for preparing the common size statements.

1. List out absolute figures in rupees at two points of time, say year 1, and year 2 (Column 2 & 4 of Table).
2. Choose a common base (as 100). For example, revenue from operations may be taken as base (100) in case of statement of profit and loss and total assets or total liabilities (100) in case of balance sheet.
3. For all items of Col. 2 and 3 work out the percentage of that total. Column 4 and 5 shows these percentages in Table.

Table : Common Size Statement

Particulars	Year one	Year two	Percentage of year 1	Percentage of year 1
1	2	3	4	5

Q.17 Explain the significance of analysis of financial statement.

Ans. Financial analysis is the process of identifying the financial strengths and weaknesses of the firm by properly establishing relationships between the various items of the balance sheet and the statement of profit and loss. Financial analysis can be undertaken by management of the firm, or by parties outside the firm, viz., owners, trade creditors, lenders, investors, labour unions, analysts and

others. The nature of analysis will differ depending on the purpose of the analyst. A technique frequently used by an analyst need not necessarily serve the purpose of other analysts because of the difference in the interests of the analysts. Financial analysis is useful and significant to different users in the following ways:

(a) Finance Manager : Financial analysis focusses on the facts and relationships related to managerial performance, corporate efficiency, financial strengths and weaknesses and creditworthiness of the company. A finance manager must be well-equipped with the different tools of analysis to make rational decisions for the firm. The tools for analysis help in studying accounting data so as to determine the continuity of the operating policies, investment value of the business, credit ratings and testing the efficiency of operations. The techniques are equally important in the area of financial control, enabling the finance manager to make constant reviews of the actual financial operations of the firm to analyse the causes of major deviations, which may help in corrective action wherever indicated.

(b) Top Management : The importance of financial analysis is not limited to the finance manager alone. It has a broad scope which includes top management in general and other functional managers. Management of the firm would be interested in every aspect of the financial analysis. It is their overall responsibility to see that the resources of the firm are used most efficiently and that the firm's financial condition is sound. Financial analysis helps the management in measuring the success of the company's operations, appraising the individual's performance and evaluating the system of internal control.

(c) Trade Payables : Trade payables, through an analysis of financial statements, appraises not only the ability of the company to meet its short-term obligations, but also judges the probability of its continued ability to meet all its financial obligations in future. Trade payables are particularly interested in the firm's ability to meet their claims over a very short period of time. Their analysis will, therefore, evaluate the firm's liquidity position.

(d) Lenders : Suppliers of long-term debt are concerned with the firm's longterm solvency and survival. They analyse the firm's profitability over a period of time, its ability to generate cash, to be able to pay interest and repay the principal and the relationship between various sources of funds (capital structure relationships). Long-term lenders analyse the historical financial statements to assess its future solvency and profitability.

(e) Investors : Investors, who have invested their money in the firm's shares, are interested about the firm's earnings. As such, they concentrate on the analysis of the firm's present and future profitability. They are also interested in the firm's capital structure to ascertain its influences on firm's earning and risk. They also evaluate the efficiency of the management and determine whether a change is needed or not. However, in some large companies, the shareholders' interest is limited to decide whether to buy, sell or hold the shares.

(f) Labour Unions : Labour unions analyse the financial statements to assess whether it can presently afford a wage increase and whether it can absorb a wage increase through increased productivity or by raising the prices.

(g) Others : The economists, researchers, etc., analyse the financial statements to study the present business and economic conditions. The government agencies need it for price regulations, taxation and other similar purposes.

Q.18 Write Objectives of Analysis of Financial Statements.

Ans. Analysis of financial statements reveals important facts concerning managerial performance and the efficiency of the firm. Broadly speaking, the objectives of the analysis are to apprehend the information contained in financial statements with a view to know the weaknesses and strengths of the firm and to make a forecast about the future prospects of the firm thereby, enabling the analysts to take decisions regarding the operation of, and further investment in the firm. To be more specific, the analysis is undertaken to serve the following purposes (objectives):

- to assess the current profitability and operational efficiency of the firm as a whole as well as its different departments so as to judge the financial health of the firm.
- to ascertain the relative importance of different components of the financial position of the firm.
- to identify the reasons for change in the profitability/financial position of the firm.
- to judge the ability of the firm to repay its debt and assessing the short-term as well as the long-term liquidity position of the firm.

Through the analysis of financial statements of various firms, an economist can judge the extent of concentration of economic power and pitfalls in the financial policies pursued. The analysis also provides the

basis for many governmental actions relating to licensing, controls, fixing of prices, ceiling on profits, dividend freeze, tax subsidy and other concessions to the corporate sector.

Q.19 Explain Tools of Analysis of Financial Statements.

Ans. The most commonly used techniques of financial analysis are as follows:

1. Comparative Statements: Refer to Q.8.
2. Common Size Statements: These are the statements which indicate the relationship of different items of a financial statement with a common item by expressing each item as a percentage of that common item. The percentage thus calculated can be easily compared with the results of corresponding percentages of the previous year or of some other firms, as the numbers are brought to common base. Such statements also allow an analyst to compare the operating and financing characteristics of two companies of different sizes in the same industry. Thus, common size statements are useful, both, in intra-firm comparisons over different years and also in making inter-firm comparisons for the same year or for several years. This analysis is also known as 'Vertical analysis'.

3. Trend Analysis: It is a technique of studying the operational results and financial position over a series of years. Using the previous years' data of a business enterprise, trend analysis can be done to observe the percentage changes over time in the selected data. The trend percentage is the percentage relationship, in which each item of different years bear to the same item in the base year. Trend analysis is important because, with its long run view, it may point to basic changes in the nature of the business. By looking at a trend in a particular ratio, one may find whether the ratio is falling, rising or remaining relatively constant. From this observation, a problem is detected or the sign of good or poor management is detected.

4. Ratio Analysis: It describes the significant relationship which exists between various items of a balance sheet and a statement of profit and loss of a firm. As a technique of financial analysis, accounting ratios measure the comparative significance of the individual items of the income and position statements. It is possible to assess the profitability, solvency and efficiency of an enterprise through the technique of ratio analysis.

5. Cash Flow Analysis: It refers to the analysis of actual movement of cash into and out of an organisation. The

flow of cash into the business is called as cash inflow or positive cash flow and the flow of cash out of the firm is called as cash outflow or a negative cash flow. The difference between the inflow and outflow of cash is the net cash flow. Cash flow statement is prepared to project the manner in which the cash has been received and has been utilised during an accounting year as it shows the sources of cash receipts and also the purposes for which payments are made. Thus, it summarises the causes for the changes in cash position of a business enterprise between dates of two balance sheets.

Fund Flow Statement

Fund Flow Statement is basically a tool of financial analysis. This statement explains the changes in Working Capital and its effect on financial position. It indicates by what means new financing was obtained and for what purposes it was utilised.

Break-Even Analysis : Refer to Q.3.

Q.20 Write objectives and advantages of comparative statement.

Ans. Purpose or Objectives of Comparative Financial Statements – The main purpose of preparing comparative statements is to get insight into the reasons for changes in financial position and operating results of a business enterprise. In brief, the purpose or objectives of comparative statements may be listed as under:

- (1) The comparative statements are prepared to know the strengths and weakness as in various areas of a business.
- (2) The comparative statements help us to know the changes in financial position.
- (3) The comparative statements help us to develop and know the trend.
- (4) Comparative statements are prepared for forecasting the future trends of the business.

- (5) To indicate increase or decrease in the various items of financial statements of two or more periods.
- (6) To study the effects of changes in profit and loss or assets, liabilities and capital.

Advantages or Utility of Comparative Financial Statements – Following are the advantages of Comparative Financial Statements:

- (1) **Easy Comparison** : In comparative statements figures of two or more periods are placed side by side, hence the comparison of various items becomes easy. The inter-period and inter-firm comparisons are also facilitated from such arrangements.
- (2) **Indicate Trend of Progress** : As the comparative statements show sales, cost of goods sold, gross profit, net profit and also the values of different assets and liabilities in a particular form, the performance, efficiency and financial position can easily be evaluated and their trend is easily visible. The common man can form an idea just by a glance on the trend of various items. Thus, they indicate the direction of movement with respect to the financial position and operating results.
- (3) **Weakness Easily Diagnosed** : When a comparative study of the two similar firms of two periods is made through the comparative statements, the weaknesses, if any, are diagnosed easily. This enables the management to take corrective action at right time.
- (4) **Forecasting** : Comparative financial statements help business undertaking in forecasting the profitability and financial soundness of the enterprise.
- (5) **Comparing of Performance** : Comparative financial statements help a business undertaking to compare its performance with the average performance of the industry.

Q.21 From the following Statement of Profit and Loss of Star Ltd. for the years ended 31st March, 2013 and 2014, prepare a Comparative Statement of Profit and Loss :

Particulars	Note No.	31.3.2014	31.3.2013
Revenue from Operations		20,00,000	16,00,000
Employees Benefit Expenses		10,00,000	8,00,000
Other Expenses		1,00,000	2,00,000
Tax		50%	50%

Ans.

Comparative Statement of Profit & Loss

Particulars	Note No.	Absolute Figure 31.3.2013	Absolute Figure 31.3.2014	Change Absolute Change (Increase or Decrease)	Change Percentage Change (Increase or Decrease)
		A	B	B-A=C	$\frac{C \times 100}{A}$
I. Revenue from Operations		16,00,000	20,00,000	4,00,000	25 ¹
II. Less : Expenses					
Employees Benefit Expenses		8,00,000	10,00,000	2,00,000	25
Other Expenses		2,00,000	1,00,000	(1,00,000)	(50) ²
III. Total Expenses (I+II)		10,00,000	11,00,000	1,00,000	10
IV. Profit before Tax (I-III)		6,00,000	9,00,000	3,00,000	50
V. Less: Tax (@ 50% of IV)		3,00,000	4,50,000	1,50,000	50
VI. Profit after Tax (IV -V)		3,00,000	4,50,000	1,50,000	50

Brackets indicate negative items.

$$1. \frac{400000 \times 100}{1600000} = 25\%$$

$$2. \frac{(100000) \times 100}{20000} = (50)\%$$

Q.22 From the following Statement of Profit and Loss of XYZ Ltd. for the year ended on 31st March, 2013 and 2014, prepare a Comparative Income Statement :

Particulars	Note No.	2012-13	2013-14
Revenue from Operations		4,00,000	5,00,000
Employees Benefit Expenses		1,00,000	1,20,000
Operating Expenses		2,00,000	2,20,000
Administrative Expenses		40,000	50,000

Rate of Income - tax : 40%

Ans.

Comparative Income Statement (For the year ended 31st March, 2013 & 2014)

	Particulars	2012-13	2013-14	Absolute (Increase or Decrease)	Percentage (Increase or Decrease)
	1	2 A	3 B	4 B-A=C	5 $\frac{C \times 100}{A}$
I.	Revenue from Operations				
II.	Less : Expenses:				
	Employees Benefit Expenses	4,00,000	5,00,000	1,00,000	25
	Operating Expenses	1,00,000	1,20,000	20,000	20
	Administrative Expenses	2,00,000	2,20,000	20,000	10
		40,000	50,000	10,000	25

III	Total Expenses	3,40,000	3,90,000	50,000	14.7
IV	Profit before Tax (I-III)	60,000	1,10,000	50,000	83.3
V	Less : Income tax (@ 40% of IV)	24,000	44,000	20,000	83.3
VI	Profit after Tax (IV-V)	36,000	66,000	30,000	83.3

PART-C

Q.23 Critically examine the Present Value Method and Internal Rate of Return Method for evaluating capital budgeting proposals. [R.T.U. Dec. 2019]

Ans. The term "capital budgeting" is the process of determining which long-term capital investments should be chosen by the firm during a particular time period based on potential profitability, and thus included in its capital budget.

Capital budgeting is extremely important to firms since capital investment projects make up some of their most important financial investments. These projects often involve large amounts of money and making poor capital investment decisions can have a disastrous effect on the business.

NPV and IRR are both used in the evaluation process for capital expenditures. Net present value (NPV) discounts the stream of expected cash flows associated with a proposed project to their current value, which presents a cash surplus or loss for the project. The internal rate of return (IRR) calculates the percentage rate of return at which those same cash flows will result in a net present value of zero. These capital budgeting methods have the following differences:

- (i) **Outcome :** The NPV method results in a dollar value that a project will produce, while IRR generates the percentage return that the project is expected to create.
- (ii) **Purpose :** The NPV method focuses on project surpluses, while IRR is focused on the breakeven cash flow level of a project.
- (iii) **Decision Support :** The NPV method presents an outcome that forms the foundation for an investment decision, since it presents a dollar return. The IRR method does not help in making this decision, since its percentage return does not tell the investor how much money will be made.
- (iv) **Reinvestment Rate :** The presumed rate of return for the reinvestment of intermediate cash flows is the firm's cost of capital when NPV is used, while it is the internal rate of return under the IRR method.

(v) **Discount Rate Issues :** The NPV method requires the use of a discount rate, which can be difficult to derive, since management might want to adjust it based on perceived risk levels. The IRR method does not have this difficulty, since the rate of return is simply derived from the underlying cash flows. Generally, NPV is the more heavily-used method. IRR tends to be calculated as part of the capital budgeting process and supplied as additional information.

Q.24 Prepare the Trading and Profit and Loss account and a balance sheet from the following particulars for ABC firm as on 31 March 2018.

Account Title	Amount ₹	Account Title	Amount ₹
Sundry debtors	200000	Bills payable	86500
Bad debts	6000	Sundry creditors	48000
Trade expenses	2500	Provision for bad debt	7200
Printing and Stationery	7400	Return outwards	5500
Rent, Rates and Taxes	8600	Capital	500000
Freight	5000	Discount received	11540
Sales return	11200	Interest received	20000
Vehicle	30000	Sales	123000
Opening stock	100000		
Furniture and Fixture	22000		
Purchases	71000		
Drawings	34900		
Investments	92000		
Cash in hand	75000		
	136140		
	801740		801740

Adjustments :

- (i) Closing stock was valued ₹ 45000.
- (ii) Depreciation charged on Furniture and Fixture @ 5%.
- (iii) Depreciation charges on vehicle @ 10%.

[R.T.U. 2019]

Ans.

**Trading Account of ABC Firm
during the period ending on 31/3/2018**

Particular	Amount (In INR)	Particular	Amount (In INR)
To Opening Stock	1,00,000	By Sales	123000
To Purchase	71000	Less : Sales Return	11200
Less : Return Outward	5500	By Gross Loss (B/F)	16,200
To Freight	5,000	By Closing Stock	45,000
To Trade Expenses	2,500		
	1,73,000		1,73,000

**P&L Account of ABC Firm
during the period ending on 31/3/2018**

Particular	Amount	Particular	Amount
To Gross Loss B/F from trading a/c	16,200	By Discount Received	11,540
To Printing and Stationary	7,400	By Interest Received	20,000
To Rent	8,600	By Net Loss C/F to Capital Account	4,760
To Depreciation on Vehicle	3,000		
To Depreciation on Furniture	1,100		
	36,300		36,300

**Balance Sheet of ABC Firm
as on 31/3/2018**

Liabilities	Amount	Assets	Amount
Capital	500000	Furniture and Fixtures	22000
Less : Drawings	34900	Less : Depreciation	1100
Less : Net Loss	4760	Vehicle	30000
Bill Payable	86,500	Less : Depreciation	3000
Sundry Creditors	48,000	Investment	92,000
	5,94,840	Sundry Debtors	1,98,800
		Cash in hand	75,000
		Cash at Bank	1,36,140
		Closing Stock	45,000
			5,94,840

Debtors :

2,00,000	
Less : Provisions for Bad Debts Made :	72,000
Add : Bad Debts (Old):	6,000
	1,98,000

- (a) Break-even point
(b) Margin of Safety

[R.T.U. 2018]

Ans.

	I Year	II Year
Sales	500	1200
FC	100	200
VC	300	600
Contribution = Sales - Variable Cost	500 - 300 = 200	1200 - 600 = 600
Profit = Contribution - Fixed Cost	200 - 100 = 100	600 - 200 = 400

Q.25 A private SME manufactures tyres of HAL and has reported the following information for two successive years :

	Year 1	Year 2
Sales	₹500 Crore	₹1200 Crore
Fixed Costs	₹100 Crore	₹200 Crore
Variable Costs	₹300 Crore	₹600 Crore

Determine :

$$PV \text{ Ratio} = \frac{\text{Change in Profit}}{\text{Change in sales}}$$

$$\text{Change in Profit } 400 - 100 = 300$$

$$\text{Change in Sales } 1200 - 500 = 700$$

$$PV \text{ Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

$$= 300/700 = 3/7$$

Since fixed cost is different in both the years we will calculate BEP and Margin of Safety (MOS) for I and II Year

$$BEP = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

$$MOS = \frac{\text{Profit}}{\text{PV Ratio}}$$

	I Year	II Year
BEP = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$	$\frac{100}{3/7} = 232.56$	$\frac{200}{3/7} = 465.12$
MOS = $\frac{\text{Profit}}{\text{PV Ratio}}$	$\frac{100}{3/7} = 232.56$	$\frac{400}{3/7} = 930.23$

If there is a mistake in question then take 100 Cr for II Year.

	Year 1	Year 2
Sales	₹500 Crore	₹1200 Crore
Fixed Costs (FC)	₹100 Crore	₹200 Crore
Variable Costs (VC)	₹300 Crore	₹600 Crore
Contribution = Sales – Variable Cost	500 – 300 = 200	1200 – 600 = 600
Profit = Contribution – Fixed Cost	200 – 100 = 100	600 – 100 = 500

$$PV \text{ Ratio} = \frac{\text{Change in Profit}}{\text{Change in sales}}$$

$$\text{Change in Profit } 500 - 100 = 400$$

$$\text{Change in Sales } 1200 - 500 = 700$$

$$PV \text{ Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

$$= \frac{400}{700} = \frac{4}{7}$$

$$BEP = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

$$MOS = \frac{\text{Profit}}{\text{PV Ratio}}$$

	Year 1	Year 2
BEP	$100/(4/7)$	$100/(4/7)$
= Fixed Cost – PV Ratio	= 175.44	= 175.44
MOS	$100/(4/7)$	$500/(4/7)$
= Profit/PV Ratio	= 175.44	= 877.19

Q.26 Explain final accounts in detail?

Ans. Final Accounts are otherwise called Annual accounts. Normally Final Accounts are prepared at the end of the financial year or Accounting year. The purpose of preparing Final Accounts is to enable one to know the progress of the business, profit or loss and financial position of the firm at the right time.

The preparation of Final Account is not the first step of the Accounting process but it is the final product of the accounting process. It will give valuable information to the management and outsiders at the end of the Accounting period. Only after the preparation of Trial Balance it is possible to prepare Final Account. Final Account consists of the following parts.

1. Trading Account,
2. Profit and Loss Account,
3. Balance Sheet.

1. Trading Account – Trading Account is prepared to know the trading results or gross profit on trading of the business. Simply, it is to find out the gross profit from business due to buying and selling of goods or services during a particular period. In other words, Gross profit is the difference between the sales and the cost of goods sold.

MEFA.86

In business, the expenditure and incomes are classified into Direct and Indirect. All the direct expenditure are debited into the debit side of the Trading Account and all the indirect incomes are credited into the credit side of the Trading Account. After transferring all the above details, we have to balance the Trading Account. If the balance is in the debit side it means the business is getting profit and named as Gross profit. Suppose the balance is in the credit side, it shows Loss and it is called Gross Loss. The Gross Profit or Gross Loss is transferred to the profit and Loss Account either on the Credit side or Debit side.

2. Profit and Loss Account – Profit and Loss Account is prepared to find out the net profit or net loss of the business. All the indirect incomes and expenditure are transferred to the Profit and Loss Account on the credit-side and debit side respectively. After transferring all details to the Profit and Loss Account, we balance this account. If the balance is in the debit side it is called Net profit. Suppose, the balance is in the credit side it is called as Net Loss. Net profit is transferred to the balance sheet Liabilities side and added to the capital. If it is Net Loss it will be deducted from the capital.

3. Balance Sheet – Refer to Q.1.

Concepts of Balance Sheet : Refer to Q.11.

Q.27 From the following Trial Balance of Mr. X, prepare the final accounts for the year ended on 31.12.1996.

Debit Balance	Rs.	Credit Balance	Rs.
Land and Building	50,000	Returns	2,500
Purchases	1,10,000	Discounts	1,200
Stock	40,000	Sales	2,05,000
Returns	1,500	Capital	1,15,000
Wages	10,000	Loan	15,000
Salaries	9,000	Commission	1,500
Office Expenses	2,400	Creditors	25,000
Carriage	3,200	Bills Payable	2,350
Discounts	750		
Bad Debts	1,200		
Insurance	1,500		
Machinery	50,000		
Furniture	10,000		
Bills Receivable	20,000		
Sundry Debtors	40,000		
Cash	6,000		
Office Equipment	12,000		
	3,67,550		3,67,550

The following adjustments are to be made :

- (a) Closing stock Rs. 60,000
- (b) Outstanding wages Rs. 2,000 and Rent Rs. 3,000
- (c) Depreciate land and buildings at 5%, Machinery at 10%, Office equipment and furniture by 10%
- (d) Provide Reserve at 2½% on debtors.
- (e) Insurance prepaid Rs. 200
- (f) Calculate interest on capital at 5%

Ans.

Trading Account of Mr. X for the year ended 31.12.1996

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Opening Stock		40,000	By Sales	2,05,000	
To Purchase	1,10,000		Less: Sales Returns	1,500	2,03,500
(-) Returns	2,500	1,07,500			
To Wages	10,000		By Closing Stock		60,000
(+) Outstanding	2,000	12,000			
To Carriage		3,200			
To Gross Profit		1,00,800			
		2,63,500			2,63,500

Profit and Loss Account of Mr. X for the year ended 31.12.1996

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Salaries		9,000	By Gross Profit		1,00,800
To Office Expenses		2,400	By Commission		1,500
To Discounts		750	By Discounts		1,200
To Bad Debts Provision		2,200			
To Rent Outstanding		3,000			
To Insurance	1,500				
(-) prepaid	200	1,300			
To Depreciation:					
5% on Land & Building		2,500			
10% on Machinery		5,000			
10% on Office Equipment		1,200			
10% on Furniture		1,000			
To Interest on capital		9,700			
To Net Profit		5,750			
(Transfer to Balance Sheet)		69,400			
		1,03,500			1,03,500

Balance Sheet of Mr. X as on 31.12.1996

Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Capital	1,15,000		Cash		6,000
+ Interest on Capital	5,750	1,20,750	Land & Building	50,000	
Loan		15,000	(-) Depreciation	2,500	47,500
Creditors		25,000	Machinery	50,000	
Bills Payable		2,350	(-) Depreciation	5,000	45,000
Outstanding Wages		2,000	Furniture	10,000	
Outstanding Rent		3,000	(-) Depreciation	1,000	9,000
Net Profit ((P&L) A/c		69,400	Bills Receivable		20,000
			Sundry Debtors	40,000	
			(-) new Reserve	1,000	39,000
			Office equipment	12,000	
			(-) Depreciation	1,200	10,800
			Closing Stock		60,000
			Prepaid Insurance		200
		2,37,500			2,37,500

Note : Bad Debts

$$\begin{array}{ccccccc}
 \text{BD} & + & \text{NR} & - & \text{OR} \\
 \downarrow & & \downarrow & & \downarrow \\
 1200 & & 1000 & & 0 & = 2200
 \end{array}$$

