SYLLABUS

Class: - B.com (Hons) I Year

Subject: - Managerial Economics

UNIT I	Concepts and Techniques- Nature and Scope of Managerial Economies, Application of Economics in Managerial Decision Making- Marginal Analysis; Meaning and definition of demand Functions of demand, Types of demand, Demand Forecasting.
इकाई - 1	अवधारणा एवं तकनीक – प्रबंधकीय अर्थशास्त्र की प्रकृति एवं क्षेत्र, प्रबंधकीय निर्णयन में अर्थशास्त्र का अनुप्रयोग – सीमांत विश्लेषण, मांग का अर्थ एवं परिभाषा, मांग के कार्य, मांग के प्रकार, मांग का पूर्वानुमान
UNIT II	Production function: Types of production function- one variable two variables, Law of return and retunto scales, law of variable proportion, isoquant curves and economies of scale
इकाई - 2	उत्पादन उत्पादन फलन के प्रकार, एक चर व दो चर, प्रतिफल का नियम एवं पैमाने का प्रतिफल, परिवर्तनशील अनुपातों का नियम, सममात्रा वक्र एवं पैमाने का अर्थशास्त्र पैमाने की बचत
UNIT III	Market Structure – Price and Output decision under different Market Structures , Price Discrumination, Non-Price Competition , Price Determination under Perfect and Monopolistic Market.
इकाई - 3	बाजार संरचना – विभिन्न बाजार संरचनाओं में मूल्य एवं उत्पादन निर्णयन, मूल्य भेद, गैर मूल्य प्रतियोगिता, पूर्ण–अपूर्ण एवं एकाधिकार बाजार मे मूल्य निर्धारण
UNIT IV	Factor Pricing: Meaning, Definition & types of Rent, Wages, Marginal Productivity Theory.
इकाई - 4	घटकों का मूल्य निर्धारण–अर्थ, परिभाषा, किराया, मजदूरी, सीमांत उत्पादकता सिद्धांत
UNIT V	New Economic Policy-1991; Liberalization, Privatization, Globalization, Impact on Business, Business Cycle.
इकाई - 5	नई आर्थिक नीति –1991; उदारीकरण, निजीकरण, भूमंडलीकरण, व्यापार पर प्रभाव, व्यापार चक्र

UNIT –I
MANAGERIAL ECONOMICS

Economics - to the great dismay of economists - is merely a branch of psychology. It deals with individual behaviour and with mass behaviour. Many of its practitioners sought to disguise its nature as a social science by applying complex mathematics where common sense and direct experimentation would have yielded far better results.

The outcome has been an embarrassing divorce between economic theory and its subjects. The economic actor is assumed to be constantly engaged in the rational pursuit of self interest. This is not a realistic model - merely a useful approximation. According to this latter day - rational - version of the dismal science, people refrain from repeating their mistakes systematically. They seek to optimize their preferences. Altruism can be such a preference, as well.

Still, many people are non-rational or only nearly rational in certain situations. And the definition of "self-interest" as the pursuit of the fulfillment of preferences is a tautology

In simple words, Economics means utilization of optimum resources. The word Economics derived from the Greek words "OIKOU" & "NOMUS", which means Rules or Law of the household. Economics is the Social Science that studies the Production, distribution & consumption of goods & services.

Basically, Economics deals with proper utilization of available scarce resources like manpower, money, raw materials & other resources which satisfy the wants of Social Animals.

Managerial economics (sometimes referred to as business economics), is a branch of economics that applies microeconomic analysis to decision methods of businesses or other management units.
Economics is able to provide a sophisticated concept & analytical tools to understand & analysis the problem of utilization of available scarce resources. It is purely Theoretical in nature. It is also known as 'Traditional Economics'.

Economics is the combination of three different activities:-

1. **MONEY;**
2. **WEALTH (ASSETS);**
3. **GOODWILL;**

"Economics is an enquiry into nature & cause of wealth in nation."

"Adam Smith"

E.g. – BIHAR/JHARKHAND- rich in mineral resources but still poorest state in INDIA. Why?
Drawback- Adam was concern with wealth.

"Economics is the study of mankind in the ordinary business of life. It examines that part of individual or social action which is closely connected with the attainment & use of material requisite of well being."

"**Marshall**"

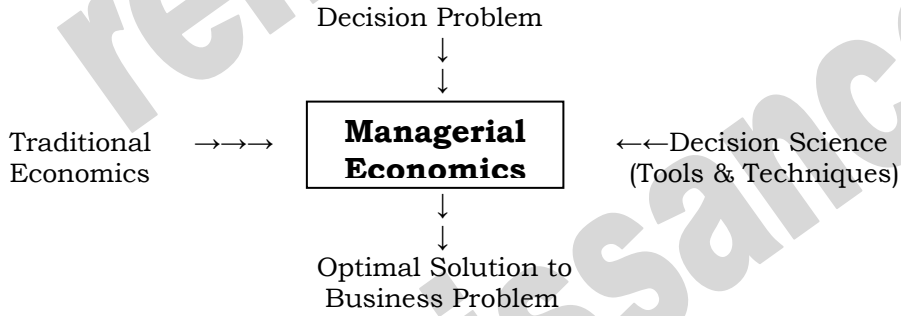
Marshall said "wealth is not an end but a means to attain an end."

Managerial Economics = Management + Economics

Class-B.com(Hons.) I Year **Sub.: Managerial Economics**

Management deals with principles which helps in decision making under uncertainty and improves effectiveness of the organization.On the other hand economics provide a set of preposition for optimum allocation of scarce resources to achieve a desired result.
ME deals with the integration of economic theory with business practices for the purpose of facilitating decision making and forward planning by management.
Almost any business decision can be analyzed with managerial economics techniques, but it is most commonly applied to:

- **Risk analysis** - various models are used to quantify risk and asymmetric information and to employ them in decision rules to manage risk.
- **Production analysis** - microeconomic techniques are used to analyze production efficiency, optimum factor allocation, costs, economies of scale and to estimate the firm's cost function.
- **Pricing analysis** - microeconomic techniques are used to analyze various pricing decisions including transfer pricing, joint product pricing, price discrimination, price elasticity estimations, and choosing the optimum pricing method.
- **Capital budgeting** - Investment theory is used to examine a firm's capital purchasing decisions.



At universities, the subject is taught primarily to advanced undergrads. It is approached as an integration subject. That is, it integrates many concepts from a wide variety of prerequisite courses. In many countries it is possible to read for a degree in Business Economics which often covers managerial economics, financial economics, game theory, business forecasting and industrial economics.
Managerial Economics is a tool which is help to solve the Business problems. It is totally practical approach over pure Economics.
Managerial Economics is an Economic applied to problems of choice of alternatives of Economic nature & allocation of scarce resources by the firm. In other words, Managerial Economics involves analysis of allocation of the resources available to a firm.
Managerial Economics is the Economics applied in the decision making. It is that branch of Economics which serves as a link between abstract theory & managerial practice.

1. "Managerial Economics is the use of Economic modes of thoughts to analyze business problem."
   "McNair & Meriam"
2. "Managerial Economics as, "price theory in the service of business executives."
   "Watson"
3. "The application of Economic theory & methodology to business practice."
   "Brigham & Pappas"
4. "Managerial Economics as, "a fundamental academic subject which seek to understand & to analyze problem of business decision making".
   "Hague"

Nature of Economics

- Is Economics a science or an art?
- Is Economics a positive or normative science?
- Is Economics a macro or micro Economics?

Economics as a science:-

For this first know what is science, "Science is a systematic & comprehensive study of knowledge which explains in cause & effective relation." is Economics is a science. For this two basic features are-

1. Argument in favour of Economics as a science.

Arguments in favour of Economics as a science: - Robbins considered Economics as a science.

The following arguments are given in favour of Economics as a science.

1) **Systematic study-** Collection, classification, & analysis of Economics facts are systematized in Economics. The subject matter of Economics is systematically divided into consumption, production, exchange, distribution, & public finance.

2) **Scientific Law-** Law of Economics is similar to the Law of other sciences. In Laws we establish cause & effective relationship of Economic activities. For E.g. the Law of demand shows the relationship between a change in demand & change in price.

3) **Experiments-** Economics carries several experiments with the laws of Economics. Different Economic laws have been experimented & tried to get out of Economics evils. For e.g. the devaluation of Indian rupee in 1955-66 was an economic experiment.

4) **Measuring rod of money-** Economists possess the measuring rod of money to measure the economic facts. Marshall said that the measuring rod of money has made Economics a more certain science than offer social sciences. Money is good measuring rod to measure individual as well as commercial motives.

5) **Universal-** Much of the Economic laws is universally true. They are applicable to all types of Economics. Whether it is a capitalist, socialist, or mixed Economy, the law of Economy is equally applicable.
6) On the basis of arguments given above, we can say that Economics is a science. It explores the facts, analysis them & classifies them.

Economics as an art:-

For this first know about what is art, Art is the practical application of knowledge of achieving definite ends.

According to "Lord J.N. Keynes"

"An art is a system of rules for the attainment of a given end." "A science teaches us to know, an art teaches us to do."

Economics as an art due to following reasons:-

1. Solution of problems- it can be helpful to human beings only, if it is able to solve their problems. Economics helps to utilize the scarce resources in the best possible ways. Prof. Pigou remarked in this context, "Economics is not only light-giving but also fruit-bearing."
2. Modern trends- Modern Economists are much concerned with solving the Economic problems. Prof. Stiglar said, "At least 90% of modern Economists spend over half of their time on applied or empirical subject." for this we can regard Economics as an art.

3. Verification of Economics law- Verification of Economics laws is possible only if Economics is an art because art is the practical application of knowledge. When we actually apply the Economics laws, only then we come to know that whether their results are true or false.From the arguments given below, we say that Economics is an art. Now days, Economic problem has become very popular & to formulate Economic plans is an art. Therefore we can conclude that Economics is a science as well as art.

Science & Art both are complementary to each other.

Macro-Economic Conditions & Micro-Economic analysis

1. Macro-Economic Condition- The decision of the firm are made almost always within the broad framework of environment within which the firm operates, known as macro-economic conditions. with regard these conditions, we may stress three points:

   a. The Economy in which the business is predominantly, a free enterprise economy using prices & market.
   b. The present day economy is the one undergoing rapid technological & economic changes.
   c. The intervention of government in economic affairs has increased in resent times & there is no likelihood that this intervention will stop in future. It can ignore neither the working of the market nor the place of economic change, nor the activities of government in the economic sphere. The management which keeps itself well & continuously informed of changes in the economic system is called progressive management.

2. Micro-Economic Analysis- The Micro-Economic analysis deals with the problem of an individual firm, industry, consumer, etc. in the case of Managerial Economics Micro-Economics helps in studying what is going on with in the firm, how best to use the available resources between various activities of the firm. It is also known as price theory.
   The concept of Micro-Economics are the elasticity of demand, marginal costs, the long-run economics, & diseconomies of scale, opportunity costs, present value, & market structures.

Positive V/s Normative approach

Positive approach concern with **WHAT IS, WAS OR WILL BE**, while Normative approach concern with **WHAT OUGHT TO BE**.
The statement 'a government deficit will reduce unemployment & cause an increase in prices' is hypothesis in positive economics, while the statement 'in setting policy, unemployment ought to matter more than inflation' is a normative hypothesis.
Positive Economics is of two types:
a. Description.
b. Theory.
The Positive Economics theory, on the other hand attempt to developed hypothesis which explain why it happened.
The Normative Micro-Economics, one is concerned with problems like what the objectives & policies of business ought to be & how to go about them. Managerial Economics is concern with analysis which is prescriptive or normative in nature.
Positive and Normative Statements
In this brief note we introduce you to the idea of positive and normative statements and the idea of value judgments contained in statements and articles.

Detecting Bias in Arguments
Whenever you are reading articles on current affairs it is important to be able to distinguish where possible between objective and subjective statements. Very often the person writing an article has a particular argument to make and will include in their piece subjective statements about what ought to be or what

should be happening. Their articles are said to carry value judgments, they are trying to persuade you of the particular merits or demerits of a particular policy decision or issues. These articles may be lacking in objectivity.

Positive Statements

Positive statements are objective statements that can be tested or rejected by referring to the available evidence. Positive economics deals with objective explanation and the testing and rejection of theories. For example:

1. A rise in consumer incomes will lead to a rise in the demand for new cars.
2. A fall in the exchange rate will lead to an increase in exports overseas.
3. More competition in markets can lead to lower prices for consumers.
4. If the government raises the tax on beer, this will lead to a fall in profits of the brewers.
5. A reduction in income tax will improve the incentives of the unemployed to search for work.
6. A rise in average temperatures will increase the demand for chicken.
7. Poverty in the UK has increased because of the fast growth of executive pay.

Normative Statements

Normative statements express an opinion about what ought to be. They are subjective statements rather than objective statements – i.e. they carry value judgments. For example:

1. The level of duty on petrol is too unfair and unfairly penalizes motorists.
2. The London congestion charge for drivers of petrol-guzzling cars should increase to £25 - three times the current charge.
3. The government should increase the national minimum wage to £6 per hour in order to reduce relative poverty.
4. The government is right to introduce a ban on smoking in public places.
5. The retirement age should be raised to 75 to combat the effects of our ageing population.
6. The government ought to provide financial subsidies to companies manufacturing and developing wind farm technology.

Scope of Managerial Economics

Managerial Economics has a closed connection with economic theory, operation research, statistics, mathematics, & the theory of decision-making. Managerial Economics also draws together & relates ideas from various functional areas of management like production, marketing, finance & accounting, project management etc.

In so for as Managerial Economics is concern, the following aspects constitutes its subject matter

1. Objective of a Business firm
2. Demand analysis & demand forecasting
3. Production & cost
4. Competition
5. Pricing & output
6. Profit
7. Investment & capital budgeting cost
8. Product policy, sales promotion & market strategy

Well scope is something which tells us how far a particular subject will go. As far as Managerial Economic is concerned it is very wide in scope. It takes into account almost all the problems and areas of manager and the firm.

ME deals with Demand analysis, Forecasting, Production function, Cost analysis, Inventory Management, Advertising, Pricing System, Resource allocation etc.

Following aspects are to be taken into account while knowing the scope of ME:

1. **Objective of the Business Firm:** As we know that Economics is playing very essential role for the business. It is first used for the Setting up of the objectives of a organization or business. The objective may be Business Expansion, Increase Sales, New technology adoption etc. or some time as per the change in government policy it help us to set the business objective as per the availability of the resources.
2. **Demand Analysis and Forecasting**: Unless and until knowing the demand for a product how can we think of producing that product. Therefore demand analysis is something which is necessary for the production function to happen. Demand analysis helps in analyzing the various types of demand which enables the manager to arrive at reasonable estimates of demand for product of his company. Managers not only assess the current demand but he has to take into account the future demand also.
3. **Production and Cost function:** Conversion of inputs into outputs is known as production function. With limited resources we have to make the alternative uses of this limited resource. Factor of production called as inputs is combined in a particular way to get the maximum output. When the price of input rises the firm is forced to work out a combination of inputs to ensure the least cost combination. Cost analysis is helpful in understanding the cost of a particular product. It takes into account all the costs incurred while producing a particular product. Under cost analysis we will take into account determinants of costs, method of estimating costs, the relationship between cost and output, the forecast of the cost, profit, these terms are very vital to any firm or business.
4. **Competition:** As per the Market situation a business has to face many tough competition from the market in terms of Perfect Competition, Monopolistic Competition, Duopoly or Oligopoly etc. as a Businessman you must know what kind of competition you are facing with the world and what are the different solution for the same. Because this is the world of competition and it has to be faced with all the possible options.
5. **Pricing and Output:** After knowing the competition, and type of it, it is must to set the price of the products or services which has to be offered in the market. It is very necessary to set a price of the commodity and its output, where the cost will be minimum and sufficient output at a required profit margin can be achieved. Economics help to decide the Pricing and output for the organization. Here pricing refers to the pricing of a product. As you all know that pricing system as a concept was developed by economics and it is widely used in managerial economics. Pricing is also one of the central functions of an enterprise. While pricing commodity the cost of production has to be taken into account, but a complete knowledge of the price system is quite essential to determine the price. It is also important to understand how product has to be priced under different kinds of competition, for different markets.
6. **Pricing :** cost plus pricing and the policies of the enterprise Now it is clear that the price system touches the several aspects of managerial economics and helps managers to take valid and profitable decisions.
7. **Profit:** Every organization is working for Profit. To decide the profit margin and the net amount of profit economics helps better. At last every one as a firm need to earn profit but profit is depends on the Competition and pricing of the firm. Economics also helps in this to determine the profit level.
8. **Investment decision and capital budgeting:** Some time firm to invest again for the business expansion and diversification. To take the decision whether to invest or not, Economics help to decision maker to take decision. Capital Budgeting is a technique to determine whether to invest or not.

9. **Product policy, sales promotion & market strategy:** As per the Situation firm take decision regarding Product mix, sales promotion in the market and the best possible market strategy. Again to decide all of these, economics will help to firm to take decision.
10. **After Inventory Management:** What do you mean by the term inventory? Well the actual meaning of the term inventory is stock. It refers to stock of raw materials which a firm keeps. Now here the question arises how much of the inventory is ideal stock. Both the high inventory and low inventory is not good for the firm. Managerial economics will use such methods as ABC Analysis, simple simulation exercises, and some mathematical models, to minimize inventory cost. It also helps in inventory controlling.
11. **Advertising:** Advertising is a promotional activity. In advertising while the copy, illustrations, etc., are the responsibility of those who get it ready for the press, the problem of cost, the methods of determining the

total advertisement costs and budget, the measuring of the economic effects of advertising ---- are the problems of the manager.

a. There's a vast difference between producing a product and marketing it.
b. It is through advertising only that the message about the product should reach the consumer before he thinks to buy it.
c. Advertising forms the integral part of decision making and forward planning.

12. **Resource allocation:** Resources are allocated according to the needs only to achieve the level of optimization. As we all know that we have scarce resources, and unlimited needs. We have to make the alternate use of the available resources. For the allocation of the resources various advanced tools such as linear programming are used to arrive at the best course of action.

Relationships between Managerial Economics & Other Subjects

1. Managerial Economics & Traditional Economics- The relationships between M.E. & T.E. starts with the basic concepts that both of them are related or concern with solving the problem of allocation of limited resources between competing ends. the two main contributions to M.E. are:

   a. To help in understanding the market conditions & the general economic environment within which the firm operates.
   b. To provide a philosophy for understanding & analyzing resources- allocation problems. Managerial Economics takes help of Economics analysis for achieving both T.E. & M.E. efficiency in the business operations. The firm maximizes its goal by producing maximum output at minimum cost is Managerial Economics efficiency. The production is carried out to the best of technological specification is Traditional Economics efficiency.

2. Managerial Economics & Operation Research- Both M.E. & O.R. are concern with taking effective decisions. M.E. & O.R. are both concerned with model-building.
   Models are generalized & scientifically analyzed relationship between various factors relevant in a specified kind of situations. Economic models are more general & confined to broad economic decision-making. whereas O.R. models on the other hand, draw from various disciplines & are more job-oriented, through situational O.R. is both expensive as well as a very slow process compare to M.E. the significant relationship between M.E. & O.R. can be highlighted with reference to certain important problems of M.E. which are solved with the help of O.R. techniques. The problems are equal allocation problems, waiting-line problems & inventory problems.

3. M.E. & Mathematics- Mathematics & M.E. are very closely related to each other. This is because M.E. is both conceptual as well as metrical. It drives its metrical property from the fact that an important function M.E. is to estimate & predict the relevant economic factors for decision-making & forward planning.

4. M.E. & Statistics- Statistics is widely used by Managerial Economists. M.E. aims at quantifying the past economic activity as well as to predict its future course. This is the way where Statistics is used in M.E. Managerial Economics heavily depending upon the theory of probability to take care of various problems in decision-making.

5. M.E. & the Theory of Decision-Making- M.E. is based on the assumption of a single goal of profit maximization & on the assumption of certainty, i.e., perfect knowledge. The theory of decision-making recognizes the multiplicity of goals & the pervasiveness of uncertainty in the business. In complex problem

with multiple goals & high degree of uncertainty & where decisions are to be taken quickly, the theory of decision-making guides M.E.

Features of Managerial Economics

- Managerial Economics concern with decision making of Economic nature. It deals with identification of Economic choices & allocation of scarce resources.
- It is goal oriented & prescriptive. It deals with how decisions should be made by managers to achieve the organizational goals.
- It is pragmatic. It is concern with those analytical tools which are useful in improving decision making.
- It is both conceptual & metrical.
- Managerial Economics provide a link between Traditional Economics & the Decision Science, for Managerial decision making, as shown in figure:-

Characteristics of ME

- Managerial Economics is micro-economic in character as it concentrates only on the study of firm & not on the working of economy.
- Managerial Economics takes the help of macro-economics to understand & adjust to the environment in which the firm operates.
- Managerial Economics is Normative rather than Positive character.
- It is only for the analysis of profits that help is taken of the theory of distribution.

Significance of Managerial Economics

1. In order to enable the manager to become a more competent model builder, Managerial Economics provides the no. of tools & techniques.
2. Managerial Economics provides most of the concepts that are needed for the analysis of business problems, concept of elasticity of demand, fixed & variable costs, short & long-run costs, opportunity costs, net present value, etc. all helps in understanding & solving decision problems.
3. It helps in making decision such as- what is the production technique & the input-mix that is least costly? How to tale investment decision? & so on…

DEMAND ANALYSIS

Meaning and Definition of Demand: -

The demand may arise from an individual, a household as well as a market.

As we have indicated earlier, 'demand' is a technical concept from Economics. Demand for product implies:

a) Desires to acquire it,

b) Willingness to pay for it, and

c) Ability to pay for it.

All three must be checked to identify and establish demand**. For example** : A poor man's desires to **stay in a five-star hotel room** and his willingness to pay rent for that room is not 'demand', because he lacks the necessary purchasing power; so it is merely his wishful thinking. Similarly, a miser's desire for and his ability to pay for a car is not 'demand', because he does not have the necessary willingness to pay for a car. One may also come across a well-established person who processes both the willingness and the ability to pay for higher education. But he has really no desire to have it; he pays the fees for a regular cause, and eventually does not attend his classes. It should also be noted that the demand for a product–-a commodity or a service–has no meaning unless it is stated with **specific reference to the time, its price, price of is related goods**, **consumers' income and tastes etc**.

To say that demand for an Atlas cycle in India is 60,000 is not meaningful unless it is stated in terms of the year, say 1983 when an Atlas cycle's price was around Rs. 800, competing cycle's prices were around the same, a scooter's prices was around Rs. 5,000. In 1984, the demand for an Atlas cycle could be different if any of the above factors happened to be different. For example, instead of domestic (Indian), market, one may be interested in foreign (abroad) market as well. Naturally the demand estimate will be different. Furthermore, it should be noted that a commodity is defined with reference to its particular quality/brand; if its quality/brand changes, it can be deemed as another commodity.

To sum up, we can say that the **Demand for a product is the desire for that product backed by willingness as well as ability to pay for it. It is always defined with reference to a particular time, place, and price and given values of other variables on which it depends**.

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

1. **Individual Demand : -** It is demand by one or more Individual e.g. Cigarettes, Footwear etc.
2. **House Holds (H.H.) : -** Demand by H.H. e.g.: Refrigerator.
3. **Market Demand : -** When we consider the demand for a commodity by all the Individuals/Households in the market at a price, we call it Market Demand.

Factors Affecting Demand or Determinants of Demand

The desire to purchase is revealed by taste and preference of the individuals/households. The capability to purchase depends upon his purchasing power, which in turn depends upon his income and price of the commodity.

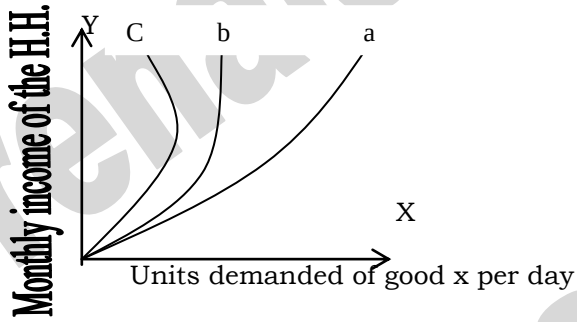
a) **Price of the Commodity**: - Effect of price on commodity even that the other determinants of demand is constant. There are two effects:
   1. The substitutes effect
   2. The Income effect

   I) **The Substitutes Effects:** - Substitutes effect the decrease in the price of commodity x, leaves the consumer with additional income which he can use in buying more amount of x, rather than its substitute y. This increasing the demand of commodity x. For e.g.: x= tea and y=coffee. If increasing in the price of the commodity x or tea, then the substitute y or coffee demand is increasing and vice-verse.

   II) **Income Effect: -** It is the increase in the real income or the purchasing power of a consumer due to the decrease in the price of commodity x.

b) **Income of Individual or Consumer and Household**: - The amount demanded of a commodity also depends upon the income of a household/individual. Income of individual or consumer can have three effects:

- An increase in the income usually increases the amount of consumption of regular goods and other factors remaining constant. Generally **Luxury Goods** are the Goods which have the same nature. As Income of the consumer increase then they purchase luxury goods more and more.
- Increase in income may need to increase in the consumption and thus the demand of certain commodity remains unchanged. In these category goods like **FMCG and Necessity goods** take place. According to this concept demand increase up to a certain limit then become constant.
- An increase in the income after a point may decrease the consumption and thus the demand of a commodity decrease, such a commodity is known as **Inferior Goods**. Normally it always happens that as income increase demand of some product becomes negative.



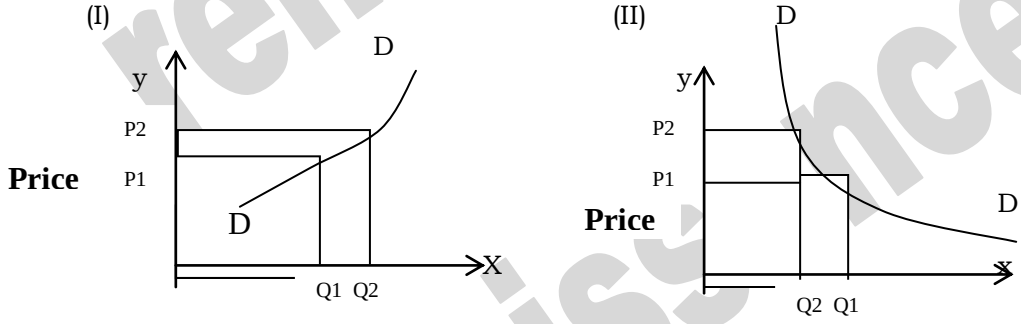
Engel was the first person to study the relationship between income and quantity demanded for the normal and inferior gods.

C] **Price of related goods: -** There are two types of relation between goods.

1st Substitute and 2nd Complimentary.

i. Substitute: - These are the goods which have same effect – as price increase of the first commodity; it results in increase in demand of other commodity. **For ex**: Apple and Pears, Tea and Coffee. Price of Tea increases and demand of Coffee also increase.

ii. Complementary: - These are those goods which have adverse effect on the demand of the commodity. The increases in the price of the first commodity decrease the demand of the other quantity or commodity. **For exp: -** Bread and Butter, Pen and Ink, Tea and Sugar.



I. Amount demanded of coffee per week [I Substitute goods case]

II. Amount demanded of butter per day [II Complementary goods case]

D] **Taste and Preference: -** Taste and Preference, if changes in the consumer favors, the demand of commodity increase and vise versa. For e.g.: Jeans will have greater demand now, because of the

preference of the consumer. Taste also play important role to change in the demand of the commodity because of the new choice of the consumer. No. of examples are considered for the taste and preference of the consumer like Food articles, dressing sense, luxury products etc.

E] **Advertisement: -** More advertisement creates favorable taste and preference for the demand of a commodity. In present scenario higher the advertising, higher the demand for the product. Every company has to use this concept or philosophies. In present Insurance and banking firm also has great advertising so they can capture more market shares.

F] **Expectations: -** The consumer makes two kinds of expectation:

a. Related to their future income.
b. Related to future price of the good and its related goods.

a. **Related to their future income: -** If the consumer feels that his future income will be more, he will spent more today. Whereas if he feels that his income will be less in the future, he would spend less today and so the demand will decrease. Income of the consumer x demand today in future. Recently in all over the world recession becomes big problem, in this situation, persons who find that their income will cut down, they stop consuming luxury goods. In recent survey, higher society persons sell their luxury hotels or Ship to survive.

b. **Related to future price of the goods and its related goods: -** If the consumer feels that the price of goods is going to increase in the future, they will buy more of it today, thus increasing the demand of the commodity. And if they feel that price will decrease tomorrow, then they postponed their demand right now.

G] Population:
H] Government Policy:
I] Others

THE LAW OF DEMAND

The law of demand states that the amount demanded of a commodity and its price are inversely related, other things remaining constant.

Exception to the law of demand: - generally the amount demanded of good increases with a decrease in price of the good and vice versa. In some cases, however, this may not be true. These exceptions are the following: -

a. Giffen goods
b. Commodities which are used as a status symbol.
c. Exceptions of change in the price of the commodity.

Nature of Demand

1. Derived demand & autonomous demand.
2. Demand for producer's goods and consumer goods.
3. Demand for durable goods and non durable goods.
4. Industry demand and firm demand.
5. Total demand and market segment demand.
6. Short run and long run demand.

1. Derived demand & autonomous demand: - derived demand means a demand which is created because to produce other commodities or the commodities which are helpful to produce other

products. For ex. Machinery, labour, raw material etc. are the example which is demanded as per requirement.
Autonomous demand is just reverse of derived demand where demand is already exist due to its direct consumption. For ex. Demand for food is direct demand or autonomous demand because it can consume directly by a person or a group of persons.
In practical there is no distinction between derived and autonomous demand because for same product may be derived demand but the same product can be autonomous demand for other. The autonomous demand is more elastic in nature then the derived demand. It is because derived demand not influences the price effect on others.

2. Demand for producer goods & consumer goods: - producer goods are those goods which are used by a producer for further production e.g. raw material, machinery, semi finished goods and other material.
   In general sense consumer goods demand is more elastic in nature as compare to the producer goods.
   Consumer goods are those goods which are directly consumed by the consumers. E.g. milk, bread and any other product which dire3ctly satisfy the needs of consumers.

3. Demand for durable goods and non durable goods :-As we know that durable goods are those goods which can be store for a long time as well as the demand can be postponed, if it is not required immediately or urgently e.g. machinery, household appliances, books etc are the durable goods.
   The non-durable goods are those which have short life. It is also divided into two parts perishable and non-perishable.
   Demand of durable goods is more elastic in nature then the non durable goods because slight change in price will directly affect the overall demand of the product.

4. Industry demand and firm demand: - firm demand denotes the demand for the products of a particular firm for ex. Demand for steel produced by "TISCO" is a firm demand.
   In contrast to these if all the companies create demand of a particular product that produce similar product is called industry demand. For ex. Demand of steel by all the companies represent s demand of steel industry.
   The firm demand is more elastic in nature as compare to Industry demand. It is because every firm faces the competition with their competitors in the industry.

5. Total demand and market segment demand: - as the name suggests market segment demand is demand of a particular market where as total demand represents demand of whole market.
   For ex. A company has a product which is sold in whole India and the demand of that product is called total demand, but if the same product has different demand in different –different segment then this is called as market segment demand.
   Market segment demand is always more elastic then the total demand.
6. Short run & long run demand: - short run demand refers to demand with its immediate to price changes & income fluctuations where as long run demand is that which will ultimately exist as a result of the changes in pricing, promotion or a product improvement other enough time is allowed to let the market adjust itself to the new situations.
   Long run demand is more elastic than the short run demand.

ELASTICITY OF DEMAND

Elasticity of demand is defined as the percentage changed in qty. demanded caused by one percentage in the demand determinants remain constant.

$$E = \frac{\%\text{age change in quantity demanded of good x}}{\%\text{age change in determinant of demand z}}$$

$$\mathbf{E} = \frac{\triangle Q}{\triangle Z} \times \frac{Q1}{Z1}$$

E = Elasticity of demand
△ = To change
Q = to quantity demanded
Z = to a demand determinant
△ Q = Q2 – Q1
△ Z = Z2 – Z1

$$\mathbf{E} = \frac{Q2-Q1/Q1}{Z2-Z1/Z1}$$

Price Elasticity of Demand

The more the value of the E.O.D. the more responsive is the quantity demanded to changes in the determinant under consideration. Price E.O.D. is the determinant of relative responsiveness of quantity demanded to price of the commodity.

$$E = \frac{\%\text{age change in quantity demanded of good x}}{\%\text{age change in price of commodity x}}$$

$$E = \frac{Q2-Q1/Q1}{P2-P1/P1}$$

$$E = \frac{\triangle Q}{\triangle P} \cdot \frac{}{Q}$$

△Q = Q2 – Q1
△P = P2 – P1

Q1 and P1 are original quantity and price respectively
Q2 and P2 are the new quantity and price respectively.

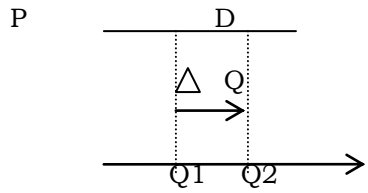
Higher the elasticity of demand, greater will be the %age change in Quantity demanded for every %age change in price.

Since the elasticity of demand is linked to the law of demand, the coefficient of price elasticity of demand E, will always have a negatively sloping demand curve, in order to avoid confusion in interpretation only the absolute value of E is taken i.e. the sigh is ignored

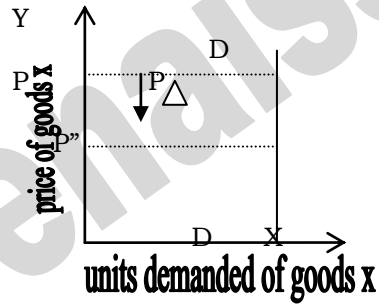
Type of price elasticity

1. Perfectly elastic demand: - where no reduction in price is needed to cause an increase in quantity demand

Example: -
1. Petrol
2. Ice cream
3. Cloths

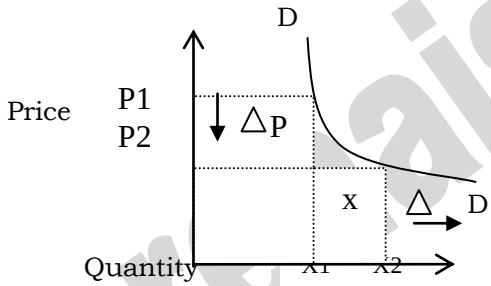


2. Absolutely (Perfectly) inelastic demand: - where a change in price, however large, causes no change in quantity demanded. (E=0)



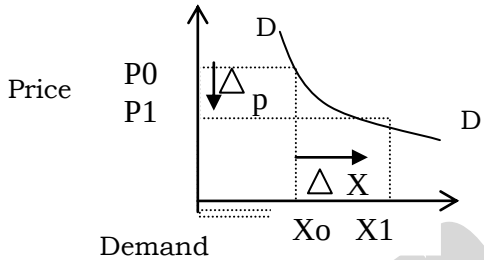
Example: -
1. Salt
2. Match box
3. Ink

3. Unit Elasticity of demand: - Where a given proportionate change in price causes an equally proportionate change in quality demanded.
(E=1)



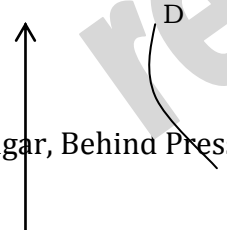
Example:-
1. Soap
2. Detergent
3. Tea
4. Milk
5. Sugar
6. Cold Drink

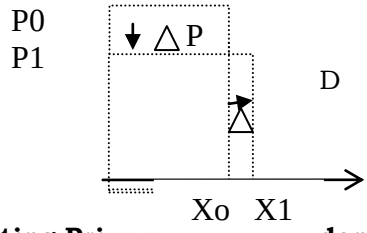
4. Relatively elastic demand quantity: - Where a change in price causes more than proportionate change in quantity demanded. (E>1)



Example: -
1. Dry Fruits
2. Bear
3. Whiskey
4. Durable item

5. Relatively inelasticity demand: - where a change in price causes a less than proportionate change in quantity demanded. (E<1)





Example:-
1. Cigarettes
2. Mobile
3. Vegetables

Factors affecting Price elasticity of demand

1. *The Number and Closeness of the Substitutes:* - The availabilities of close substitutes of the commodity are the most important determinant of the degree of price elasticity. In case the product has large no. of close substitutes in price range demand for the product is bound to be highly elastic.

   For e.g.: Demand for cigarettes will be inelastic because there are no close substitutes.
2. *The share of commodity in buyer's budget:* - if the proportion of consumer income, which is spent on the commodity, is very small, demand will tend to be in elastic. The commodities in the category are salt, match- boxes, ink etc.
3. *The nature of the commodity:* - the demand of necessities is inelastic, while these of luxuries are elastic.
4. *Number of uses a commodity can be put to:* - larger the number of user of a commodity, greater will be the elasticity of that commodity. The various uses of the commodity are put in the order of their importance.
5. *Habit-forming characteristics:* - there are some goods which are habit-forming like the use of tobacco and alcohol. Since the consumer forms a habit with their use the demand for such goods will tend to be inelastic.
6. *Time - Period:* - Time is very important in price elasticity of demand. Demand is more elastic in the long run than in the short run.

INCOME ELASTICITY OF DEMAND

It is for a commodity shows the extant to which a consumers demand for the commodity changes as a result of the change in his/her income.

Income elasticity of demand may be defined as a ratio of percentage change in the quality demanded of a good. Say x to the %age change in income of the consumer.

$$Ey = \frac{\%\text{age change in quantity demanded of good x}}{\%\text{age change in Income of Consumer}}$$

$$E\frac{\triangle Q}{\triangle Z} \times \frac{\overline{Z1}}{Q1}$$

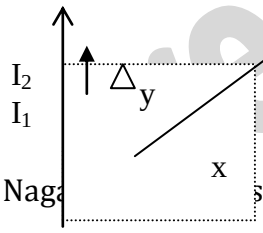
$\triangle Q$ – Q2 – Q1

$\triangle Z$ = Z2 – Z1

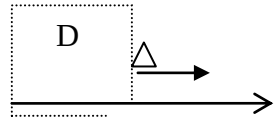
The income elasticity of demand is positive for all normal goods because the consumers demand for a good change in the direction of the change in his income. In the case of an inferior goods the demand for the good various inversely with income. Therefore the income elasticity of demand is negative.

Types of Income Elasticity

1. High Income elasticity: - when the quantity demanded of good x increases by a larger % age change than the income of the consumer. Ey>1

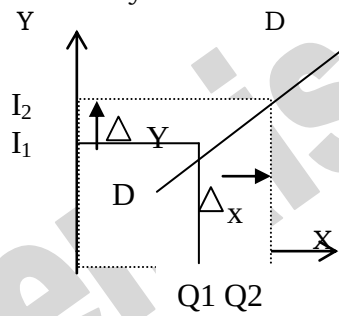


Income of the House hold



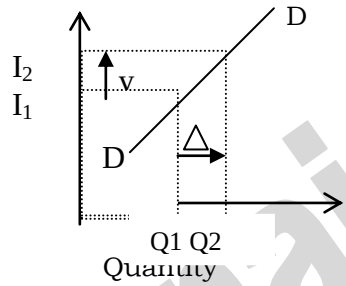
2. Unitary income elasticity: - The %age change in the quality demanded is equal to the %age change in money income. Ey=1

Income of the House Hold



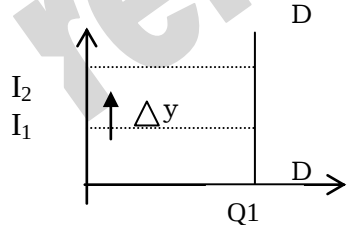
3. Low income elasticity: - income elasticity is low if the relative change in quantity demanded is less then the relative change in money. Ey<1

Income of the House Hold



4. Zero income elasticity: -A change in the income will have effect on the quantity demanded for ex. Salt. Ey=0

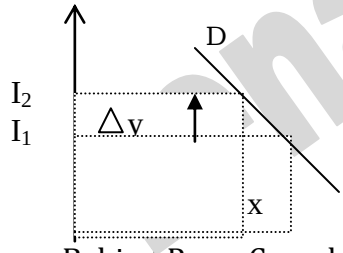
Income of the House Hold

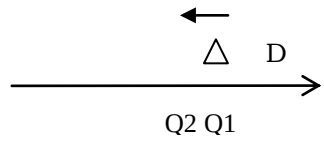


Ey=0

5. Negative income elasticity: - as the income increases, the demand decrease because less is bought at higher income and more is bought at lower income. Ey<0

Income of the House Hold





We have high-income elasticity in case of luxury goods and low-income elasticity in case of necessity of goods.

Cross elasticity of demand

It is defined as the ratio of percentage change in demand for me goods due to a change in the price of some other related goods. The concept of cross elasticity is useful in inter commodity demand relation. This change in the demand for one good due to a change in the price of some other goods comes about because often fact that the two goods may be either substitutes or complementary to each other.

$$E = \frac{\text{\%age change in demand of commodity x}}{\text{\%age change in price of commodity y}}$$

$$E = \frac{\triangle Qx}{\triangle Py} \times \frac{Py}{Qx}$$

1. If the two goods are **substitutes**, the value of cross-elasticity will be positive.
2. In the case of **complementary** goods the value of cross elasticity of demand will be negative, because the change in the price of one good cause opposite change in the quality demanded of the other goods.

UNIT-II

Production Function And Cost Analysis

What is Cost – Cost is defined as the expenses incurred to produce the product and sell the product. Cost is the amount of expenditure incurred to a given thing.

We can look at the business firm from at least two points of view: productivity, inputs, and outputs or outputs and costs. In advanced microeconomics, these two points of view are called "duals." They are equally valid, but they point up different things. They are also opposites from a certain point of view-- the higher the productivity, the lower the costs. By looking at the firm from the point of view of costs, we shift our perspective somewhat, and gain a much more direct understanding of supply.

Types of cost:-

1. Actual and opportunity cost.
2. Sunk and outlay cost.
3. Explicit and implicit cost.
4. Book cost and out of pocket cost.
5. Direct and indirect cost.
6. Controllable and Non-controllable cost.
7. Replacement and original cost.
8. Shut down and abandonment cost.
9. Urgent and postponable cost
10. Marginal cost, average cost and total cost.
11. Fixed and variable cost.
12. Semi fixed cost and semi variable cost.
13. Short run and long run cost.

We also look more directly at the difference between the long and short run. In the short run, we have two major categories of costs:

- Fixed Costs
- Variable Costs

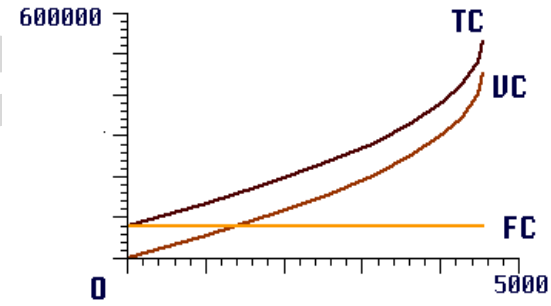
In the long run, however, all costs are variable. Thus, we must study costs under two quite different headings. Costs will vary quite differently in the long run and in the short.

Fixed and Variable Cost

Variable costs are costs that can be varied flexibly as conditions change. Fixed costs are the costs of the investment goods used by the firm, on the idea that these reflect a long-term commitment that can be recovered only by wearing them out in the production of goods and services for sale.

The idea here is that labor is a much more flexible resource than capital investment. People can change from one task to another flexibly (whether within the same firm or in a new job at another firm), while machinery tends to be designed for a very specific use. If it isn't used for that purpose, it can't produce anything at all. Thus, capital investment is much more of a commitment than hiring is. In the eighteen hundreds, when John Bates Clark was writing, this was pretty clearly true.

Over the past century, education and experience have become more important for labor, and have made labor more specialized. Increasing automatic control has made some machinery more flexible. So the differences between capital and labor are less than they once were, but all the same, it seems labor is still relatively more flexible than capital. It is this relative difference in flexibility that is expressed by the simplified distinction of long and short run.



Of course, productivity and costs are inversely related, so the variable costs will change as the productivity of labor changes. Here is a picture of the fixed costs (FC), variable costs (VC) and

the total of both kinds of costs (TC) for the productivity example in the last unit:
Output produced is measured toward the right on the horizontal axis. The cost numbers are on the vertical axis. Notice that the variable and total cost curves are parallel, since the distance between them is a constant number -- the fixed cost.

Opportunity Cost

Connection between the distinctions of fixed vs. variable costs and opportunity costs

In economics, all costs are included whether or not they correspond to money payments.

Unit Cost

Costs may be more meaningful if they are expressed on a per-unit basis, as averages per unit of output. In this way, we again distinguish -

Average Fixed Cost (AFC)

This is the quotient of fixed cost divided by output. In the numerical example we are using, when output is 4020 (in the table) fixed cost is 80000, so AFC is 80000/4020=19.9

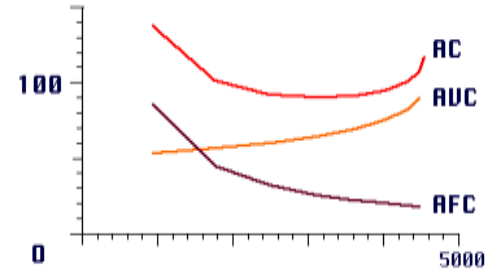
Average Variable Cost (AVC)

This is the quotient of average cost divided by output. In the example, at an output of 4020 the variable cost is 350000, giving AVC of 350000/4020=87.06.

Average Total Cost (ATC or AC)

This is the quotient of total cost divided by output. In the example, with 4020 of output total cost is 430000, so AC is 430000/4020 = 106.96 = 87.06+19.90.

Here are the average costs (AC), average variable cost (AVC) and average fixed cost (AFC) in a diagram. This is a good representative of the way that economists believe firm costs vary in the short run.



Notice how the average fixed costs decline as the fixed costs are "spread over more units of output." For large outputs, however, average variable costs rise pretty steeply. The idea is that with a limited capital plant and thus limited productive capacity -- in the short run -- costs would rise much more than proportionately to output as output goes beyond "capacity." The average total cost, dominated by fixed costs for small output, declines at first, but as output increases, fixed costs become less important for the total cost and variable costs become more important, and so, after reaching a minimum, average total cost begins to rise more and more steeply.

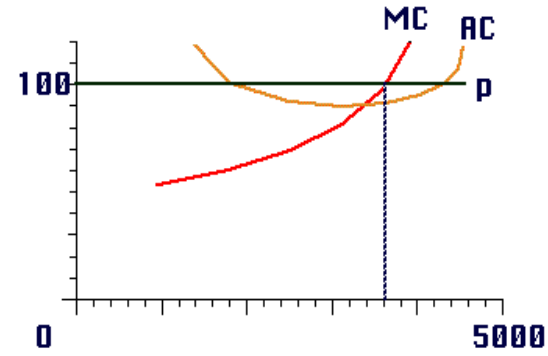
Marginal Cost

As before, we want to focus particularly on the marginal variation. In this case, of course, it is marginal cost. **Marginal cost** is defined as –

$$MC = \frac{\triangle C}{\triangle Q}$$

As usual, Q stands for (quantity of) output and C for cost, so ▵Q stands for the change in output, while ▵C stands for the change in cost. As usual, marginal cost can be interpreted as the additional cost of

producing just one more ("marginal") unit of output. Here is the Marginal Cost for our example firm, along with output and average cost.
Here is a picture of marginal cost for our example firm, together with average cost as output varies.
As before, the distance to the right on the horizontal axis measures the output produced.
The average and marginal costs are on the vertical axis. Average cost is shown by the curve in yellow and marginal cost in red. Notice how the marginal cost rises to cross average cost at its lowest point.



Maximization of Profit and Cost
We can now give another rule for the maximization of profits. The new rule is really just the same rule as we saw before, only now we state it in terms of price and costs. It is the equimarginal principle in yet another form.

The question is: "I want to maximize profits. How much output should I sell, at the given price?"
The answer is**:** increase output until **P = MC**

Cost Function
Determinants of Cost Function: - Cost function means what is cost and what are the basic determinants which affect the cost like size of plant, level of output, technology etc.
In mathematical term it define is:
C= F (S, P, O, T…….)
C= Refers to Cost, S= Refers to Size of Plant, O=Means Level of Output, P=Price of Input, T=Technology.

1. **Size of the Plant –** There are different different types of the Plant. Small Scale Industries, Medium Scale Industries and Large scale of Industries. Every type of Plant size needs different cost to operate the organization.
2. **Output –** Every firm needs to take the output from the business. As per the different setup, they may have different output for the firm. Output is a variable factor, which can be very as per the requirement and demand.
3. **Price of Input –** To produce the product or service, we need to put inputs like Raw material, labour and other factors. Cost of the material and labour always vary as per the time.
4. **Technology –** Machinery and equipments are the most important factors, which help to produce the product. It also needs cost to set up the business.

These all are the major factors/function which incurred cost for the organization.

Short-Run Cost Function

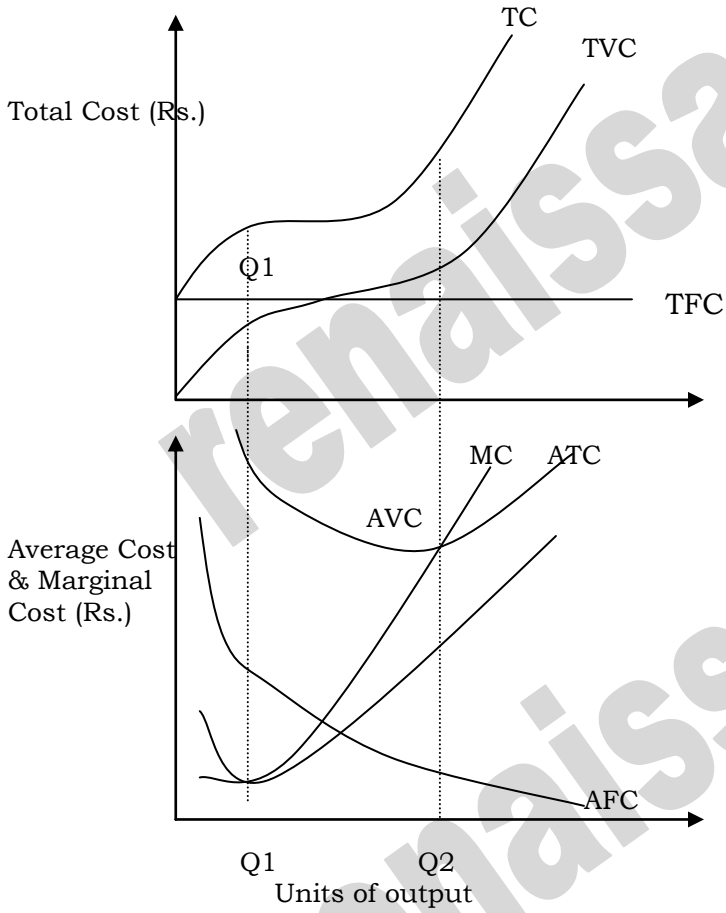
In short run cost function any one factor is variable and other remaining constant. In short run once money is invested to increase their output they can only change a single variable or factor. In short run cost Function Company thinks to expand their output and it is possible only in short run function. When all the resources are available to the company, maximum from these resources are invested in to acquire fixed assets and to acquire fixed assets short run is not sufficient. Firm wants to utilize these assets with full efficiency & for these they try to increase their output, which is possible in short run function. When all the basic facilities are available in the organization like building, machinery and fixed assets, it can't be easily changed in short run time duration. Because of lack of time, the company must decide the rate of utilization of these assets. This result in 2 kinds of input –

1. Fixed
2. Variable.

Fixed inputs are fixed which don't change with the rate of output but variable input are always change as per the change in rate of output. These two incurs two types of cost i.e.

1. Fixed Cost

2. Variable Cost.
   Through this Total Cost (T.C.) can be calculated i.e.
   T.C. = F.C. + V.C.



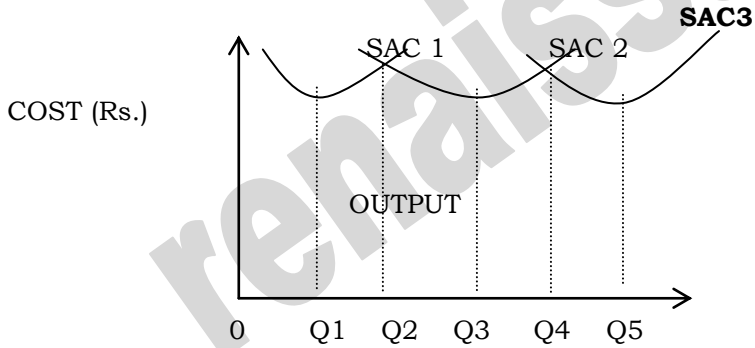
1. Base on above diagram we find that total variable cost (TVC) increases at a decreasing rate up to Q1 output & then increase by increasing rate. The reason is up to Q1 output the variable inputs are insufficient for the given fixed inputs. As variable inputs are increasing, it shows that variable inputs are increasing, which result in better utilization of fixed inputs. Since the fixed cost is always fixed which shown as horizontal straight line, T.C. is summation of TFC + TVC.
2. To understanding the short run function we have to understand several other costs like AFC, ATC, MC, AVC etc. Since TFC remains unchanged or constant but AFC always decline continuously as output increases. This is because as output increases Proportion of fixed cost on one unit going to be decrease. AVC at initial stage it decreases gradually and then increases gradually. Marginal cost MC initially decreasing at faster rate and then increases at faster rate.

As per our figure company should produce Q2 quantity where MC at ATC showing an intersection where ATC is at its minimum point. At this point, company utilize its all the resources in an optimum manner.

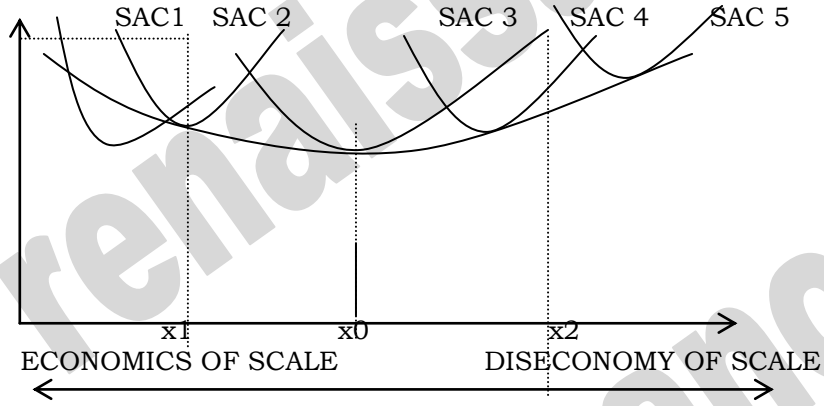
1. **Long- Run Cost Function: -** As tthe name suggest Long Run Cost Function means the function where the enterpreneur has sufficient time where he has number of alternative regarding plant size & level of output. Because of this reason it is also known as “Planning Curve” which guide to enterpreneure

regarding his future decision like expansion or diversification. As compare to short run the firm has more choices. In Long Run Cost Function all the production factors are variable. As we know that combination of short run will convert in to long run.

In long run cost function there is more flexiblility regarding choice of most suitable plant size for desire level of output, when the firm shifts to another plant in short run some of the production factors may become fixed & this continues to shift to a higher plant size. This conclude that long run cost curve is derived from short run average cost curves. To understand clearly what actually long run cost function is, we must take an example:-suppose there are Z different plant size availabe to a firm that is a small, mediam and a large plant. These pants operate with the average costs of SAC1, SAC2 & SAC3 respectively shown in diagram below.



As we seen in the diagram the firm must shift from one to another when initially the average cost is at lower side & then increasing each plant operates most efficiently at output level corresponding to lowest point on its short run average cost. If it founds that the average cost of larger output is less on a bigger plant the firm would adopt that bigger size means shift from SAC1 to SAC 2 & then SAC 3 and same as continues And when there all collect by a thick line it become a long run average cost curve.



If we assume that there are many plant sizes, each suitable for a certain level of output & at this stage we get many SAC curves intersecting each other, as the no. of plant increases, the points of intersections of SAC curves will come closer. Here we find almost a continuous curve, which is known as Long Run Average Cost Curve (LAC) or the **envelop curve.** In traditional theory it is called as **'U' shaped curve** which reflects to economics and diseconomies of scale. As shown in the diagram towards the left from the centre it shows economies of scale & rest is known as diseconomies of scale.

MEANING OF PRODUCTION

Conversion of input into output this process of transforming inputs into outputs can be any one of the following 3 kinds:-

1. Change in form.

2. Change in space.(transportation)
3. Change in time. (storage)

In short production means producing, sorting and distribution tangible goods and services. Even it consist intangible goods and services.

By above discussion we conclude that production is any activity that increases consumer usability of goods and services.

Factors Of Production/ Production Function: -

1. Technology
2. Inputs
   - ❖ Labour
   - ❖ Land
   - ❖ Capital
   - ❖ Entrepreneurship
3. Time Period Of Production
   - ❖ Short run
   - ❖ Long run

Production Function –

Q=F (L, N, K,)
Q=Output
L=Land
N=Labour
F=Function

Assumption Of Production Function:-

1. Technology is invariant.
2. It is assume that firm utilize there inputs at maximum level of efficiency.

The Other Name of Production Function -

1. Short Run Production Function or Law of Variable Proportion or Law of Diminishing Marginal Return.
2. Long Run Production Function Or Law Of Return To Scale.

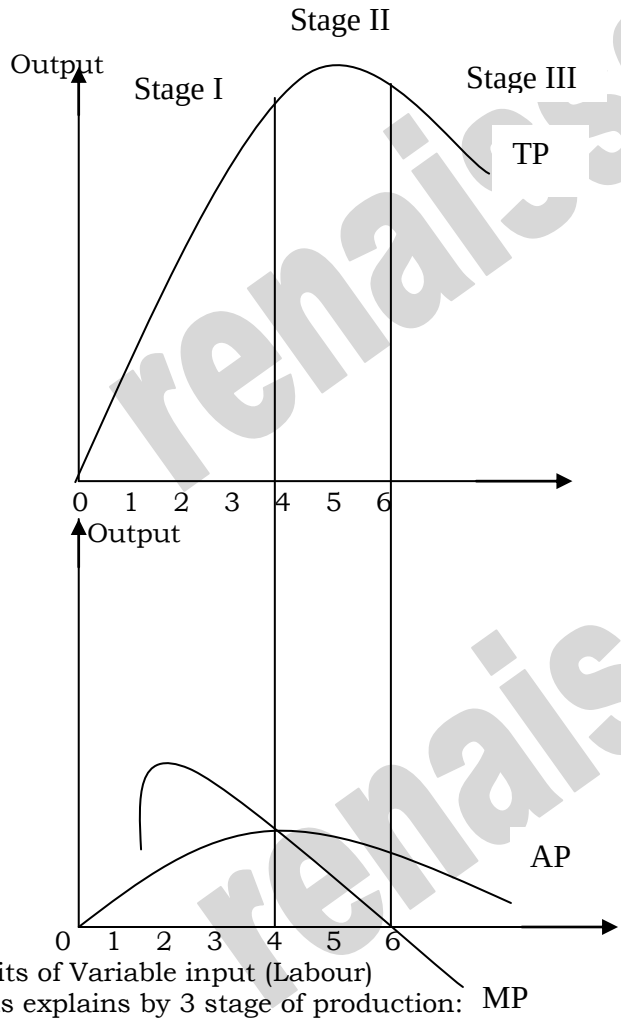
1. **Short Run Production Function: -** In short run production function one factor is variable and others are constant. To understand the short run production function few terms should be clear that is Total Product, Marginal Product and Average Product.

Total Product (TP) means total amount of output resulting from the use of different quantities of inputs. If labour is variable input in short run and other remains constant than **Marginal Product (MP)** is defined as change in total product per unit as change in labour, and **Average Product (AP)** may define as total product per unit divided by labour per unit.

As we already discuss that only one factor is variable and others are constant, Generally it is labour. If input change, the overall production or output will change. When firms change only the amount of labour, these experience the **"Law Of Diminishing Marginal Return Or Law Of Variable Proportion"**. This law states that as more of one factor input is employed & all other reached where additional quantities of the varying inputs will yield diminishing marginal contribution to total product. In short if variable inputs are increasing the total product increases by increasing rate up to a certain limit and after that it becomes negative. Simultaneously the marginal product increases by faster rate & decline where as average product increase by decreasing rate & decrease by decreasing rate. The stage where the marginal physical product starts declining shows the laws of diminishing return.

Variable Input	Total Product (TP)	Marginal Product (MP)	Average Product (AP)
0	0	-	-
1	5	5	5

2	15	10	7.5
3	35	20	11.67
4	45	10	11.25
5	50	5	10
6	45	-5	7.5



This explains by 3 stage of production:

1. Stage I start from 0 unit of output ... variable input (Labour) to the level where AP is maximum.
2. Stage II precede from or follow the stage I to the point where total product is at maximum point and marginal product is at 0.
3. Stage III is continuing even after at same point where total products going to be declining with Negative MP.

On the basis of this study it is obvious that no firm will choose to operate either in stage I or stage III. It is because in stage I, the firm is not utilizing there fixed capacity completely. At these point MP of variable input increases and it is therefore profitable for the firm to keep moving with additional unit of inputs. In stage III the firm over utilize their fixed capacity and because of which the marginal product decline and become negative.

The conclusion of this study is that firm should operate in stage II rather in stage III but practically it is not possible to stay at stage II for long while.

Isoquant: - an Isoquant is a curve representing the various combinations of two inputs that produce the same amount of output. It is also known as iso-product curve, equal product curve or production indifferent curve.

Types of Isoquants:-

1. Linear Isoquant.
2. Input output Isoquant.
3. Kinked Isoquant.
4. Smooth convex Isoquant.

2. Long Run Production Function:-

Law of return to scale- In the long run production function all the inputs are variable. In the long run we have sufficient time to decide the overall production function. In long run various combinations are possible 2 inputs.

E.g.:- **Labour and Capital**

These can change in 2 ways:

1. Both are change in the same proportion.
2. Both can change in the different proportion.

This ratio or technique of production various with change in output.

The percentage increase in output when all inputs in the same proportion is known as return to scale. In return to scale 3 different situation are possible-

A. Constant return to scale: - It means output increases in the same proportion as the increase in input.
B. Increasing return to scale: - output increases by a greater proportion then the increase in input.
C. Decreasing return to scale: -This law suggest that when inputs are increasing the output increase in same proportion.

Constant Return to Scale: - According to Return to Scale, Up to an extent by increasing the Variable factor, output also increase by increase rate but a point comes where it becomes constant. Generally this is a nature of Production that up to an extent it increase and then almost become same, then decrease because of utilization of Recourses.

E.g.: if we want to increase our production by 25% factors of production should be increase by 25% as compare to previous inputs. In this case marginal and average productions remain the same because as increase in output will affected by same input.

Units of the Variable factors	Total product	Marginal product	Average product
1	20	20	20
2	40	20	20
3	60	20	20
4	80	20	20
5	100	20	20
6	120	20	20

Increasing return to scale: - When variable factors increases and production increases by more than proportion input known as law of increasing return to scale. Production increase in the input. The law of return to scale (increasing) is based on certain assumption.

1. There is a scope improvement in the technique of production and organization of production.
2. At least one factor of production is assumed to be indivisible.
3. Some factors of production are supposes to be divisible.

Units of variable factors labour and capital	TP	MP	AP
1	4	4	4
2	10	6	5
3	18	8	6
4	28	10	7
5	40	12	8

Decreasing return to scale: - when variable factors are increasing but the output is at lower proportion as compared to input. In other term it state that with a fixed amount of any one factor of production successive increase in the amount of other factor will after a particular point yield diminishing increment of the production. To understand this we take an example: -

Suppose land is a fixed factor and labour and capital are variable. As we increase our variable factors the marginal product shows the diminishing returns.

Unit of labour and capital	TP	AP	MP
	12	12	12
2	16	8	4
3	19	6.3	3
4	21	5.2	2
5	22	4.4	1

ISOQUANT CURVES

An **isoquant** is a firm's counterpart of the consumer's indifference curve. An **isoquant** is a curve that shows all the combinations of inputs that yield the same level of output. 'Iso' **means** equal and 'quant' **means** quantity. Therefore, an **isoquant** represents a constant quantity of output.

Assumptions

1. There are two factor inputs labour and capital
2. The proportions of factor are variable.

3. Physical production conditions are given
4. The Scale of operation is variable
5. The state of technology remains constant

The shape of Isoquant

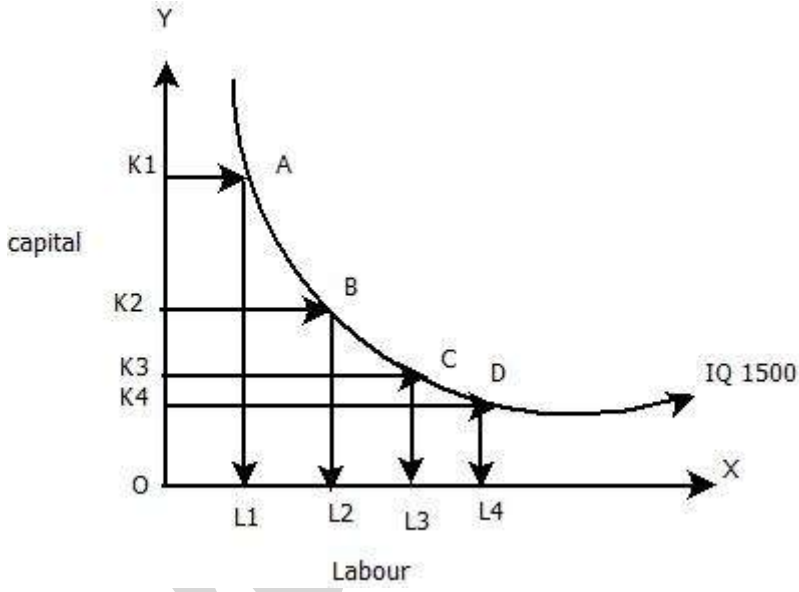
In this section we examine the characteristics of isoquants, define the economic region of production and consider the special cases where the commodities can only be produced with least cost factor combination.

We can see that the shape of isoquant plays an important a role in the production theory as the shape of indifference curve in the consumption theory. Iso quant map shows all the possible combinations of labour and capital that can produce different levels of output. The iso quant closer to the origin indicates a lower level of output. The slope of iso quant is indicated as

K/L
=MRSLk=
MPL/MPk

Table indicating various combinations of Labour and Capital to produce 1500 Units of Output

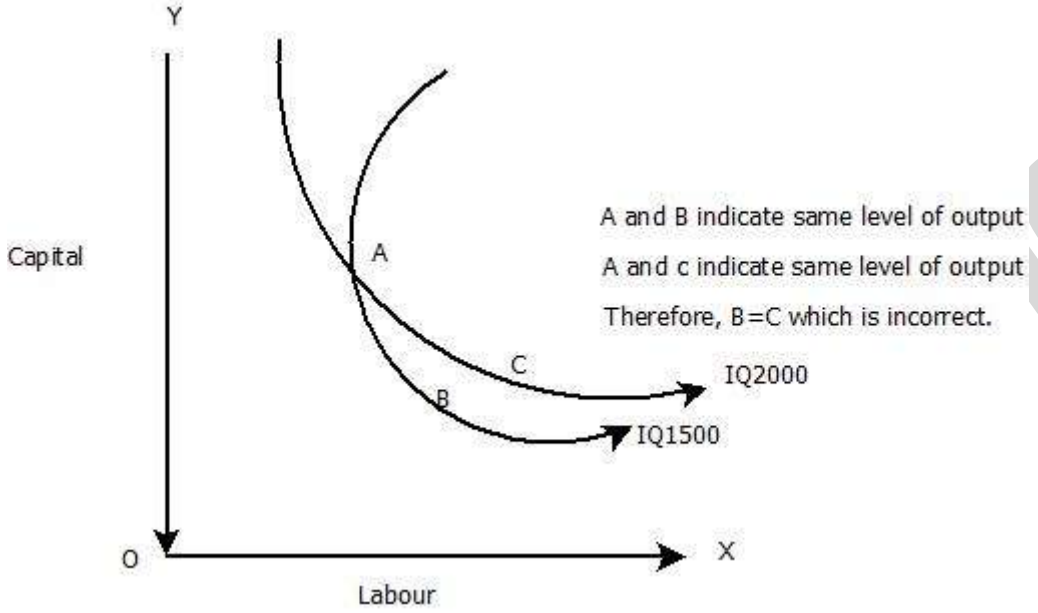
COMBINATIONS	UNITS OF CAPITAL	UNITS OF LABOUR	TOTAL OUTPUT
A	50(OK)	1 (OL1)	1500(IQ1)
B	45(OK2)	2(OL2)	1500(IQ1)
C	41(OK3)	3(OL3)	1500(IQ1)
D	38(OK4)	4(OL4)	1500(IQ1)



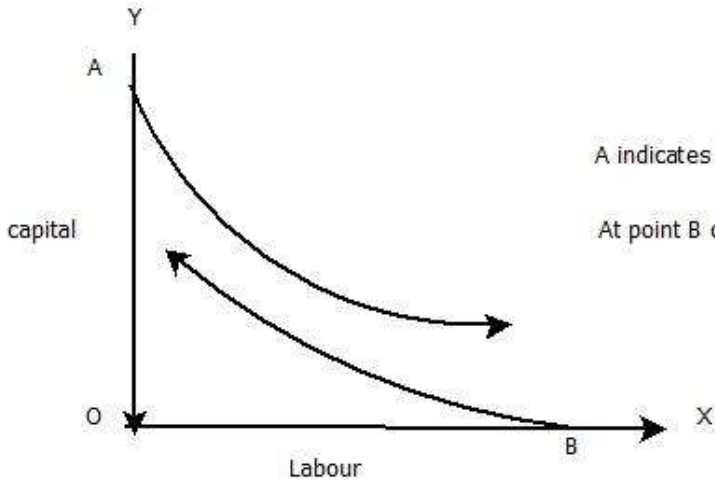
Properties/Characteristics of Isoquants

Isoquants, abbreviated as IQs, possess the same properties as those of the indifference curves. For the convenience of the students, we can state them as follows.

1. **Two isoquants do not intersect each other:**



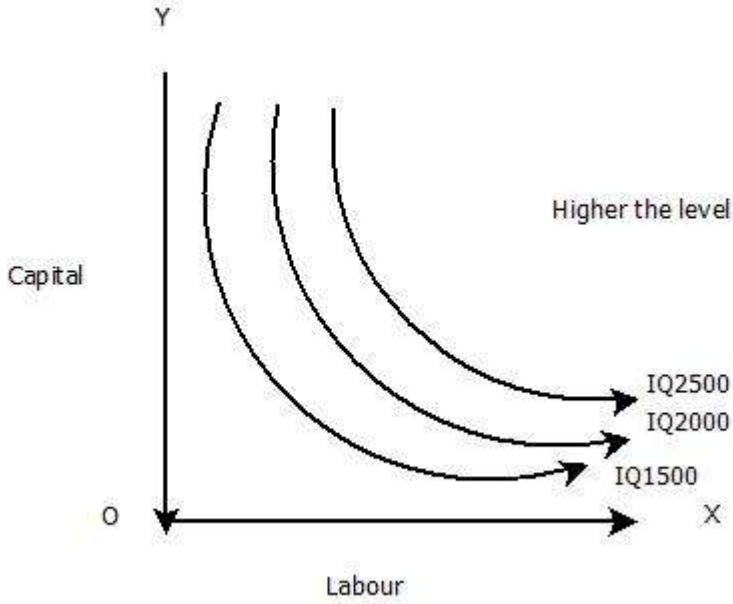
2. **No isoquant can touch either axis**



A indicates that goods are produced by employing capital and no units of labour

At point B only labour are employed for producing goods

3. **A higher IQ implies a higher level of output**



Higher the level of IQ higher will be the level of production

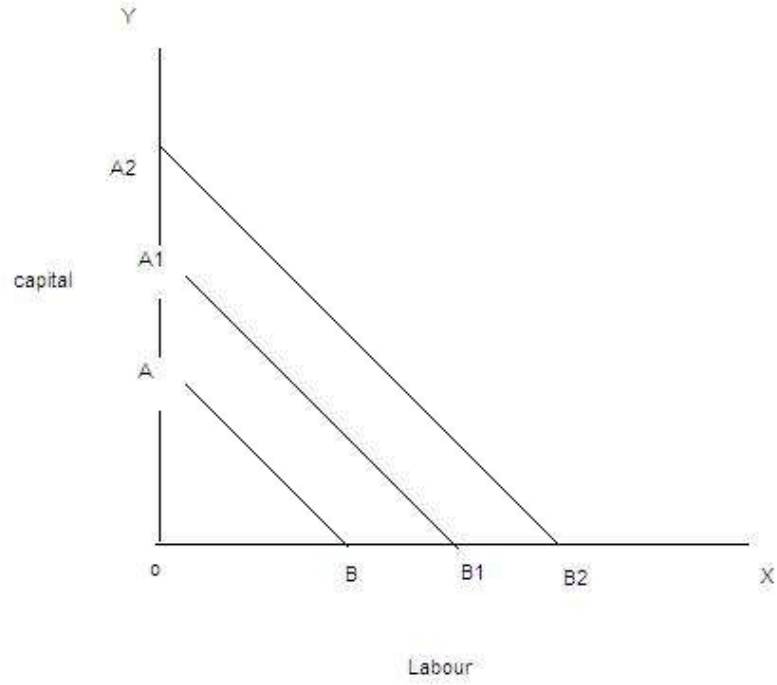
1. **IQs are never parallel to each other**. Interspacing between them is least at the ends and maximum in the middle.
2. **IQs are convex to the origin**: convex isoquants possess continuous substitutability of K and L over a stretch. Beyond this stretch, K and L are not substitutable foe each other.
3. **IQs may be linear when labour and capital are perfect substitute**. A linear isoquant implies that either factor can be used in proportion. If isoquant has several linear segments separated by kinks, the isoquant is called kinked isoquant or activity analysis isoquant or linear programming isoquant. Such isoquants are used in linear programming.
4. **If Land K are prefect complements to each other, the IQ is L-shaped**. Such isoquant is known a input-output isoquant or Leontief isoquant. There is only one combination of L and K available for production. It is the corner point of L-shaped isoquant.
5. If marginal product of one of the two factors is zero, IQ is parallel to the axis on which the factor with zero marginal products is represented.
6. If one of the two factors has negative marginal product the IQ slopes upwards from left to right.
7. If both the factors have negative marginal products, the IQ is concave to the origin.
8. If the producer has a preference for a factor of production, the IQ is quasi linear.
9. If the factors to be employed in whole numbers units only. The IQ is discontinuous.

Isocost curves:

Isocost curve is the locus traced out by various combinations of L and K, each of which costs the producer the same amount of money (C) Differentiating equation with respect to L, we have $dK/dL = -w/r$ This gives the slope of the producer's budget line (isocost curve). Iso cost line shows various combinations of labour and capital that the firm can buy for a given factor prices. The slope of iso cost line = PL/Pk. In this equation , PL is the price of labour and Pk is the price of capital. The slope of iso cost line indicates the ratio of the factor prices. A set of isocost lines can be drawn for different levels of factor prices, or different sums of money. The iso cost line will shift to the right when money spent on factors increases or firm could buy more as the factor prices are given.

Slope of iso cost line

With the change in the factor prices the slope of iso cost lien will change. If the price of labour falls the firm could buy more of labour and the line will shift away from the origin. The slope depends on the prices of factors of production and the amount of money which the firm spends on the factors. When the amount of money spent by the firm changes, the isocost line may shift but its slope remains the same. A change in factor price makes changes in the slope of isocost lines as shown in the figure.



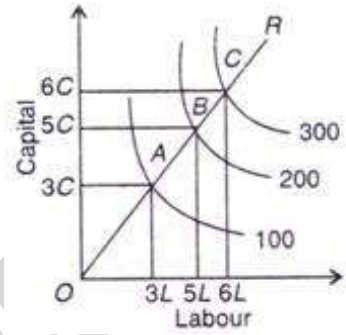
THE LAWS OF RETURNS TO SCALE: PRODUCTION FUNCTION WITH TWO VARIABLE INPUTS

The laws of returns to scale refer to the effects of a change in the scale of factors (inputs) upon output in the long run when the combinations of factors are changed in the same proportion.

If by increasing two factors, say labour and capital, in the same proportion, output increases in exactly the same proportion, there are constant returns to scale. If in order to secure equal increases in output, both factors are increased in larger proportionate units, there are decreasing returns to scale. If in order to get equal increases in output, both factors are increased in smaller proportionate units, there are increasing returns to scale.

Increasing Returns to Scale:

Below figure shows the case of increasing returns to scale where to get equal increases in output, lesser proportionate increases in both factors, labour and capital, are required.

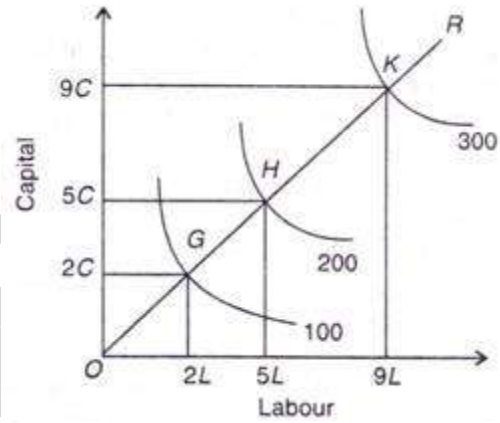


It follows that in the figure:
100 units of output require 3C + 3L
200 units of output require 5C + 5L
300 units of output require 6C + 6L
So that along the expansion path OR, OA > AB > BC. In this case, the production function is homogeneous of degree greater than one. The increasing returns to scale are attributed to the existence of indivisibilities in machines, management, labour, finance, etc. Some items of equipment or some activities have a minimum size and cannot be divided into smaller units. When a business unit expands, the returns to scale increase because the indivisible factors are employed to their full capacity.
Increasing returns to scale also result from specialisation and division of labour. When the scale of the firm expands there is wide scope for specialisation and division of labour. Work can be divided into small tasks and workers can be concentrated to narrower range of processes. For this, specialized equipment can be installed.

Thus with specialization efficiency increases and increasing returns to scale follow:
Further, as the firm expands, it enjoys internal economies of production. It may be able to install better machines, sell its products more easily, borrow money cheaply, procure the services of more efficient manager and workers, etc. All these economies help in increasing the returns to scale more than proportionately.
Not only this, a firm also enjoys increasing returns to scale due to external economies. When the industry itself expands to meet the increased long-run demand for its product, external economies appear which are shared by all the firms in the industry. When a large number of firms are concentrated at one place, skilled labour, credit and transport facilities are easily available.
Subsidiary industries crop up to help the main industry. Trade journals, research and training centres appear which help in increasing the productive efficiency of the firms. Thus these external economies are also the cause of increasing returns to scale.

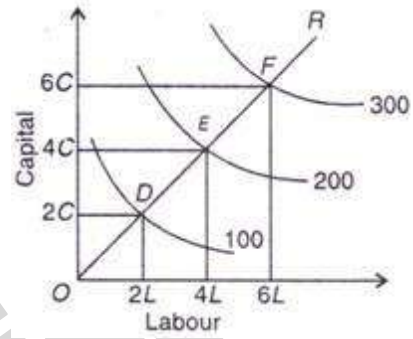
Decreasing Returns to Scale:

Below Figure shows the case of decreasing returns where to get equal increases in output, larger proportionate increases in both labour and capital are required.



It follows that:
100 units of output require 2C + 2L
200 units of output require 5C + 5L
300 units of output require 9C + 9L
So that along the expansion path OR, OG < GH < HK.
In this case, the production function is homogeneous of degree less than one. Returns to scale may start diminishing due to the following factors. Indivisible factors may become inefficient and less productive. Business may become unwieldy and produce problems of supervision and coordination.
Large management creates difficulties of control and rigidities. To these internal diseconomies are added external diseconomies of scale. These arise from higher factor prices or from diminishing productivities of the factors. As the industry continues to expand the demand for skilled labour, land, capital, etc. rises.
There being perfect competition, intensive bidding raises wages, rent and interest. Prices of raw materials also go up. Transport and marketing difficulties emerge. All these factors tend to raise costs and the expansion of the firms leads to diminishing returns to scale so that doubling the scale would not lead to doubling the output.

Constant Returns to Scale:
Below Figure shows the case of constant returns to scale. Where the distance between the isoquants 100, 200 and 300 along the expansion path OR is the same, i.e., OD = DE = EF. It means that if units of both factors, labour and capital, are doubled, the output is doubled. To treble the output, units of both factors are trebled.



It follows that:
100 units of output require
1 (2C + 2L) = 2C + 2L
200 units of output require
2 (2C + 2L) = 4C + 4L
300 units of output require
3 (2C + 2L) = 6C + 6L
The returns to scale are constant when internal economies enjoyed by a firm are neutralised by internal diseconomies so that output increases in the same proportion. Another reason is the balancing of external economies and external diseconomies.
Constant returns to scale also result when factors of production are perfectly divisible, substitutable, homogeneous and their supplies are perfectly elastic at given prices. That is why, in the case of constant returns to scale, the production function is homogeneous of degree one.

ECONOMIES AND DISECONOMIES OF SCALE

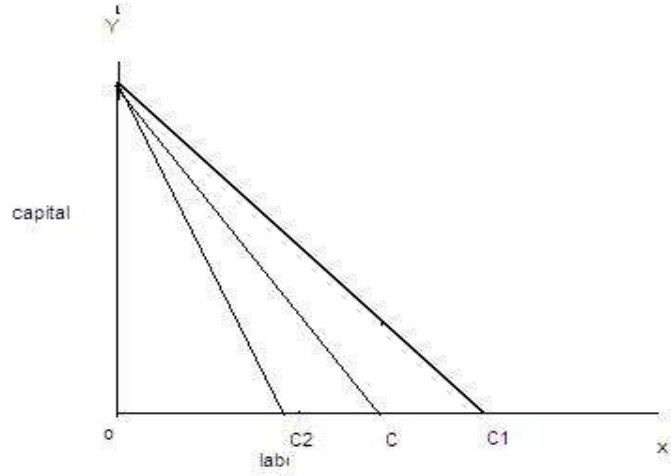
Economies of scale are advantages that arise for a firm because of its larger size, or scale of operation. These advantages translate into lower unit costs (or improved **productive efficiency**), although some economies of scale are not so easy to quantify.
In some markets, firms have to be of at least a certain size to be able to compete at all, because of the minimum level of investment required; economists call this **minimum efficient scale**.
On the other hand, inefficiencies can also creep in because of increased size, known as **diseconomies of scale**
In the correct sense of the term, **economies and diseconomies of scale** relate to advantages and disadvantages of an ***increase*** in the firm's productive capacity – such as moving to a larger factory or installing completely new technology. Do not confuse these terms with **capacity utilisation**, which is the degree to which the***current*** scale of operations is actually being used.
Economies of scale can be 'internal' (specific to an individual firm) or external (advantages that benefit the industry as a whole).

The main kinds of ***internal*** **Economies of Scale** are:
Purchasing – firms producing on a larger scale should be able to *bulk buy* raw materials or product for resale in larger quantities. They may be able to cut out wholesalers by buying direct from producers, and transport costs per unit may also be reduced. The firm might also be buying in large enough quantities to make very specific demands about product quality, specifications, service and so on, so that supplies exactly match their needs.

Technical – it may be cost-effective to invest in more advanced production machinery, IT and software when operating on a larger scale.
Managerial – larger firms can afford to have specialist managers for different functions within a business – such as Marketing, Finance and Human Resources. Furthermore, they may be able to pay the higher salaries required to attract the best people, leading to better planning and decision making.
Specialisation – with a larger workforce, the firm may be better able to divide up the work and recruit people whose skills very closely match the requirements of the job.
Marketing – more options are available for larger firms, such as television and other national media, which would not be cost-effective for smaller producers. The marketing cost for selling 10 million items might be no greater than to sell 1 million items. Larger firms might find it easier to gain publicity for new launches simply because of their existing reputation.
Financial – there is a wider range of finance options available to larger firms, such as the stock market, bonds and other kinds of bank lending. Furthermore, a larger firm is likely to be perceived by banks as a lower risk and the cost of borrowing is likely to be lower.
Risk bearing – a larger firm can be safer from the risk of failure if it has a more diversified product range. A larger firm may have greater resilience in the case of a downturn in its market because of larger reserves and greater scope to make cutbacks.
Social and welfare – larger firms are more likely to be able to justify additional benefits for employees such as pension funds, healthcare, sports and social facilities, which in turn can help attract and retain good employees.

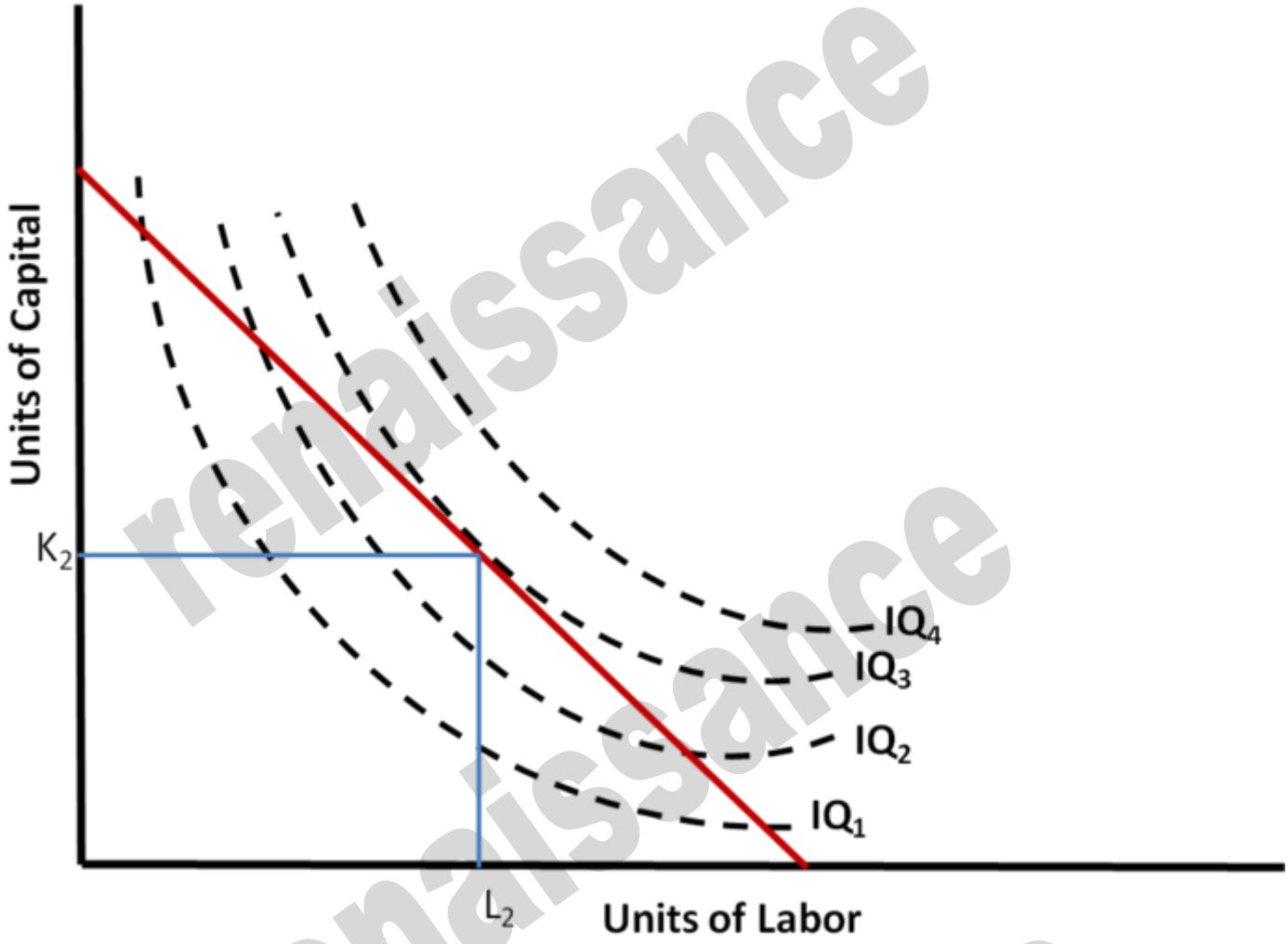
External economies of scale
External economies of scale arise from firms in related industries operating in a concentrated geographical area; suppliers of services and raw materials to all these firms can do so more efficiently. Infrastructure such as roads and sophisticated telecommunications are easier to justify.
There is also likely to be a growing local pool of skilled labour as other local firms in the industry also train workers. This gives a larger and more flexible labour market in the area.

Diseconomies of scale
These are inefficiencies that can creep in when a firm operates on a larger scale (do not confuse with high capacity utilisation). The main diseconomies of scale are:
Lack of motivation – in larger firms, workers can feel that they are not appreciated or valued as individuals - see **Mayo** and **Herzberg**. It can be more difficult for managers in larger firms to develop the right kind of relationship with workers. If motivation falls, productivity may fall leading to inefficiencies.
Poor communication – it can be easier for smaller firms to communicate with all staff in a personal way. In larger firms, there is likely to be greater use written of notes rather than by explaining personally. Messages can remain unread or misunderstood and staff are not properly informed.
Co-ordination – a very large business takes a lot of organising, leading to an increase in meetings and planning to ensure that all staff know what they are supposed to be doing. New layers of management may be required, adding to costs and creating further links in the chain of communication.



Least Cost Factor Combination or Producer's Equilibrium or Optimal Combination of Inputs

The firm can achieve maximum profits by choosing that combination of factors which will cost it the least. The choice is based on the prices of factors of production at a particular time. The firm can maximize its profits either by maximizing the level of output for a given cost or by minimizing the cost of producing a given output. In both cases the factors will have to be employed in optimal combination at which the cost of production will be minimum. The least cost factor combination can be determined by imposing the isoquant map on isocost line. The point of tangency between the isocost and an isoquant is an important but not a necessary condition for producer's equilibrium. The essential condition is that the slope of the isocost line must equal the slope of the isoquant. Thus at a point of equilibrium marginal physical productivities of the two factors must be equal the ratio of their prices. The marginal physical product per rupee of one factor must be equal to tht of the other factor. And isoquant must be convex to the origin. The marginal rate of technical substitution of labour for capital must be diminishing at the point of equilibrium.



The Economic region of production

The firm would not operate on the positively sloped portion of an isoquant because it could produce the same level of quantity with less capital and labour. Economic region of Production:

Ridge lines: separate the relevant (i.e. negatively sloped) from the irrelevant (or the positively sloped) portion of the isoquant.

Ridge lines joins points on the various isoquants where the isoquants have zero slope (and thus zero MRTSlk) .

UNIT-III

What is Market?

Meaning

"Market refers to an arrangement, whereby buyers and sellers come in contact with each other directly or indirectly, to buy or sell goods."

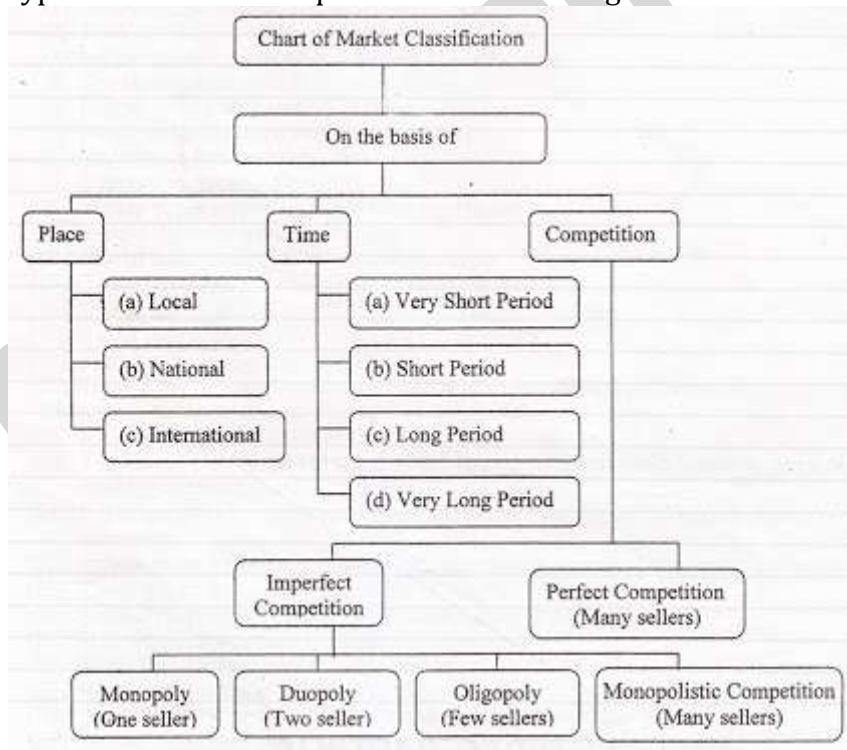
Thus, above statement indicates that face to face contact of buyer and seller is not necessary for market. E.g. In stock or share market, the buyer and seller can carry on their transactions through internet. So internet, here forms an arrangement and such arrangement also is included in the market.

Characteristics of Market

1. Existence of commodity which is to be bought and sold.
2. The existence of buyers and sellers.
3. A place, be it a certain region, a country or the entire world.
4. Communication between buyers and sellers that only one price should prevail for the same commodity at the same time.

Classification or Types of Market

The classification or types of market are depicted in the following chart.



Generally, the market is classified on the basis of:

1. Place,

2. Time and
3. Competition.

On the basis of **Place**, the market is classified into:
1. Local Market or Regional Market.
2. National Market or Countrywide Market.
3. International Market or Global Market.

On the basis of **Time**, the market is classified into:
1. Very Short Period Market.
2. Short Period Market.
3. Long Period Market.
4. Very Long Period Market.

On the basis of **Competition/Market Structure**, the market is classified into:
1. Perfectly Competitive Market Structure.
2. Imperfectly Competitive Market Structure.

(Market structure refers to number and types of firms operating in the industry.)

Both these market structures widely differ from each other in respect of their features, price, etc. Under imperfect competition, there are different forms of markets like monopoly, duopoly, oligopoly and monopolistic competition.

1. A monopoly has only one or a single (mono) seller.
2. Duopoly has two (duo) sellers.
3. Oligopoly has little or fewer (oligo) number of sellers.
4. Monopolistic competition has many or several numbers of sellers.

The suffix poly has its origin from Greek word *Polus* which means many seller.

PERFECT COMPETITION

What is Perfect Competition?

1) Perfect Competition refers to a market situation where there are very large number of buyers and sellers dealing in a homogenous product at a price fixed by the market.
2) Perfect Competition is a market structure where there is a perfect degree of competition and single price prevails.
3) The concept of Perfect Competition was introduced by Dr. Alfred Marshall.
4) Nothing is 100% perfect in this world. So, this states that perfect competition is only a theoretical possibility and it does not exist in reality.

Main Features of Perfect Competition ↓

The following are the characteristics or main features of perfect competition :-

1. Many Sellers

In this market, there are many sellers who form total of market supply. Individually, seller is a firm and collectively, it is an industry. In perfect competition, price of commodity is decided by market forces of demand and supply. i.e. by buyers and sellers collectively. Here, no individual seller is in a position to change the price by controlling supply. Because individual seller's individual supply is a very small part of total supply. So, if that seller alone raises the price, his product will become costlier than other and automatically, he will be out of market. Hence, that seller has to accept the price which is decided by market forces of demand and supply. This ensures single price in the market and in this way, seller becomes price taker and not price maker.

2. Many Buyers

Individual buyer cannot control the price by changing or controlling the demand. Because individual buyer's individual demand is a very small part of total demand or market demand. Every buyer has to accept the price decided by market forces of demand and supply. In this way, all buyers are price takers and not price makers. This also ensures existence of single price in market.

3. Homogenous Product

In this case, all sellers produce homogeneous i.e. perfectly identical products. All products are perfectly same in terms of size, shape, taste, colour, ingredients, quality, trade marks etc.

4. Zero Advertisement Cost

Since all products are identical in features like quality, taste, design etc., there is no scope for product differentiation. So advertisement cost is nil.

5. Free Entry and Exit

There are no restrictions on entry and exit of firms. This feature ensures existence of normal profit in perfect competition. When profit is more, new firms enter the market and this leads to competition. Entry of new firms competing with each other results into increase in supply and fall in price. So, this reduces profit from abnormal to normal level.

When profit is low (below normal level), some firms may exit the market. This leads to fall in supply. So remaining firms raise their prices and their profits go up. So again this ensures normal level of profit.

6.Perfect Knowledge

On the front of both, buyers and sellers, perfect knowledge regarding market and pricing conditions is expected. So, no buyer will pay price higher than market price and no seller will charge lower price than market price.

7. Perfect Mobility of Factors

This feature is essential to keep supply at par with demand. If all factors are easily mobile (moveable) from one line of production to another, then it becomes easy to adjust supply as per demand.

Whenever demand is more, additional factors should be moved into industry to increase supply and vice versa. In this way, with the help of stable demand and supply, we can maintain single price in the Market.

8. No Government Intervention
Since market has been controlled by the forces of demand and supply, there is no government intervention in the form of taxes, subsidies, licensing policy, control over the supply of raw materials, etc.

9. No Transport Cost
It is assumed that buyers and sellers are close to market, so there is no transport cost. This ensures existence of single price in market.

IMPERFECT COMPETITION
It is an important market category wherein individual firms exercise control over the price to a smaller or larger degree depending upon the degree of imperfection present in a case.

A) Monopoly

1. The term monopoly is derived from Greek words '*mono*' which means single and '*poly*' which means seller. So, monopoly is a market structure, where there is only a single seller producing a product having no close substitutes.
2. This single seller may be in the form of an individual owner or a single partnership or a Joint Stock Company. Such a single firm in market is called monopolist. Monopolist is price maker and has a control over the market supply of goods. But it does not mean that he can set both price and output level. A monopolist can do either of the two things i.e. price or output. It means he can fix either price or output but not both at a time.

Characteristics / Features of Monopoly
Following are the features or characteristics of Monopoly :-

1. A single seller has complete control over the supply of the commodity.
2. There are no close substitutes for the product.
3. There is no free entry and exit because of some restrictions.
4. There is a complete negation of competition.
5. Monopolist is a price maker.
6. Since there is a single firm, the firm and industry are one and same i.e. firm coincides the industry.
7. Monopoly firm faces downward sloping demand curve. It means he can sell more at lower price and vice versa. Therefore, elasticity of demand factor is very important for him.
8. No advertisement cost

Classification / Kinds / Types of Monopoly

1. Perfect Monopoly
It is also called as absolute monopoly. In this case, there is only a single seller of product having no close substitute; not even remote one. There is absolutely zero level of competition. Such monopoly is practically very rare.

2. Imperfect Monopoly
It is also called as relative monopoly or limited monopoly. It refers to a single seller market having no close substitute. It means in this market, a product may have a remote substitute. So, there is fear of competition to some extent e.g. Mobile (Cellphone) telcom industry (e.g. vodaphone) is having competition from fixed landline phone service industry (e.g. BSNL).

3. Private Monopoly
When production is owned, controlled and managed by the individual, or private body or private organization, it is called private monopoly. e.g. Tata, Reliance, Bajaj, etc. groups in India. Such type of monopoly is profit oriented.

4. Public Monopoly
When production is owned, controlled and managed by government, it is called public monopoly. It is welfare and service oriented. So, it is also called as 'Welfare Monopoly' e.g. Railways, Defence, etc.

5. Simple Monopoly
Simple monopoly firm charges a uniform price or single price to all the customers. He operates in a single market.

6. Discriminating Monopoly
Such a monopoly firm charges different price to different customers for the same product. It prevails in more than one market.

7. Legal Monopoly
When monopoly exists on account of trademarks, patents, copy rights, statutory regulation of government etc., it is called legal monopoly. Music industry is an example of legal monopoly.

8. Natural Monopoly
It emerges as a result of natural advantages like good location, abundant mineral resources, etc. e.g. Gulf countries are having monopoly in crude oil exploration activities because of plenty of natural oil resources.

9. Technological Monopoly
It emerges as a result of economies of large scale production, use of capital goods, new production methods, etc. E.g. engineering goods industry, automobile industry, software industry, etc.

10. Joint Monopoly

A number of business firms acquire monopoly position through amalgamation, cartels, syndicates, etc, it becomes joint monopoly. e.g. Actually, pizza making firm and burger making firm are competitors of each other in fast food industry. But when they combine their business, that leads to reduction in competition. So they can enjoy monopoly power in market.

Monopolistic Competition

1. Pure monopoly and perfect competition are two extreme cases of market structure. In reality, there are markets having large number of producers competing with each other in order to sell their product in the market. Thus, there is monopoly on one hand and perfect competition on other hand. Such a mixture of monopoly and perfect competition is called as monopolistic competition. It is a case of imperfect competition.
2. Monopolistic competition has been introduced by American economist Prof. Edward Chamberlin, in his book 'Theory of Monopolistic Competition' published in 1933.

Features of Monopolistic Competition ↓

The following are the features or characteristics of monopolistic competition :-

1. Large Number of Sellers

There are large number of sellers producing differentiated products. So, competition among them is very keen. Since number of sellers is large, each seller produces a very small part of market supply. So no seller is in a position to control price of product. Every firm is limited in its size.

2. Product Differentiation

It is one of the most important features of monopolistic competition. In perfect competition, products are homogeneous in nature. On the contrary, here, every producer tries to keep his product dissimilar than his rival's product in order to maintain his separate identity. This boosts up the competition in market. So, every firm acquires some monopoly power.

3. Freedom of Entry and Exit

This feature leads to stiff competition in market. Free entry into the market enables new firms to come with close substitutes. Free entry or exit maintains normal profit in the market for a longer span of time.

4. Selling Cost

It is a unique feature of monopolistic competition. In such type of market, due to product differentiation, every firm has to incur some additional expenditure in the form of selling cost. This cost includes sales promotion expenses, advertisement expenses, salaries of marketing staff, etc.

But on account of homogeneous product in perfect competition and zero competition in monopoly, selling cost does not exist there.

5. Absence of Interdependence

Large numbers of firms are different in their size. Each firm has its own production and marketing policy. So no firm is influenced by other firm. All are independent.

6. Two Dimensional Competition

Monopolistic competition has two types of competition aspects viz.

i. Price competition i.e. firms compete with each other on the basis of price.
ii. Non price competition i.e. firms compete on the basis of brand, product quality advertisement.

7. Concept of Group

In place of Marshallian concept of industry, Chamberlin introduced the concept of Group under monopolistic competition. An industry means a number of firms producing identical product. A group means a number of firms producing differentiated products which are closely related.

8. Falling Demand Curve

In monopolistic competition, a firm is facing downward sloping demand curve i.e. elastic demand curve. It means one can sell more at lower price and vice versa.

Oligopoly

The term oligopoly is derived from two Greek words: 'oligi' means few and 'polein' means to sell. Oligopoly is a market structure in which there are only a few sellers (but more than two) of the homogeneous or differentiated products. So, oligopoly lies in between monopolistic competition and monopoly.

Oligopoly refers to a market situation in which there are a few firms selling homogeneous or differentiated products. Oligopoly is, sometimes, also known as 'competition among the few' as there are few sellers in the market and every seller influences and is influenced by the behaviour of other firms.

Example of Oligopoly:

In India, markets for automobiles, cement, steel, aluminium, etc, are the examples of oligopolistic market. In all these markets, there are few firms for each particular product.

DUOPOLY is a special case of oligopoly, in which there are exactly two sellers. Under duopoly, it is assumed that the product sold by the two firms is homogeneous and there is no substitute for it. Examples where two companies control a large proportion of a market are: (i) Pepsi and Coca-Cola in the soft drink market; (ii) Airbus and Boeing in the commercial large jet aircraft market; (iii) Intel and AMD in the consumer desktop computer microprocessor market.

Types of Oligopoly:

1. Pure or Perfect Oligopoly:

If the firms produce homogeneous products, then it is called pure or perfect oligopoly. Though, it is rare to find pure oligopoly situation, yet, cement, steel, aluminum and chemicals producing industries approach pure oligopoly.

2. Imperfect or Differentiated Oligopoly:

If the firms produce differentiated products, then it is called differentiated or imperfect oligopoly. For example, passenger cars, cigarettes or soft drinks. The goods produced by different firms have their own distinguishing characteristics, yet all of them are close substitutes of each other.

3. Collusive Oligopoly:

If the firms cooperate with each other in determining price or output or both, it is called collusive oligopoly or cooperative oligopoly.

4. Non-collusive Oligopoly:

If firms in an oligopoly market compete with each other, it is called a non-collusive or non-cooperative oligopoly.

Features of Oligopoly:

The main features of oligopoly are elaborated as follows:

1. Few firms:

Under oligopoly, there are few large firms. The exact number of firms is not defined. Each firm produces a significant portion of the total output. There exists severe competition among different firms and each firm try to manipulate both prices and volume of production to outsmart each other. For example, the market for automobiles in India is an oligopolist structure as there are only few producers of automobiles.

The number of the firms is so small that an action by any one firm is likely to affect the rival firms. So, every firm keeps a close watch on the activities of rival firms.

2. Interdependence:

Firms under oligopoly are interdependent. Interdependence means that actions of one firm affect the actions of other firms. A firm considers the action and reaction of the rival firms while determining its price and output levels. A change in output or price by one firm evokes reaction from other firms operating in the market.

For example, market for cars in India is dominated by few firms (Maruti, Tata, Hyundai, Ford, Honda, etc.). A change by any one firm (say, Tata) in any of its vehicle (say, Indica) will induce other firms (say, Maruti, Hyundai, etc.) to make changes in their respective vehicles.

3. Non-Price Competition:

Under oligopoly, firms are in a position to influence the prices. However, they try to avoid price competition for the fear of price war. They follow the policy of price rigidity. Price rigidity refers to a situation in which price tends to stay fixed irrespective of changes in demand and supply conditions. Firms use other methods like advertising, better services to customers, etc. to compete with each other.

If a firm tries to reduce the price, the rivals will also react by reducing their prices. However, if it tries to raise the price, other firms might not do so. It will lead to loss of customers for the firm, which intended to raise the price. So, firms prefer non- price competition instead of price competition.

4. Barriers to Entry of Firms:

The main reason for few firms under oligopoly is the barriers, which prevent entry of new firms into the industry. Patents, requirement of large capital, control over crucial raw materials, etc, are some of the reasons,

which prevent new firms from entering into industry. Only those firms enter into the industry which is able to cross these barriers. As a result, firms can earn abnormal profits in the long run.

5. Role of Selling Costs:

Due to severe competition 'and interdependence of the firms, various sales promotion techniques are used to promote sales of the product. Advertisement is in full swing under oligopoly, and many a times advertisement can become a matter of life-and-death. A firm under oligopoly relies more on non-price competition. Thus, Selling costs are more important under oligopoly than under monopolistic competition.

6. Group Behaviour:

Under oligopoly, there is complete interdependence among different firms. So, price and output decisions of a particular firm directly influence the competing firms. Instead of independent price and output strategy, oligopoly firms prefer group decisions that will protect the interest of all the firms. Group Behaviour means that firms tend to behave as if they were a single firm even though individually they retain their independence.

7. Nature of the Product:

The firms under oligopoly may produce homogeneous or differentiated product.

i. If the firms produce a homogeneous product, like cement or steel, the industry is called a pure or perfect oligopoly.

ii. If the firms produce a differentiated product, like automobiles, the industry is called differentiated or imperfect oligopoly.

8. Indeterminate Demand Curve:

Under oligopoly, the exact behaviour pattern of a producer cannot be determined with certainty. So, demand curve faced by an oligopolist is indeterminate (uncertain). As firms are inter-dependent, a firm cannot ignore the reaction of the rival firms. Any change in price by one firm may lead to change in prices by the competing firms. So, demand curve keeps on shifting and it is not definite, rather it is indeterminate.

Duopoly

Duopoly is a limiting case of oligopoly, in the sense that it has all the characteristics of oligopoly except the number of sellers which are only two incase of duopoly.

Examples are:

Pepsi and Coca-Cola soft drinks.

Price Determination under Perfect Competition

1. In prefect competition, price is determined by the market forces of demand and supply. All buyers and sellers are price takers and not price makers. Buyer represents demand side in the market. Every rational buyer aims at maximising his satisfaction by purchasing more at lower price and lower at higher price. This is called demand behaviour of buyer i.e. Law of Demand.

2. Seller represents supply side in the market. Every rational seller aims at maximizing his profits by selling more at higher price and lesser at lower price. This is called supply behaviour of seller i.e. Law of supply. But at a common price, buyer is ready to demand a particular quantity of goods and seller is also ready to supply exactly the same quantity of goods to buyer, such common price is called 'Equilibrium Price' and such quantity is called 'Equilibrium Quantity'.

"***Equilibrium Price is a price which equates both demand and supply***".

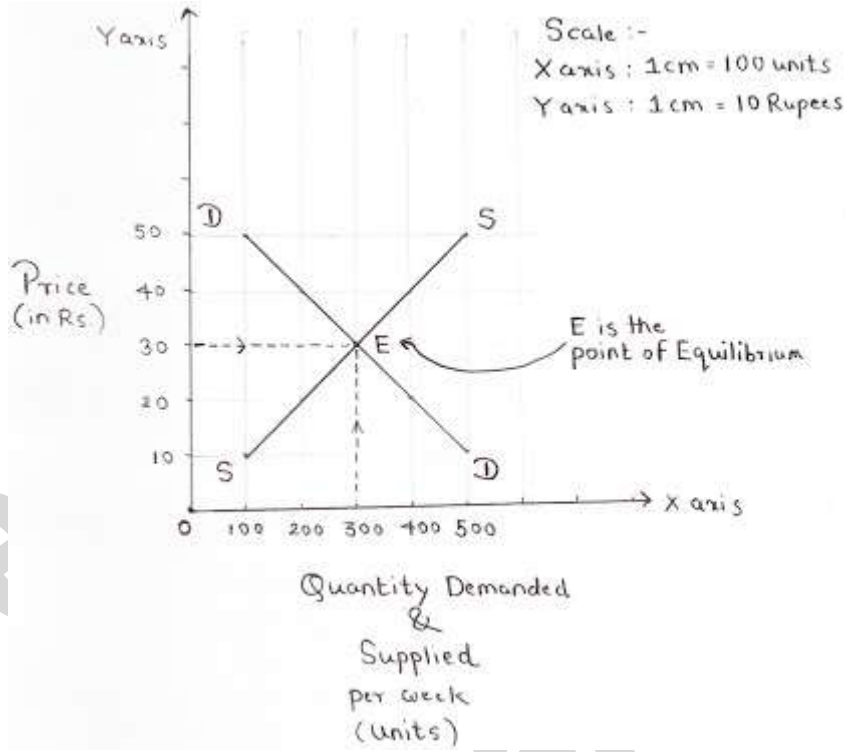
Table - Sample Demand and Supply Schedules

Demand and Supply Schedules

Price per unit of commodity	Quantity demanded per week	Quantity Supplied per week
(Rs.)	(Units)	(Units)
50	100	500
40	200	400
30	300	300
20	400	200
10	500	100

It is the price at which total demand is exactly equal to total supply. Graphically it is the point where DD curve and SS curve intersect each other.

Graph - Equilibrium Price Determination



In the above graphical diagram, the following points have been observed :-

1. On X axis, quantity demand and supplied per week has been given and on Y axis, price has been given.
2. Buyers are purchasing more at lower price and vice versa. This negative relationship is shown by downward sloping DD curve.
3. Sellers are selling more at higher price and vice versa. This positive relationship is shown by upward sloping SS curve.
4. As per the data given in table, Rs. 30 is that price at which demand equates supply (300 units). So, Rs. 30 is an equilibrium price and 300 units is an equilibrium quantity.
5. Suppose, price fails to Rs. 20/-, So this results into increase in demand (as per Law of Demand) and decrease in supply (as per Law of Supply). Since DD > SS, i.e. because of low supply, sellers will be dominant and competition will be among buyers, this leads to rise in price level. (i.e. from Rs. 20 to Rs. 30) Again price will come back at original level i.e. equilibrium price (Rs. 30).
6. Suppose, supply exceeds demand (DD < SS) now buyers become dominant and competition will be among sellers. This leads to downfall in price. (i.e. from Rs. 40 to Rs.30). Again price will come back to original level. i.e. equilibrium price (Rs. 30).
7. Such automatic adjustment by demand and supply forces will keep single price in market.

Price Determination under Monopoly

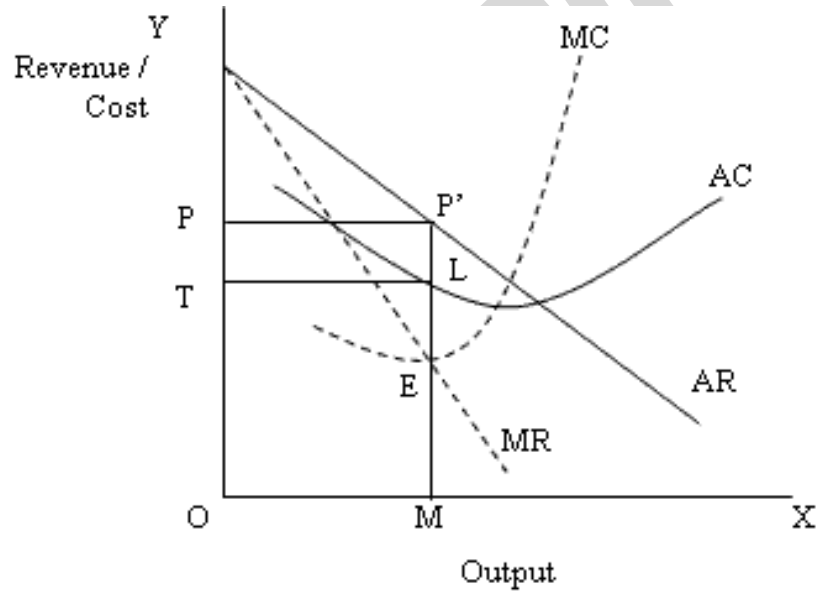
1. *Monopoly is that market form in which a single producer controls the whole supply of a single commodity which has no close substitute.*

2. From this definition there are two points that must be noted:

(i) Single Producer: There must be only one producer who may be an individual, a partnership firm or a joint stock company. Thus single firm constitutes the industry. The distinction between firm and industry disappears under conditions of monopoly.

(ii) No Close Substitute: The commodity produced by the producer must have no closely competing substitutes, if he is to be called a monopolist. This ensures that there is no rival of the monopolist. Therefore, the cross elasticity of demand between the product of the monopolist and the product of any other producer must be very low.

3. A firm under monopoly faces a downward sloping demand curve or average revenue curve. Further, in monopoly, since average revenue falls as more units of output are sold, the marginal revenue is less than the average revenue. In other words, under monopoly the MR curve lies below the AR curve.
4. The Equilibrium level in monopoly is that level of output in which marginal revenue equals marginal cost. The producer will continue producer as long as marginal revenue exceeds the marginal cost. At the point where MR is equal to MC the profit will be maximum and beyond this point the producer will stop producing.



5. It can be seen from the diagram that up till OM output, marginal revenue is greater than marginal cost, but beyond OM the marginal revenue is less than marginal cost. Therefore, the monopolist will be in equilibrium at output OM where marginal revenue is equal to marginal cost and the profits are the greatest. The corresponding price in the diagram is MP' or OP. It can be seen from the diagram at output OM, while MP' is the average revenue, ML is the average

cost, therefore, P'L is the profit per unit. Now the total profit is equal to P'L (profit per unit) multiply by OM (total output).

6. In the short run, the monopolist has to keep an eye on the variable cost, otherwise he will stop producing. In the long run, the monopolist can change the size of plant in response to a change in demand. In the long run, he will make adjustment in the amount of the factors, fixed and variable, so that MR equals not only to short run MC but also long run MC.

Price Determination under Monopolistic Competition:

Now the question arises at which price-output level the monopolistic competitive firm will be in equilibrium position? Here we have to remember that every seller, whether a monopolist or one working under perfectly or imperfectly competitive situations, wants to maximise his profits.

The seller will go on producing till the extra receipts to be had from additional production exceed the extra cost incurred in the production process. In other words, profits will be maximised when marginal revenue is equal to marginal cost. So long as marginal revenue is greater than marginal cost, the seller will find it profitable to expand his output, and if marginal revenue is less than marginal cost, obviously it is to his advantage to reduce his output to the point where marginal revenue is equal to marginal cost. In the short run, therefore, the firm will be in equilibrium when it is maximising its profits, i.e., when

Marginal Revenue = Marginal Cost

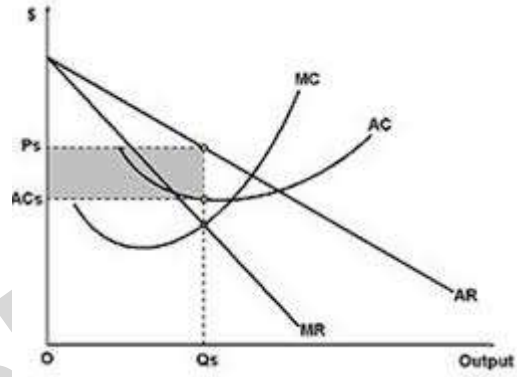
In the short run, a monopolistically competitive firm may either realise abnormal profits or be faced with losses. But, in the long run, such supernormal profits disappear. This is because we assume that entry is free and new firms will enter the industry if the existing firms are making supernormal profits. As new firms enter and start production, the demand curve or average revenue curve faced by the firms will fall (shift to the left) and, therefore, the supernormal profits will be competed away, and the firms will be earning only normal profits.

Similarly, if in the short run firms are suffering losses, then in the long run some firms will leave the industry so that the remaining firms are able to earn normal profits. Another point which is to be noted in regard to the long-run equilibrium under monopolistic competition is that average revenue curve in the long run will be more elastic, since large number of substitutes will be available in the long run. Therefore, in the long run, equilibrium is restored when firms are earning only normal profits. Now, profits are normal only when

Average Revenue = Average Cost.

Therefore, equilibrium in the long run under imperfect competition holds when

Average Revenue = Average Cost.



Price determination under Oligopoly:
In an oligopoly, the number of sellers is small as against a sole seller under monopoly and many sellers under monopolistic completion.

Principal Characteristics of Oligopoly

The principal features of oligopoly are as under:

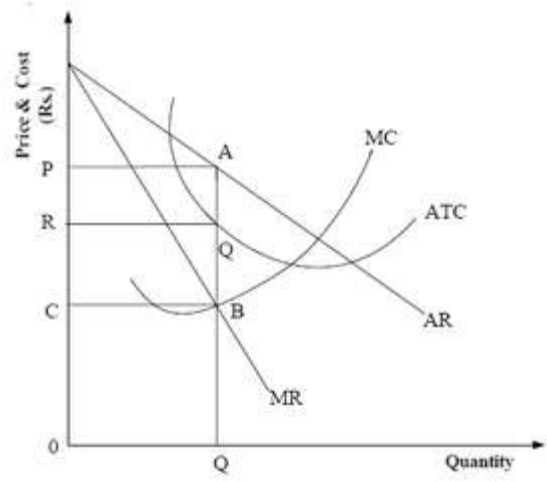
(i) Interdependence:
Owing to a small number of sellers, the price-output decisions of one firm are taken note of by other firms and affect their decisions too.

(ii) Indeterminate Demand Curve:
Since no firm is able to predict the reaction or behaviour of other firms consequent on price output decision of one firm, there is uncertainty, and no firm can be sure of the quantity of the commodity it can sell at a price. The demand curve is thus indeterminate.

(iii) High Pressure Salesmanship:
There being only a small number of firms in the field, there is a tendency for a firm in oligopoly to increase its selling costs and indulge in advertisement so that it may capture as much of the market as possible. There is a counter-campaign by the rivals.

(iv) Sticky Prices:
In order to avoid adverse reaction by the rivals, there is a tendency for the firms to avoid changing the price of their products. Hence comparative price stability rules in the oligopolistic market.

How is Price Determined under Oligopoly?
Since price-output decisions by one firm affect the decisions of other firms, nobody can be sure of their reaction. As pointed out above, the demand curve is indeterminate and no single price-output decision is possible.



Unit IV

Factor Pricing Concept & Meaning

Factor Pricing is associated with the prices that an entrepreneur pays to avail the services rendered by the factors of production. For example, an entrepreneur needs to pays wages to labour, rents for availing land, and interests for capital so that he/she can earn maximum profit. These factors of production directly affect the production process of an organization.

In other words, the theory of factor pricing is concerned with of principals according to which the price of each factor of production is determined and distributed.

Therefore, the theory of factor pricing is also known as theory of distribution.

Distribution is one of the important divisions of economics. In modern world, human wants are unlimited and resources are limited, so large scale production is necessitates large amount of factors of production like land, labour, capital and organization. These factors are supplied by various persons . For example, the land is supplied by landlords, labour by laborers, and capital by capitalists and management by entrepreneurs. Since production is the result of joint effort, all the factors of production.

According to **Nicholson,** "Distribution in the economic sense refers to the division of the wealth of a nation amongst the different classes."

According to **Chapman,** "The economics of distribution accounts the sharing of the wealth product by a community among the agents, of the owners of agents, which have been in active in its production."

Meaning of Rent

Rent is the payment made for the use of any factor of production. In simple words, rent is used as a portion of the produce which is paid to the owner of land for the use of his goods and services. It is a surplus earned by the owner after paying all other expenses.

Concepts of Rent

Rent occurs when the factor of production is less than perfectly elastic demand. Under perfectly elastic demand whenever market price of the factor is above its supply price, new suppliers of the factor would enter the market and push down the price. Among all the factor land has least elastic supply. The total supply. The total supply of land is fixed and its supply price is zero. Therefore it is said that return for any use of land is called a rent.

For example, a typist is ready to work for Rs. 4600 per month in a college but he is paid Rs.4900 per month . this is because of the fact that the market demand for the typist is greater than its supply. So long as the supply cannot be adjusted to demand the typist will continue earning a payment in excess of Rs. 4600 of the amount which is necessary to keep him in that occupation. This monthly surplus money of Rs. 300(4900-4600= Rs. 300) is an economic rent.

Definitions-

1. *"Rent is that portion of the produce is earth which is paid to landlord for the use of original and indestructible powers of the soil."*

-Ricardo

2. *" Rent is the income derived from the ownership of land and other free gifts of Nature. "He further called it 'Quasi Rent' Which arises on the manmade equipment's and machines in the short period and tend to disappear in the long run."*

-Marshall

3. *"Rent is the price paid for the use of land."* ***– Prof. Carver***

In Economics, there may be the following types of rent

1. ***Economic Rent:*** Economic rent may be defined as "payment made to a factor of production, in excess of the minimum amount necessary to keep the factor in its present occupation. "It is payment made for the use of land and scarce natural resources.
2. **Gross Rent:** It is the rent which is paid for the services of land and capital invested on it. It includes the following:
   (a) Payment for the use of land.
   (b) Interest on capital invested for improvement of land.
   (c) Wages for the services of landlord for supervising the investment in land.
3. **Contractual Rent:** It is the payment made to the landlord by tenants on the basis of contract which may be verbal or written.
4. **Scarcity Rent:** Scarcity rent is the price paid for the use of homogenous land when its supply is limited in relation to its demand.
5. **Differential Rent:** Differential rent refers to the rent which arises due to difference in the fertility of land. This type of rent arises under extensive cultivation.
   According to Ricardo, "In order to increase production on same type of land, more units of labour and capital are employed".

Ricardian Theory of Rent

General Theme of Ricardian Theory

David Racardo, an English classical economist was the first one to develop a theory in 1817 to explain the origin and nature of Economic rent. According to Ricardian. " Rent is that portion which is paid to the land for the use of the original and indestructible powers of soil" fertility of land is original and indestructible and supply of land cannot be increased in short and long period. Hence, rent arises because of Indestructible or original power of land/soil.

Assumptions of the Theory

1. Fertility of land differs from land to land .
2. There is no alternate use of land.
3. The production in agriculture takes place under the law of diminishing return
4. Ricardo looks at the supply of land from the stand point of the society as a whole.
5. Land is a free gift of nature. It has no supply price and cost of production.
6. Supply of land is limited and fixed and is perfectly inelastic.
7. The presence of perfect competition in market.

8. Rent is the result of original and indestructible powers of soil.
9. One will use the more fertile and favourable land first i.e. land is cultivated in order of declining fertility.
10. Population will keep on increasing.

Reasons for Existence of Rent

Rent arises due to two main reasons.

i) Scarcity of land as a factor and
ii) Difference in the fertility of the soil.

Explanation of Ricardian Theory of Rent

According to Ricardian, "Rent is that portion which is paid to the land for the use of the original and indestructible powers of the soil".

While Economic rent is surplus left after the expense of cultivation as represented by payment to labour, capital and enterprise have been met.

If a land can meet the entire demand for food at prevailing price, it will command no rent. It is considered as free gift of nature.

But if population has increased and land is not enough to meet growing demand for food, more labour and capital will be put. This can be done by adding unit of 2nd land into 1st. If there is any surplus available then cultivators of 2nd land will pay 'rent' to the owners of 1st land.

As the demand for food still grows so this process will continue. More and more units of labour and capital will be applied to the superior lands and inferior lands brought under cultivation.

No rent land is land that produces no surplus over cost of production. Its produces is just enough to over production expenses.

Scarcity rent takes place due to scarcity of land because worst land is cultivated and its yields a surplus over cost.

Suppose there are four grades of land. i.e. A,B, C and D. The grade A land is more fertile than B and B grade land is more fertile than C and so on. People migrate to this island where we have four types of land . The Recardian theory also assumes that people know about the fertility of the land. As per theory, one will use the land in order of its superiority.

So, People will use grade A land first for cultivation. Land A is no rent land and is the marginal land first. The production form this land is 45 quintals. As it is marginal land. So the total revenues form 45 quintals of rice of exactly equal to the cost incurred for the production of that much rice.

Now due to population growth or more people migrating there, Grade A land falls short of requirements. So, People will bring B grade land under cultivation. We know that grade B is inferior to Grade A land B island will have the production of 40 quintals only. Now, just because it has an output equal to its cost of production. It will be the marginal rent and hence. Grade A rent yields rent and the rent of grade A land will be (45-30=15). Their fertility differs and that's why the difference between outputs of both the land will be determined as the rent for the first one.

Similarly, Grade B land also falls short of the requirements. Now, People will settle in Grade C land and use it for cultivation. Suppose the production here is 35 quintals and it covers only the cost of production. So C Grade land will become marginal land and Grade B yields rent i.e. (40-30=10) When greade C also falls short of the requirements, people will use Grade D land for cultivation and then Grade C land will yield rent i.e. (35-30=5)

When Grade C land is full, people will settle on Grade D land. The Grade D land Covers only the cost of production and thus it is now the marginal land . the rent is due to the superiority and of one over the other it is also because of the scarcity of land.

Schedule

Kind of land	**Production (Rice)**	**Rent**
A	45	45-30=15
B	40	40-30=10
C	35	35-30=05
D	30	30-30=00

The Schedule area is the cost of production which is same for all four grades of land. Because the input variables are same for all and hence you can see the rent for each Grade of land.

The shaded area is the cost of production which is same for all four grades of land. Because the input variable are same for all and hence you can see the rent for each grade of land.

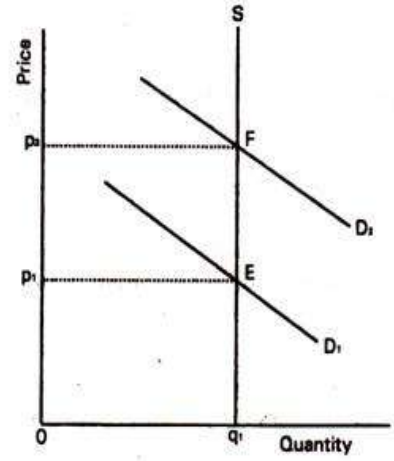


Fig. 13.1. Earnings of a Factor in Fixed Supply

Criticisms of the theory

Ricardian theory has been criticized on the following ground:

1. Ricardo considers land as fixed in supply. Of course, land is fixed in an absolute sense. But land has alternative uses. So the supply of land to a particular use not fixed (inelastic). For example the supply of wheat land is not absolutely fixed at any given time.

2. Ricardo's order of cultivation of lands is also not realistic. If the price of wheat falls, the marginal land need to not necessarily go out of cultivation first . Superior grade of land might causes such land being demanded for other purpose (e.g., for constructing houses).
3. The productivity of land does not depend entirely on fertility. It also depends on such factors as position, investment and effective use of capital.
4. Critics have pointed out that land does not possess any original and indestructible powers, as the fertility of land gradually diminishes, unless fertilizers are applied regularly.
5. Ricardo's assumption of no-rent land is unrealistic as, in reality; every plot of land earn some rent, although the amount may be small.
6. Ricardo restricted rent to land only, but modern economists have shown that rent arise in return to any factor of production, the supply of which is inelastic.
7. According to Ricardo, rent does not enter into price (cost) but from the point of view of an individual farm rent forms a part of cost and price.

Modern Theory of Rent

According to Modern theory, rent is the payment for the use of land. Rent is determined by the demand for and supply of land.

If demand of product rises or falls , the demand for the use of land reading to increase or decrease of rents.

The supply of Lands is fixed although individuals can increase their own supply acqulring more land rom others or decrease by parting with Land.

Meaning

Wages are payment for services rendered to someone, as per certain terms and conditions. Wages are the remuneration to a person who works for someone else Wages may be paid on the basis of hours, days, month or even year.

Definition

1. "A wage may be defined as the sum of money paid under contract by an employer to worker for services rendered."

-A.H. Hansen

2. "Wages is the Payment to labour for its assistance to production."

-A.H. Hansen

3. "Wage rate is the price paid for the use of labour."

-Mc Connell

Concept of Wages

Wages are basically the pay that a person receives when they have performed a duty or a service. A person that does labour or a service for a certain company or institution is paid in money or wages in terms of remuneration. He may also be given certain benefits such as sick leaves, accommodation allowance. Travel expense, etc. These are known as fringe benefits. There are two types of wages that can be paid Money Wages and Real Wage.

- **Money wages or nominal**

Wages are wages that are paid to a person regardless of the inflation rate in the market. Many companies use this method to pay their employers. Money wages include the whole salary package of the employee such as basic salary plus any additional benefits that are provided by the company of institution.

- **Real wages**

  Real wages are wages that determine the purchasing power of the individual or how much goods the salary can buy. Real wage can also be defined as "the amount of goods and services that can be bought from the individual's.

  According to author J.L. Hanson, "Real wages is the wages in terms of the goods and services that can be bought with them."

  Real wages indirectly affect the money wages, as real wages rises they may force employee to demand a higher money wage.

  Money wages may or may not affect real wage, but higher money wages can increases the cost of living which could indirectly affect the real wage.

  Type of Wages

  Piece wages: Piece wages are the wages paid according to the work done by the worker. It is calculated by number of units Produced by the worker.
  Time wages: If the labourer is paid for his services according to time. It is called as time wages for example, if the labour is paid Rs. 35 per day. It will be termed as time wage.
  Cash wages: Cash wages refer to the wages paid to the labour in terms of money. The salary paid to a worker is cash wages.
  Wages in Kind: When the labourer is paid in term of goods rather than cash. Is called the rather wages in kind. These types of wages are popular in rural areas.
  Contract Wages: Under his type, the wages are fixed in the beginning for complete work. For Instance, if a contractor is told that he will be paid Rs. 25,000 for the construction of building, it will be termed as contract wages.

Difference between Real Wages and Nominal Wage

SN.	Real Wages	Nominal Wages
1	The real wages consist of quantity of necessaries and convenience that are given for labour.	The money paid to the worker a reward of his work is known nominal wages.
2	The real wage has wider scope.	The scope is limited.
3	It includes all fringe benefits that are Provided to the worker in addition to nominal wages.	It includes only cash wages.
4	It refers to the quantity of goods and Services that can be bought for the money wages.	It refers only money content of wage
5	There are always fluctuations in real wages depending upon the price level.	The change in nominal wages Usually once in a year.

Marshall, Jevons and Walras made significant contribution to the development of this theory. The marginal productivity theory is basically developed as a theory of distribution and can be applied to any factor of production. It rests on the assumption of a perfectly competitive market and profit maximization motive of employers.

The theory explains that demand for labour is determined by the value of output of an additional worker as long as the revenue created by the marginal worker exceeds the cost of that worker (wage) i.e. marginal revenue product is equal to the market wage rate. Since the entrepreneur works for profit, therefore he/she would like to pay as low as possible. Due to perfect competition, no factor input would be willing to accept a return lower than its marginal productivity. Thus, in an open market, marginal productivity determines the equilibrium factor price.

Thus, in a perfectly competitive market. The optional level of labour used will be determined by the equality of marginal cost of labour with the marginal revenue derived from the last unit of labour employed labour (MRP) is the economic value additional revenue earned by a firm employing one additional unit o labour. It is equal to the marginal product of labour (MP0 times the Marginal revenue of the output generated (MR). In other words

$$\mathbf{MRP_L = dR/dL = dQ/dL = dR/dL = MP_L = MR_0}$$

The economic value of a marginal unit of an input is referred to as Value of Marginal Product (VMP) of that input. Thus, value of marginal product of labour (VMP_L) in a competitive market would be.

$$\mathbf{VMP_L = MP_L \times P_0}$$

Where P_0 is the price of the product.

Now in a competitive market

$$P_0 = MR_Q$$

Hence we can deduce that

$$VMP_L = MRP_L$$

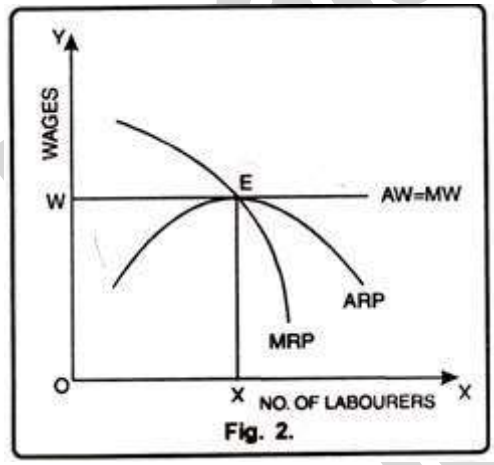


Fig. 2.

If we assume W tc be the price of labour when W is less than MRP_L the firm will have a tendency to cut down the labour employed. An optimal level of employed. An optimal level of employment will be attained only when W equal to MRP.

In the figure, the supply of labour is perfectly elastic. The wage (W) is equal to average wage (AW) and marginal wage, (MW)=W= AW=MW. At point E, the MRP of labour is equal to marginal wage (MW). The producer is in equilibrium at point E. when units of labour are employed, the marginal revenue productivity of labor MRP_L =Wage.

To the left of E the MRP of labour is higher than wage (MRP>W), the producer will increase the units of the MRP_L < wage. So the firm will curtail the units of labour. It is only at point E, the firm is in equilibrium where MRP_L = Wage.

Assumptions

The theory of marginal Productivity is based on the following assumption:

1. **Factor identical :** It assumes that all the nits of a factor are exactly alike and can be substituted to any extent.
2. **Factor can be substituted:** It is assumed that the various factors of production, which help in the production of particular commodity can be substituted for one another.
3. **Perfect mobility of factors:** It is assumed that the various factors of production can be moved from one use to another.
4. **Application of law of diminishing return:** The theory rests on the assumption that the law diminishing returns applies to the organization of a business.
5. **Perfect competition:** It is based on the assumption that the reward of each factor of production is determined under conditions of perfect competition and full employment.

Criticisms:

1. Marginal productivity is based on wrong assumption that all units of a factor of production are homogeneous. Which is impossible to exits in real world.
2. The theory implies that employment can be increased through reducing wages which is not true.
3. This theory is applicable only in the long run.
4. It is not possible to find out the marginal productivity of each factor separately.

Conclusion:

Marginal Productivity theory is not a theory that explains wages, rent or interest. It simply explains how factor of production are hired by the firms once their prices are known. It can be concluded that the theory is true only under the assumption of perfect competition and state of full employment.