Self-Study Material (OLD)

RKDF UNIVERSITY, BHOPAL
Bachelor of Arts (B.A.)
First Semester

Course	Category	Subject	Subject Code
B.A.	GE	MICRO ECONOMICS	BA EC-103
Total Credit: 6		Max.Marks:100 (Internal:40+External:60)	

Course Learning outcomes (CLO):

After completing this course, students will be able to understand rational behaviour and fundamentals of microeconomics. They will be able to explain consumer's and producer's behaviour and their optimum decisions. Students will be able to know about the firms and industry, markets and their decisions about optimum production. They will be also able to explain the theory of distribution and concept of economic welfare. Learning microeconomics is an excellent way to gain an understanding of many factors that affect us in the real world, such as methods of buying goods, product pricing and input pricing, ultimately, learning microeconomics is key in learning about the principles of economics.

Units	Topic	Duration (In Hours)	Marks
I **Introduction of Economics**	1. Definitions, Scope and Nature of Economics 2. Positive and Normative		20

	Economics 4. Methods of Economics Analysis- Inductive and Deductive methods. 5. Central Problems of An Economy – Production Possibility Curve	18	
II **Consumer Behaviour**	1. Cardinal Approach – Utility, Magrinal Utility and Total Utility. 2. Law of Diminishing Marginal Utility 3. Law of Equi-Marginal Utility, Consumer's Surplus 4. Ordinal Approach-Indifference curve-Meaning and Characteristics, Consumer's Equilibrium 5. Law of Demand and its exceptions- Giffen goods 6. Elasticity of Demand-Price, Income	19	20
III **Production**	1. Law of supply 2. Production function 3. Law of variable proportions 4. ISO- Product Curve-Meaning and characteristics.	18	20
IV	1. Meaning and Classification of	18	20

Market, factor pricing and welfare economics	Markets 2. Perfect competition-Meaning and characteristics 3. Determination of Price and Output under perfect competition		

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MICRO ECONOMICS

Introduction of Economics

Definitions, Scope and Nature of Economics

We all use economics in our day-to-day life. For example, all of us have to make certain choices with the limited money at our disposal. You may spend your money on things like food, house rent, electricity bills and medicines, and somebody else may spend the same amount of money on buying clothes, watching movies and other allied activities. Both spend the same amount of money, but in a different manner. Making such choices is just one activity related to Economics. The fundamental nature of economics is trying to understand how both individuals and nations behave in response to certain material constraints.

Definition of Economics

The various definitions of economics as given by various economists and other sources Simply defined, "Economics is the social science that examines how people make a choice for using their limited or scarce resources in order to satisfy their unlimited wants."

One of the earliest and most famous definitions of Economics was that of Thomas Carlyle, who in the early 19th century termed it the "dismal science." Carlyle believed that population would always grow faster than food and due to this; people will have to face severe poverty and hardship. Carlyle argued that slavery was actually morally superior to the market forces

of supply and demand promoted by economists, since, in his view, the freeing up of the labour market by the liberation of slaves had actually led to a moral and economic decline in the lives of the former slaves themselves.

Another early definition, one which is perhaps more useful, is that of English economist W. Stanley Jevons who, in the late 19th century, wrote that economics was "the mechanics of utility and self-interest." One can think of economics as the social science that explores the results of people acting on the basis of self-interest. Psychology, Sociology, Anthropology, and Political Science – attempt to tell us about those other dimensions of man. The assumption of self-interest, that a person tries to do the best for himself with what he has, underlies virtually all of economic theory.

At the turn of the century, Alfred Marshall's Principles of Economics was the most influential textbook in Economics. Marshall defined Economics as "a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing. Thus it is on one side a study of wealth; and on the other, and more important side, a part of the study of man."

Many other books of the period included in their definitions something about the "study of exchange and production." Definitions of this sort emphasize that the topics with which economics is most closely identified concern those processes involved in meeting man's material needs. Economists today do not use these definitions because the boundaries of economics have expanded since Marshall. Economists do more than study exchange and production, though exchange remains at the heart of economics. The standard definition is something like this: "Economics is the social science that examines how people choose to use limited or scarce resources in attempting to satisfy their unlimited wants."

The above **definition** has the following characteristics:

1. *Economics is Social Science:* A social science is a systematic body of knowledge that Seeks solutions to the problems of the society, in general. Economics also does this. So it is Considered a social science.

2. *Economics examines how people choose to use scare resources:* We all know that the Resources on this earth are not in abundance. In simpler words, they are only limited. They Will get over after some time. So, people have to use them very carefully.

3. *Human wants are unlimited:* one want gets satisfied, another one comes up. There is no Limit to our wants.

Scope of Economics

Economics is concerned with the application of economic concepts and analysis to the problem of formulating rational individual and national decisions. There are four groups of problem in both decision making and forward planning.

1. **Resource allocation:** Scarce resources have to be used with utmost efficiency to get optimal results. These include production planning, problem of transportation, etc.

2. **Inventory and queuing problem:** Inventory problems involve decisions about holding of optimal levels of stocks of raw materials and finished goods over a period. These decisions are taken by considering demand and supply conditions. Queuing problems involve decisions about installation of additional machines or hiring of extra labour in order to balance the business lost by not undertaking these activities.

3. **Pricing problems***:* Fixing prices for the products of the firm is an important part of the decision making process. Pricing problems involve decisions regarding various methods of pricing to be adopted.

4. **Investment problems:** Forward planning involves investment problems. These are problems of allocating scarce resources over time. For example, investing in new plants, how much to invest, sources of funds, etc.

Study of economics essentially involves the analysis of certain major subjects like:

1. Demand analysis and methods of forecasting

2. Cost analysis

3. Pricing theory and policies

4. Profit analysis with special reference to break-even point

5. Capital budgeting for investment decisions

6. The business firm and objectives

7. Competition.

Nature of Economics

Economics is a social science which deals with economic activities of people. People have unlimited wants, but the resources required to satisfy these wants are limited. Scarcity of resources in the presence of unlimited wants gives rise to all economic activities. If the resources were not scarce, there would not be any economic activity at all. With unlimited resources, a person could get as much as he would like to have without any work. Economics is rightly called the study of the allocation of resources for satisfying human wants.

Positive and Normative Economics

1. POSITIVE economics is concerned with what is;
2. NORMATIVE economics is concerned with what should be.

It was mentioned earlier that in principle there are more than one ways of solving the central problems of an economy. These different mechanisms in general are likely to give rise to different solutions to those problems, thereby resulting in different allocations of the resources and also different distributions of the final mix of goods and services produced in the economy. Therefore, it is important to understand which of these alternative mechanisms is more desirable for the economy as a whole. In economics, we try to analyse the different mechanisms and figure out the outcomes which are likely to result under each of these mechanisms. We also try to evaluate the mechanisms by studying how desirable the outcomes resulting from them are. Often a distinction is made between positive economic analysis and normative economic analysis depending on whether we are trying to figure out how a particular mechanism functions or we are trying to evaluate it. In positive economic analysis, we study how the different mechanisms function, and in normative economics, we try to understand whether these mechanisms are desirable or not. However, this distinction between positive and normative economic analysis is not a very sharp one. The positive and the normative issues involved in the study of the central economic problems are very closely related to each other and a proper understanding of one is not possible in isolation to the other.

Methods of Economics Analysis- Inductive and Deductive methods.

Analysis refers to studying a given topic in detail. Economic analysis refers to the investigation of a particular topic from the perspective of an economist. It includes conducting an in-depth study of various processes such as production, consumption,

consumer behaviour, national income, employment and others. It evaluates the given industry in detail with all the aspects associated with that particular industry. Moreover, the primary aim of economic analysis is to determine the effectiveness of operations within an economy. There are two types of economic study or economic analysis: Deductive Method and Inductive Method. Here, we take a look at these methods and also present an overview of the process of making the hypothesis.

Economic generalisations describe the laws or statements of tendencies in various branches of economics such as production, consumption, exchange and distribution of income. In the view of Robbins, economic generalisations or laws are statements of uniformities which describe human behaviour in the allocation of scarce resources between alternative ends.

The generalisations of economics like the laws of other sciences, state cause and effect relationships between variables and describe those economic hypotheses which have been found consistent with facts or, in other words, have been found to be true by empirical evidence. But a distinction may be drawn between a generalisation (law) and a theory. A law or generalisation just describes the relationship between variables; it does not provide any explanation of the described relation. On the other hand, a theory provides an explanation of the stated relation between the variables, that is, it brings out the logical basis of the generalisation. An economic theory or a model derives a generalisation through process of logical reasoning and explains the conditions under which the stated generalisation will hold true.

Deductive Method

Generalisations in economics have been derived in two ways:

(1) Deductive Method,

(2) Inductive Method.

The deductive method is also called abstract, analytical and a priori method and represents an abstract approach to the derivation of economic generalisations and theories.

The principal steps in the process of deriving economic generalisations through deductive logic are:

(1) Selecting the problem:

The problem which an investigator selects for enquiry must be stated clearly. It may be very wide like poverty, unemployment, inflation, etc. or narrow relating to an industry. The narrower the problem the better it would be to conduct the enquiry.

(2) Formulating Assumptions:

The next step in deduction is the framing of assumptions which are the basis of hypothesis. To be fruitful for enquiry, the assumption must be general. In any economic enquiry, more than one set of assumptions should be made in terms of which a hypothesis may be formulated.

(3) Formulating Hypothesis:

The next step is to formulate a hypothesis on the basis of logical reasoning whereby conclusions are drawn from the propositions. This is done in two ways: First, through logical deduction. If and because relationships (p) and (q) all exist, then this necessarily implies that relationship (r) exists as well. Mathematics is mostly used in these methods of logical deduction.

(4) Testing and Verifying the Hypothesis:

The final step in the deductive method is to test and verify the hypothesis. For this purpose, economists now use statistical and econometric methods. Verification consists in confirming whether the hypothesis is in agreement with facts. A hypothesis is true or not can be verified by observation and experiment. Since economics is concerned with human behaviour, there are problems in making observation and testing a hypothesis.

The Inductive Method

Induction "is the process of reasoning from a part to the whole, from particulars to generals or from the individual to the universal." Bacon described it as "an ascending process" in which facts are collected, arranged and then general conclusions are drawn.

The inductive method was employed in economics by the German Historical School which sought to develop economics wholly from historical research. The historical or inductive

method expects the economist to be primarily an economic historian who should first collect material, draw generalisations, and verify the conclusions by applying them to subsequent events. For this, it uses statistical methods. The Engel's Law of Family Expenditure and the Malthusian Theory of Population have been derived from inductive reasoning.

The inductive method involves the following steps:

1. The Problem: In order to arrive at a generalisation concerning an economic phenomenon, the problem should be properly selected and clearly stated.
2. Data: The second step is the collection, enumeration, classification and analysis of data by using appropriate statistical techniques.
3. Observation: Data are used to make observation about particular facts concerning the problem.
4. Generalisation: On the basis of observation, generalisation is logically derived which establishes a general truth from particular facts.
Thus induction is the process in which we arrive at a generalisation on the basis of particular observed facts.

The best example of inductive reasoning in economics is the formulation of the generalisation of diminishing returns. When a Scottish farmer found that in the cultivation of his field an increase in the amount of labour and capital spent on it was bringing in less than proportionate returns year after year, an economist observed such instances in the case of a number of other farms, and then he arrived at the generalisation that is known as the Law of Diminishing Returns.

Central Problems of an Economy – Production Possibility Curve

CENTRAL PROBLEMS OF AN ECONOMY

Production, exchange and consumption of goods and services are among the basic economic activities of life. In the course of these basic economic activities, every society has to face scarcity of resources and it is the scarcity of resources that gives rise to the problem of choice. An analysis of scarcity of resources and choice making poses three basic questions:

1. What to produce and how much to produce?
2. How to produce?

3. For whom to produce?

What is produced and in what quantities?

Every society must decide on how much of each of the many possible goods and services it will produce. Whether to produce more of food, clothing, housing or to have more of luxury goods. Whether to have more agricultural goods or to have industrial products and services. Whether to use more resources in education and health or to use more resources in building military services. Whether to have more of basic education or more of higher education. Whether to have more of consumption goods or to have investment goods (like machine) which will boost production and consumption tomorrow.

How are these goods produced?

Every society has to decide on how much of which of the resources to use in the production of each of the different goods and services. Whether to use more labour or more machines. Which of the available technologies to adopt in the production of each of the goods?

For whom are these goods produced?

Who gets how much of the goods that are produced in the economy? How should the produce of the economy be distributed among the individuals in the economy? Who gets more and who gets less? Whether or not to ensure a minimum amount of consumption for everyone in the economy. Whether or not elementary education and basic health services should be available freely for everyone in the economy.

Thus, every economy faces the problem of allocating the scarce resources to the production of different possible goods and services and of distributing the produced goods and services among the individuals within the economy. The allocation of scarce resources and the distribution of the final goods and services are the central problems of any economy.

The Production Possibilities Frontier

Just as individuals cannot have everything they want and must instead make choices, society as a whole cannot have everything it might want, either. This section of the chapter will explain the constraints society faces, using a model called the **production possibilities frontier (PPF)**. There are more similarities than differences between individual choice and social choice. There are more similarities than differences between individual choice and

social choice.
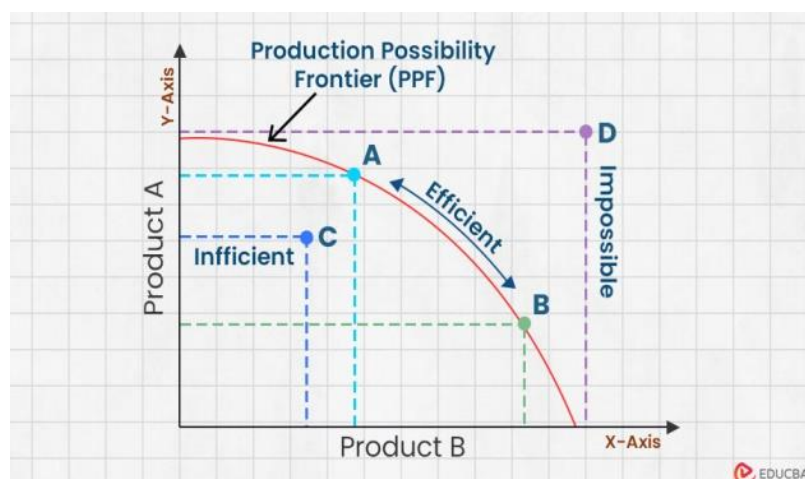
An allocation of the scarce resource of the economy gives rise to a particular combination of different goods and services. Given the total amount of resources, it is possible to allocate the resources in many different ways and, thereby achieving different mixes of all possible goods and services. The collection of all possible combinations of the goods and services that can be produced from a given amount of resources and a given stock of technological knowledge is called the production possibility set of the economy.

Consumer Behaviour

Cardinal Approach - Utility, Marginal Utility and Total Utility

Meaning of Utility: - its economic meaning, the term *utility* refers to the benefit or satisfaction or pleasure a person gets from the consumption of a commodity or service. In abstract sense, *utility* is the power of a commodity to satisfy human want, i.e., *utility* is want-satisfying power. A commodity is likely to have utility if it can satisfy a want. For example, rice has the power to satisfy hunger; water quenches our thirst; books fulfill our desire for having knowledge, and so on.
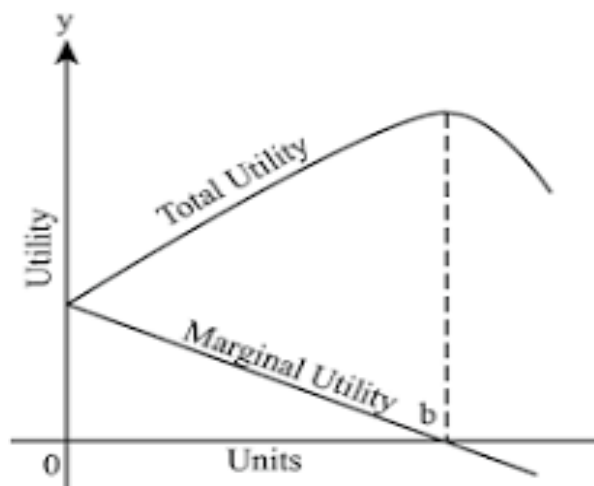
The Cardinal Utility Approach

Cardinal Utility Analysis:- Cardinal utility analysis assumes that level of utility can be expressed in numbers. For example, we can measure the utility derived from a shirt and say, this shirt gives me 50 units of utility. Before discussing further, it will be useful to have a look at two important measures of utility.

Measures of Utility

Total Utility: Total utility of a fixed quantity of a commodity (TU) is the total satisfaction derived from consuming the given amount of some commodity x. More of commodity x provides more satisfaction to the consumer. TU depends on the quantity of the commodity consumed. Therefore, TU_n refers to total utility derived from consuming n units of a commodity x.

Marginal Utility:- Marginal utility (MU) is the change in total utility due to consumption of one additional unit of a commodity. For example, suppose 4 bananas give us 28 units of total utility and 5 bananas give us 30 units of total utility. Clearly, consumption of the 5th banana has caused total utility to increase by 2 units (30 units minus 28 units). Therefore, marginal utility of the 5th banana is 2 units. $MU_5 = TU_5 - TU_4 = 30 - 28 = 2$ In general, $MU_n = TU_n - TU_{n-1}$, where subscript n refers to the n th unit of the commodity Total utility and marginal utility can also be related in the following way. $TU_n = MU_1 + MU_2 + \ldots + MU_{n-1} + MU_n$ This simply means that TU derived from consuming n units of bananas is the sum total of marginal utility of first banana (MU_1), marginal utility of second banana (MU_2), and so on, till the marginal utility of the n th unit.

The Law of Diminishing Marginal Utility

This law is the main instrument used in the cardinal utility analysis of the consumer behavior. It explains why the demand curve of a specific commodity is downward sloping? It also explains the elasticity of demand for a product. Except these, there are many other applications of this law in our everyday life.

Law of Diminishing Marginal Utility
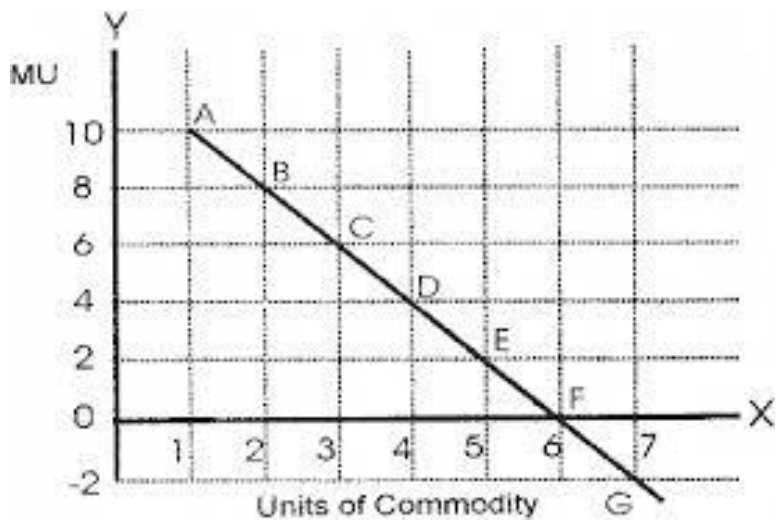
Main theme of the law

The additional units of a specific commodity are worth less and less to a consumer as more of the commodity she/he consumes. Law of Diminishing Marginal Utility states that marginal utility from consuming each additional unit of a commodity declines as its consumption increases, while keeping consumption of other commodities constant. MU becomes zero at a level when TU remains constant. In other words, marginal utility of a specific commodity declines as more of it is consumed.

Law of Equi-Marginal Utility

Law of Equi-Marginal Utility

This law is based on the principle of obtaining maximum satisfaction from a limited income. It explains the behavior of a consumer when he consumes more than one commodity.

The law states that a consumer should spend his limited income on different commodities in such a way that the last rupee spent on each commodity yield him equal marginal utility in order to get maximum satisfaction.

Suppose there are different commodities like A, B, …, N. A consumer will get the maximum satisfaction in the case of equilibrium i.e.,

$$MU_A / P_A = MU_B / P_B = \ldots = MU_N / P_N$$

Where MU's are the marginal utilities for the commodities and P's are the prices of the commodities.

Assumptions of the Law

- There is no change in the price of the goods or services.

- The consumer has a fixed income.

- The marginal utility of money is constant.

- A consumer has perfect knowledge of utility.

- Consumer tries to have maximum satisfaction.

- The utility is measurable in cardinal terms.

- There are substitutes for goods.

- A consumer has many wants.

Ordinal Approach-Indifference curve- Meaning and Characteristics, Consumer's Equilibrium

The Concept of Ordinal Utility

The word *ordinal* is synonymous to the word *rank.* We know that rank is not a quantity; rather it indicates the position of something in a group in terms of magnitude or satisfaction or any other attributes. The *ordinal utility* is the expression of the consumer's preference for one commodity over another or one basket of goods over another, but not a numerical figure of utility derived from different commodities or baskets. So, *ordinal utility analysis* is a more advanced explanation of consumer behavior than *cardinal utility analysis.*

Let's now discuss *indifference curve analysis* which is based on the ordinal utility concept.

Indifference Curve Analysis

Two geometric devices are used in this analysis: *indifference curves* and *budget lines.* Both of them are the locus of various combinations of two commodities. However, the first one is concerned with those combinations from which the consumer gets same satisfaction or she/he is indifferent among them, while the second one is concerned with such combinations or bundles which she/he can afford by spending the same amount of money.
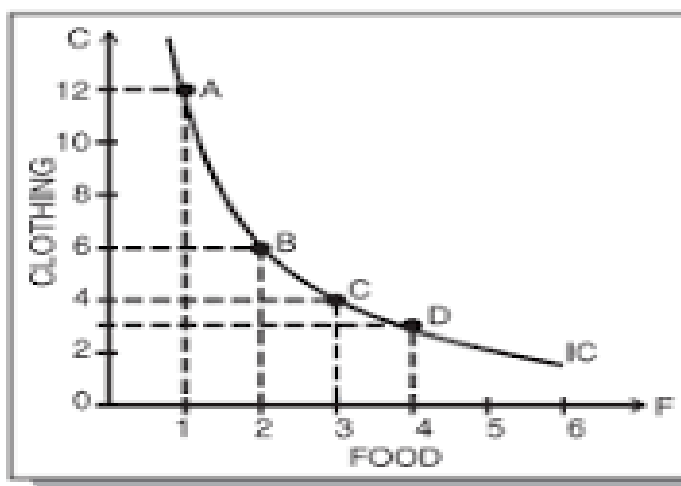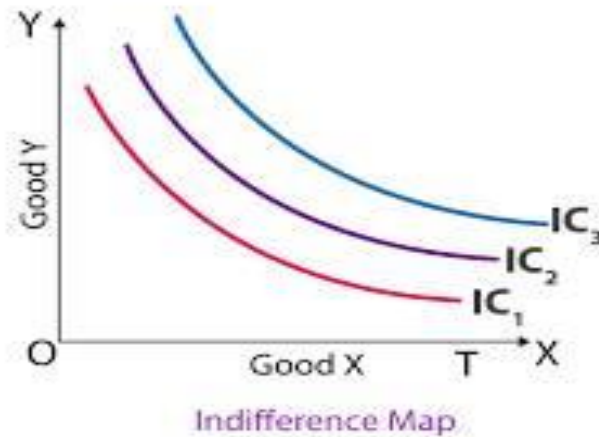

Fig. 1 : A Consumer's Indifference Curve

Indifference Map

Indifference Curve: What the Consumer Prefers

An indifference curve is the locus of points which indicates various combinations of two commodities that yield the same level of satisfaction or utility to the consumer. So, the indifference curves embody subjective information about consumer preferences for two commodities.

Properties of the indifference curve

The indifference curve has the following basic properties:

Downward sloping: The indifference curve is downward sloping, which implies that: the two commodities can be substituted for each other; and if quantity of one commodity decreases, quantity of the other commodity must increase if the consumer has to stay at the same level of satisfaction. Technically, the slope of the indifference curve is called the *Marginal Rate of Substitution (MRS),* because it shows the rate, at the margin, at which the consumer will substitute one good for the other to remain equally satisfied.

Convex to the origin: Downward slope is the necessary, not sufficient, property of the indifference curve. As viewed from the origin, a downward sloping curve can be concave (bowed outward) or convex (bowed inward). The indifference curve is convex to the origin, which means that slope of the indifference curve, the marginal rate of substitution, diminishes as we move down the curve. The diminishing slope of the indifference curve means the willingness to substitute one commodity (orange) for the other (Apple) diminishes as one move down the curve.

Indifference curves do not intersect nor be tangent to one another: By definition, we know that along an indifference curve the consumer's satisfaction remains the same. If indifference curves intersect, the point of their intersection would imply two different levels of satisfaction, which is impossible.

Upper indifference curves represent higher level of satisfaction than the lower ones: The further away from the origin an indifference curve lies, the higher the level of utility it denotes. Bundles of commodities on an upper indifference contain a larger quantity of one or both of the commodities than the lower indifference curve. Thus bundles of commodities on a higher indifference curve are more preferred by the rational consumer

Law of Demand and its exceptions - Giffen goods
Demand

We studied the choice problem of the consumer and derived the consumer's optimum bundle given the prices of the goods, the consumer's income and her preferences. It was observed that the amount of a good that the consumer chooses optimally, depends on the price of the good itself, the prices of other goods, the consumer's income and her tastes and preferences. The quantity of a commodity that a consumer is willing to buy and is able to afford, given prices of goods and consumer's tastes and preferences is called demand for the commodity. Whenever one or more of these variables change, the quantity of the good chosen by the consumer is likely to change as well. Here we shall change one of these variables at a time and study how the amount of the good chosen by the consumer is related to that variable.

Law of Demand

Law of Demand states that other things being equal, there is a negative relation between demand for a commodity and its price. In other words, when price of the commodity increases, demand for it falls and when price of the commodity decreases, demand for it rises, other factors remaining the same.

A basic economic hypothesis about the relationship between price and quantity demanded is as: "Other things remaining the same, the higher the price of a commodity, the smaller the

quantity demanded and the lower the price of a commodity, the higher the quantity demanded." Economists call this relationship the

Law of demand. Here, *other things* indicate the determining factors of quantity demanded other than commodity's own price.
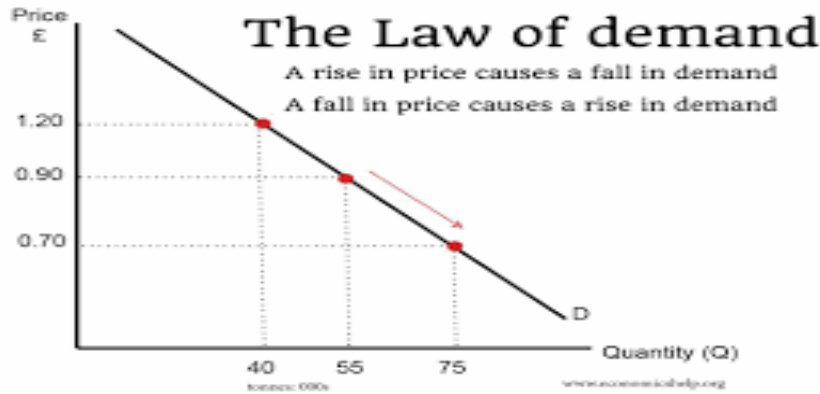
Demand Schedule	
Px	Dx
5	100
4	200
3	300
2	400
1	500
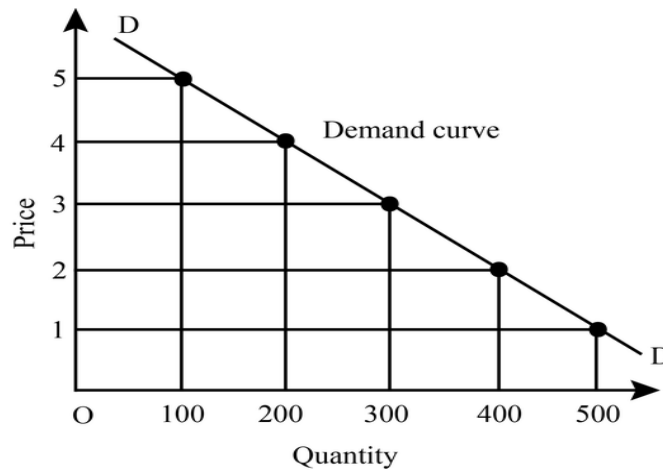
Giffen Goods. An exception to this law is also the classic case of Giffen Goods named after Robert Giffen (1837-1910). A Giffen Good does not mean any specific commodity. It may be any commodity much cheaper than its substitutes, consumed mostly by the poor households claiming a large part of their incomes. If price of such a good increases (price of its substitute remaining constant), its demand increases instead of decreasing.

A rise in the purchasing power (income) of the consumer can sometimes induce the consumer to reduce the consumption of a good. In such a case, the substitution effect and the income effect will work in opposite directions. The demand for such a good can be inversely or positively related to its price depending on the relative strengths of these two opposing effects. If the substitution effect is stronger than the income effect, the demand for the good and the price of the good would still be inversely related. However, if the income effect is

stronger than the substitution effect, the demand for the good would be positively related to its price. Such a good is called a *Giffen good.*

The quantity of a good that the consumer demands can increase or decrease with the rise in income depending on the nature of the good. For most goods, the quantity that a consumer chooses, increases as the consumer's income increases and decreases as the consumer's income decreases. Such goods are called **normal goods**. Thus, a consumer's demand for a normal good moves in the same direction as the income of the consumer. However, there are some goods the demands for which move in the opposite direction of the income of the consumer. Such goods are called **inferior goods**. As the income of the consumer increases, the demand for an inferior good falls, and as the income decreases, the demand for an inferior good rises. Examples of inferior goods include low quality food items like coarse cereals.

Elasticity of Demand-Price, Income

What Is Elasticity?

Elasticity is the ratio which measures the responsiveness or sensitiveness of a dependent variable to the changes in any of the independent variables. Specifically, the term *elasticity* refers to the percentage change in dependent variable divided by the percentage change in independent variable. That is,

If Y = f (X), i.e., Y depends on X, then the elasticity of Y with respect to X is as follows:

Percentage change in Y %ΔY

Elasticity of Y = ---------------------------- = ----------

Percentage change in X %ΔX

If Y = f (X1, X2... Xn), then we can calculate elasticity of Y with respect all X's, which is called total elasticity, as follows:

or we can calculate the elasticity of Y with respect to each of the X's, which is called partial *Elastici*ty.

Price Elasticity of Demand

Price elasticity of demand is the ratio of the percentage change in quantity demanded of a product to the percentage change in price. Economists employ it to understand how supply and demand change when a product's price changes.

Types of Price Elasticity of Demand

If the percentage change in quantity demanded divided by the percentage change in price equals:	It is known as:	Which means:
Infinity	Perfectly elastic	Changes in price result in demand declining to zero
Greater than 1	Elastic	Changes in price yield a significant change in demand
1	Unitary	Changes in price yield equivalent (percentage) changes in demand
Less than 1	Inelastic	Changes in price yield an insignificant change in demand
0	Perfectly inelastic	Changes in price yield no change in demand

$$PED = abs\left[\frac{\%\Delta \text{ Quantity Demanded}}{\%\Delta \text{ Price}}\right]$$

$$\%\Delta Q_d = \frac{Q_1 - Q_0}{(Q_1 - Q_0)/2} \qquad \%\Delta P = \frac{P_1 - P_0}{(P_1 - P_0)/2}$$
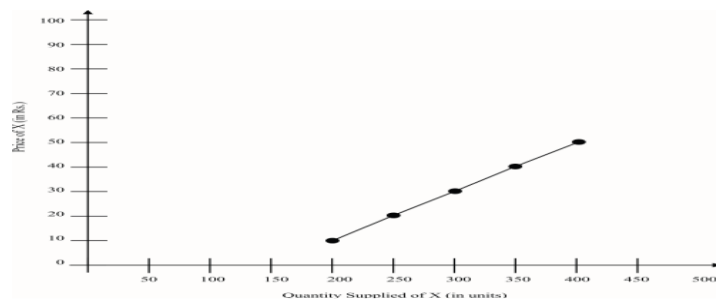
Production

Law of supply

Supply is a schedule which shows the amounts of a product a producer is willing and able to produce and make available for sale at each price in a series of possible prices during a specified period. The amount the firms are willing to sell (desired sales) may not be the same as the amount they succeed in selling. Desired sales many not be equal to the actual sales.

Law of Supply

According to the Law of Supply, other things remaining constant, higher the price of a commodity, higher will be the quantity supplied and vice versa. There is a positive relationship between supply and price of a commodity.

The law of supply also assumes that other things are held constant. Other variables, like price of inputs used in production, technology, producers' expectations and number of producers in the market, might change, causing a shift in supply.

Production function

A production function is a function that specifies the output of a firm, an industry, or an entire economy for all combinations of inputs. In other words, it shows the functional relationship between the inputs used and the output produced. The production function of a firm is a relationship between inputs used and output produced by the firm. For various quantities of inputs used, it gives the maximum quantity of output that can be produced.

One possible example of the form this could take is:

$q = K \times L$,

Where, q is the amount of wheat produced, K is the area of land in hectares, L is the number of hours of work done in a day. Describing a production function in this manner tells us the exact relation between inputs and output. If either K or L increase, q will also increase. For any L and any K, there will be only one q. Since by definition we are taking the maximum output for any level of inputs, a production function deals only with the efficient use of inputs. Efficiency implies that it is not possible to get any more output from the same level of

inputs. A production function is defined for a given technology. It is the technological knowledge that determines the maximum levels of output that can be produced using different combinations of inputs. If the technology improves, the maximum levels of output obtainable for different input combinations increase. We then have a new production function.

Law of variable proportions

If all inputs of a firm are fixed and only the amount of labour services differs, then any decrease or increase in output is achieved with the help of changes in the amount of labour services used. When the firm changes the amount of labour services only, it changes the proportion between the fixed input and the variable input. As the firm keeps on changing this proportion by changing the This law states that, As more and more of the factor input is employed, all other input quantities remaining constant, a point will finally be reached where additional quantities of varying input will produce diminishing marginal contributions to total product.

Fig. 11.1
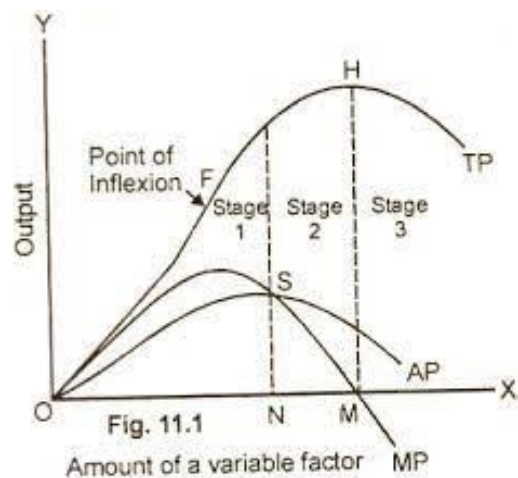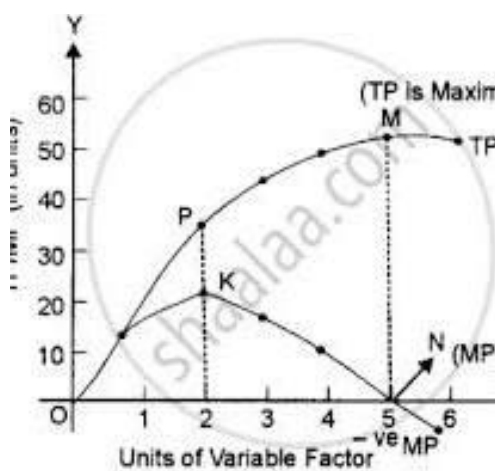
MP begins to fall before the AP does. The reason is that the AP attributes the increase in TP equally to all the units of the variable factor whereas the MP, by definition, attributes the increase in TP to the marginal unit of the variable factor. If the MP is greater than the AP, the AP rises and if the MP is less than the AP, then the AP falls.

Returns to scale all inputs are changed at the same time (possible only in the long run), and suppose are increased proportionately, then the concept of returns to scale has to be used to understand the behaviour of output. The behaviour of output is studied when all factors of

production are changed in the same direction and proportion. In the long run, output can be increased by increasing the 'scale of operations'. When we speak of increasing the 'scale of operations' we mean increasing all the factors at the same time and by the same proportion.

Concept of Revenue and Cost-Total , Average and Marginal

The revenue is defined as the total income a business receives from selling a good or service to its customers. The cost is defined as the total expenses that are incurred in the production of goods or services by any individual or organisation. If the revenue increases, it will lead to a rise in the gross margin.

The cost is defined as the total expenses that are incurred in the production of goods or services by any individual or organisation. The cost of production is one of the major items that impact the gross margin, and it also affects the profitability of a company.
Marginal cost is the addition to the total cost for producing one additional unit. Average cost is the total cost divided by the total number of units produced.

The average cost is the average price of goods and services. When we have multiple products to sell or buy, of almost the same value, the average of these values will give the average cost price. It helps shopkeepers in the buying and selling process.

The average cost is the ratio of the total of cost of all the products to the total number of products. In Maths, we also have the term called "average". The average of any given set of data is called the mean of data. But in case of business, where profit and loss are the key features, the average is said to be the right term.

In economics, marginal cost is the change in the total cost when the quantity produced changes by one unit. It is the cost of producing one more unit of a good. Marginal cost includes all of the costs that vary with the level of production.

Market, factor pricing and welfare economics

Meaning and Classification of Market

When we talk about a market we generally visualize a crowded place with a lot of consumers and a few shops. People are buying various goods like groceries, clothing, electronics, etc. And the shops are also selling a variety of products and services as well. So in a traditional sense, a market is where buyers and seller meet to exchange goods and services.

Now we have seen what a market is. Let us learn more about the classification of markets. Broadly there are two classifications of markets – the product market and the factor market. The factor market refers to the market for the buying and selling of factors of production like land, capital, labor, etc. The other classification of markets is as follows:-

- **Local Markets:** In such a market the buyers and sellers are limited to the local region or area. They usually sell perishable goods of daily use since the transport of such goods can be expensive.

- **Regional Markets:** These markets cover a wider are than local markets like a district, or a cluster of few smaller states.

- **National Market:** This is when the demand for the goods is limited to one specific country. Or the government may not allow the trade of such goods outside national boundaries.

- **International Market:** When the demand for the product is international and the goods are also traded internationally in bulk quantities, we call it an international market.

Perfect competition-Meaning and characteristics

Perfect Competition Market: A perfectly competitive market is one in which the number of buyers and sellers is very large, all engaged in buying and selling a homogeneous product without any artificial restrictions and possessing perfect knowledge of market at a time. According to R.G. Lipsey, "Perfect competition is a market structure in which all firms in an industry are price- takers and in which there is freedom of entry into, and exit from, industry." Characteristics of Perfect Competition: The following are the conditions for the existence of perfect competition:

(1) **Large Number of Buyers and Sellers**: The first condition is that the number of buyers and sellers must be so large that none of them individually is in a position to influence the price and output of the industry as a whole. The demand of individual buyer relative to the total demand is so small that he cannot influence the price of the product by his individual action. The individual seller is unable to influence the price of the product by increasing or decreasing its supply. Rather, he adjusts his supply to the price of the product.

(2)) **Freedom of Entry or Exit of Firms:** The next condition is that the firms should be free to enter or leave the industry. It implies that whenever the industry is earning excess profits, attracted by these profits some new firms enter the industry. In case of loss being sustained by the industry, some firms leave it.

(3) **Homogeneous Product:** Each firm produces and sells a homogeneous product so that no buyer has any preference for the product of any individual seller over others. This is only possible if units of the same product produced by different sellers are perfect substitutes. No seller has an independent price policy. Commodities like salt, wheat, cotton and coal are homogeneous in nature. He cannot raise the price of his product.

(4) **Perfect Mobility of Goods and Factors:** Another requirement of perfect competition is the perfect mobility of goods and factors between industries. Goods are free to move to those places where they can fetch the highest price. Factors can also move from a low-paid to a high-paid industry.

(5) **Perfect Knowledge of Market Conditions:** Buyers and sellers possess complete knowledge about the prices at which goods are being bought and sold, and of the prices at which others are prepared to buy and sell. perfect knowledge of market conditions forces the sellers to sell their product at the prevailing market price and the buyers to buy at that price.

(6) **Absence of Selling Costs**: Under perfect competition, the costs of advertising, sales-promotion, etc. do not arise because all firms produce a homogeneous product.

Determination of Price and Output under perfect competition

In perfect competition, sellers and buyers are fully aware about the current market price of a product. Therefore, none of them sell or buy at a higher rate. As a result, the same price prevails in the market under perfect competition.

Under perfect competition, the buyers and sellers cannot influence the market price by increasing or decreasing their purchases or output, respectively. The market price of products in perfect competition is determined by the industry. This implies that in perfect competition, the market price of products is determined by taking into account two market forces, namely market demand and market supply.

In the words of Marshall, "Both the elements of demand and supply are required for the determination of price of a commodity in the same manner as both the blades of scissors are required to cut a cloth." As discussed in the previous chapters, market demand is defined as a sum of the quantity demanded by each individual organization in the industry.

On the other hand, market supply refers to the sum of the quantity supplied by individual organizations in the industry. In perfect competition, the price of a product is determined at a point at which the demand and supply curve intersect each other. This point is known as equilibrium point as well as the price is known as equilibrium price. In addition, at this point, the quantity demanded and supplied is called equilibrium quantity. Let us discuss price determination under perfect competition in the next sections.

Demand under Perfect Competition:

Demand refers to the quantity of a product that consumers are willing to purchase at a particular price, while other factors remain constant. A consumer demands more quantity at lower price and less quantity at higher price. Therefore, the demand varies at different prices.
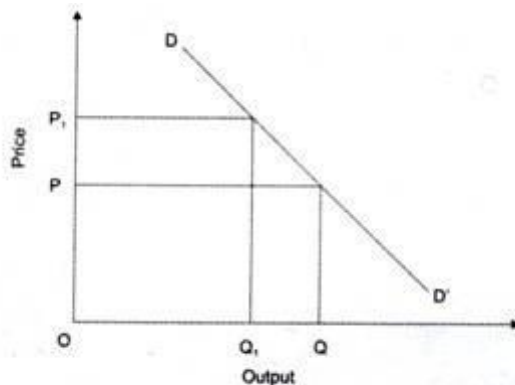

Figure-1: Demand Curve under Perfect Competition

Supply under Perfect Competition:

Supply refers to quantity of a product that producers are willing to supply at a particular price. Generally, the supply of a product increases at high price and decreases at low price.
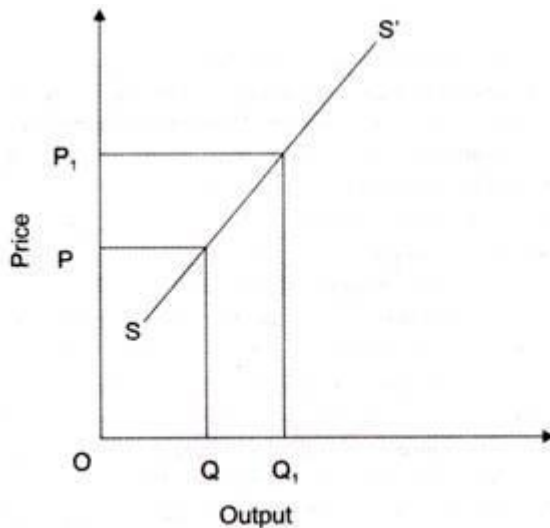
Figure-2: Supply Curve under Perfect Competition

Equilibrium under Perfect Competition:

As discussed earlier, in perfect competition, the price of a product is determined at a point at which the demand and supply curve intersect each other. This point is known as equilibrium point. At this point, the quantity demanded and supplied is called equilibrium quantity.
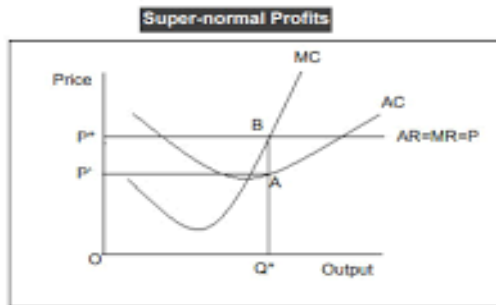
Determination of Price and Output under Monopoly

Monopoly refers to a market structure in which there is a single producer or seller that has a control on the entire market.

This single seller deals in the products that have no close substitutes and has a direct demand, supply, and prices of a product.

Therefore, in monopoly, there is no distinction between an one organization constitutes the whole industry.

Concept of Welfare Economics

Welfare economics is the study of how the allocation of resources and goods affects social welfare. This relates directly to the study of economic efficiency and income distribution, as well as how these two factors affect the overall well-being of people in the economy.

Welfare economics is the study of how economic policies, the allocation of resources, specific market structures, and the distribution of income impact the social welfare of individuals and society as a whole. In this way, welfare economists are concerned with the distribution of economic resources and the efficiency of the economy as well as how these two factors interact with the overall well-being of people in a society. The purpose of welfare economics is to develop theories and models that can be used to improve the economic and social welfare of people in a society as well as ensure the equitable distribution of resources and income.