

Unit 1st Consumer Behavior

Q. What do you mean by Micro Economics?

Ans. Micro Economics: - The word micro is derived from a Greek word "**Mikros**" which means small. It studies the behaviour of individual units rather than all the combined units of an economy. For example, Individual household, pricing of a firm, wages of a worker, profits of an entrepreneur, and so on. Micro economics can be regarded as the microscopic study of the economy. Its main tools are demand and supply. According to Shapiro "Micro economics deals with small parts of the economy."

Q. What is the significance or importance of micro economics?

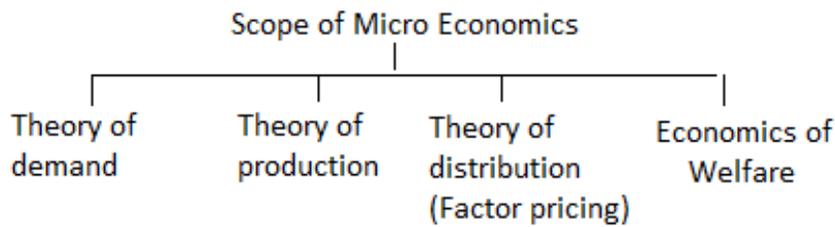
- Micro economics has both theoretical as well as practical importance. It is highly helpful in the formulation of economic policies of an economy to promote overall welfare of its population.
- Micro economics tells us how goods and services produced are distributed among the various people for consumption through price or market mechanism.
- Micro economic theory shows how economic efficiency is achieved when there prevails perfect competition in the product and factor market.
- Micro economic analysis is also usefully applied to the various branches of economics such as public finance and international economics.
- In international economics micro economics analysis is applied to show the gains from trade.
- Microeconomics is of great importance in understanding the working of free enterprise economy without any central planning and control.
- Micro economics provides the basis for welfare economics. The entire structure of welfare economics has been built on price theory which is an ingredient of micro economics.
- Microeconomics is helpful in the efficient employment of the limited resources of a country. The principal problem faced by the modern governments is the allocation of its scarce resources among competing uses.
- The greatest advantage of micro economics is that it provides the basis for welfare economics. The entire structure of welfare economics has been built on price theory which is an ingredient of micro economics.

Q. Explain scope of Micro economics?

Ans. Micro economic analysis is used to study the following problems and concepts:

1. **Theory of demand:** In the theory of demand we study the concept of individual demand and market demand, elasticity of demand, equi-marginal principle, consumer's surplus etc.
2. **Theory of production:** It deals with various factors of production, production function, and optimum combination of inputs to maximize the output, returns to a variable factor and returns to scale.
3. **Theory of price determination:** It deals with the determination of commodity price by a firm under different market structures.
4. **Theory of factor pricing:** It deals with the determination of rent, wages, interest and profit.
The above can be summed up in the following diagram.

5. **The theory of economic welfare.** It is sometimes referred to as Price theory. Thus the prices are the core of microeconomics.



Q. What are the Limitations of micro economics?

1. It fails to explain the working of the whole economy. As it throws light upon the activities of individual units.
2. Micro economics is based on the assumption of full employment in the economy. But in real life full employment does not exist.
3. Whatever is true to an individual unit may not be true for the group as a whole.
4. Micro economic theories assume national income, employment, savings and investment as constant factors. In reality these factors are not constant.
5. There are certain problems which cannot be analysed with the aid of micro economics. For example, important problems relating to public finance, monetary policy and fiscal policy etc. are beyond the purview of microeconomics.

Q: Meaning of utility:

Ans: utility is the power of a good or a service to satisfy a human want. Utility is thus the satisfaction which is derived by the consumer by consuming the goods. For example, cloth has a utility for us because we can wear it. Pen has a utility who can write with it. Utility in economics is devoid of legal, social or ethical implications.

Q. What are the characteristics of utility?

Ans: The following are the, most important characteristics of utility:

1. Utility depends upon the intensity of want.
2. Utility is subjective, i e, it cannot be quantified.
3. Utility has got no social or ethical implication.
4. Utility is relative. It changes from person to person, place to place, and from time to time.

Q. Define utility function?

Ans. Utility function explains the relationship between the utility of a commodity and the units of the commodity consumed. Symbolically,

$U = f(x_1, x_2, x_3 \dots \dots \dots x_n)$. Where U denotes total utility if there are 'n' commodities in a bundle with quantities $x_1, x_2, x_3 \dots \dots \dots x_n$.

Q. Define Initial utility?

Ans: Initial utility refers to the utility which is derived by consuming first unit of a commodity. E.g. taking a first cup of tea to reduce fatigue is the initial utility.

Q: Define marginal utility:

Ans: Marginal utility is the utility derived from the additional unit of a commodity or the last unit consumed. It is an increase in total utility derived from the consumption of one additional unit. More precisely, marginal utility is the change in the total utility resulting from the consumption of one additional unit. That is,

$$MU = \Delta TU / \Delta C$$

Where ΔTU = change in total utility, and ΔC = change in consumption by one unit.

Marginal utility can also be expressed as. Symbolically: $MU_n = TU_n - TU_{n-1}$ where TU_n = total utility derived from the consumption of n units and TU_{n-1} = TU derived from the consumption of $n-1$ units.

Q: Define Total utility?

Ans: It is the sum of all the utilities derived from the total number of units of a commodity consumed. In other words it is the sum of the marginal utilities associated with the consumption of successive units.

Symbolically:

$$TU_n = U_1 + U_2 + U_3 + \dots + U_n$$

Where: TU_n = Total utility from n units of a given commodity.

$U_1, U_2, U_3, \dots, U_n$ = utility from 1st, 2nd, 3rd ----- n^{th} unit.

n = number of units consumed.

Q. Define positive Marginal Utility?

Ans: It means when total utility increases by consuming an additional unit of commodity. It is known as positive marginal utility.

Q. Define Negative Marginal Utility?

Ans: It means by consuming an additional unit of a commodity, total utility of a commodity declines. It is termed as negative marginal utility.

Q. Define zero utility?

Ans. It means when consumption of an additional unit causes no change in total utility. Marginal utility in this case will be zero.

Q: Explain cardinal utility? What are its assumptions?

Ans: The utility that a consumer gets after consuming different units of commodity can be measured cardinally. I.e. added, subtracted and compared. E.g. if the utility of one apple is 10 utils, of a banana 20 utils and of an orange 40 units, the utility of a banana is double that of an apple..The unit of measurement of utility may be called a 'util'. When a utility statement is tabulated as a schedule of utility, it is referred to as the cardinal measurement of utility.

Q. What are the assumptions of cardinal utility?

Ans: The main assumption or premises on which the cardinal utility analysis rests are as under.

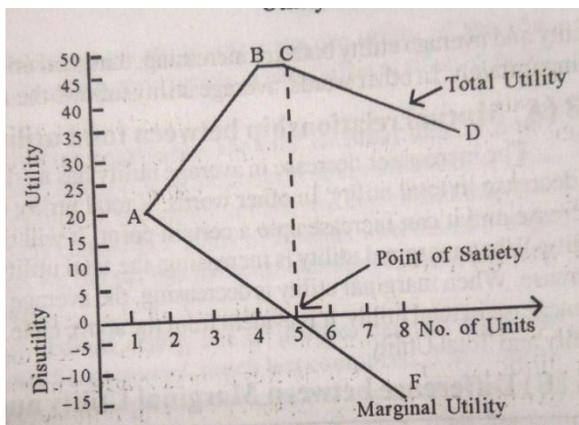
- (i) Rationality. (ii) Utility is cardinally measurable.
- (iii) Marginal utility of money remains constant.
- (iv) Diminishing marginal utility.
- (v) Independent utilities. (vi) Introspection method.

Q. Explain relationship between TU and MU?

Ans: Total utility is the sum of all the utilities derived from the various units of the same commodity. While marginal utility is the change in the total utility resulting from the consumption of one additional unit. The relationship between MU and TU can be understood with the help of following table.

Units	Marginal utility	Total utility
1	20	20
2	15	35
3	10	45
4	5	50
5	0 Zero utility	← 50 → point of satiety
6	-5	45
7	-15	35
8	-20	30

Here, upto 4th unit of consumption, the consumer gets positive utility (though at decreasing rate). At 5th unit the MU becomes Zero. This is the point of satiety. Even if after 5th unit, the consumer continues his consumption, dissatisfaction starts and the MU becomes negative.



In the above diagram MU is decreasing upto the consumption of 5th unit at a positive rate. At point E, The 5th unit of consumption gives zero utility. If the consumer still continues the consumption, the 6th, 7th and 8th unit of consumption will give negative utility. (from E to F point).

Q. Difference between marginal utility and total utility?

Ans:

No.	Basis	Marginal Utility	Total Utility
1.	Meaning	The utility which is derived from the last unit of a commodity consumed is the marginal utility	The sum total of the utilities of all the units of a commodity is known as total utility.
2.	Effect	Marginal utility decreases as the consumption increases.	Total utility goes on increasing with the increase in consumption.
3.	Contribution	Marginal utility contributes a lot in price determination.	Total utility has no role in price determination.

4.	Point of satiety	Marginal utility becomes zero at the point of satiety.	The total utility is maximum at the point of satiety.
----	-------------------------	--	---

Q: Explain the law of diminishing marginal utility?

Ans: This fundamental law of economics was significantly explained by Gossen; later on it was developed by Marshall. . Law of diminishing marginal utility states that as more and more standard Units of a commodity are continuously consumed, marginal utility, derived from every additional unit must decline . Suppose a hungry man is consuming successive units of oranges. The first orange has great utility for him. The second orange would not give him as much satisfaction as the first one. Thus the utility obtained from the successive oranges goes down or diminishing. A point will soon be reached where marginal utility drops to zero. This point is called satiety. As seventh unit in the below table. If the consumption of oranges is continued still further, the man would get disutility instead of any utility. It is also called fundamental law of satisfaction or fundamental psychological law.

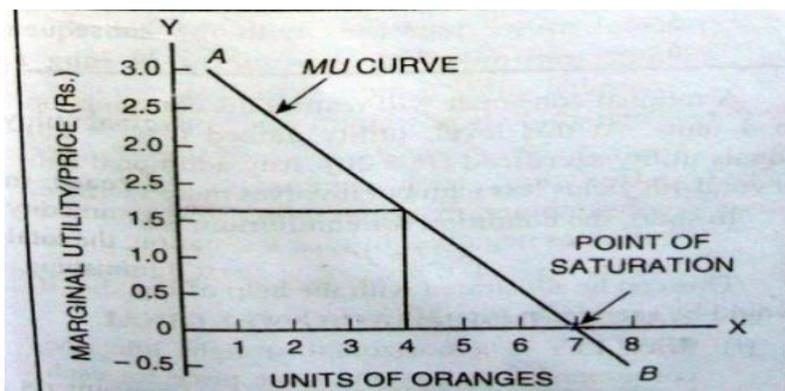
❖ **This law can be explained with the help of following table.**

Marginal Utility of Oranges

Units of Orange	Marginal Utility (in rupees)
1	3.0
2	2.5
3	2.0
4	1.5
5	1.0
6	0.5
7	0.0 (point of Satiety)
8	- 0.5

It is clear from the table that marginal utility goes on diminishing. From the seventh unit the consumer does not get any utility, i.e., marginal utility falls to zero. It is called the point of saturation. After seventh unit He gets negative marginal utility.

❖ **Graphic illustration of the law:** Marginal utility goes on declining as we consume more units of the commodity. Therefore, marginal utility curve is down word sloping It is clear from the table and diagram it becomes zero at 7th unit. After this point every additional unit gives negative utility and MU curve goes down through x-axies.



❖ **Assumptions of the law of diminishing marginal utility**

1. Consumption of a commodity should be in proper units.
2. All units of the commodity should be identical.
3. Consumption should be continuous.
4. Time period of consumption should not be too long.
5. The price of substitute goods should not change.
6. Utility can be measured.
7. Marginal utility of money remains constant.
8. Rational consumer.
9. Independent utilities.

Q. Define consumer's equilibrium? How is it determined in case of commodity?

Ans. A consumer attains his equilibrium when he maximizes his total utility given his income, consumption expenditure and price of commodity he consumes. This happens when marginal utility (MU) of the commodity he is consuming is equal to its price in the market. In other words Consumer will attain its equilibrium at the point where marginal utility of a product divided by the marginal utility of a rupee is equal to the price of the commodity.

The cardinal utility approach to consumer's equilibrium is based on the following assumptions.

- (i) Rationality.
- (ii) Utility is cardinally measurable.
- (iii) Marginal utility of money remains constant.
- (iv) Diminishing marginal utility.
- (v) Limited money income.
- (vi) Utility is additive.

➤ **Determination of consumer's equilibrium in case of one commodity:**

In case of single commodity, consumer attains equilibrium, when $\frac{MU_x}{P_x} = MU_m$. Or $\frac{MU_x}{MU_m} = P_x$. It implies that in state of equilibrium, ratio of MU_x and MU_m is equal to price of commodity.

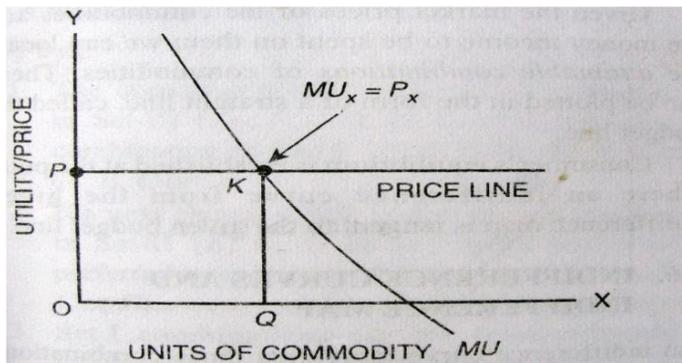
$MU_x = P_x$: It implies that in state of equilibrium, marginal utility derived from the consumption of a commodity is equal to its price.

➤ **Explanation of Consumer's equilibrium with the help of Marginal utility schedule.**

Units of Commodity	MU	Price (= Rs. 20)
1	65	20
2	45	20
3	30	20
4	20	20
5	0	20
6	15	20

A rational consumer will restrict his consumption to 4 units. At this point marginal utility ($MU_x = 20$) is equal to the price ($P_x = 20$). In short, the condition for equilibrium trucks here I.e. $MU_x = P_x$

➤ **Explanation of Consumer's equilibrium with the help of diagram.**



The consumer will stop the consumption of the commodity at point Q. Beyond Q, the consumer gets lesser satisfaction than what he has to pay for each unit. Equilibrium takes place at point K. The equilibrium condition can also be expressed as: $\frac{MU_x}{P_x} = MU_m$.

Q. Explain the consumer's equilibrium in case of two or multiple commodities?

Ans. The consumer is said to be in equilibrium when he distributes his expenditure among the various goods and services in the market in such a way as to attain the highest sum total of satisfaction. He switches his expenditure from one commodity to other in accordance with their marginal utility. He continues until he reaches a stage where MU of each commodity per unit of money expenditure is the same. This is called the law of equi marginal utility.

❖ Conditions of equilibrium in case of two commodities are as:

- (i) Ratio of Marginal Utility (MU) to price is same in case of both the goods.
- (ii) Marginal utility (MU) falls as consumption increases:

A consumer will be at equilibrium when he spends his limited income in such a way that the ratios of marginal utilities and their respective prices are equal and marginal utility falls as consumption increases. In case of two goods consumer's equilibrium can be stated as. $\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_m$.

As marginal utility of money (MU_m) is assumed to be constant, the above equilibrium condition can be restated as: $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$ or $\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$

When $P_x = P_y$, then equilibrium condition can be restated as: $MU_x = MU_y$

(ii) Marginal utility (MU) falls as consumption increases: If MU does not fall as consumption increases, the consumer will end up buying only one good which is unrealistic and consumer will never reach the equilibrium position.

Conclusion: A consumer in consumption of two commodities will be at equilibrium when he spends his limited income in such a way that the ratios of marginal utilities and their respective prices are equal and marginal utility falls as consumption increases.

➤ Explanation of consumers equilibrium in two goods with the help of an example:

Symbolically, consumer is in equilibrium when $MU_X = MU_Y$ in this situation, total utility will be the maximum; any change from this situation will only result in a fall in total utility. Example: following is the utility schedule of a consumer for two commodities A and B.

Units of commodity	MU_A	MU_B
1	20	30
2	14	16
3	12	6
4	6	0
5	0	-5

1. Money income of the consumer is Rs 7

2. The price of A and B is Rs 1 each.

The consumer will spend his entire money income in the following way.

The consumer can spend Rs 4 on A, and Rs. 3 on B. His total utility will be:

$$(20+14+12+6) + (30+16+6) = 104.$$

It may be noted that the marginal utility of both the two commodities is the same (I.e., 6) and total utility is 104 units which is maximum. Suppose the consumer reallocates his money income and decides to spend Rs.3 on A and Rs. 4 on B. His total utility will be: $(20+14+12) + (30+16+6+0) = 98$

The allocation where the marginal utilities are equal and total utility is maximum represents the consumer's equilibrium.

Q: What is ordinal utility and what are its assumptions?

Ans: According to ordinalists, the utility derived from the consumption of commodities cannot be measured but more or less compared. It permits us to say only that the consumer preferred one commodity to another, but it does not indicate how much. It is not expressed in terms of a quantity or in a numerical value. In short ordinal utility indicates the consumer's preference or choice for one commodity or basket of goods over another of the same.

Q. Define Utility?

Ans: Utility is the power of a commodity to satisfy human wants.

Q. What is the meaning of demand?

Ans. Demand means the quantity of a commodity that a consumer is willing and able to purchase, at each possible price during a given period of time. Thus the demand has four essential elements:

1. Quantity of the commodity.
2. Willingness to pay.
3. Price of the commodity.
4. Period of time.

Q. Difference between demand and quantity demanded?

Ans. Demand for a commodity. The term demand refers to various quantities of a commodity that the consumer is ready to buy at different possible prices of a commodity.

Quantity demanded. On the other hand quantity demanded refers to a specific quantity to be purchased against a specific price of the commodity.

Q. What are the determinants of Demand?

Ans. The demand of a commodity is affected by many factors. Economists break down the determinants of an individual's demand into five categories'. Most important among them are as follows:-

1. Price of Commodity (P_x):- Price is very important factor, which affects demand of a commodity. Generally the higher the price of a commodity is, the lower is the quantity demanded and vice versa.

2. Price of Related Commodity(P_R):- Related commodities are of two types :-

(i) Substitute goods are those goods which can be used in place of one another for satisfaction of a particular want, like tea and coffee. A Change in the price of substitute will affect the demand of other commodity.

(ii) Complementary goods. Goods which are used together to satisfy a particular want , like tea and sugar. An increase in the price of complementary good leads to a decrease in the demand for given commodity and vice-versa. For example, If price of complementary good (say sugar) increases, then demand for given commodity (sat tea) will fall as it will be relatively costlier to use both the goods together.

3. Income of the Consumer (Y): Demand of goods is directly relate with the income of the consumer. A rise in consumer's income will raise the demand for commodities and vice versa.

4. Tastes and preferences of consumer (T): We like to consume those commodities which suit our tastes. Generally, demand for a commodity bears a direct relationship to taste (T), a favorable taste leading to an increase in demand and vice versa.

5. Besides these, size and composition of population, distribution of income and expected change in future price are also some of the factors which influence the demand.

Q. Define demand function?

Ans. A demand function explains the relationship between the demand for a commodity and various determinants. It shows how demand for a commodity is related to, say, price of the commodity or income of the consumer or other determinants.

Q. Define individual demand function?

Ans. Individual demand function refers to the functional relationship between individual demand and the factors affecting individual demand.

It is expressed as: $D_x = F (P_x , P_R , Y , T, F)$.

Where, D_x = Demand for commodity x;

P_x = Price of the given commodity.

P_R = Price of related goods.

Y = Income of consumer.

T = Tastes and preferences

F = Expectation of change in price in future.

(ao) **Price of the given commodity.** Other things being constant, with a rise in price of a commodity, its demand contracts and with a fall in price, its demand extends. This inverse relationship between price of the commodity and its demand is called law of demand.

a) **Price of the other related goods.** Demand for a commodity is also influenced by change in price of related goods. These are of two types 1) Substitute goods, 2) Complimentary goods.

b) **Level of income and wealth;** Income is an important factor which influences the demand. If the income of a consumer is high his demand will be more. If the income of a consumer decreases his demand for goods will also decrease.

c) **Tastes and preferences** of consumer also affect the level of demand. Other things being equal, demand for those goods increase for which consumers develop tastes and preferences. Contrary to it if a consumer has no taste or preference for a product, its demand will decrease. .

Symbolically individual demand function can be written as;

$$D_N = F (P_N , P_R , Y , T.)$$

Q. Define market demand function?

Ans. Market demand for a commodity is influenced by all those factors that affect an individual household's demand for a commodity. Market demand in turn is affected by a few other factors also. Most important among other factors are;

a) **Size of the population.** Demand increases with increase in population and decrease with decrease in population. This is because with the increase or decrease in population size, the number of buyers of the product tends to increase or decrease.

b) **Distribution of income.** Market demand is also influenced by change in the distribution of income in the society .if income is equally distributed, there will be more demand. If income is not equally distributed, there will be less demand. In case of unequal distribution; most people will not have enough money to buy things.

c) **Composition of population.** Composition of population also affects demand. If composition of population changes e.g. female population increases, demand for goods meant for women will go up.

d) Sociological factors;

e) Weather conditions;

Symbolically market demand function can be written as.

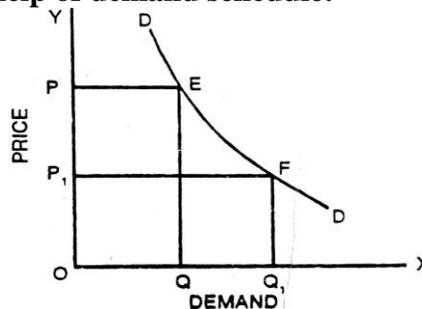
$$D_N = F (P_N , P_R, Y, T, U.)$$

Q. Describe the Law of Demand?

Ans. The Law of demand expresses inverse relationship between price and its quantity demanded. It means that, other, things being equal, the demand of a commodity falls with a rise in price and rises with a fall in its price. Geometrically, it is represented by a downward sloping demand curve.

Law of demand may be explained with the help of demand schedule:-

Demand Schedule	
Price (Rs.)	Demand (Units)
7	16
8	14
9	12
10	10
11	8
12	6



In the above diagram DD is the demand curve. X-axis represents demand and Y-axis represents price as shown in the diagram. When price is OP demand is OQ, when price falls from OP to OP₁ demand increases from OQ to OQ₁. When price increases from OP₁ to OP, demand decreases from OQ₁ to OQ. Generally, a demand curve slopes downwards to the right.

Assumptions of law of demand are as:

Law of demand is based on certain basic assumptions. They are as follows

- 1) There is no change in consumers' taste and preference
- 2) Income should remain constant.
- 3) Prices of other goods should not change.
- 4) People should not expect any change in the price of the commodity.

Limitations of Law of Demand: The law fails in case of following cases-

1. **Articles of Distinction:**-Articles of distinction have more demand only if their prices are high. Diamond, jeweler's costly carpets etc have high demand because their prices are high. If their prices fall they will be no more considered as articles of distinction and so their demand will decrease.
2. **Necessities:**-Law of demand fails in case of necessary goods like salt. Because necessary goods have to be used whether their price is high or low.
3. **Giffen goods:**-Giffen goods are those goods whose demand falls with the fall in their price. In case of Griffin goods income effect is negative and stronger than substitution effect.
4. Extraordinary situations.
5. Changes in fashion
6. Expected changes in price.
7. Ignorance, habit and attitude.

Q. What are the causes of downward slope of demand Curve?

Ans. Demand curve slopes downwards from left to right because of following reasons:-

Law of diminishing Marginal Utility:-According to this law, when a consumer uses more units of a commodity its marginal utility decreases continuously. Therefore the consumer will buy more units of that commodity only when its price falls. This proves that demand will be more at lower price and less at higher price. That is why demand curve is downwards sloping.

Substitution Effect:-When the price of a commodity falls, it becomes cheaper in comparison to other commodities thus consumer starts to substitute this commodity in place of other commodities they have been using. E.g. when price of meat will increase consumer will substitute chicken for meat. It is known as substitution effect.

Income effect:-With a fall in price of a commodity, purchasing power of a consumer will increase which enables him to purchase more of the same product. It is called income effect.

The combination of substitution effect and income effect becomes price effect which tells us that with the fall in price more of quantity is demanded and with rise in price less of the quantity is purchased, the demand curve, hence slopes down words from left to right.

Q. Describe Demand Schedule?

Ans. Demand schedule is a tabular statement showing various quantities of a commodity being demanded at various levels of price, during a given period of time. It shows an inverse relationship between the price of a commodity and its quantity demanded.

Q. What are the types of Demand schedule?

Ans: Demand schedule is of two types which are as:

1. Individual Demand Schedule:- Individual demand schedule refers to a tabular statement showing various quantities of a commodity that a consumer is willing to buy at various levels of price, during a given period of time.

Individual Demand schedule.

Price (Rs)	Quantity Demanded
1	4
2	3
3	2
4	1

When the price of a commodity is Rs. 1. The demand of a consumer at this price is 4 units and when price rises to Rs. 2,3,4 quantity demanded falls to 3,2,1 respectively.

2. Market Demand Schedule:- Market demand schedule refers to a tabular statement showing various quantities of a commodity that all the consumers are willing to buy at various levels of price, during a given period of time. On the assumption that there are only two buyers in the market. Market demand schedule may be drawn as under:

Price of comm. Y	A's demand (1)	B's demand (2)	Market Demand (3)=(1+2)
1	4	5	4+5=9
2	3	4	3+4=7
3	2	3	2+3=5
4	1	2	1+2=3

The schedule shows that when price of commodity Y increases its market demand falls. E.g. when price is Rs 1 then A's demand is 4 units and B, s demand is 5 units. Thus market demand at Rs 1 is 9 units. But when price rises to Rs 2 market demand falls to 7 units.

Q-What is demand curve and what are its types?

Ans. Demand curve is simply a graphical representation of demand schedule. It is based on the inverse relationship between the price and quantity demanded of a commodity during a given period of time.

Demand curve is also of two types:

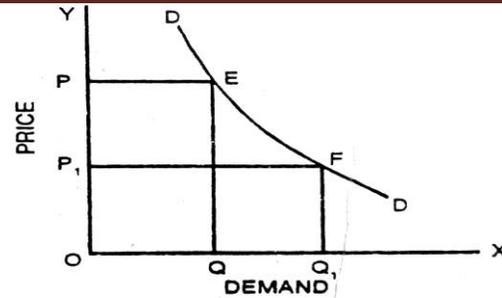
1. Individual demand curve:- Individual demand curve refers to a graphical representation of individual demand schedule. It shows different units of a commodity demanded by an individual consumer at different prices.

In the following figure Individual demand curve has been shown.

In this diagram when price is OP, OQ units are demanded when price falls to OP₁ quantity demanded increases to OQ₁. Demand curve DD slopes downwards due to inverse relationship between price and quantity demanded.

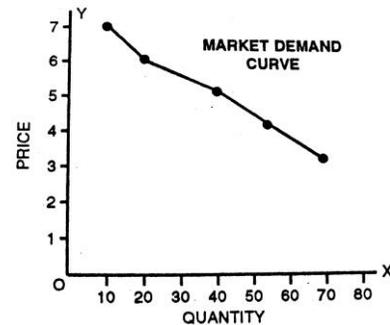
Demand Schedule

Price (Rs.)	Demand (Units)
7	16
8	14
9	12
10	10
11	8
12	6



Market Demand curve. Market Demand curve refers to a graphical representation of market demand schedule. It is obtained by horizontal summation of the individual Demand Curves. Market demand curve represents the total quantity of a commodity demanded by all the consumers in the market at different prices.

Ans.	Price (Rs.)	Household 'A'	Household 'B'	Household 'C'	Market Demand
	3	16	20	32	68
	4	12	15	25	52
	5	8	11	17	36
	6	5	3	10	18
	7	3	2	7	12



In fig 2 market demand curve had been drawn on the basis of table 2. By adding the different points on individual demand curves we get the market demand curve DD as shown in above fig. The slope of market demand curve is also negative indicating the negative relationship between price and quantity demanded.

Q. Why is market demand curve flatter?

Ans: Market demand curve is flatter than the individual demand curves. It happens because as price changes, proportionate change in market demand is more than proportionate change in individual demand.

Q. Difference between Individual demand and Market demand?

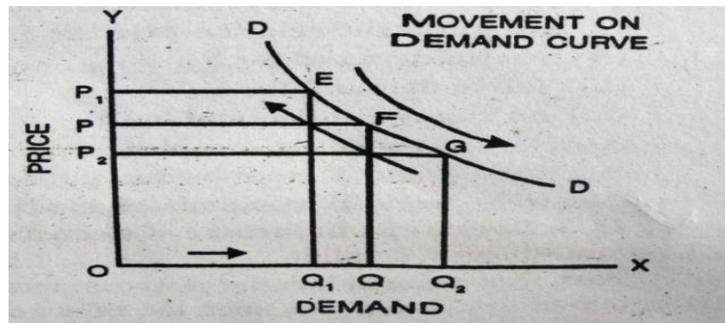
Individual Demand	Market Demand
It is the quantity demanded of a commodity by an individual consumer at a given price during a given period.	It is the quantity demanded of a commodity by all the consumers at a given price during a given period.
It may or may not follow the law of Demand, i.e. it is possible that an individual consumer may demand more even at higher price.	It always follows the law of Demand i.e. market demand always falls with rise in price and vice-versa
Individual demand is not affected by all the factors affecting market demand.	Market demand is affected by all the factors affecting individual demand

Q. Write a short note on movement on a Demand curve?

Ans. When quantity demanded of a commodity changes due to a change in its price, keeping other factors constant, it is known as change in quantity demanded. It is graphically expressed as a movement along the same

demand curve. There can be either a downward movement (expansion in demand) or an upward movement (contraction in demand) along the same demand curve.

In figure OQ quantity is demanded at a price of OP. Changes in price leads to an upward or downward movement along the same demand curve.



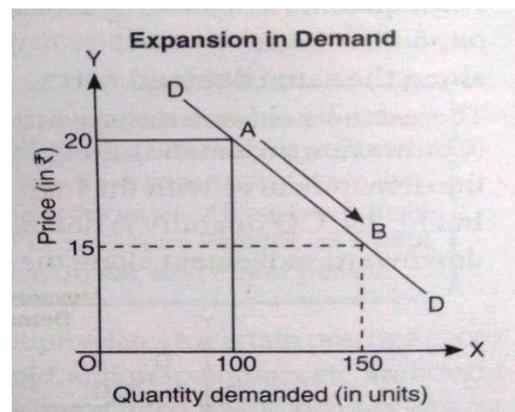
- **Upward movement:** When price rises to op_1 , quantity demanded falls to OQ_1 (known as contraction in demand) leading an upward movement from F to E along the same demand curve DD.
- **Downward movement:** When price falls to op_2 , quantity demanded increases to OQ_2 (known as extension in demand) leading a downward movement from F G E along the same demand curve DD.

Q. Explain extension and contraction of demand?

Ans. Extension of demand:- Keeping other factors constant, when due to fall in price more quantity of a commodity is demanded. It is called extension in demand. In case of extension in demand we move from a higher point to a lower point along the same demand curve.

Extension in demand is further explained in the following schedule and diagram.

Price (Rs)	Demand (Units)
20	100
15	150

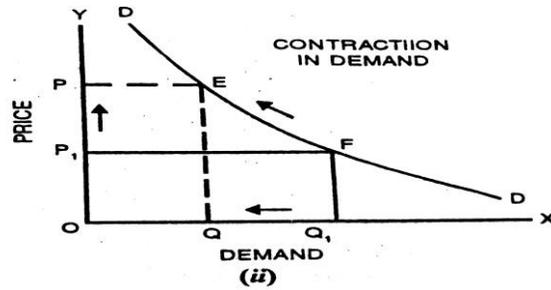


As seen in the above schedule and diagram, the quantity demanded rises from 100 units to 150 units with a fall in the price from Rs 20 to Rs 15, resulting in a downward movement from A to B along the same demand curve DD.

Contraction in Demand:- Other things remaining constant, when due to the rise in price of a commodity quantity demanded falls, it is termed as contraction in demand. In case of contraction we move from a lower point to a higher point along the same demand curve.

Contraction in demand is further explained in the following schedule and diagram.

Price in rupees	Demand in units
20	100
25	70

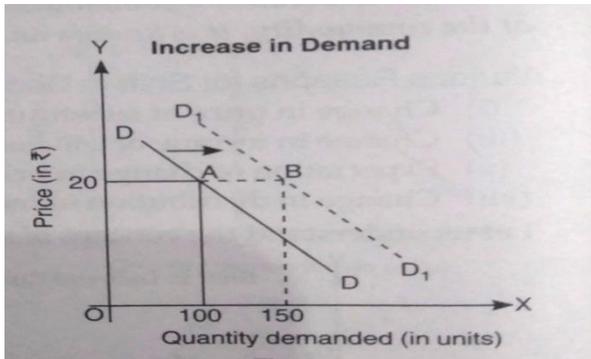


As seen in the above schedule and diagram, the quantity demanded falls from 100 units to 70 units with a rise in the price from Rs 20 to Rs 25, resulting in an upward movement from F to E along the same demand curve DD.

Q. Describe Increase in Demand?

Ans:- It is also known as rightward shift in demand Curve. When due to the factors other than price more quantity of a good at same price is demanded, it is termed as increase in demand. In this case demand Curve shifts from left to right side.

Schedule and diagram showing Increase in Demand.



Price (Rs)	Demand (units)
20	100
20	150

As seen in the above schedule and diagram, the quantity demand rises from 100 units to 150 units at the same price of Rs 20, resulting in a rightward shift in the demand curve from DD D₁ D₁.

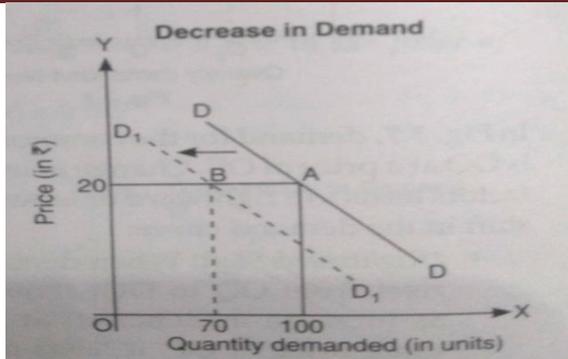
Q- Decrease in Demand or leftward shift of Demand Curve.

Ans: - When due to the factors other than price, smaller quantity of a good at the same price is demanded, it is known as decrease in demand. In this case demand Curve shifts from right to left side.

It is also known as backward shift of Demand Curve.

Schedule and diagram showing decrease in demand.

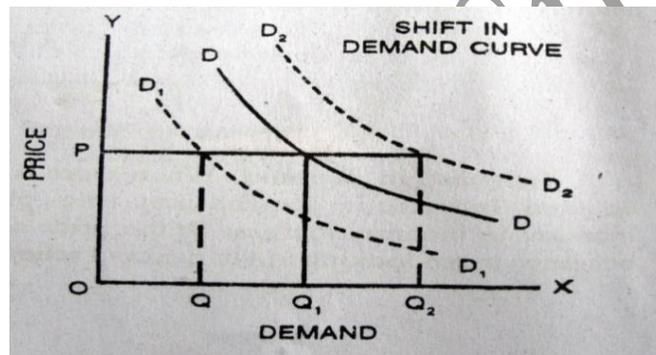
Price (Rs)	Demand (units)
20	100
20	70



As seen in the above schedule and diagram, the quantity demanded falls from 100 units to 70 units at the same price of Rs 20, resulting in a leftward shift in the demand curve from DD to D₁ D₁.

Q. Write a note on shift in demand curve?

Ans. Shift in demand curve indicates increase and decrease in demand. Increase and decrease signify changes in demand which are not in accordance with the law of demand. Both leftward and rightward shift in demand curve is caused by other determinants of demand except the price. The shift in demand curve can be understood

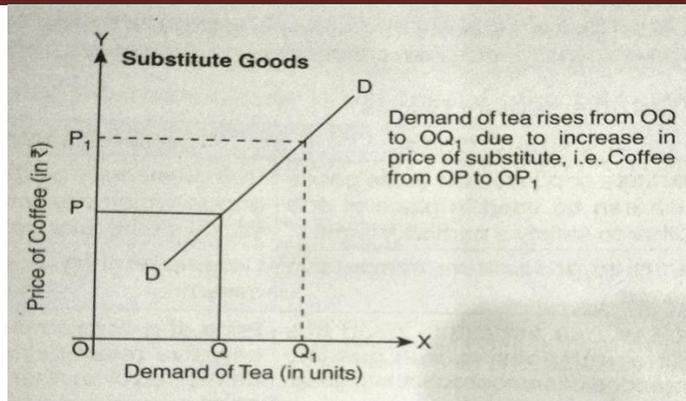


with the help of diagram.

When demand curve DD shifts to D₂ D₂, it is a case of increase in demand, price is the same .i e, OP but demand increases from OQ₁ TO OQ₂. When demand curve DD shifts leftward to D₁D₁, it is a case of decrease in demand, price is same i.e., OP but demand falls from OQ₁.to OQ.

Q. What are substitute goods?

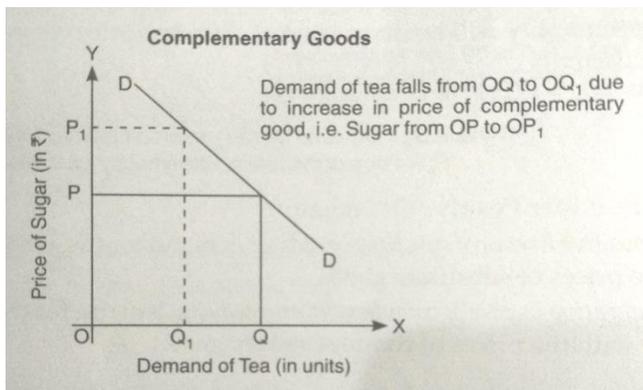
Ans: Substitute goods are those goods which can be used in place of one another for satisfaction of a particular want, like tea and coffee. A Change in the price of one substitute will affect the demand of other commodity. For example if price of substitute good (say coffee) increases, then demand of its substitute say tea) will rise as tea will become relatively cheaper in comparison to coffee. So, demand for a given commodity is directly affected by change in price of substitute goods.



As seen in the diagram, when price of coffee rises from OP to OP₁ on price X-axis, demand for tea also rises from OQ to OQ₁ on Y- axis.

Q. What are complementary goods?

Ans: Complementary goods. Goods which are used together to satisfy a particular want, like tea and sugar. An increase in the price of complementary good leads to a decrease in the demand for given commodity and vice-versa. For example, If price of complementary good (say sugar) increases, then demand for given commodity (say tea) will fall as it will be relatively costlier to use both the goods together.



As seen in the above diagram, when the price of sugar rises from OP to OP₁ on price X-axis, demand for tea falls from OQ to OQ₁ on Y- axis.

Q. Define income demand?

Ans. Income demand refers to the various quantities of commodity that a consumer would buy at various income levels. However, all the goods are not equally affected. The demand for superior goods increases while that of inferior goods falls when the income increases.

Q. What are prestigious goods?

Ans. Prestigious goods are also called status goods. These are demanded by wealthy persons. Diamonds, pearls and gems are the examples of these goods. The demand curve of these goods rises upwards and is called exceptional demand curve. These goods are demanded by rich people to hold their economic and social status in the society.

Q. Define joint demand?

Ans: When two or more goods are demanded simultaneously to satisfy a particular want, then such a demand is called joint demand. For example, demand for sugar, milk and tea leaves is a joint demand, as they are demanded together to prepare tea.

Q. Define composite demand?

Ans: When a commodity can be put to several uses, its demand is known as composite demand. For example, demand for electricity is a composite demand. As it can be used for various purposes like lighting rooms, running the refrigerator, TV, AC, etc.

Q. Difference between Substitute Goods and Complementary?

Ans:

Basis	Substitute Goods	Complementary Goods
Meaning	Substitute Goods refer to those goods which can be used in place of one another to satisfy a particular want	Complementary goods refer to those goods which are used together to satisfy a particular want.
Nature of Demand	Substitute goods have competitive demand.	Complementary goods have joint demand.
Relation	Price of one substitute good has positive relationship with quantity demanded of another substitute good.	Price of a complementary good has negative relationship with quantity demanded of another complementary good.
Examples	(i) Tea and Coffee. (ii) Coke and Pepsi	(i) Tea and Sugar (ii) Car and Petrol

Q.10:- Define Price Elasticity of Demand?

Ans:- Price elasticity of demand is a measurement of percentage change in quantity demanded due to percentage change in price of that commodity or in other words the responsiveness of quantity demanded due to change in price is termed as price elasticity of demand. It expresses the relationship between quantity demanded of a commodity and its price. It can be written as:

$$\text{Price elasticity of demand} = \frac{\text{percentage changes in quantity demanded}}{\text{Percentage change in price}}$$

A more general formula for calculating coefficient of price elasticity is given as:

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

Where ΔQ = change in quantity demanded, ΔP = change in price, P= Original price, Q= original quantity demanded.

Q. What are the factors which determine elasticity of demand?

Ans: Elasticity of demand varies from product to product, time to time and market to market. This is due to influence of various factors. They are;

- 1. Nature of commodity-** Price elasticity of demand also depends on the nature of commodity. Commodities can be grouped broadly as luxuries, comforts and necessities, on the basis of their nature. Demand for necessary goods (salt, rice, sugar, vegetables etc.) is inelastic. Demand for comfort is generally more elastic than that for necessities and less elastic than the demand for luxuries.
- 2. Availability of substitutes** – A commodity against which lot of substitutes are available, the demand for that is elastic. But the goods which have no substitutes, demand is inelastic.
- 3. variety of uses-** a commodity having a variety of uses has a comparatively elastic demand. Eg. Demand for steel, electricity , milk etc.

4. **Postponement/urgency of demand-** if the consumption of a commodity can be post pond, then it will have elastic demand. Urgent commodity has inelastic demand.
5. **Income level-** income level also influences the elasticity. E.g. Rich man will not curtail the consumption quantity of fruit, milk etc, even if their price rises, but a poor man will not follow it.
6. **Amount of money spend on the commodity-** where an individual spends only a small portion of his income on the commodity, the price change doesn't materially affect the demand for the commodity, and the demand is inelastic... (Match box, salt Etc)
7. **Durability of commodity-** if the commodity is durable or repairable at a substantially less amount (e.g. Shoes), the demand for that is elastic.

Q. What is price effect?

Ans. Price effect is the combined effect of income effect and substitution effect. Price effect is caused due to change in price where as the level of income remaining constant.

Q. Explain importance of elasticity of demand?

Ans. The elasticity of demand is of a great practical importance. We can explain its importance in the following way.

- 1) **Importance to finance minister:** - He would levy taxes on those commodities which have an inelastic demand. By, doing so total income of the govt. will increase.
- 2) **Importance to the monopolist:** - The aim of the monopolist is to earn maximum profits. Keeping in mind the nature of demand if the demand of the commodity is inelastic, the monopolist can fix a higher price. By doing so monopolist will earn higher revenue.
- 3) **Importance in international trade:-** In international trade the country earns more profits which imports those commodities which have more elastic demand. The commodities which are exported should have less elastic demand.

Q. Describe the measurement of price elasticity of Demand?.

Ans:- By measuring price elasticity of demand we know whether demand for a commodity is (i) Unitary elastic (ii) Greater than unitary elastic or (iii) less than unitary elastic. There are three different methods of measurement of price elasticity of demand they are:

- **Total expenditure method.**
- **Proportionate method and**
- **Geometric method.**

Q.12:- Explain expenditure method of measuring price Elasticity of Demand? Or outlay

Ans:- This method was evolved by Marshall and is also known as total outlay method of measurement of price elasticity of demand under this method. We measure price elasticity of demand by examining, the changes in total expenditure due to change in the price of the commodity. Total expenditure is equal to price multiplied by quantity demanded of a commodity i.e.

Total expenditure= Price × Quantity demanded. (P x Q)

According to this method elasticity of demand is of three types which are as under:

1. **Unitary Elastic demand (Ed=1):-** if rise or fall in price have no effect on total expenditure, elasticity of demand is said to be unitary elastic (Ed=1)
2. **Greater than Unitary elastic (Ed>1):-** If with the fall in price of a commodity total expenditure increases and with the rise in price total expenditure falls. Then demand for commodity is said to be elastic or greater than unitary i.e.; Ed>1.
3. **Less than Unitary Elastic (Ed<1):-** If with the fall in price total expenditure falls and with the rise in price total expenditure rises. Elasticity of demand is said to be less than unity i.e. Ed<1.

The three cases are also explained in the following schedule:

Schedule showing different Elasticities of demand according to Total Expenditure method.

Three causes in the schedule

Price (in Rs) P_x	Quantity demanded (Q_x units)	Total Expenditure $P_x \cdot Q_x$	Elasticity of demand
4	5	20	
6	3	18	Ed>1
4	5	20	
5	4	20	Ed=1
4	5	20	
8	4	32	Ed<1

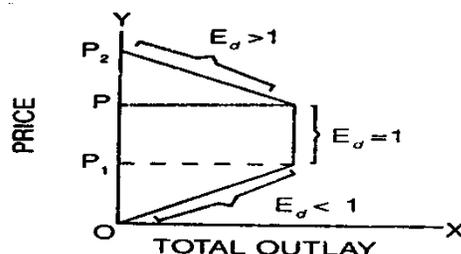
- 1) It is clear from above schedule that when prices increases from Rs 4 to Rs 6, total expenditure decreases from 20 to 18 and when price falls total expenditure increases. Hence Ed>1.
- 2) When total expenditure remains same with the increase in price from Rs. 4 to Rs 5, elasticity of demand is equal to be unitary elastic.
- 3) When price rises from Rs. 4 to Rs 8, total expenditure increases from 20 to 32, elasticity of demand is less than one i.e.; Ed<1

Total outlay method of measuring elasticity of demand is expressed diagrammatically as.

In the figure TB shows inverse relationship between Price and total expenditure. It is a situation when Ed>1.

EC shows positive relationship between price and total Expenditure. It is a situation when. Ed<1.

BC shows total expenditure as constant in response to Increase or decrease in price. It is a situation when Ed=1.



Q. Explain Percentage (or) Proportionate method of measuring of price elasticity of demand?

Ans. This method was also suggested by Marshall. According to this method elasticity of demand is measured by the percentage or proportionate change in quantity demanded due to percentage or proportionate change in price. The following formula is used to measure the elasticity of demand.

Price elasticity of Demand=
$$\frac{\text{Percentage change in Demand}}{\text{Percentage change in price}}$$

The formula is mathematically presented as: $ep = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

Here Δ stands for change, Q Stands for original quantity demanded, P stands for original price.

Example: When price is Rs 10 per unit, demand for a commodity is 100 units. As the price falls to Rs 8 per unit, demand expands to 150 units. Calculate elasticity of demand.

Solution:

Original quantity (Q)	= 100 units	Original price (P)	=Rs 10
New Quantity (Q ₁)	= 150 units	New price (P ₁)	=Rs 8
Change in Quantity (ΔQ)	= 50 units	Change in Price (ΔP)	= -2
Elasticity of demand (Ed)=?			

Elasticity of demand (Ed) = $\frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{50}{-2} \times \frac{10}{100} = (-)2.5$

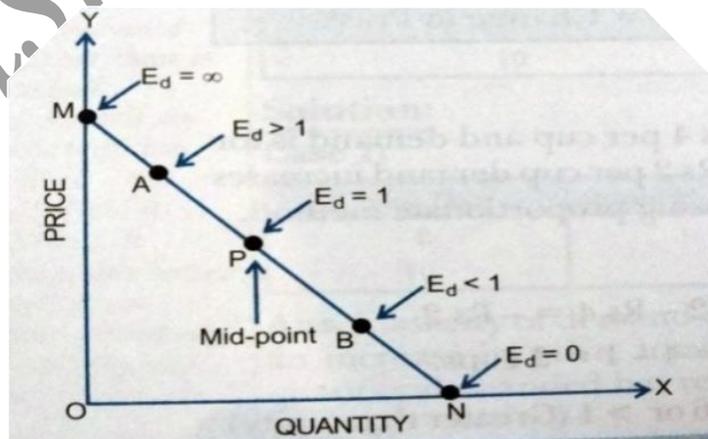
Ans. Ed=(-)2.5 Demand is highly elastic as Ed > 1

Negative sign of Ed indicates the inverse relationship between price and quantity demanded.

3 Point Method or Geometric method of measurement of Elasticity of demand: - Price elasticity of demand is also measured geometrically. The method is also known as point method. According to this method elasticity of demand on each point on the straight line demand curve shall be different. According to this method elasticity of demand on each point is measured with the help of following formula:

(Ed) = Lower segment of demand curve

Upper segment of demand curve



This is explained with the help of given diagram. Here along x-axis we measure quantity demand and along y-axis we measure price. MN is the straight line demand curve and we have to measure Ed on different points on demand curve MN. It has following cases:

Elasticity of demand at mid point (P) of demand curve is equal to 1 i.e. (Ed=PN/MP=1) because lower segment is equal to upper segment of demand curve.

Elasticity of demand at point M is infinity because lower segment is MN and upper segment is zero. Hence Ed =MN/0 =∞

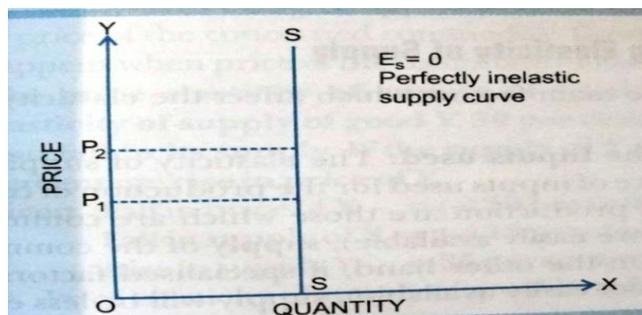
Elasticity of demand at point N is equal to 0 because lower segment is zero and upper segment is equal to NM. Hence $ED = 0/NM = 0$.

Elasticity of demand between M and P is greater than one say at point A because lower segment is greater than upper segment. E.g. at A. $Ed = \frac{AN}{AM} > 1$

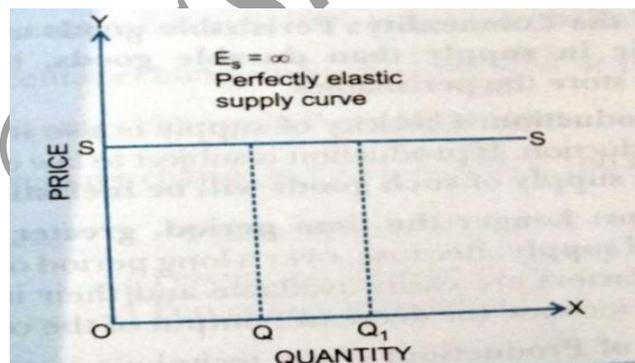
Elasticity of demand at any point between P and N is less than one say at Point B because lower segment is less than upper segment. E.g. $Ed = BN/BM < 1$ because $BN < BM$.

Q. Explain different Types of Price elasticity of demand?

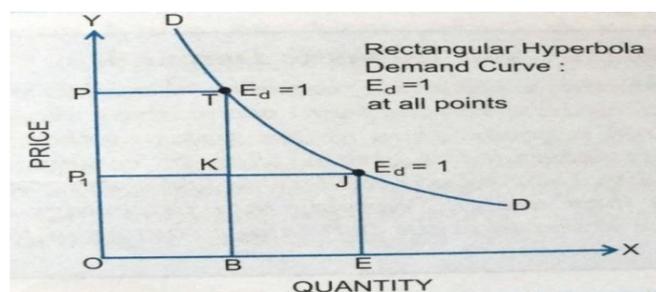
Ans; -1- **Perfectly inelastic demand or zero elastic demand:** - when there is no change in quantity demanded due to change in price, it is known as perfectly inelastic demand or zero elastic demand. The demand curve becomes vertical or parallel to y-axis. It is shown in given figure.



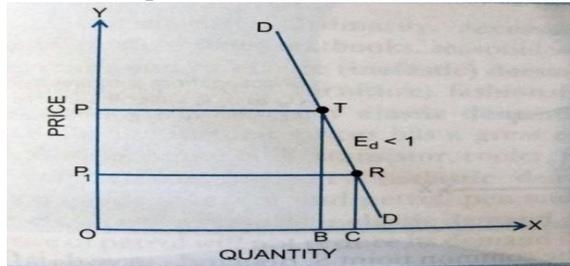
2- **Perfectly elastic or infinite elastic demand:** When a negligible change in price leads to an infinite change in the demand, it is called perfectly elastic demand. As shown in the figure below $Ed = \infty$ and demand curve becomes horizontal or parallel to x-axis.



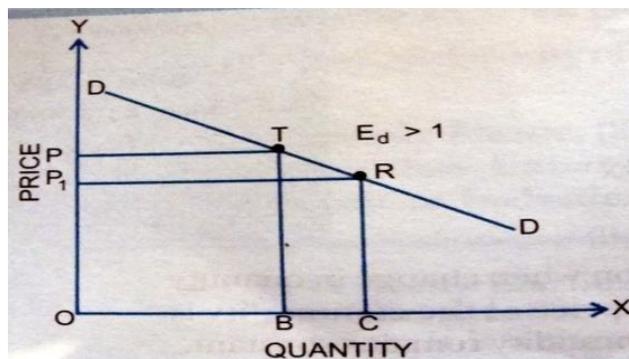
3. **Unitary Elastic demand:** -When demand changes in the same proportion as in the price of the commodity, then Ed is equal to one. Demand curve takes the shape of rectangular hyperbola. It is shown in the figure below.



4. In-elastic or less than unitary elastic demands:-When a considerable change in price does not lead much change in demand, the demand is said to be less than unitary elastic or inelastic. It is shown in figure. Here demand increases from OB to OC as price falls from OP to OP₁. Since change in price is more than change in quality demanded.



5. Elastic or more than unit elastic demanded:-When a small change in price leads to a greater change in demand. The demand is said to be elastic or more than unit elastic. This case is shown in diagram:-



The following table summarizes the terminology of price elasticity of demand.

Serial No.	Type	Numerical expression	Description	Shape of curve
1	Perfectly elastic	∞	infinity	Horizontal
2	Perfectly inelastic	0	Zero	Vertical
3	Unitary elastic	1	One	Rectangular hyperbola
4	Relatively elastic	>1	More than one	Flat
5	Relatively inelastic	<1	Less than one	Steep

The terminology of income elasticity is summarized in the following table.

Type of Goods	Numerical Measure of Income elasticity	Verbal description
(1) Inferior Goods	Negative	Quantity demanded decreases as income increases
(2) Normal goods	Positive	Quantity demanded increases as income increases
(3) Necessity	Less than one	Quantity demanded increases less than proportion to increase in income
(4) Luxury	Greater than one	Quantity demanded increases more than proportion to increase in income

Q. Give the meaning of demand function?

Ans. Demand function expresses a functional relationship between demand of a commodity and factors which determine demand. It can be expressed as : $D_x = f(P_x, P_r, Y, T, E)$ Where D_x is demand for x , P_x stands for price

of X, (P_r stands for price of related commodities, Y is income of consumer; T stands for tastes and P preferences, E stands for expected change in future price.

Q. What is utility?

Ans. The want satisfying power of a good or service is called utility

Q. What is the law of diminishing marginal utility?

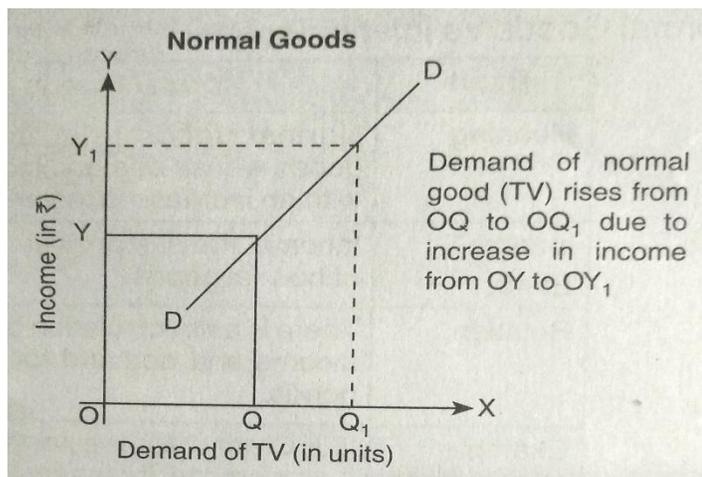
Ans. Law of diminishing marginal utility states that as more and more standard Units of a commodity are continuously consumed, marginal utility, derived from every additional unit must decline . It is also called fundamental law of satisfaction or fundamental psychological law.

Q. What Does Arc Elasticity Mean?

Ans. The elasticity of one variable with respect to another between two given points. It is used when there is no general function to define the relationship of the two variables. Arc elasticity is also defined as the elasticity between two points on a curve.

Q. Define normal good?

Ans: Normal goods refer to those goods whose demand increases with an increase in income. E.g., if the demand for TV increases with a rise in income, then TV will be called a normal good. Income effect is positive in case of normal goods.



When income rises from OY to OY1 on Y-axis, the demand for TV also rises from OQ to OQ1 on X-axis. Thus TV is a normal good.

Q. Define inferior goods?

Ans: Inferior goods refer to those goods whose demand decreases with an increase in income. It means that there exists an inverse relationship between income and the demand for inferior goods. Income effect is negative in case of inferior goods.

Q. Does a rise in income of a consumer have the same effect on the consumer's demand for all commodities? Explain.

Ans. No, a rise in income of a consumer does not have same effect on the consumer's demand for all commodities. It depends upon the nature of the good.

- 1) If the commodity is very cheap, a change in consumer's income will not affect demand for it, such as common salt.
- 2) If a commodity is of inferior quality, a rise in consumer's income will lead to a fall in its demand as the consumer will shift to a better quality product.

Unit 2: theory of production

Q. what do you mean by production function?

Ans: production function explains the relationship between factor inputs and output under given technology. Prof. Richard H. Leftwich attributes that production function refers to the relationship between inputs and outputs at a given period. In short a technological relationship that tells the maximum output producible from various combinations of inputs. The term input includes factor and non-factor inputs namely labour, capital, fuel, raw materials etc.

Mathematically, production function can be stated in the following form:

$$Q = f(L, K, M, I, V, E).$$

Here Q = output, f = function of, l = labour point, k = capital input
M = land point, I = raw material v = returns to scale E = Efficiency.

The concept of production function stems from the following two things:

1. It must be considered with reference to a particular period.
2. It is determined by the state of technology. Any change in technology may alter output, even when the quantities of inputs remain fixed.

Q. Define Short run production function?

Ans: In short run production function one factor is treated as variable and other's fixed and for increasing the output additional units of variable factor are used. Short run production function may be state as:

$$Q = f(a/b^0 A = \pi r^2, C, \dots, n^0 T)$$

Q. Define Long run production function?

Ans: In this type of production function all the factors (inputs) are treated as variable and increased in the same proportion for increasing output. This means all the factors are changed in the same proportion for increasing output. This kind of production function is confirmed to the long run. The scale of production can be changed in the long run. The long run production function can be stated as:

$$Q = f(a, b, c, x, T)$$

Q. What are the Properties of production function?

Ans: Following are the properties of production function:

1. **Flow concept:** A production function is a flow concept. It relates to the flow of inputs and the resulting flows of output of a commodity during a period of time. Here, time is taken to be functional or operational time period.
2. **Physical concept:** A production function is a technical relationship between inputs and outputs expressed in physical terms and not in terms of monetary unit, such as a rupee or dollar.

3. State of technology and inputs: It implies that the production of a firm depends on the state of technology and inputs. Anything that is used in production process by the firm is called input, i.e. land, labour, capital etc also time and human energy as well as knowledge which are employed by the firm for producing a unit of commodity.

4. Factors combination for the maximum output: From the economic point of view a rational firm is inserted only in those combinations which yields maximum output. In short affirm among numerous factor inputs is selecting the most specific combination of high yielding inputs for the purpose of maximum output. **5.**

Short run and long run production function: in case of production function on the basis of functional criteria, we have short run and long run production functions. Short run production function pertains to the given scale of production pertains to the changing scale of production.

Q: Linear homogenous production function?

Ans: production function can take several forms but a particular form of production function which enjoys wide popularity is linear homogenous production function, it is production which is homogenous of the first degree. Homogenous production function of the first degree implies that if all the factors of production are increased in same proportion, output also increases in the same proportion. Hence linear homogenous production function represents the case of constant return scale. If there are two factors X and Y, then homogenous production function of the first degree can be mathematically expressed as: $mQ = f(mx, my)$

The given function means that if factors X and Y are increased m – times (m = any real number) the total production Q also increased by m – times. It is because of this that homogenous production function of the first degree yields constant returns to scale.

Q. Define producer's equilibrium?

Ans. Producer's equilibrium can be defined as the level of output at which a firm gets maximum profits. In other words a situation in which a producer has allocated the available factor inputs in such a form that he gets maximum output at minimum cost.

Q. Distinguish between increasing returns to a factor and increasing returns to scale?

Ans. Under increasing returns to a variable factor only one factor is variable and others are fixed. For increasing output more and more units of variable factor are employed. As a result of using more and more units of variable factor, total output increases at increasing rate. On the contrary, under increasing returns to scale all factors are treated as variable and increased in the same proportion, as

Result of which proportionate increase in the total product is more than the proportionate increase in all the factors.

Q. Distinguish between decreasing returns to a factor and decreasing returns to scale?

Ans. Under decreasing returns to a factor, more units of a variable factor are employed for increasing output as a result of which total product increases at decreasing rate or marginal product declines. On the contrary under decreasing returns to scale, the proportionate increase in the output is less than the proportionate increase in the factor inputs E.g. output may be less than double as a result of doubling all the factor inputs.

Q. Define fixed factors?

Ans. Fixed factors: - Factor inputs are classified as fixed factors and variable factors. Fixed factors are those factors which do not change with the change in output. E.g. building of a firm, capital, permanent labour etc.

Q. Define variable factors?

Ans: Variable factors: are those factors which change with the change in output such as raw materials, ordinary labour, electricity, water supply etc when firm, is not producing anything, it does not use variable factors. It should be noted that the distinction between fixed and variable factors is restricted to short period. In long run all factors are variable.

Q. Define short run time period?

Ans. Short period. In such a period a firm keeps some factors as fixed (such as land) and other factors as variable (such as labour). For increasing the output the volume of variable factors are increased only.

Q. Define long run time period?

Ans. Long period. In the long period all the factors are variable and for increasing the output all the factors are increased. Duration of period (time) for production process of commodities cannot be defined; it differs from commodity to commodity.

Q. Define short run production function?

Ans. In this type of production function one factor is treated as variable and others fixed and for increasing the output additional units of variable factor are used. E.g. increasing the units of variable inputs (Such as labour).

Q. Explain the law of variable proportions? (or) Explain law of returns to a factor? (or)

Explain law of Non proportional return?

Ans. Law of variable proportions state that as we increase the quantity of only one input keeping other inputs fixed, total product initially increases at an increasing rate, then at a decreasing rate and finally at a negative rate. According to the law of variable proportions, the changes in TP and MP can be classified into following three phases:

- **Phase i:** Total productivity rises at increasing rate.
Marginal productivity also increases.
- **Phase ii:** Total productivity rises at decreasing rate.
Marginal productivity decreases and is positive
- **Phase iii:** Total productivity falls
Marginal productivity becomes negative.

Assumptions of the law:

1. It operates in short run time period.
2. This law applies to all fixed factors including land;
3. Different units of variable factor can be combined with fixed factors.
4. This law applies to the field of production only;
5. The effect of change in output due to change in variable factor can be easily determined
6. Factors of production become imperfect substitutes of each other beyond a certain limit.
7. All variable factors are equally efficient.

Law of variable proportion can be under stood with the help of following example:

Suppose a farmer has 1 acre of land (fixed factor) on which he wants to increase the production of wheat with the help of labour (variable factor). When he employed more and more units of labour, initially output increased at an increasing rate, then at decreasing rate and finally at a negative rate. This behaviour of output is shown in the following table:

Fixed factor (Land in acres)	Variable factor (labor)	TP (units)	MP (units)	Phase
1	1	10	10	Phase i: Increasing Returns to a Factor
1	2	30	20	
1	3	45	15	
1	4	52	7	Phase ii: Diminishing returns to a factor
1	5	52	0	
1	6	48	-4	Phase iii: Negative Returns to a factor

➤ **Diagrammatic presentation of the Law of variable proportions:**

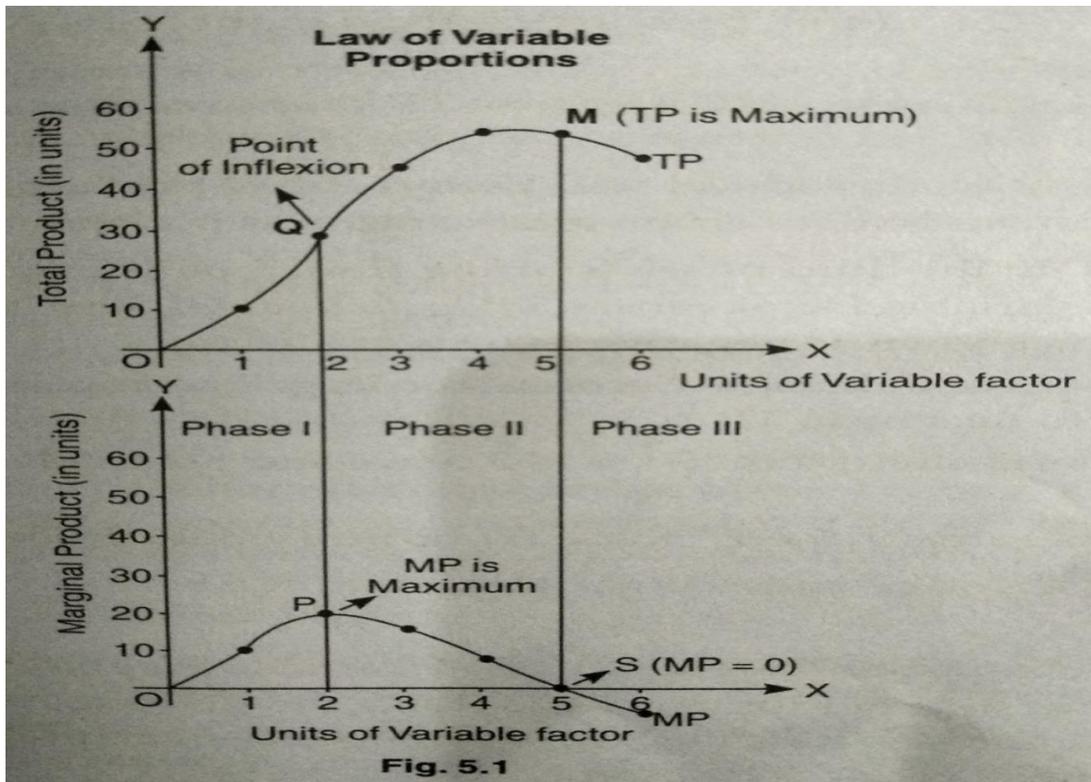


Fig. 5.1

As is evident from the figure in the figure:

- ❖ **Phase i:** (between O to Q) TP increases at an increasing rate and MP also increases.
- ❖ **Phase ii:** (between O to M) Total productivity increases at decreasing rate and MP falls. This phase ends when MP becomes zero and TP reaches its maximum point.
Marginal productivity decreases and is positive
- ❖ **Phase iii:** (Beyond point M) Total productivity starts decreasing and Marginal productivity not only falls but also becomes negative.
- ❖ **Point of inflexion (point Q):** point Q is known as point of inflexion as curvature of TP curve changes at this point.

Q. In which stage a producer should operate?

Ans. This law applies in the short period as producer should operate in the second stage. There are many causes responsible for this. Main causes are discussed below.

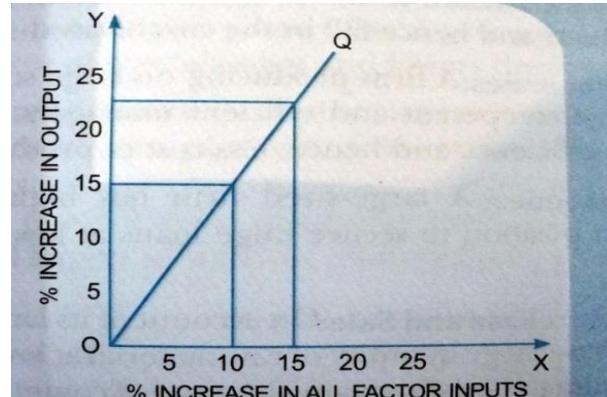
- 1) Some factors are fixed. They can be optimally used only at one point. Till a producer reaches that point law of increasing returns applies. Had all the factors been variable this situation would not have arisen.
- 2) Some factors are indivisible and therefore only at one point they can be optimally used. Because of this either marginal product is increasing or decreasing.

Q. Explain the concept of Return to scale?

Ans. In long run when all factors and variable and are increased in the same proportion, the scale of production also increase and this corresponding behavior of output is studied as returns to scale. Thus, returns to scale refers to the behavior to of output as all factors inputs are varied in the same proportion. This Law of Returns to scale has three forms which are as under:-

1. Increasing Returns to Scale:-Increasing returns to scale occurs when a given percentage increase in all factor inputs causes proportionately greater increase in output or in other words , percentage increase in output is greater than percentage. Increase in inputs. It is explained with the help of following figure:

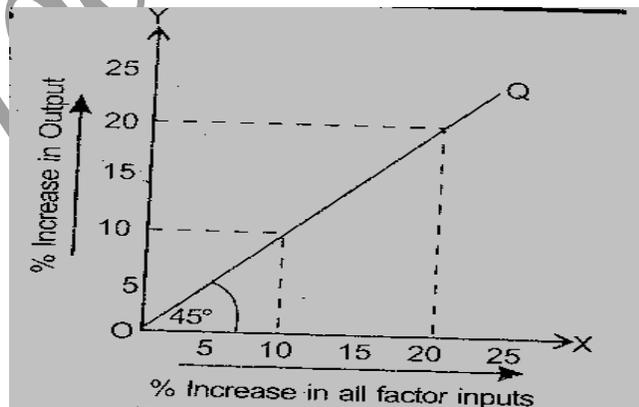
In figure 10% increase in inputs causes 15% increase in output like wise 15% increase in inputs causes 25% increase in output. Hence it is a case of increasing returns to scale.



2. Constant Return of Scale

:-Constant return to scale occurs when a given percentage increase in all factor inputs cause an equal percentage increase in outputs. It is explained with the help of the following diagram.

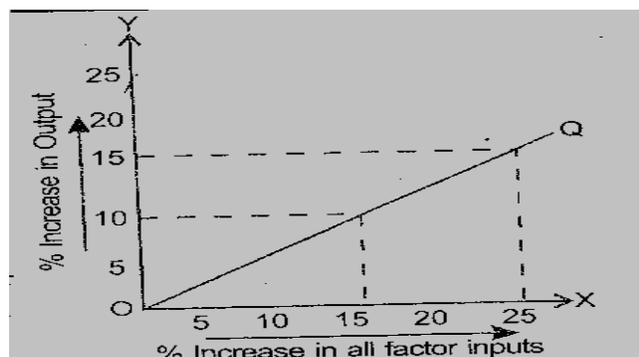
In figure 10% increase inputs causes 10% increase in output. Likewise 20% increase in inputs causes 20% change in output. Thus percentage increases in inputs causes equal percentage increases in output. Hence it is a case of constant returns to scale.



3. Diminishing Return to scale:

Diminishing returns to scale occurs when a given percentage increases in inputs causes proportionally lesser increases in output i.e. increases

in output is less than increases in inputs. it is explained with the help of given diagram . Figure shows that 15% increase in all factors input causes only 10% increase in output. Thus it is a case of diminishing returns to scale.



Q. What are the Causes of returns to scale?

Ans: The scale of production can be increased in the long run. Due to increase in the scale of production a firm can get many internal and external economies of scale. External economies are available to the whole industry whereas internal economies are confined only to individual firms. Internal economies arise because of two cases (i) indivisibility (2) specialization. External economies also arise because of the two factors; (I) localization of industries and (2) specialization among the centralized firms.

As a result of the availability of all these economies, in the beginning with the increase in the scale of production, marginal returns start increasing i.e. the conditions of increasing returns to scale generated. However, due to further increase in the scale of production, specialization is reduced this adversely affects savings. As a result of this, stage of constant returns to scale starts operating. Increasing the scale of production further adversely affects savings and generates diseconomies of scale. Due to this stage of decreasing returns to scale starts operating.

Assumptions of the law of returns to scale.

This law is based on the following assumptions:

- 1). All the factors of production (such as land, labor and capital) but organization are variable
- 2). The law assumes constant technological state. It means that there is no change in technology during the time considered.
- 3). The market is perfectly competitive.
- 4). Outputs or returns are measured in physical terms.

Q.Distinguish between Returns to a factor and Returns to scale?

Returns to a factor	Returns to scale
1. It refers to change in the output as a result of increase in quantity of only one variable factor.	1. It refers to change in the output as a result of increase in scale of production
2. Factor ratio changes i.e. ratio between factors of production changes.	2. Factor ratio remains the same as all factors are changed in same proportion.
3. It is a short run phenomenon.	3. It is a long run phenomenon.

Q. Explain relationship between TP and MP?

Ans: The relationship between TP and MP can be better understood with the help of following schedule and diagram:

Fixed factor (land) (in acres)	Variable factor (Labour) (in units)	TP (units)	MP (units)
1	0	0	---
1	1	10	10
1	2	30	20
1	3	45	15
1	4	52	7
1	5	52	0
1	6	48	-4

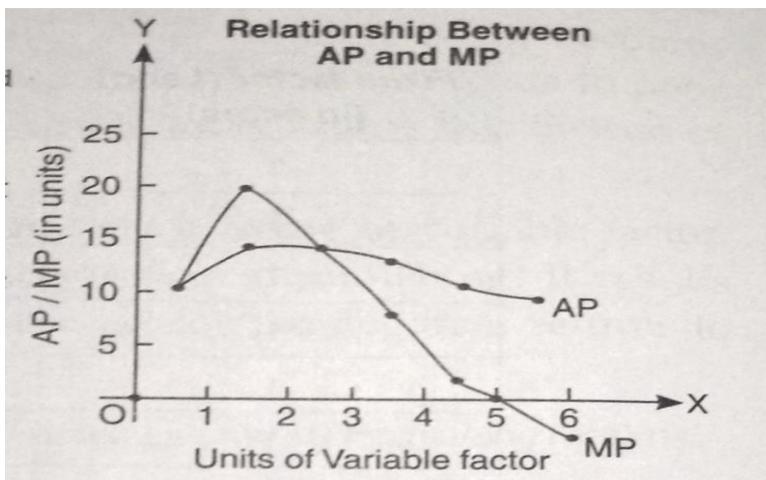
The relationship between TP and MP can be summarized as under:

1. As long as TP increases at increasing rate (till point P) ;MP also increases.
2. When TP increases at diminishing rate, MP decreases. It starts happening when 3 units of labour are employed and continues till 5 unit of variable factor.
3. When TP reaches its maximum point (point M), MP becomes 0(point N) I.e. at 5th unit of variable factor.

4. When TP starts decreasing, MP becomes negative, i.e. from 6th unit of variable factor.

Q. Explain relationship between AP and MP?

Fixed factor (land) (in acres)	Variable factor (Labour) (in units)	AP (units)	MP (units)
1	0	--	---
1	1	10	10
1	2	15	20
1	3	15	15
1	4	13	7
1	5	10.40	0
1	6	8	-4



The relationship can be summarized as:

1. As long as MP is more than AP, AP rises, I.e. 2nd unit of variable factor.
2. When MP is equal to AP, AP is at its maximum at 3rd unit of variable factor.
3. When MP is less than AP, AP falls from 4th unit of variable factor.
4. Therefore both AP and MP fall, but MP becomes negative, whereas, AP remains positive. MP falls at a faster rate in comparison to fall in AP.

Q.1:- Give the meaning of Supply?

Ans: - Supply refers to the quantity of a commodity that a firm is willing and able to offer for sale at a given price during a given period of time. According to Thomas, “The supply of goods is the quantity offered for sale in a given market at a given time at various prices”.

Q. Give the meaning of stock?

Ans: Stock refers to the total quantity of a particular commodity that is available with the firm at a particular point of time. Stock indicates a fixed quantity. If a seller has 50 tonnes sugar in his godown and he is willing to sell 30 tonnes @Rs 38 per kg, then supply is 30 tonnes and stock is 50 tonnes

Q .What do you mean by cost?

Ans. In order to produce goods, a firm uses raw material and factors of production called 'inputs'. The expenditure incurred on these factors is called cost of production. Hence cost of production refers to all sorts of monetary, expenditures incurred in the production of a commodity.

Q. Explain briefly the concept of the cost function?

Ans. Cost function refers to the mathematical relation between cost of a product and various determinants of cost. Cost function signifies that total cost depends on several factors. Cost function may be expressed in the following way.

$$C = f(Q, P, T, K)$$

Where: Q= output, P = prices of factors, T = technology, K=plant, machinery etc.

Q. Define opportunity cost?

Ans. Opportunity cost is cost of the next best alternative foregone. In short opportunity cost of any good is the next best alternative good that is sacrificed. E.g. suppose, a farmer can produce either 50 quantals of rice or 40 quantals of Wheat on his land with the given resources. If he chooses to produce rice, then he will have to forego the opportunity of producing 40 quantals of Wheat.

Q. Define Sunk Cost?

Ans: Sunk costs are those which have already been incurred and which cannot be changed by any decision made now or in the future. These are past or historical costs.

Q. Define Differential Cost?

Ans: It refers to the change in cost due to change in the level of activity or pattern of production or method of production.

Q. Define social costs?

Ans. The social costs are the sum of the private costs and the net of negative externalities over positive externalities. If there are no any negative externalities, social costs will be greater than private costs.

Q. What do you mean by implicit and explicit costs?

Ans. Explicit Costs: - Explicit cost means the payment made to the factors of production which has been hired by the firm to produce goods and services. E.g. payment to the supplier of raw material, wages to hired labour, etc. These costs are also known as accounting costs.

Implicit Costs: - Implicit cost is the cost of self employed resources. A person who works as manager of his own firm is an example of implicit cost. In short, the imputed cost of the factors provided by the entrepreneur himself is called implicit cost.

Q. Define Real costs and Money cost?

Ans. Real costs:-These can only be expressed, but not measured. These are expressed in terms of mental and physical efforts for rendering a service.

Money costs:-These are expressed and measured in terms of money paid for hiring or purchasing the factors of production.

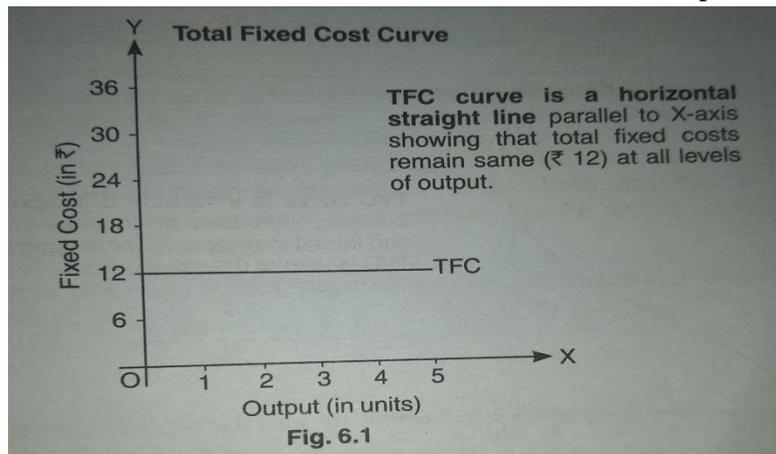
Q. What do you mean by fixed and variable costs?

Ans. Fixed costs or total fixed cost:- Fixed costs of a firm refer to the costs which does not change with change in output. These costs are rent of the building, salaries of permanent employees, insurance premium, license fees etc. Fixed cost is also known as supplementary cost, Overhead cost, Unavoidable cost.

Total fixed cost schedule Table: 6.1

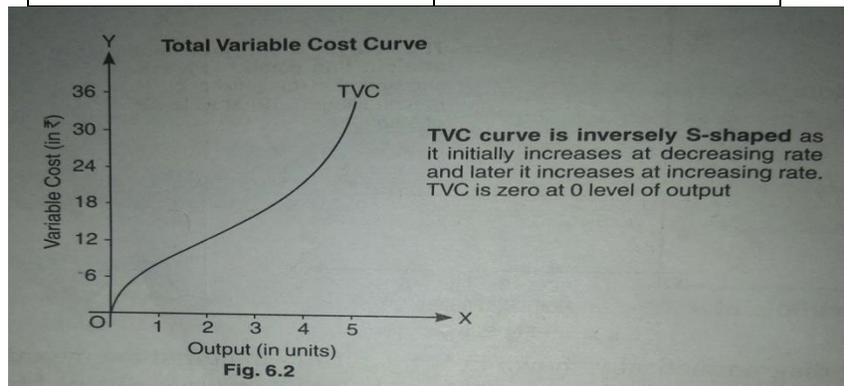
Output (in units)	TFC (Rs)
0	12
1	12
2	12
3	12
4	12

TFC is diagrammatically shown in Figure 6.1. TFC curve is obtained by plotting the points shown in Table 6.1. The curve makes an intercept on the Y-axis which is equal to the fixed cost of Rs 12. TFC is a horizontal straight line parallel to X- axis because TFC remains same at all levels of output, even if the output is zero.



Variable costs or total variable cost. These costs directly vary with the volume of production. If volume of output is zero, these costs will be zero. These costs are cost of raw material, payment for transportation of goods, daily wages etc. these costs are called prime costs.

Output (in units)	TVC (Rs)
0	0
1	6
2	10
3	15
4	24
5	35



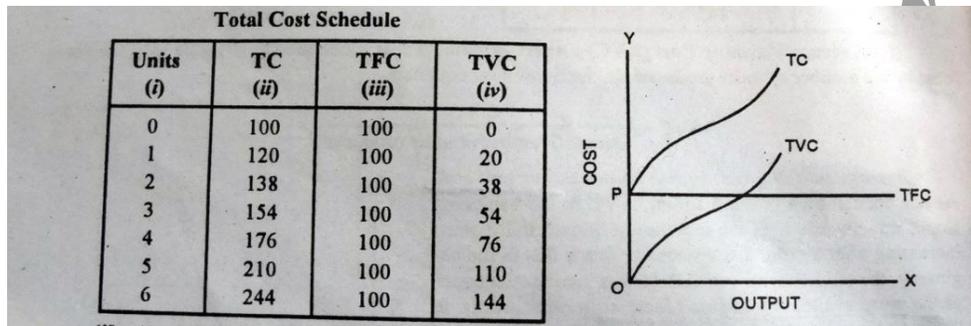
TVC curve is obtained by plotting the points shown in Table 6.2. As seen in the diagram, TVC curve starts from the origin indicating that when output is zero, variable cost is also zero. TVC is an inversely S- shaped curve due to the law of variable proportions.

Q. Define Economic Cost?

Ans: Economic cost refers total of explicit cost and implicit cost. Thus it includes the payment for factors of production (that is rent, wages etc.) and the payments for the self owned factors (interest on owned capital, rent on owned premises, salary to entrepreneur etc.)

Q. Explain relationship between TC, TFC and TVC. With the help of a suitable diagram.

Ans. (I) Total Cost: By adding up total fixed cost and total variable cost we get total cost. In the table given bellow, TC is given in column (ii) which is the sum of columns (iii) and (iv). IN the adjacent diagram, TC curve has been drawn adding up TFC and TVC curves. Total fixed cost is fixed. Therefore whatever changes take place in the total cost are due to the changes in the total variable cost. TVC can be derived by subtracting TFC from Total cost.



(II) Average total cost (ATC): Average total cost is the sum of average fixed cost And average variable cost. ATC can be derived by dividing total cost by the number of units produced.

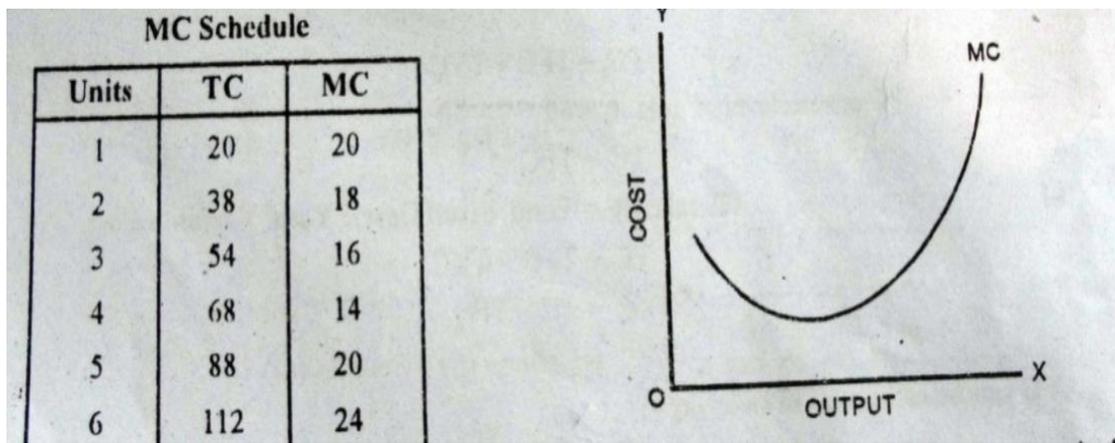
$$TC = TFC = TVC \dots\dots\dots (1)$$

$$TC/N = TFC/N + TVC/N\dots\dots(2)$$

$$ATC = AFC + AVC\dots\dots\dots (3)$$

Q. Define marginal cost?

Ans. Marginal cost is the change which takes place in the total cost by producing one more or one less unit. E.g. If a producer produces 3 units in place of 2, his total cost goes up from Rs.38 to Rs. 54. In this way, by producing an additional unit (3rd) unit, the total cost has gone up by Rs. 16. Therefore marginal cost of third unit is Rs. 16. Symbolically marginal cost can be written as $MC = TC_N - TC_{N-1}$ units.



Q. Difference between Fixed costs and Variable costs?

Ans:

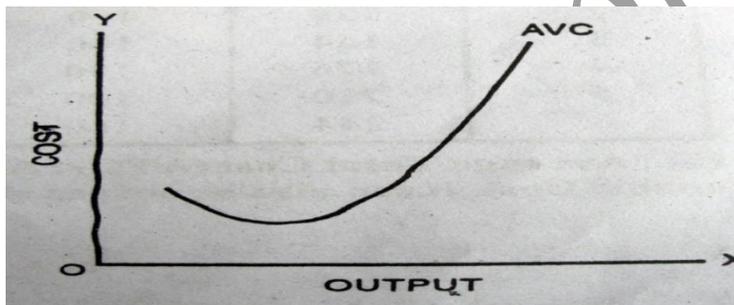
Fixed costs.	Variable costs.
1. Fixed costs are which do not change when output changes.	1. These costs vary with the changes in the level of output.
2. Examples are rent of land, Insurance charges.	2. Examples are cost of raw materials, fuel etc.
3. Fixed factors do not vary and confined to.	3. All factors vary in the long-run.
4. Total cost at zero level of Output is total factor cost.	4. These costs are nil when output is nil.
5. Total fixed cost curve is parallel to X-axis.	5. Average variable cost curve rises upwards from left to right.

Q. Write a note on average variable cost (AVC)?

Ans. Average variable cost is the variable cost per unit at a given level of output. Average variable cost is obtained by dividing total variable cost by the Number of units produced. In the form of an equation,

$$AVC = \frac{\text{Total variable cost}}{\text{Number of units produced}}$$

Average variable cost is also known as per unit cost. AVC in the beginning slopes downwards with the increase in output, but it starts increasing after a limit. In other words, in the beginning with the increase in output the utilization of fixed factors is better. After some level all the fixed factors are fully utilized. Beyond this limit, if output increased, then AVC starts rising because in this situation, the Efficiency of variable factor declines because of the less availability of fixed factors.



Q. Explain relationship between Total cost and Marginal cost?

Ans.(I) Marginal cost is estimated as the difference between total cost of two successive units of output.

$$\text{Thus, } MC = TC_N - TC_{N-1}.$$

- (ii) When TC rises at a diminishing rate, MC should be decreasing.
- (III) When the rate of increase in TC stops diminishing, MC should be at its minimum.
- (iv) When the rate of increase in total cost starts rising, MC should be increasing.

Q. Define private costs?

Ans. The sum of the explicit and implicit costs incurred by a firm to produce a product constitutes his private costs. It is these private costs that it takes into account while making decisions regarding price and output of the commodity it produces.

Q. Explain relationship between the average cost and the marginal cost?

Ans. The relationship between the two can be explained as follows:

- 1) When AC decreases, MC also decreases, but at a rapid rate.

$$MC < AC$$

- 2) When AC increases, MC also increases, but at a rapid rate.

$$MC > AC$$

3) When AC is at its minimum, MC is equal to AC.

$$MC = AC$$

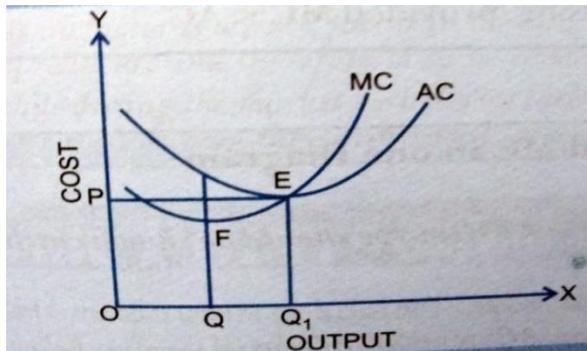
4) There can be a range of output where MC starts rising. AC may be still falling.

5) MC cuts AC below from its lowest point.

6) Thereafter, both AC and MC increases at a faster rate as compared to AC. As a result, MC curve is steeper as compared to AC curve.

7) AC depends on the nature of MC. When MC curve lies below the AC curve, it pulls the later down words.

Relationship between Average and Marginal Cost can be understood with the help of following diagram



Q. Define revenue?

Ans. Revenue refers to the payments received by the entrepreneur. In other words, revenue refers to the receipts obtained by a firm from the sale of certain quantities of the goods produced of a commodity at various prices. E.g. if a producer can sell during a week 100 shirts at the price of Rs. 50 each, his total revenue during the week equals Rs. 50 x 100 = Rs. 5,00.

Q. Define total revenue?

Ans. Total revenue refers to the total amount of money that a firm receives from the sale of its products, i.e., gross revenue. It depends upon a firm's total sales and the price at which these have been sold. Thus,

$$TR = Q \times P.$$

Q. Define marginal revenue?

Ans. Marginal revenue is the change in total revenue which results from the sale of one more (or one less) unit of a commodity.

Symbolically $MR = TR_n - TR_{n-1}$ units.

Here, MR = Marginal revenue

TR = Total revenue

TR_n = Total revenue of 'n' products.

TR_{n-1} = Total revenue of 'n-1' products.

Q. Define average revenue?

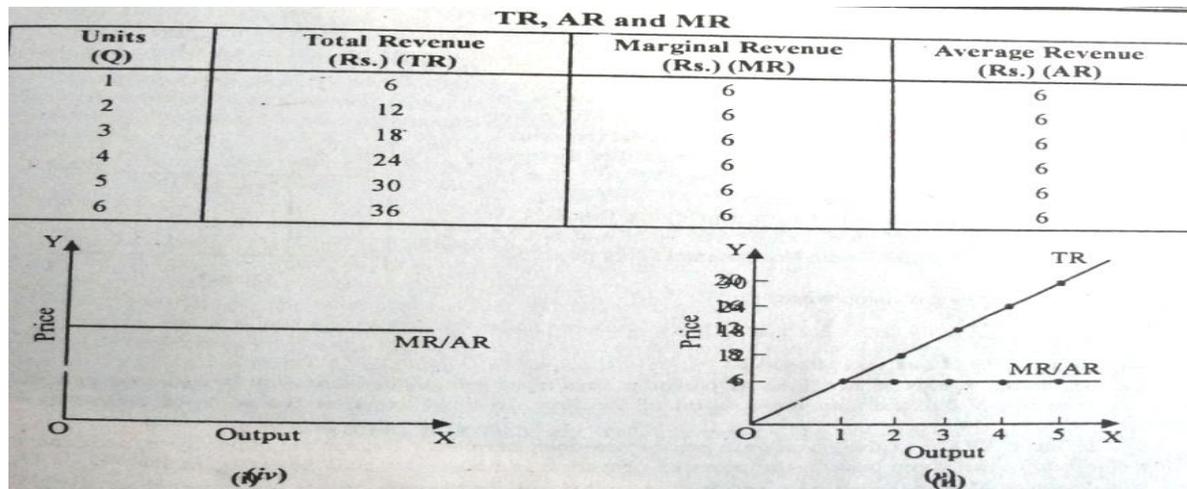
Ans. Average revenue is the revenue per unit of the commodity sold and it can be found out by dividing total revenue by the units of the commodity. It is the same as the price of the commodity.

Symbolically $AR = TR / Q$ or Average Revenue = $\frac{\text{Total revenue}}{\text{Total output sold}}$.

Q. Explain relationship between TR, AR and MR under perfect competition?

Ans. Under perfect competition MR and AR are equal and therefore, graphically they are in the form of a single straight horizontal line cutting the Y-axis at the given price level. At zero output level TR is zero, therefore,

TR curve is an upward rising straight from the point of origin as shown in the diagram given below. All the three concepts TR, AR and MR can be better understood with the help of following table and diagram.



Q. Explain relationship between total revenue (TR) and marginal revenue (MR)?

Ans. The relationship between TR and MR can be explained as follows.

- 1) When MR rises, TR also rises.
- 2) When MR is zero, TR is at its maximum.
- 3) When MR is negative, TR starts falling.

Q. Explain relationship between Total cost and Marginal cost?

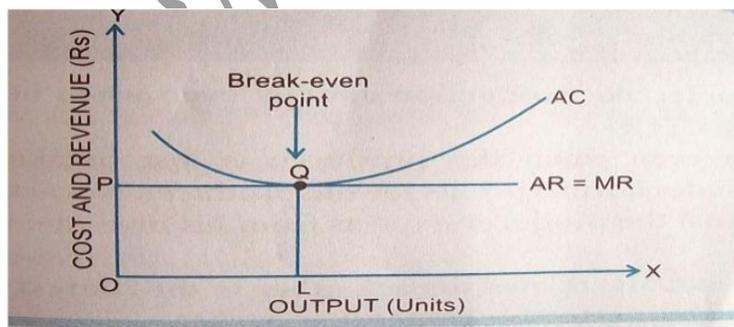
Ans.(I) Marginal cost is estimated as the difference between total cost of two successive units of output.

$$\text{Thus, } MC = TC_N - TC_{N-1}.$$

- (ii) When TC rises at a diminishing rate, MC should be decreasing.
- (III) When the rate of increase in TC stops diminishing, MC should be at its minimum.
- (iv) When the rate of increase in total cost starts rising, MC should be increasing.

Q: What is breakeven point?

Ans: It is the point where total cost of the firm equals its total revenue. $TR = TC$ or $TR/Q = TC/Q$ OR $AR=AC$. In other words there is no loss. In a situation of break even, a firm earns only normal profits.



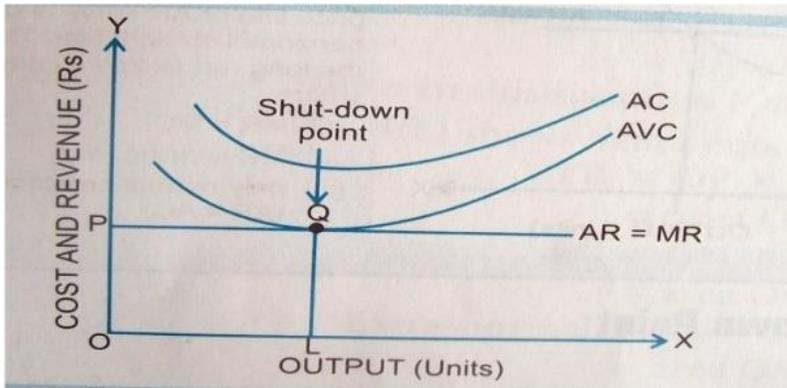
Break even is struck at point Q. where $AR=P=AC=LQ=OP$. A firm is just covering its costs as price = OP happens to be equal to $AC=LQ$.

Q: What is shutdown point?

Ans: it is the situation in which the price falls below average variable cost and thus the firm is forced to stop production or shutdown, because the firm in this situation will not be able to recover its entire average cost. The

firm will continue to produce as long as the price of the commodity covers its average variable cost. As such, shutdown point is a situation, where average revenue of the firm is equal to average variable cost i.e.

AR = AVC I.e. At this point the firm will shut down production.



In the above diagram shut down occurs at point Q. here $AR=AVC$. The firm is incurring the loss of AFC. Per unit of output. Total loss to the firm = $AFC \times \text{output} = TFC$ for a given level of

Unit 3rd Market structure

Q. What is Firm?

Ans. A Firm is a group of people, with production tools, located in some premises, who, with work, transform raw materials into goods and services, and sell them. Can also be defined as a business unit which owns, controls and manages a plant or plants, where plant refers to the technical unit.

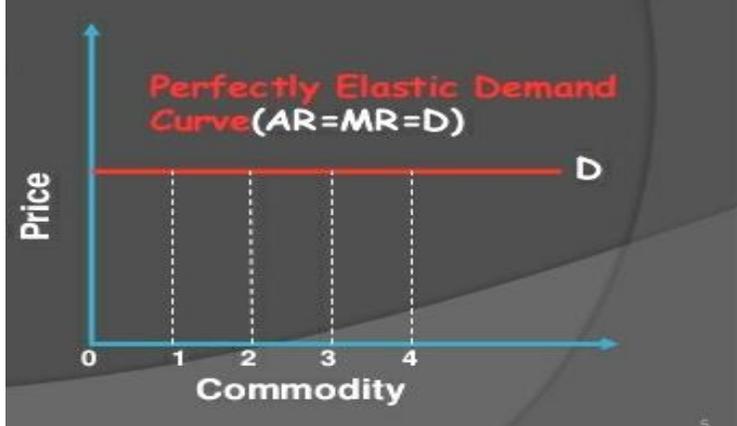
Q. What Industry refers?

Ans. The Firm and Industry are two different entities but co-related. A group of Firms producing a homogeneous products is called Industry and conversely we can say a Firm is the company that operates within the Industry to create that product. An Industry is the name given to a certain type of manufacturing or retailing environment. For example, the retail industry is the industry that involves everything from clothes to computers. You can presume KFC as one firm, but all the fast food restaurants and their suppliers would make up the fast food Industry.

Q. What is the Perfect Competition?

Ans. Perfect Competition : 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. In the words of A. Koutsoyiannis, "Perfect competition is a market structure characterised by a complete absence of rivalry among the individual firms." AR and MR Curves Under Perfect Competition AR (Average revenue) curve and MR (Marginal Revenue) curve under perfect competition becomes equal to D (Demand) curve and it would be a horizontal line or parallel to the X-axis. The curve simply implies that a firm under perfect competition can sell as much quantity as it likes at the

given price determined by the industry i.e. a perfectly elastic demand



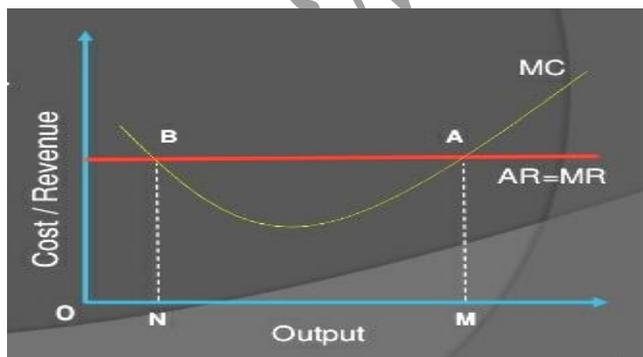
curve Price Commodity Perfectly Elastic Demand Curve($AR=MR=D$)

Q. Explain the meaning of Firm's equilibrium under perfect competition?

Ans. A firm is in equilibrium when it has no tendency to change its level of output. It needs neither expansion nor contraction. So the Firm's Equilibrium means, "The level of output where the firm is maximizing its profits and therefore, has no tendency to change its output. In the words of Hansen, "A Firm will be in equilibrium when it is of no advantage to increase or decrease its output".

Necessary Conditions For The Firms Equilibrium Profit of a Firm is equal to the difference between its total revenue (TR) and the total cost (TC) i.e. ($Profit=TR-TC$) and so for the equilibrium of the Firm it should be maximum Marginal cost should be equal to Marginal revenue ($MC=MR$) And when these are equal profit is maximum Equality of MR and MC is necessary but not sufficient, so the sufficient condition is that MC curve should cut the MR curve from below not from the above No firm has an incentive to change its behavior.

There are two points at which $MR (=AR) =MC$ but at both the points the Firm can't be in equilibrium or can't have maximum profit As stated before, as a sufficient condition for the equilibrium MC curve should cut the MR curve from below which is point A Cost/Revenue MNO B A MC AR=MR Output



Firms Equilibrium Under Perfect Competition In Two Time Periods As a matter of fact, the price of a good is determined at a point where its demand is equal to supply and so further it depends on the time taken by the demand and supply to adjust themselves So this time element plays a vital role in determination of price of the goods Acc. to Alfred Marshall - If the period is short, price determination will be influenced more by the demand, on the other hand, if the period is long it will be influenced more by the supply So the two periods we have to study.

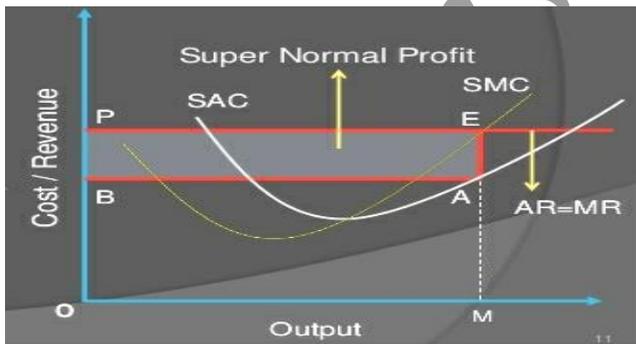
1. Short Period Long Period

Short Run Firm Equilibrium: In Short run, the Firms output (supply) can be changed only by the variable factors (like labor force through overtime), fixed factors (like machinery) can't be changed. There is not enough time for new Firms to enter the Industry. Further, if the demand is increased, the supply can be increased only up to its existing production capacity. A firm in Short Run Equilibrium may face one of these situations Super Normal Profits. Normal Profits and Suffer Minimum Losses Shut Down Point For the analysis of these situations Short-run Average Cost curve (SAC) will be introduced.

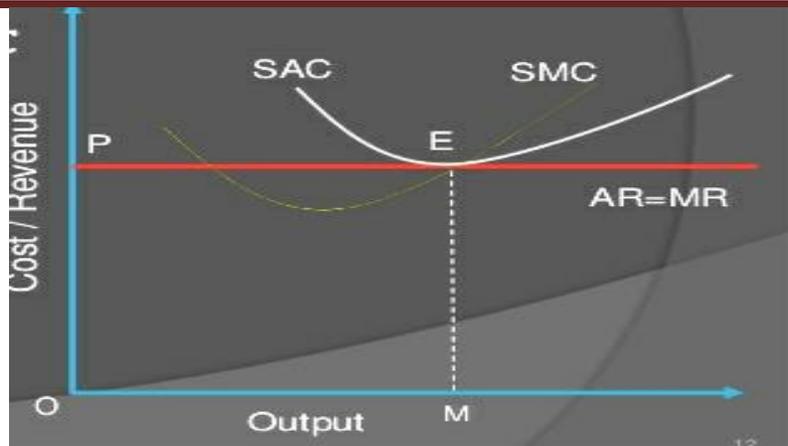
This analysis is based on the following assumptions:

1. All firms in an industry use homogeneous factors of production.
2. Their costs are equal. Therefore, all cost curves are uniform.
3. They use homogeneous plants so that their SAC curves are equal.
4. All firms are of equal efficiency.
5. All firms sell their products at the same price determined by demand and supply of the industry so that the price of each firm is equal to $AR = MR$.

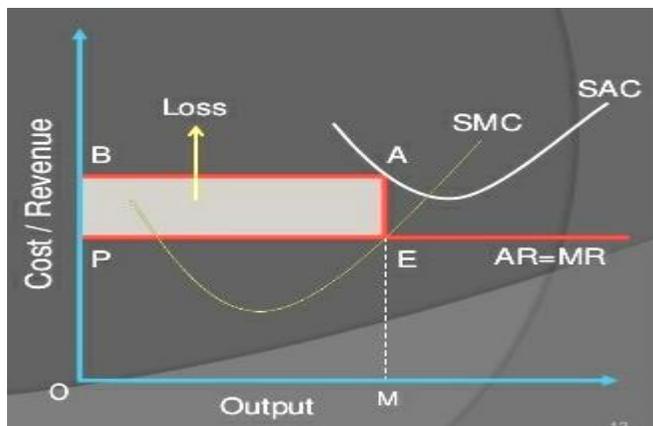
Super Normal Profits: A Firm in Equilibrium earns super normal profits, when average revenue (price per unit) determined by the Industry is more than its short-run average cost (SAC) Firm's equilibrium is at point=E, where $MR (=AR) = SMC$. Equilibrium output is=OM since $AR (EM) > SAC (AM)$. Firm is earning EA super normal profit per unit of output. Total super normal profit of the Firm on OM output is= EABP. Shaded area in the following diagram is Super-Normal Profits.



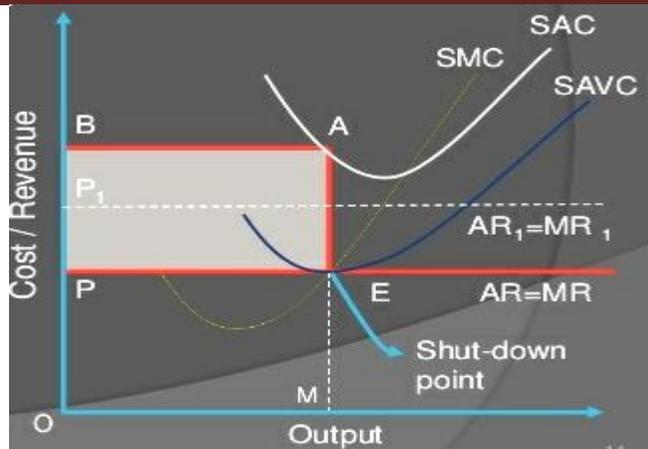
Normal Profits: A Firm in Equilibrium earns normal profit, when average revenue (price per unit) determined by the Industry is equal to its short-run average cost (SAC). A Firm is in equilibrium at point=E, where $MR (=AR) = SMC$. Equilibrium level of output=OM. At this output AR and SAC both are equal at point E and Firm at this point is earning normal profit per unit of output. It results no gain in terms of money for an entrepreneur as this profit is included in the cost of production Normal Profits are when $AR=SAC$.



Losses: A Firm may continue production even if it is incurring losses because in short run, it can't leave the Industry. At equilibrium output, a firm may suffer losses. Because a part of fixed cost may not be recovered in short run. Despite these losses a firm would decide to produce, so long as it is able to recover the average variable cost. At equilibrium point $EMC=MR$ at OM equilibrium output firm's average revenue is ME While AC is MA . Since AR is less than AC thus the firm bears losses being equal to $AEPB$. Firm's per unit loss= AE i.e. $(AM-EM)$ Even if Firm discontinues the production, it will have to bear the loss of fixed cost which is minimum possible loss of a Firm.



Shut down Point : The firm will shut down if it cannot cover average variable costs i.e. when $AR=SAVC$. A firm should continue to produce as long as price is greater than average variable cost. Once price falls below that point it makes sense to shut down temporarily and save the variable costs. In the diagram at point E Firm just manages to keep its AVC equal to AR . In case the price slips down below OP , the firm will have to close down its business. The shutdown point is the point at which the firm will gain more by shutting down than it will by staying in business.



Q. Explain Long Run Equilibrium of a firm under perfect competition?

Ans. Long-run Equilibrium of the Firm: In the long-run, it is possible to make more adjustments than in the short-run. The firm can adjust its plant capacity and scale of operations to the changed circumstances. Therefore, all costs are variable. Firms must earn only normal profits. In case the price is above the long-run AC curve firms will be earning supernormal profits.

Attracted by them, new firms will enter the industry and supernormal profits will be competed away. If the price is below the LAC curve firms will be incurring losses. As a result, some of the firms will leave the industry so that no firm earns more than normal profits. Thus “in the long-run firms are in equilibrium when they have adjusted their plant so as to produce at the minimum point of their long-run AC curve, which is tangent (at this point) to the demand (AR) curve defined by the market price” so that they earn normal profits.

It's Assumptions:

This analysis is based on the following assumptions:

1. Firms are free to enter into or leave the industry.
2. All firms are of equal efficiency.
3. All factors are homogeneous. They can be obtained at constant and uniform prices.
4. Cost curves of firms are uniform.
5. The plants of firm: are equal having given technology.
6. All firms have perfect knowledge about price and output.

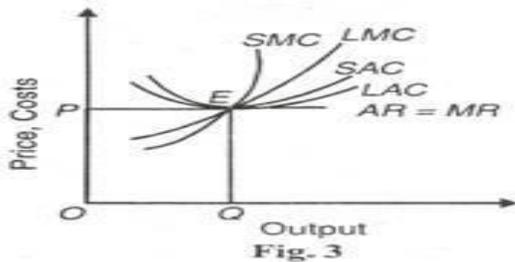
Determination: Given these assumptions, each firm of the industry will be in the following two conditions.

(1) In equilibrium, its short-run marginal cost (SMC) must equal to its long-run marginal cost (LMC) as well as its short-run average cost (SAC) and its long-run average cost (LAC) and both should be equal to $MR=AR=P$. Thus the first equilibrium condition is:

$SMC = LMC = MR = AR = P = SAC = LAC$ at its minimum point, and

(2) LMC curve must cut MR curve from below.

Both these conditions of equilibrium are satisfied at point E in Figure 3 where SMC and LMC curves cut from below SAC and LAC curves at their minimum point E and SMC and LMC curves cut AR = MR curve from below. All curves meet at this point E and the firm produces OQ optimum quantity and sell it at OP price.



Since we assume equal costs of all the firms of industry, all firms will be in equilibrium in the long-run. At OP price a firm will have neither a tendency to leave nor enter the industry and all firms will earn normal profit.

Q. How Equilibrium of the Industry under Perfect Competition is determined?

Ans. An industry is in equilibrium when there is no tendency for the firms either to leave or enter the industry, and (ii) when each firm is also in equilibrium. The first condition implies that the average cost curves coincide with the average revenue curve of all the firms in the industry. They are earning only normal profits, which are supposed to be included in the average cost curves of the firms. The second condition implies the equality of MC and MR. Under a perfectly competitive industry, these two conditions must be satisfied at the point of equilibrium, i.e.,

$$SMC = MR$$

$$SAC = AR$$

$$P = AR = MR$$

$$SMC = SAC = AR = P$$

Such a situation represents full equilibrium of the industry.

Short-Run Equilibrium of the Industry: An industry is in equilibrium in the short run when its total output remains steady, there being no tendency to expand or contract its output. If all firms are in equilibrium, the industry is also in equilibrium. For full equilibrium of the industry in the short run, all firms must be earning only normal profits. The condition for this is $SMC = MR = AR = SAC$. But full equilibrium of the industry is by sheer accident because in the short run some firms may be earning supernormal profits and some incurring losses.

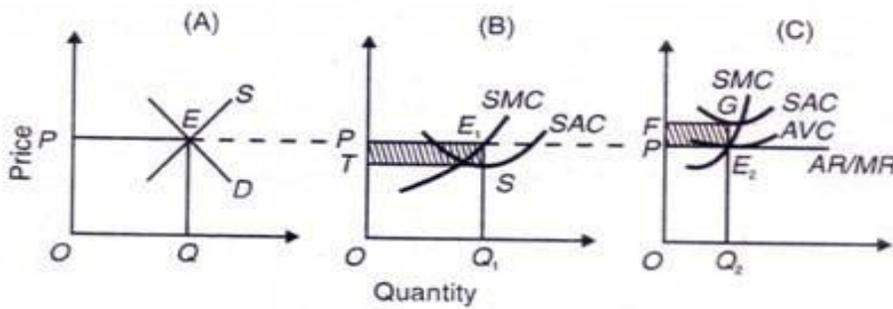


Fig. 4

Even then, the industry is in short-run equilibrium when its quantity demanded and quantity supplied are equal at the price which clears the market. This is illustrated in Figure 4, where in Panel (A), the industry is in equilibrium at point E where its demand curve D and supply curve S intersect which determine OP price at which its total output OQ is cleared. But at the prevailing price OP some firms are earning supernormal profits PE_1ST as shown in Panel (B), while some other firms are incurring FGE_2P losses as shown in Panel (C) of the figure.

Q. Long-run Supply Curve?

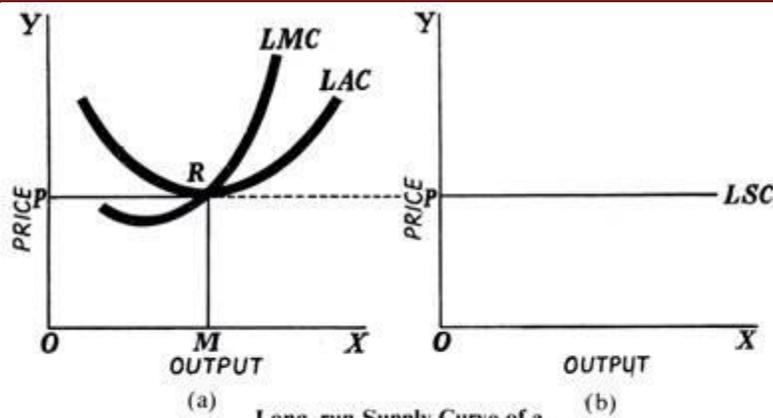
Ans. The long-run is supposed to be a period sufficiently long to allow changes to be made both in the size of the plant and in the number of firms in the industry. Whereas in the short period, an increase in demand is met by over-using the existing plant, in the long-run, it will be met not only by the expansion of the plants of the existing firms but also by the entry into the industry of new firms.

Moreover, we have seen that, in the short-run, a firm produces that output at which its marginal cost is equal to the price. But, in the long-run, the price must be equal to both the-marginal cost and the average cost. The reason is that an industry will be in equilibrium when all firms in the industry are making normal profits, and they will be making normal profits only if the price, i.e., average revenue (AR) is equal to average cost AC.

The shape of supply curve, in the long run, will depend on whether the industry is subject to the law of constant return (i.e., constant costs), or to diminishing returns (i.e., increasing costs) or to increasing returns (i.e., diminishing costs). We show these curves below.

Supply Curve of Constant Cost Industry:

The supply curve of the constant cost industry is shown in the following diagram (Fig. 24.3).



Long-run Supply Curve of a Constant Cost Industry
Fig. 24.3

In the Fig. 24.3(a) which relates to a firm, LMC is the long-run marginal cost curve, and LAC is the long-run average cost curve. They intersect at R which means that at the point R, the marginal cost is equal to the average cost. Here they are also equal to price OP. The output at this point is OM. Thus, at the output OM, $MC = AC = \text{Price}$.

Now look at the Fig. 24.3(b). Corresponding to OP price, the long-run supply curve is LSC, which is a horizontal straight line parallel to the X-axis. This means that whatever the output along the X-axis, price is the same OP where the marginal cost and average cost are equal. The cost remains the same, because it is a constant cost industry.

It is an industry in which, even if the output is increased (or decreased), the economies and diseconomies cancel out so that the cost of production does not change. Also, when new firms enter the industry to meet the increased demand, they do not raise or lower the cost per unit.

Thus, the industry is able to supply any amount of the commodity at the price OP which is equal to the minimum long-run average cost which ensures normal profit to all the firms engaged in the industry. That is, every firm will be in the long-run equilibrium where $\text{Price} = MC = AC$. All firms have identical cost conditions.

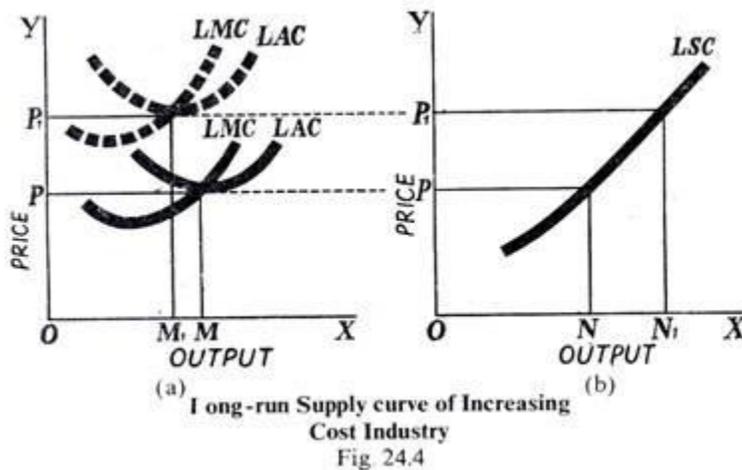
Hence, in the case of a constant cost industry, the long-run supply curve LSC is a horizontal straight line (i.e., perfectly elastic) at the price OP, which is equal to the minimum average cost. This means that whatever the output supplied, the price would remain the same.

Supply Curve of an Increasing Cost Industry:

In the case of an increasing cost industry, the cost of production increases as the existing firms expand or the new firms enter into the industry to meet an increase in demand. The external diseconomies outweigh the external economies. The increased demand for the productive resources required to produce larger output to meet increased demand for the product raises their prices resulting in higher cost of production.

The rise in costs will shift both the average and marginal cost curves upward and the minimum average cost will rise. This means that the additional supplies of the product will be forthcoming at higher prices, whether the

additional supplies come from the expansion of the existing firms or from the new firms which may have entered the industry. All this is shown in the following diagram (Fig. 24.4).



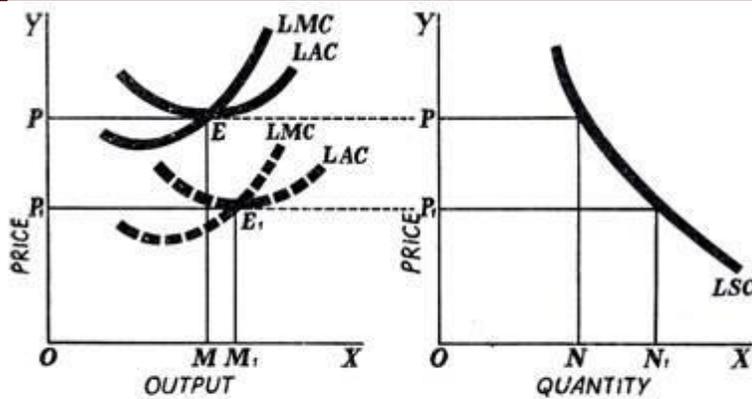
The Fig. 24.4(a) shows the position of individual firms. The position of the dotted LMC and LAC curves shows that they have been shifted upwards where each firm achieves a long-run equilibrium so that the price $OP_1 = MC = AC$. But, in the Fig. 24.4(b) which relates to the industry, we find that at the price OP_1 a larger amount ON_1 is supplied than at the price OP (i.e., ON).

This means that the long-run supply curve LSC slopes upwards to the right as the output supplied increases. That is, more will be supplied at higher prices. This is probably typical of the actual competitive world, because higher prices have to be paid for the scarce productive resources to attract them from other uses so that production in this particular industry may be increased. Thus, we see that in the case of an increasing cost industry, the long-run supply curve slopes upward to the right.

Supply Curve of a Decreasing Cost Industry:

In a decreasing cost industry, costs decrease as output is increased either by the expansion of the existing firms or by the entry of new firms. In this case, the economies of scale out-weight the diseconomies, if any. This happens when a young industry grows in a new territory where the supply of productive resources is plentiful. The net external economies will push the cost curves down so that the additional supplies of the output are forthcoming at lower prices.

The following diagram (Fig. 24.5) makes the whole thing clear:



Long-run Supply Curve of a Decreasing Cost Industry
Fig. 24.5

The Fig. 24.5(a) shows how the new, i.e., dotted LMC and LAC curves have been shifted downwards from their original position, when the LMC and LAC curves intersect at E where every firm was the equilibrium and was producing OM. The new curves intersect at E₁ which means that, at this point, the firms in the industry have achieved the long-run equilibrium, each producing OM₁ output, so that the price OP = MC = AC. But looking at the Fig. 24.5(b), we find that, at OP₁ price, ON₁ is supplied which is more than ON supplied at the original price OP.

The LSC slopes downwards to the right which means that the additional supplies of the output are forthcoming at lower prices, since both the marginal cost and average cost have fallen owing to cheaper supplies of the productive resources.

Summing Up:

Thus, we find that, while the short-run supply curve of the industry always slopes upwards to the right, the long-run supply curve may be a horizontal straight line, sloping upwards or sloping downwards depending upon the fact whether the industry in question is a constant cost industry, increasing cost industry or decreasing cost industry. But the long-run upward sloping curve is more typical of the actual world.