# Chapter – 2 Micro Economics

## Lesson – 1 Demand Supply and Market Equillibrium

**Summary Question**

**1. Define demand.**

Demand refers to both the desire to purchase and ability to pay for a commodity. It is the amount of a good that buyers are willing and able to purchase.

**2. What do you mean by demand function?**

Demand function is the functional relationship between demand for a good and its determinants. It is expressed as: $Qx = f(Px, Y, T, PY, E, A, Sp, ..........)$

**3. Define linear demand function.**

If both price and quantity demanded changes at a constant rate, the demand function is said to be linear. In linear demand function, slope of demand curve remains constant all along the demand curve, it is called linear. $Qx = a - b(Px)$

**4. Write down any four determinants of demand.**

a. Price of the commodity

b. Price of related goods

c. Income of the consumers

d. Distribution of national income

**5. What do you mean by supply?**

Supply means the quantity of commodity that a seller is willing to sell at various prices in the market at a particular unit of time.

**6. Define linear supply function**

If both price and supply change at different rates the, supply function will be non-linear. In non-linear supply curve, the slope of supply curve changes all along its length. It is expressed as $Q_x = a(Px)_b$.

**7. Define meaning of market equilibrium.**

Market equilibrium is defined as a state in which the two opposite forces like demand and supply are equal.

**8. Define supply function.**

The supply function shows the functional relationship between supply and its determinants. $Q = 1 (Px, PR, C. T, To, Ts)$

**9. What is movement along demand curve?**

If other things being equal, the quantity demanded increases or decreases due to fall or rise in the price of a commodity, it is known as movement along a demand curve.

**10. Write any four causes of shift in supply curve.**

**The four causes of shift in supply curve are :-**

a. Change in cost of production

b. Change in technology

c. Goals of the firm

d. Taxation policy

# Short Type Answer Question

## 1.Define Law of Supply

"Law of Supply" shows the relation between quantity supplied of a commodity and its price. Law of Supply states that other things remaining same, quantity supply increases with a rise in price and decreases with fall in price. It means when a price of commodity increases, quantity supply also increases and when the price decreases, quantity supply also decreases. Hence, there is a direct relation between price and supply or supply is the function of price.

This law can be expressed symbolically, as S=f(P)

Where, S = Quantity Supplied

P = Price of a commodity

F = function

Supply is influenced by the rate of return. Higher the expected rate of return, higher will be the production and quantity supplied.

**Assumptions**

1. Technology remains constant.

2. Price of factors of production remains constant.

3. No change in tax rates.

4. No change in price expectation by seller.

Law of supply can be explained with the help of supply schedule and diagram.

| Price ( Rs) | Quantity Supplied (Rs) |
|-------------|------------------------|
| 5 | 10 |
| 10 | 20 |
| 15 | 30 |
| 20 | 40 |

The table shows that, when price is Rs. 5 per kg, quantity supplied is 10 kg. As the price rises from Rs. 5 to Rs. 10, Rs. 15 and Rs. 20, the quantity supplied increases from 10 kg to 20 kg, 30 kg and 40 kg respectively. The above table represents the positive relationship between price and quantity supplied of the good.

**Supply Curve**

Supply curve is a graph of the relationship between the price of a good and the quantity supplied. It is a graphical representation of supply schedule, which indicates that the positive relationship between price of a commodity and quantity supplied.
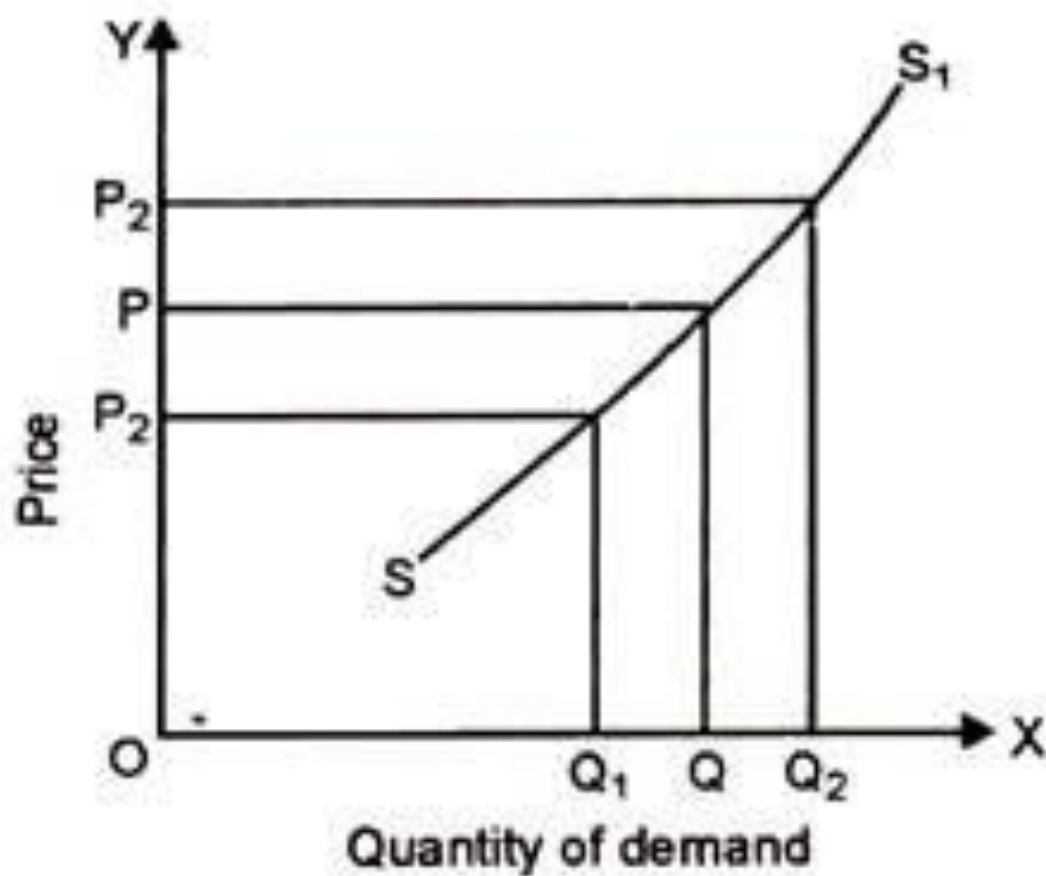


Quantity of demand

This law can be shown in this way also.

In the figure above OX axis shows quantity of demand and OY axis shows price. $SS_1$ line is the line of supply when the price of the commodity is OP then quantity of supply is OQ. When the price rises from OP to $OP_2$ and then supply also rises from OQ to $OQ_2$. Similarly, if price is reduced from OP to $OP_1$, then supply will reduce from OQ to $OQ_1$. By seeing the diagram the conclusion can be drawn that when price rises supply increases and when the price reduces the supply reduces.

## 2. Define the law of demand.

The law of demand was propounded by neo-classical economist Alfred Marshall in 1890 A.D. in his famous book "Principle of Economics". The law of demand expresses the functional relationship between price and commodity demanded. A rise in the price of a commodity leads to a fall in the quantity demanded and a fall in the price of a commodity leads to a rise in the quantity demanded. Thus, the law of demand states that quantity demanded for commodity varies inversely to the change in its price, other things being equal. Marshall states the law of demand as "Other things remaining the same, the amount demanded increases with a fall in price and diminishes with a rise in price.

**Other things being same these are the assumptions of law of demand:**

a. Income of the consumer remains constant

b. Tastes and preferences of the consumers remain unchanged

c. Size of population remains constant

d. Price of related goods remains same.

e. Fashion and habit of the consumer remains same.

f. Climate and season remain constant.

Demand Schedule The law of demand can be explained with the help of demand schedule:

| Price ( Rs) | Quantity Demanded (Rs) |
|---|---|
| 5 | 5 |
| 4 | 10 |
| 3 | 15 |
| 2 | 20 |
| 1 | 25 |

The above schedule shows the inverse relationship between price and quantity demanded of the commodity, when the price of the commodity per unit is Rs. 5 the demand for the commodity is only 5 kg. When price decreases from Rs. 5 to Rs. 4, 3, 2 and 1, then quantity demanded increases from 5 kg to 10kg, 15kg, 20kg and 25kg respectively.

**Demand Curve**

A graphical presentation of the demand schedule is simply known as demand curve. We can put the demand schedule in the curve like this:



Fig. 7
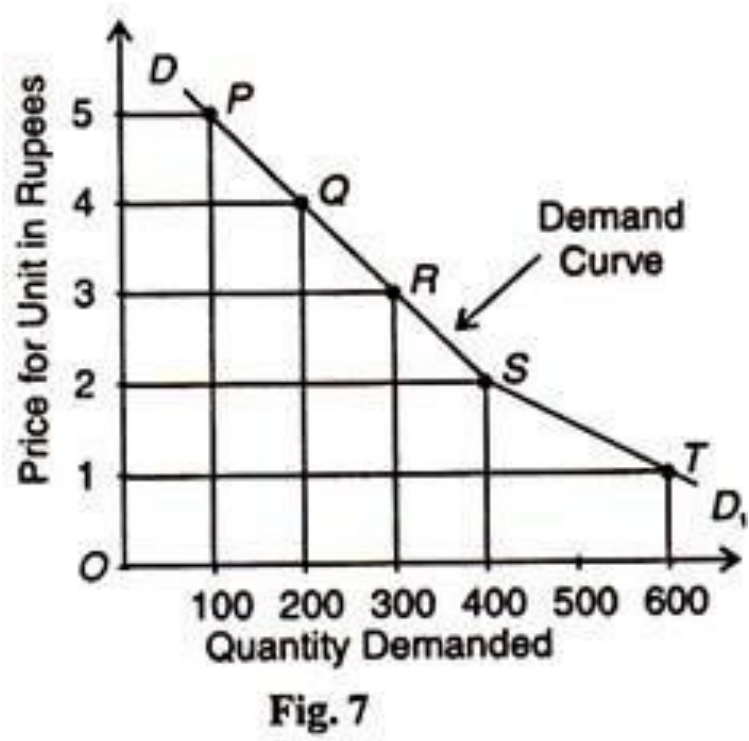
In the figure, point P of the demand curve $DD_1$ shows demand for 100 units at the Rs. 5. As the price falls to Rs. 4, Rs. 3, Rs. 2 and Re. 1, the demand rises to 200, 300, 400 and 600 units respectively. This is clear from points Q, R, S, and T. Thus, the demand curve $DD_1$ shows increase in demand of orange when its price falls. This indicates the inverse relation between price and demand.

# 3.Explain the factors causing the shift on demand curve.

The factors causing the shift in demand curve are as follows:

❖ **Change in Income:**

The change in income leads to change in quantity demanded of goods. Generally, if there is increase in income of the consumers, demand for normal goods increases and demand curves shift towards right. If there is decrease in income of the consumers, demand for normal goods decreases and demand curve shift towards left. But, in the case of interior goods, demand decreases with increase in income of consumers and vice versa.

❖ **Change in Price of Related Goods:**

The term related goods refer to the substitute goods and complementary goods. The increase in price of one goods (tea) leads to increase in the demand for another goods (coffee). Now the demand curve of coffee shifts towards right and it shift towards left if there is fall in price of tea. On the other hand, in the case of complementary goods, increase in price of petrol leads to decrease in the demand for car. Now the demand curve of car shifts towards left.

❖ **Change in Taste and Preferences:**

If the taste and preference for goods increases, the demand for those goods increases. Increase in demand shifts the demand curve towards right. Similarly, if the taste and preference for goods decreases, the demand for those goods also decreases. Any decrease demand shifts demand curve towards left.

❖ **Size of Population:**

If the size of population is large, the demand for goods will be high and the demand curve shift towards right and vice versa.

❖ **Distribution of National Income:**

The demand for goods depends upon the distribution of national income. If the distribution of national income is equal, it increases the demand for goods and demand curve shift towards right. Similarly, if the distribution of national income is unequal, it decreases the demand for goods and demand curve shift towards left.

## 4.Explain the factors causing the supply curve.

The factors causing the shift in supply curve are as follows:

❖ **Change in Cost of Production:**

Cost of production includes prices of energy, raw-materials, cost of labour, cost of capital, etc. A rise in cost reduces the production and thereby shifts the supply curve leftward indicating decrease in supply. Conversely, a fall in cost of production raises the production thereby shifts the supply curve rightward indicating increase in supply.

❖ **Change in Technology:**

An improvement in production technology reduces the cost of production per unit. As a result, the suppliers become able to supply more quantities even at the same price. It makes the supply curve shift toward right. On the other hand, the old technology reduces the supply even at the same price and supply curve shifts towards left.

❖ Goals of the Firms:

If the firm expects higher profits in the future, they will take the risk and produce goods on large scale resulting in large supply of the commodity. The supply curve shift towards right and vice versa.

❖ **Taxation Policy:**

If a government imposes high taxes on the commodities then the supply of commodities is reduced and the supply curve shift towards left. Similarly, if the taxes are low, the supply can be increased and the supply curve shifts towards the right.

❖ Change in the Size of Population:

High Population encourages for more supply and supply curve shifts towards right on the other hand, low population causes supply curve shift towards left.

## 6.Explain the shift in the demand curve.

When more or less quantity of a commodity is demanded at the same price due to change in factors other than the price of the commodity (such as income of the consumer, price of related goods, size of population, taste etc.) it is called shift in demand curve. Any change that raises the quantity that buyers wish to purchase at any given price shifts the demand curve to the right. Any change that lowers the quantity that buyers wish to purchase at any given price shifts the demand curve to the left. Rightward shift in the demand curve indicates increase in demand, while the leftward shift in the demand curve indicates decrease in demand.

There are two types of shift in demand curve and they are as follows:

1. Rightward shift in Demand Curve (Increase in Demand)

2. Leftward shift in Demand Curve (Decrease in Demand)

1. Rightward Shift in Demand Curve (Increase in Demand) Aany change that raises the quantity that buyers wish to purchase at any given price shifts the demand curve to the right. Rightward shift in the demand curve indicates increase in demand. So, it also called increase in demand.

2. Leftward Shift in Demand Curve (Decrease in Demand) Any change that lowers the quantity that buyers wish to purchase at any given price shifts the demand curve to the leftward is called leftward shift in demand curve. Which is also known as decrease in demand.

The concept of shift in demand curve can be explained with the help of table

| Combinations | Price (Rs) | Quantity Purchased (Units) |
|---|---|---|
| A | 20 | 10 |
| B | 20 | 20 |
| C | 20 | 30 |

Above table shows that at point B, 20 units of a commodity are p 30 the price of that commodity is Rs. 20. Because of unfavorable change in factors other than price of the commodity, the purchased quantity decreases to 10 units at the same price Rs. 20 per unit at point A. Similarly, the purchased quantity increases to 30 units at the same price Rs. 20 per unit at point C.

## 6.Explain movement along the demand curve.

If other things being equal, the quantity demanded increases or decreases due to fall or rise in the price of a commodity, it is known as movement along the demand curve. It explains how the combination of price and demand move from one point of the same demand curve to another point.

There are two types of movement along a demand curve:

Expansion in demand (or Increase in Quantity Demanded)

Rise in quantity demanded due to decrease in price, if other things being equal is known as expansion in demand. Where, the demand curve and its position remain same.

2. Contraction in demand (or Decrease in Quantity Demanded)

Other things being same, fall in quantity demanded due to rise in price is known as contraction in demand. Where, the demand curve does not change its position but consumer moves upward. By combining these both i.e. Expansion in demand and contraction in demand, we can see the figure which explains this:
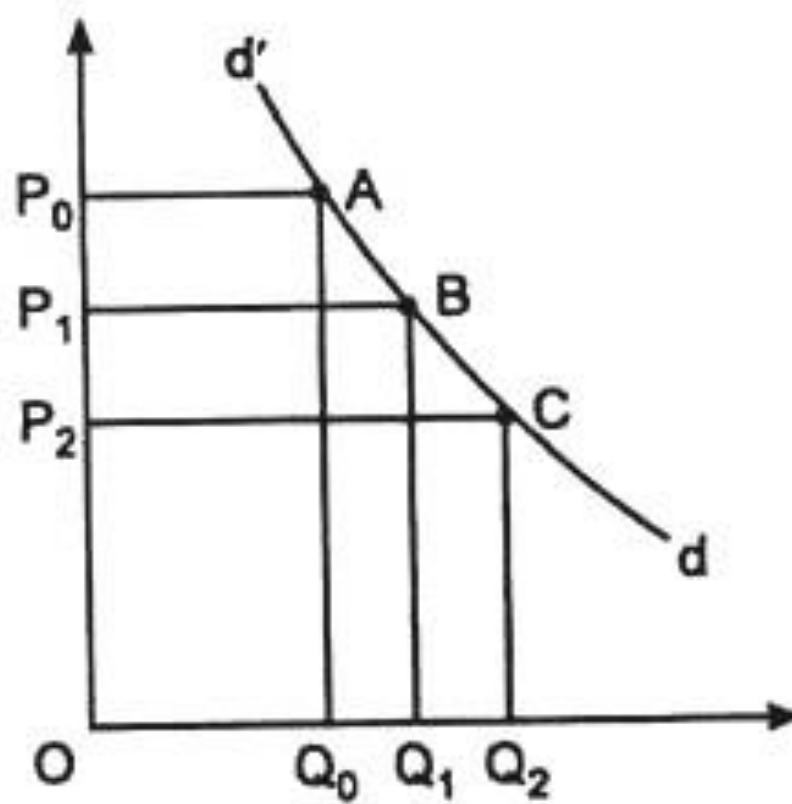
Fig. 3 : Movement along the same demand curve

## 8. Explain shift in supply curve.

Shift in supply curve refers to the change in supply of the commodity due to the change in all or one of the determinants of supply except its own price. Any change that raises the quantity that sellers wish to produce and sell at any given odity price shifts the supply curve to the right. Any change that lowers the quantity that sellers wish to produce and sale at any given price shifts the supply curve to the left. For instance, use of improve technology reduces the cost of production and indicates the firm to supply more at the same price. On the other hand, use of worse technology raises the cost of production and indicates the firm to supply less at the same price. Rightward shift of supply is called increase in supply and leftward shift in supply curve is called decrease in supply.

### i) Rightward Shift in Supply Curve (Increase in Supply)

Any change that raises the quantity that sellers wish to produce and sell at any given price shifts the supply curve to the right. For instance, use of improve technology reduces the cost of production and indicates the firm to supply more at the same price. Rightward shift of supply is called increase in supply

### ii) Leftward Shift in Supply Curve (Decrease in Supply)

Any change that lowers the quantity that sellers wish to produce and sale at any given price shifts the supply curve to the left. For instance, use of worse technology raises the cost of production and indicates the firm to supply less at the same price. Leftward shift in supply curve is called decrease in supply.
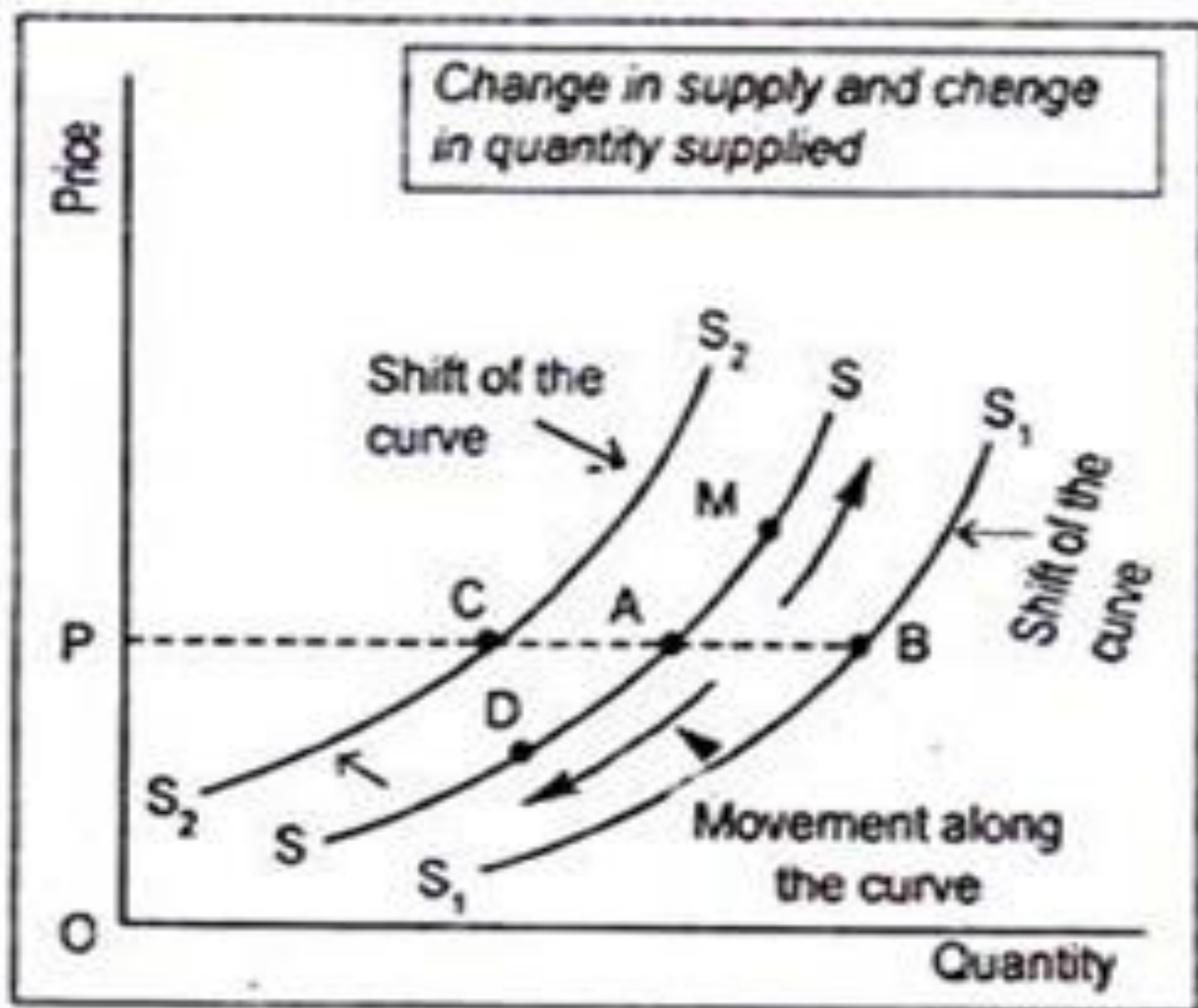
Fig. 4.16: Shifts of the Supply Curve

# Lesson - 2 Elasticity of Demand and Supply

## 1. Define elasticity of demand.

The elasticity of demand is the measure of responsiveness of demand for a commodity to the change in any of its determinants like, price of the same commodity, price of the related commodity, income of the consumer, etc.

## 2. What are the types of elasticity of demand?

There are three types of elasticity of demand.
a. Price elasticity of demand (Ep)
b. Income elasticity of demand (Ex)
c. Cross elasticity of demand (Ec)

## 3. Define price elasticity of demand.

The price elasticity of demand measures the degree of responsiveness of quantity demanded for a commodity to the change in its price.

It can be expressed as :-

$$Ep = \frac{Percentage\ Change\ in\ quantity\ demanded}{Percentage\ change\ in\ price} = \frac{\Delta Q}{\Delta P} * \frac{P}{Q}$$

## 4. What are the types of price elasticity of demand?

The types or degree of price elasticity of demand are as follows:

a. Perfectly elastic demand (Ep = ∞)

b. Relatively elastic demand (Ep > 1)

c. Unitary elastic demand (Ep = 1)

d. Relatively inelastic demand (Ep < 1)

e. inelastic demand (Ep = 0)

## 5. Give the name of four determinants of price elasticity of demand.

The main determinants of price elasticity of demand are as follows:

a. Nature of the commodity

b. Substitute

c. Goods having several uses

d. Income of the consumer

## 6. What is income elasticity of demand?

Income elasticity of demand shows the degree of responsiveness of quantity demanded for a good to the change in the income of the consumer.

$$Ec = \frac{Percentage\ change\ in\ qunatity\ demanded}{Percentage\ change\ in\ income} = \frac{\Delta Q}{\Delta P} * \frac{Y}{Q}$$

## 7. State three degrees of positive income elasticity of demand.

1. Unitary Income elasticity of demand (Ey = 1)
2. Less than Unitary Income elasticity of demand (Ey < 1)
3. More than Unitary Income elasticity of demand (Ey > 1)

## 8. Define cross elasticity of demand.

The cross elasticity of demand is defined as the percentage change in the quantity demanded for X resulting from a percentage change in the price of Y. The cross elasticity of demand between good X and Y is given below:

$$Ec = \frac{Percentage\ change\ in\ qunatity\ demanded\ for\ X\ good}{Percentage\ change\ in\ income\ for\ Y\ good} = \frac{\Delta Qx}{\Delta Py} * \frac{PY}{Qx}$$

## 9. What is the cross elasticity of demand of respect to change in price of motor cars?

Cross elasticity of demand in case of independent goods like pens and motor cars is zero. It means there is no effect on the demand for pens with respect to the change in price of motor cars.

## 10. What are the types of cross elasticity of demand?

Cross elasticity of demand is of three types:

a. Positive cross elasticity of demand (Ec > 0)

b. Negative cross elasticity of demand (Ec < 0)

c. Zero cross elasticity of demand (Ec=0)

# Important Questions and answers

## 1.Explain the types of price elasticity of demand.

### 1. Perfectly Elastic Demand:
When a small change in price of a product causes a major change in its demand, it is said to be perfectly elastic demand. In perfectly elastic demand, a small rise in price results in fall in demand to zero, while a small fall in price causes increase in demand to infinity. In such a case, the demand is perfectly elastic or $e_p$ = infinity.

**In perfectly elastic demand, the demand curve is represented as a horizontal straight line, which is shown in Figure-2:**
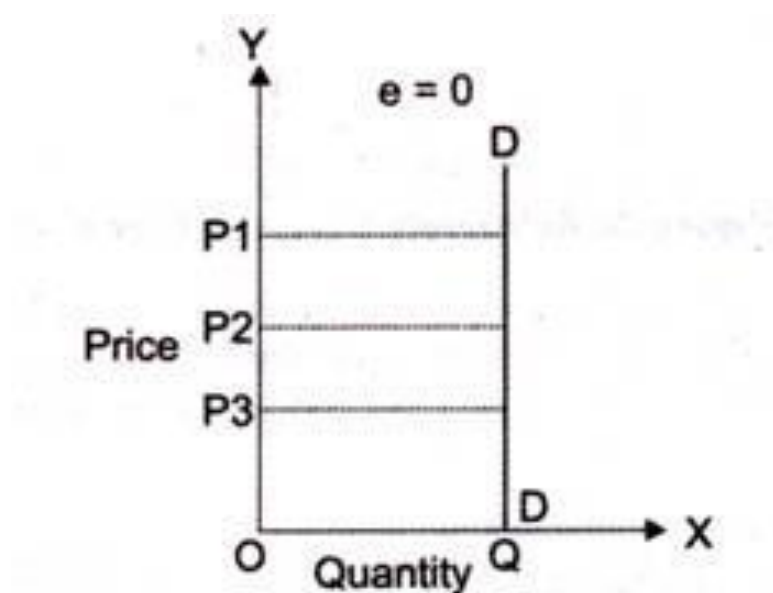


Figure-2: Perfectly Elastic Demand
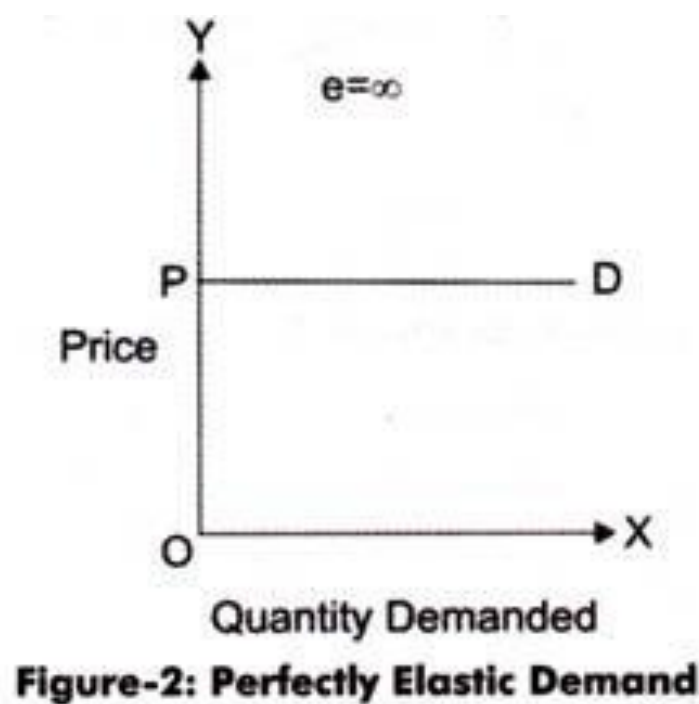
From Figure-2 it can be interpreted that at price OP, demand is infinite; however, a slight rise in price would result in fall in demand to zero. It can also be interpreted from Figure-2 that at price P consumers are ready to buy as much quantity of the product as they want. However, a small rise in price would resist consumers to buy the product.

### 2. Perfectly Inelastic Demand:
A perfectly inelastic demand is one when there is no change produced in the demand of a product with change in its price. The numerical value for perfectly inelastic demand is zero ($e_p$=0).

**In case of perfectly inelastic demand, demand curve is represented as a straight vertical line, which is shown in Figure-3:**



Figure-3: Perfectly Inelastic Demand

It can be interpreted from Figure-3 that the movement in price from OP1 to OP2 and OP2 to OP3 does not show any change in the demand of a product (OQ). The demand remains constant for any value of price. Perfectly inelastic demand is a theoretical concept and cannot be applied in a practical situation. However, in case of essential goods, such as salt, the demand does not change with change in price.

## 3. Relatively Elastic Demand:

Relatively elastic demand refers to the demand when the proportionate change produced in demand is greater than the proportionate change in price of a product. The numerical value of relatively elastic demand ranges between one to infinity.

Mathematically, relatively elastic demand is known as more than unit elastic demand ($e_p>1$). For example, if the price of a product increases by 20% and the demand of the product decreases by 25%, then the demand would be relatively elastic.

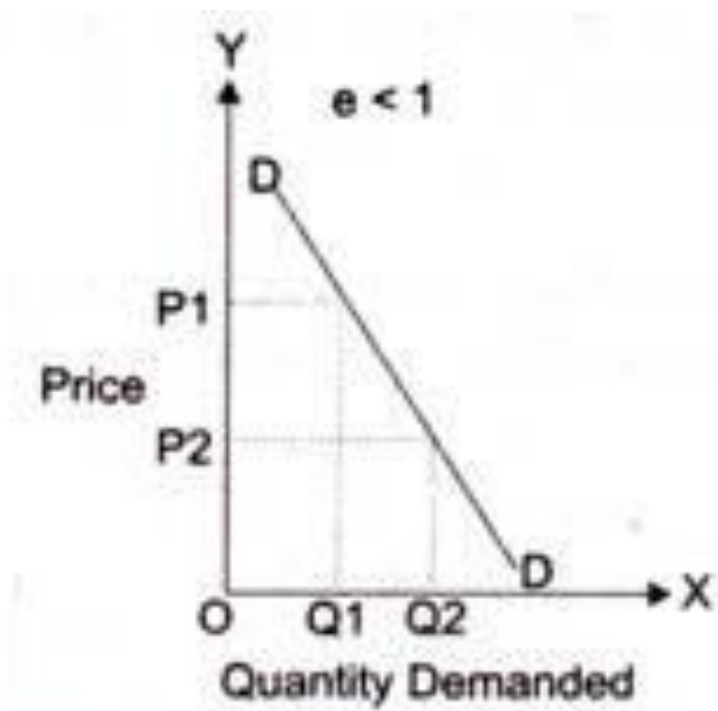**The demand curve of relatively elastic demand is gradually sloping, as shown in Figure-4:**
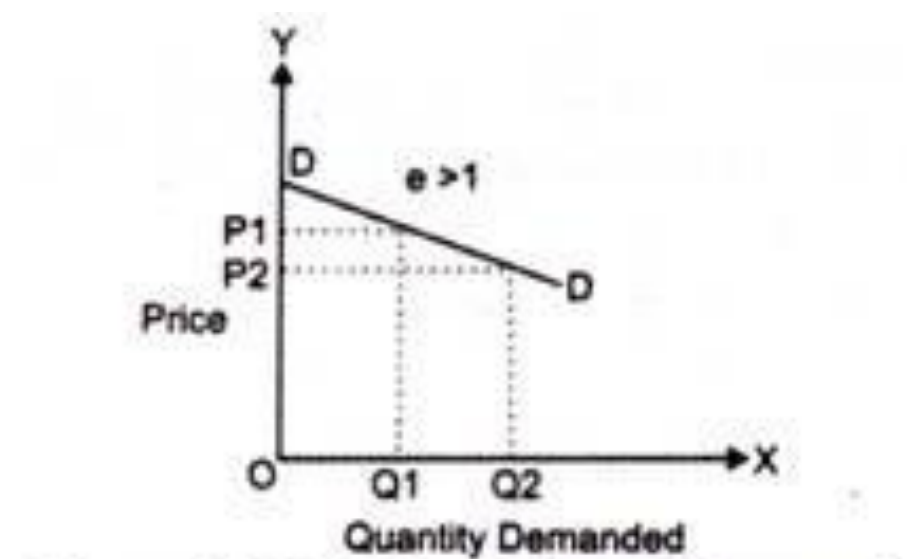


Figure-4: Relatively Elastic Demand

It can be interpreted from Figure-4 that the proportionate change in demand from OQ1 to OQ2 is relatively larger than the proportionate change in price from OP1 to OP2. Relatively elastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices.

## 4. Relatively Inelastic Demand:

Relatively inelastic demand is one when the percentage change produced in demand is less than the percentage change in the price of a product. For example, if the price of a product increases by 30% and the demand for the product decreases only by 10%, then the demand would be called relatively inelastic. The numerical value of relatively elastic demand ranges between zero to one ($e_p<1$). Marshall has termed relatively inelastic demand as elasticity being less than unity.

**The demand curve of relatively inelastic demand is rapidly sloping, as shown in Figure-5:**



**Figure-5: Relatively Inelastic Demand**

It can be interpreted from Figure-5 that the proportionate change in demand from OQ1 to OQ2 is relatively smaller than the proportionate change in price from OP1 to OP2. Relatively inelastic demand has a practical application as demand for many of products respond in the same manner with respect to change in their prices.

## 5. Unitary Elastic Demand:

When the proportionate change in demand produces the same change in the price of the product, the demand is referred as unitary elastic demand. The numerical value for unitary elastic demand is equal to one ($e_p=1$).

**The demand curve for unitary elastic demand is represented as a rectangular hyperbola, as shown in Figure-6:**
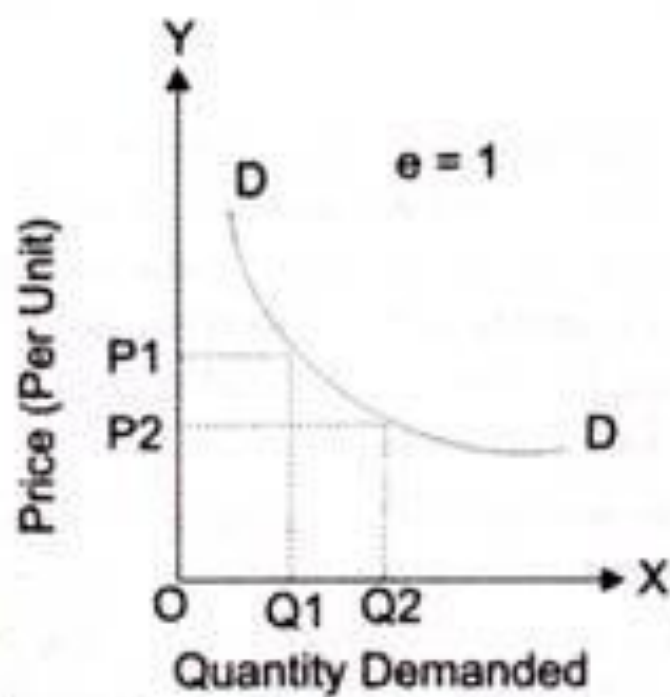
Figure-6: Unitary Elastic Demand

From Figure-6, it can be interpreted that change in price OP1 to OP2 produces the same change in demand from OQ1 to OQ2. Therefore, the demand is unitary elastic.

## 2. Explain the different types of cross elasticity of demand.

Like price elasticity of demand, the degree of responsiveness of demand with change in consumer's income is not always the same. The income elasticity of demand is different for different products.

On the basis of numerical value, income elasticity of demand is classified into three groups, which are as follows:

### i. Positive Income Elasticity of Demand:

Refers to a situation when the demand for a product increases with increase in consumer's income and decreases with decrease in consumer's income. The income elasticity of demand is positive for normal goods.
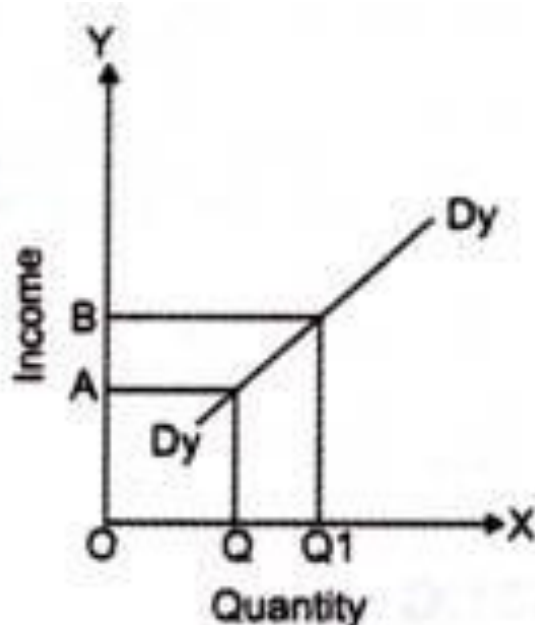


Figure-12: Positive Elasticity of Demand

In Figure-12, the slope of the curve is upward from left to right, which indicates that the increase in income causes increase in demand and vice versa. Therefore, in such a case, the elasticity of demand is positive.

The positive income elasticity of demand can be of three types, which are discussed as follows:

### a. Unitary Income Elasticity of Demand:

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Implies that positive income elasticity of demand would be unitary when the proportionate change in the quantity demanded is equal to proportionate change in income. In such a case, the numerical value of income elasticity of demand is equal to one ($e_y = 1$).

### b. More than Unitary Income Elasticity of Demand:

Implies that positive income elasticity of demand would be more than unitary when the proportionate change in the quantity demanded is more than proportionate change in income. For example, if the income increases by 50% and demand rises by 100%. In such a case, the numerical value of income elasticity of demand would be more than one ($e_y>1$).

### c. Less than Unitary Income Elasticity of Demand:

Implies that positive income elasticity of demand would be less than unitary when the proportionate change in, the quantity demanded is less than proportionate change in income. For example, if the income increases by 50% and demand increases only by 25%. In such a case, the numerical value of income elasticity of demand would be less than one ($e_y<1$).

### ii. Negative Income Elasticity of Demand:

Refers to a kind of income elasticity of demand in which the demand for a product decreases with increase in consumer's income. The income elasticity of demand is negative for inferior goods, also known as Giffen goods. For example, if the income of a consumer increases, he would prefer to purchase wheat instead of millet. In such a case, the millet would be inferior to wheat for the customer.

**Negative income elasticity of demand is shown with the help of Figure-13:**



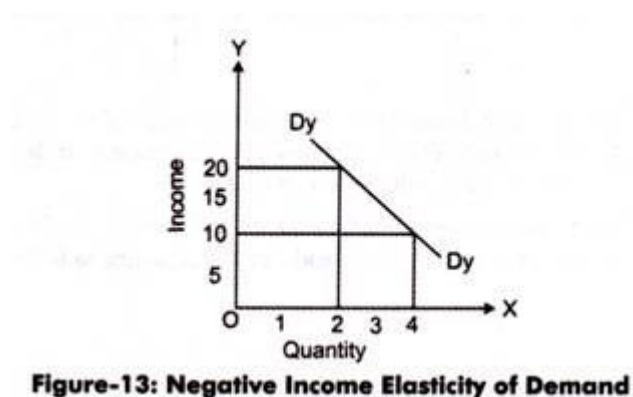Figure-13: Negative Income Elasticity of Demand

Figure-13 shows that when income is Rs. 10, then the demand for goods is 4 units. On the other hand, when the income increases to Rs. 20, then the demand is 2 units. In Figure-13, the slope of the curve is downward from left to right, which indicates that the increase in income causes decrease in demand and vice versa. Therefore, in such a case, the elasticity of demand is negative.

### iii. Zero Income Elasticity of Demand:

Refers to the income elasticity of demand whose numerical value is zero. This is because there is no effect of increase in consumer's income on the demand of product. The

income elasticity of demand is zero ($e_y = 0$) in case of essential goods. For example, salt is demanded in same quantity by a high income and a low income individual.

**Figure-14 shows the zero income elasticity of demand:**



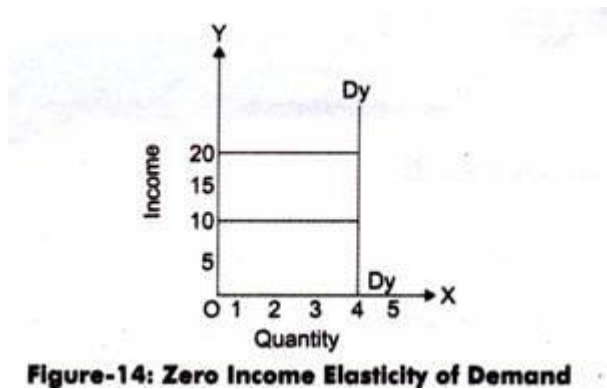Figure-14: Zero Income Elasticity of Demand

Figure-14 shows that when income increases from Rs. 10 to Rs. 20, then the demand for goods is remain same, 4 units. In Figure-14, the slope of the curve is parallel to Y-axis (income side), which indicates that the increase in income causes no effect in demand. Therefore, in such a case, the elasticity of demand is zero.

## 3. Explain the types of cross elasticity of demand

### 1. Positive:

When goods are substitute of each other then cross elasticity of demand is positive. In other words, when an increase in the price of Y leads to an increase in the demand of X. For instance, with the increase in price of tea, demand of coffee will increase.

In fig. 21 quantity has been measured on OX-axis and price on OY-axis. At price OP of Y-commodity, demand of X-commodity is OM. Now as price of Y commodity increases to $OP_1$ demand of X-commodity increases to $OM_1$ Thus, cross elasticity of demand is positive.



Fig. 21.
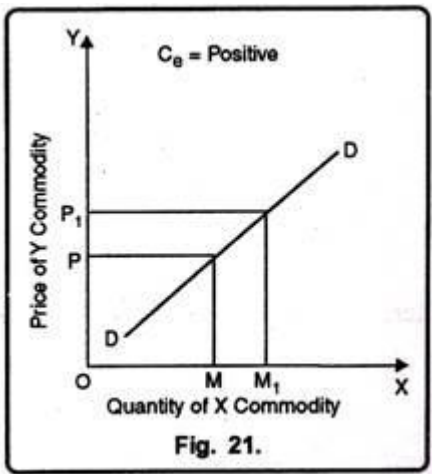
### 2. Negative:

In case of complementary goods, cross elasticity of demand is negative. A proportionate increase in price of one commodity leads to a proportionate fall in the demand of another commodity because both are demanded jointly. In fig. 22 quantity has been measured on OX-axis while price has been measured on OY-axis. When the price of commodity increases from OP to $OP_1$ quantity demanded falls from OM to $OM_1$. Thus, cross elasticity of demand is negative.

Fig. 22.
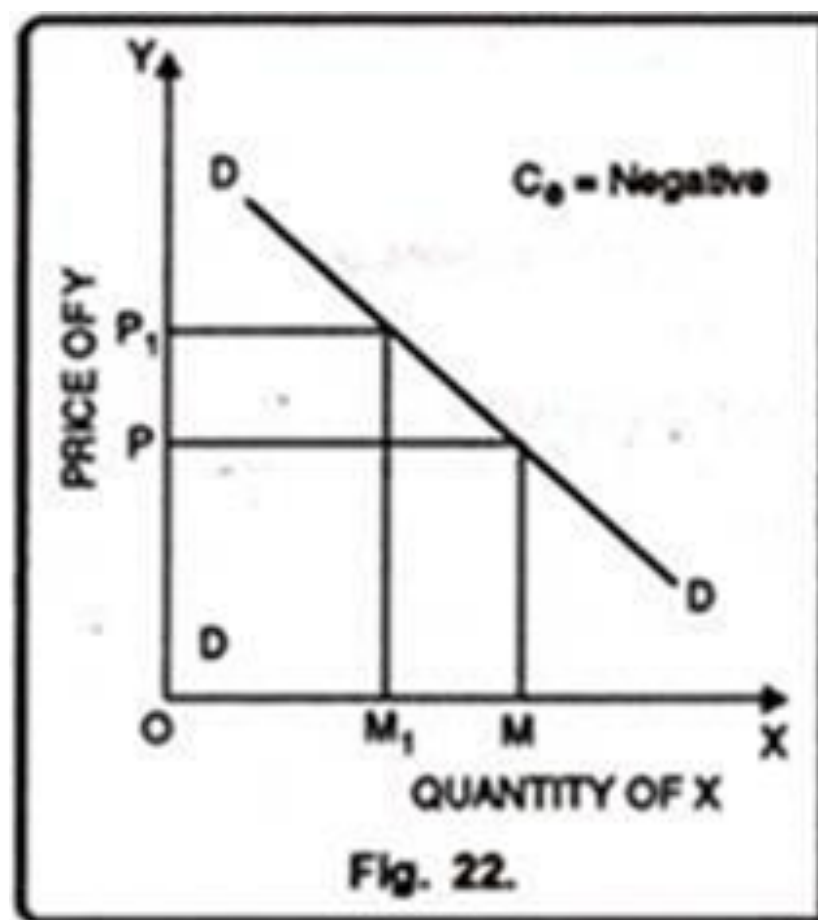
### 3. Zero:

Cross elasticity of demand is zero when two goods are not related to each other. For instance, increase in price of car does not effect the demand of cloth. Thus, cross elasticity of demand is zero. It has been shown in fig. 23.



Fig. 23.
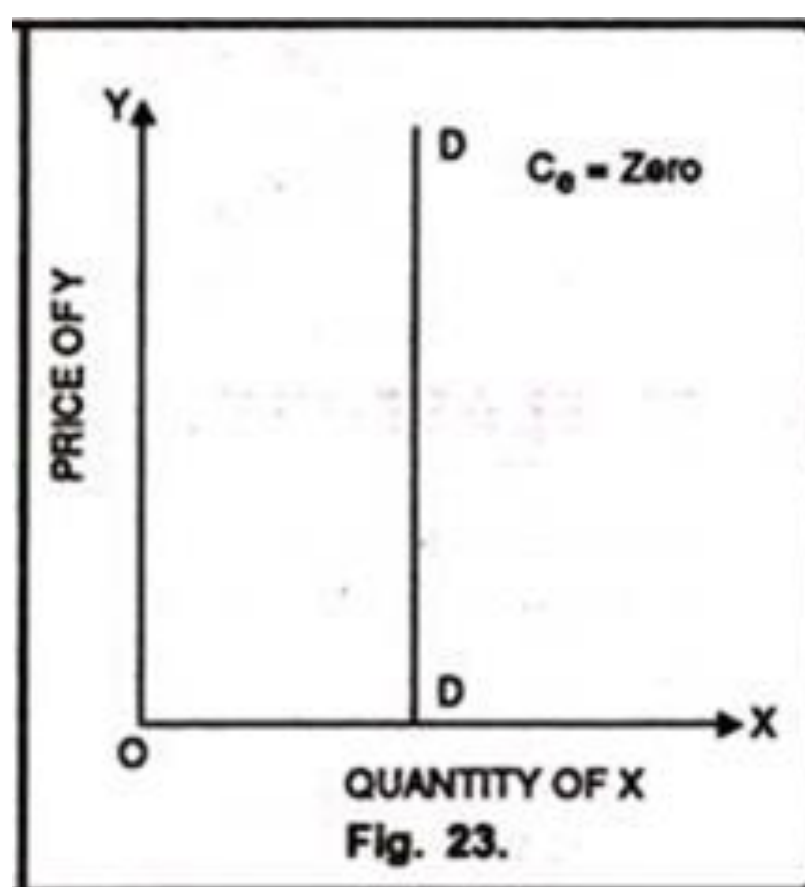
Therefore, it depends upon substitutability of goods. If substitutability is perfect, cross elasticity is infinite; if on the other hand, substitutability does not exist, cross elasticity is zero. In the case of complementary goods like jointly demanded goods cross elasticity is negative. A rise in the price of one commodity X will mean not only decrease in the quantity of X but also decrease in the quantity demanded of Y because both are demanded together.

# Lesson – 3 Consumer's Behaviour

## 1. What is utility ?

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The power to satisfy human wants is called utility. Goods and services are desired and demanded because of their power to satisfy human wants and needs.

## 2. What is Total Utility ?

Total utility is the utility obtained from the consumption of total units of commodities. In other words, total utility is the sum of marginal utilities.

## 3. What is marginal utility?

Marginal utility is the additional utility derived from the consumption of one extra unit of commodity.

## 4. State law of diminishing marginal utility.

Law of diminishing marginal utility state that as a consumer takes more units of a good, the additional utility or satisfaction that he derives from an extra unit of the goods goes

on falling.

## 5. State the limitation of the law of diminishing marginal utility.

1. Standard unit

2. Continuity in consumption

3. Rationality

# 4. Consistency in consumer's taste, habit, fashion

6. State Law of Substitution

According to the consumer will get maximum satisfaction only when he obtains equal marginal utilities from the consumption of different commodities. So, the consumer should allocate his money income in goods in such a way that the value of the last unit of money spent on these goods is equal to the ratios between marginal utilities and prices of the respective goods.

$$\frac{MUx}{Px} = \frac{MUy}{Py} = MUm$$

## 7. Write the Limitations of  Law of Substitution

1. Ignorance
2. Cardinal measurement of utility
3. Constancy of marginal utility of money
4. Indivisible goods

5. Utilities are Interdependent
6. Changes in Tastes, fashions etc

## 8. Write the Importance of law of substitution

1. Useful in the field of consumption
2. Useful in production
3. Useful in the field of exchange
4. Useful in the field of distribution
5. Useful in the field of public finance

## 9. What is Consumer's Surplus

Consumer surplus is the benefit that consumer receives over what he is willing to pay for a product and what he actually pays. The price which a consumer pays for a good never exceeds that which he would be willing to pay rather than go without it. We are prepared to pay much more for a good than we actually have to pay.

## 10. Write the Criticisms of Consumer's Surplus

1. Measurement of utility
2. Marginal utility of money is not constant
3. Imaginary concept
4. Not applicable to necessaries
5. Neglects the complementary and substitutable goods

## 11. Importance of Consumer's Surplus

1. To compare economic conditions
2. Formulation of fiscal policy
3. For cost-benefit analysis
4. International trade
5. Distinguish between value in use and value in exchange

## 12. What is Producer's Surplus ?

Producer's surplus is the benefit that producer receive over his cost of providing a good against what he is paid for that good. In other words, producer's surplus is the difference between what producers are willing and able to supply a good for and the price they actually receive.

# Important Questions and answers.

## 1. Describe the law of diminishing marginal utility.

The law of diminishing marginal utility is one of the vital laws of economics. The law represents the fundamental tendency of human behavior.

According to the law, when a consumer increases the consumption of a good, there is a decline in MU derived from each successive unit of that good, while keeping the consumption of other goods constant.

In other words, as more and more of goods are consumed, the process of consumption at some point yields smaller and smaller additions to the utility. For example, an individual feels very hungry and decides to have golgappas. The first golgappa consumed by him/her gave maximum satisfaction to him/her. In such a case, on a 10-point scale, he would give ten points.

This law applies to all kinds of consumer goods, such as durable and non-durable goods. The utility of a good is measureable in a quantitative term called utils. Let us now learn the law of diminishing marginal utility with the help of an example. Assume that a consumer only consumes good X.

**Table-1 shows the total and marginal utility schedules for good X:**

| Table-1: Total and Marginal Utility Schedules | | |
|---|---|---|
| Units of good X | Total Utility (TU.) | Marginal Utility( MU, ) |
| 1 | 20 | 20 |
| 2 | 27 | 7 |
| 3 | 32 | 5 |
| 4 | 35 | 3 |
| 5 | 35 | 0 |
| 6 | 34 | -1 |

As shown in Table-1, TU increases as number of units consumed are increased till the fifth unit. At the fifth unit, TU has achieved its maximum level of 35 utils. Beyond this level, an additional unit consumed yields negative satisfaction for the consumer that results in decrease in total utility. As per the law of diminishing marginal utility, Table-1 exhibits a decreasing trend as more and more units are consumed. The question arises why MU diminishes. This is because of the fact that the utility which is obtained from the good consumed depends on the need of the consumer for that good.

**Figure-2 shows the total utility and marginal utility curve:**
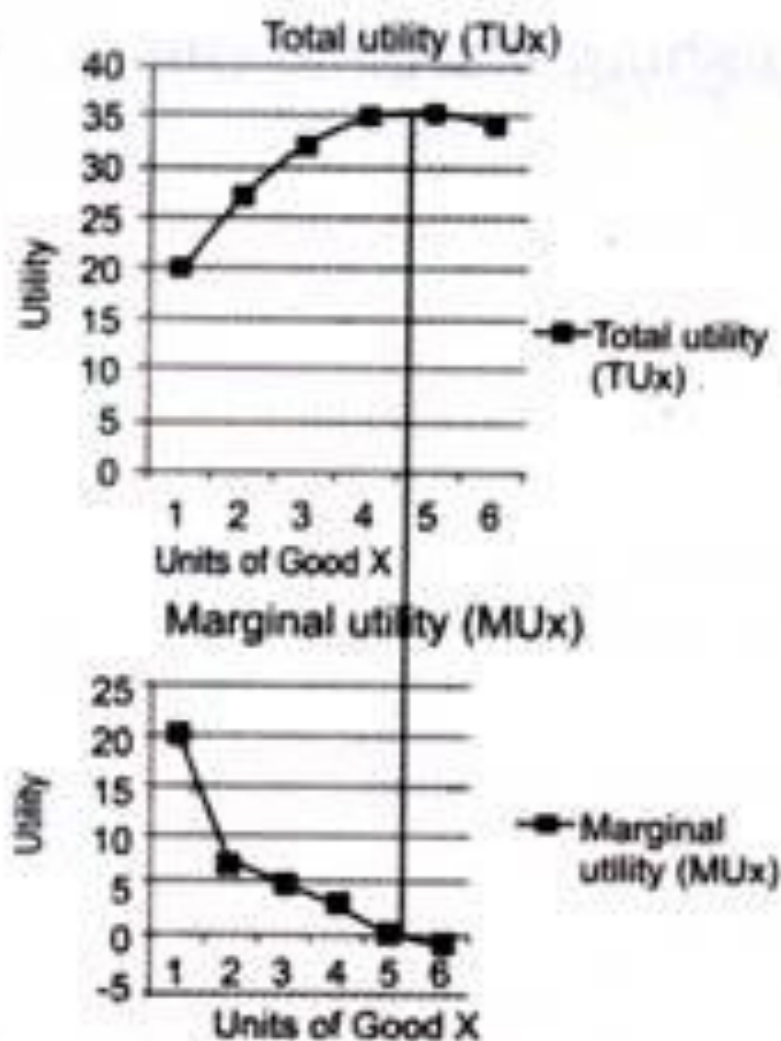
**Figure-2: Total Utility and Marginal Utility Curve**

In Figure-2, it can be seen that TU curve increases with an increase in number of units of good X. It reaches the saturation point when maximum level of 35 utils is achieved. After that, TU starts declining as fifth unit is consumed. In Figure-2, MU curve is decreasing as consumption of good X is increasing. At fifth unit, where TU is maximum, MU reaches zero and becomes negative. At this point, TU also starts falling.

**The law of diminishing marginal utility is applied under certain conditions, called assumptions.**

1. Standard Unit
2. Consistency in consumers tastes:
3. Continuity in consumption
4. Reasonability
5. Rationality

## Limitations of Law of Diminishing Marginal Utility:

However, the law of diminishing marginal utility suffers from limitations.

**Some of the important limitations of the law are discussed as follows:**

**i. Unrealistic assumptions:**

Include homogeneity, continuity, and constancy conditions. All these assumptions are impossible to find at once.

**ii. Inapplicability to certain goods:**

Implies that the law of diminishing marginal utility cannot be applied to goods, such as television and refrigerator. This is because the consumption of these goods is not continuous in nature.

### iii. Constant marginal utility of money:

Assumes that MU of money remains constant, which is unrealistic. There is also a gradual decline in the MU of money.

### iv. Change in other people's stock:

Implies that the utility of consumers is also dependent on what other people have in their stock. Thus, the utility depends on social needs.

### v. Other possessions:

Assumes that utility of consumers also depends on possessions already owned by them. For example, a consumer is suffering from diabetes, thus, he is not allowed to consume sugar that he/she already possesses. In such a case, the utility of coffee derived by him/her would be less.

**Exceptions to the Law of Diminishing Marginal Utility:**

The law of diminishing marginal utility states that as more and more of goods are consumed, the utility derived from them falls. However, there is an exception to this law. It is observed that a consumer sometimes gain more utility as more and more of a good is consumed.

## 2. Describe the law of consumer's surplus

According to Penson – "The difference between what we would pay and what we have to pay is called Consumer's Surplus."

According to Prof. J. K. Mehta – "Consumer's Surplus obtained by a person from a commodity is the difference between satisfaction which he derives from it and which he foregoes in order to procure that commodity."

Assumptions of Consumer's Surplus:

Prof. Marshall has discussed the concept of Consumer's Surplus on the basis of the following assumptions:

1. Marginal Utility of Money is Constant:

The marginal utility of money to the consumer remains constant. It is so when the money spent on purchasing the commodity is only a small fraction of this total income.

2. No Close Substitutes Available:

The commodity in question has no close substitutes and if it does have any substitute, the same may be regarded as an identical commodity and thus only one demand should may be prepared.

## 3. Utility can be Measured:

The utility is capable of cardinal measurement through the measuring rod of money. Moreover, the utility obtainable from one good is absolutely independent of the utility from the other goods. No goods affect the utility that can be derived from the other goods.

## 4. Tastes and Incomes are Same:

That all people are of identical tastes, fashions and their incomes also are the same.

**Marginal Utility, Price and Consumer's Surplus Schedule**

| Units of bread | Marginal Utility (in Rs.) | Price (in Rs.) | Consumer's Surplus (in Rs.) |
|---|---|---|---|
| 1 | 10 | 2 | 8 |
| 2 | 8 | 2 | 6 |
| 3 | 6 | 2 | 4 |
| 4 | 4 | 2 | 2 |
| 5 | 2 | 2 | 0 |
| 6 | 0 | 2 | – 2 |

The above table expresses the various amounts of utilities he derives from the consumption of different units of bread. From the first bread alone he derives marginal utility of Rs. 10 but the price which he pays is Rs. 2 and hence Rs. 8 is the Consumer's Surplus. Similarly, the Consumer's Surplus from $2^{nd}$, $3^{rd}$, $4^{th}$ and $5^{th}$ units are 6, 4, 2 and zero respectively. A rational consumer will consume only $5^{th}$ commodity where the marginal utility is equal to its price and thereby maximises his Consumer's Surplus. If he will consume the $6^{th}$ unit he derive zero marginal utility where as he pays the price as Rs. 2. A rational consumer will not consume that commodity.

Diagrammatic Representation of Consumer Surplus:

This can be shown by the following diagram:

In this diagram AB is a demand curve of a consumer OR is the market price. The price line is parallel to X axis because of perfect competition. At point P the marginal curve AB intersect the market price curve OR. Thus for OQ quantity the consumer derives utility as AOQP where as he pays ROQP. Thus, triangular shaded area ARP is Consumer's Surplus.
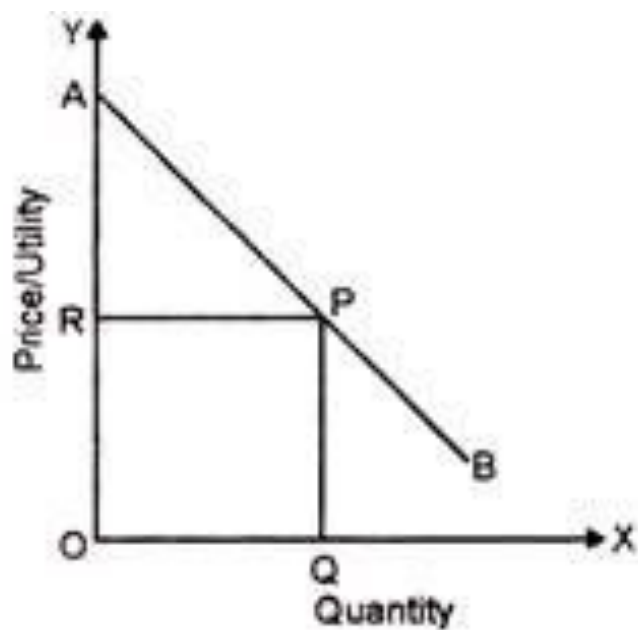
Consumer's Surplus = Total Utility-(Marginal Utility) x (Multiply x No. of Units purchased)

# Lesson – 3  Theory of production

## 1. Define production function.

The functional relationship of output with inputs is known as production function. The output is thus a function of inputs. Symbolically, it can be written as, Q=(N, L, K, T, B...)

Where,

Q = Quantity of output,

N = Land, L = Labour,

K= Capital, T=State of technology,

B = Building.

## 2.Define short-run production function.

The short-run production function is also known as single variable production function. It shows the technical relationship between output and one variable factor, keeping other factors constant. Symbolically,

Q = f(L) K Where, K = Capital is constant

Define long-run production function.

Long-run production function is the technical relationship between output and all inputs. Symbolically, Q= f (L, K) Where, labour (L) and capital (K) are variable.

## 3. Define total product.

Total product is the amount of total output produced by a given amount of factor, other factors held constant.

Symbolically,

TPL = APL * L

Where, TP represents total product of labour AP represents the average product of labour L represents the number of labour

## 4. Define average product.

Average product refers to the output per unit of an input. It is found by dividing the total product by the number of a factor used.

Symbolically, $APl = \frac{TPl}{L}$ where, APL represents the average product of labour L represents the number of labour.

Define marginal product.

Marginal product may be defined as the change in total product resulting from one additional unit of a factor.

Symbolically, MPL = $\frac{\Delta TPl}{\Delta L}$

Where, MPL = marginal product of labour ,TPL change in total product ,L= change in variable factor (labour).

## 5. State the law of variable proportion diminishing returns.

Law of variable proportion examines the effect on production when the unit of one factor of production is increased, keeping other factors constant. The short-run production function can be written as, Q = f(L,K)

Where, K = Capital is constant.

## 6. Define Iso-quant.

By definition, an iso-quant is locus of points representing different combinations of two inputs (labour and capital) yielding the same output. Since an iso-quant curve shows those combinations of two inputs which can produce equal quantity of output, the producer would be indifferent between them.

## 7. Define law of returns to scale.

Law of returns to scale is long run production theory which assumes all factors of production are variable i.e. Q = f(L K). When both inputs are altered simultaneously and at the same proportion, the scale of production or the size of the firm also changes.

# Important questions and answers

## 1. Explain the relationship between TP,AP,MP with the help of diagram.

The relationship between TP and MP is explained through the Law of Varibale Proportionals. As long as the the TP increases at an increasing rate, the MP also increases. This goes on till MP reaches maximum. When TP increases at a diminishing rate, MP declines. This continues till the point where TP is at its highest. When TP reaches its maximum point, MP becomes zero. This concept can be explained with the help of the following schedule and diagram:

$AP = TP/Q$, $MP_{nth} = TP_n - TP_{n-1}$

| Land (Units) | Labour (Units) | Total Product (TP) | Marginal Product (MP) | Stages |
|---|---|---|---|---|
| 1 | 1 | 2 | 2 | |
| 1 | 2 | 5 | 3 | Increasing returns |
| 1 | 3 | 9 | 4 | |
| 1 | 4 | 12 | 3 | |
| 1 | 5 | 14 | 2 | Diminishing returns |
| 1 | 6 | 15 | 1 | |
| 1 | 7 | 15 | 0 | Negative returns |
| | 8 | 14 | -1 | |

## RELATIONSHIP BETWEEN TP AP AND MP

The above table shows fixed factor of production i.e. land and variable factor of production i.e. labor. The total product initially increases and marginal product decreases. But after applying 6 units of labor on the fixed factor land, it becomes maximum i.e. 15. Here the Marginal Product is zero. As 8 units of variable factor are applied with fixed factor land, the total product decreases and marginal product becomes negative.

**RELATIONSHIP BETWEEN TP AP AND MP**
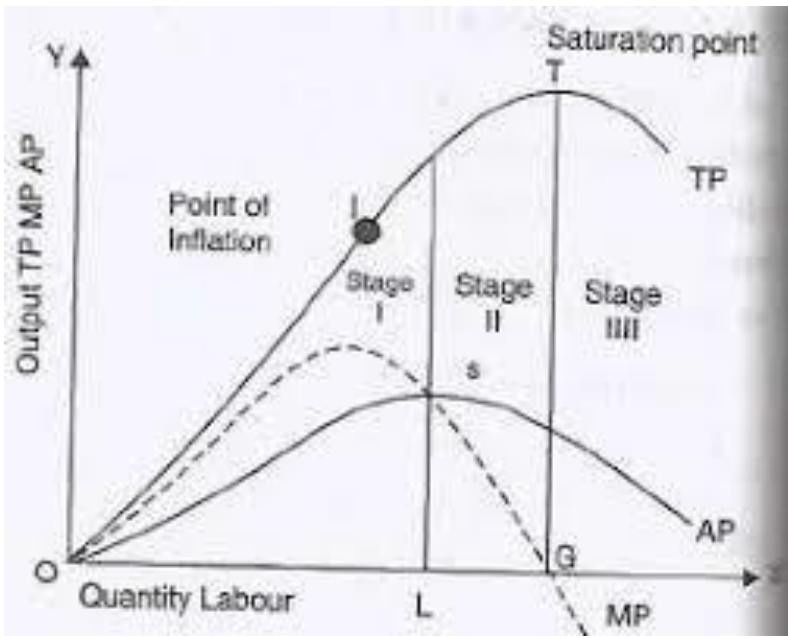


The diagram or curve shows three stages of production which are as follows:

**Stage I:** MP > 0, AP is rising. Thus, MP > AP. This is increasing stage;

**Stage II.** MP > 0, but AP is falling. Thus, MP < AP, but TP is increasing because MP > 0. This is diminishing stage.

**Stage III:** MP < 0 and TP is falling. This is negative stage.

## CONCLUSION

To conclude, the following findings are found:

When TP increases at an increasing rate, MP increases.

When TP increases at diminishing rate, MP declines

When TP is maximum, MP is Zero

When TP begins to decline, MP becomes negative

When MP > AP, this means that AP is rising

When MP = AP, this means that AP is maximum

When MP < AP, this means that AP is falling

## 2. Explain the law of variable proportional.

"As the proportion of the factor in a combination of factors is increased after a point, first the marginal and then the average product of that factor will diminish."

"An increase in some inputs relative to other fixed inputs will in a given state of technology cause output to increase, but after a point the extra output resulting from the same additions of extra inputs will become less and less."

Assumptions:

**Law of variable proportions is based on following assumptions:**

**(i) Constant Technology:**

The state of technology is assumed to be given and constant. If there is an improvement in technology the production function will move upward.

**(ii) Factor Proportions are Variable:**

The law assumes that factor proportions are variable. If factors of production are to be combined in a fixed proportion, the law has no validity.

**(iii) Homogeneous Factor Units:**

The units of variable factor are homogeneous. Each unit is identical in quality and amount with every other unit.

**(iv) Short-Run:**

The law operates in the short-run when it is not possible to vary all factor inputs.

**By keeping land as a fixed factor, the production of variable factor i.e., labour can be shown with the help of the following table:**

## Table 1.

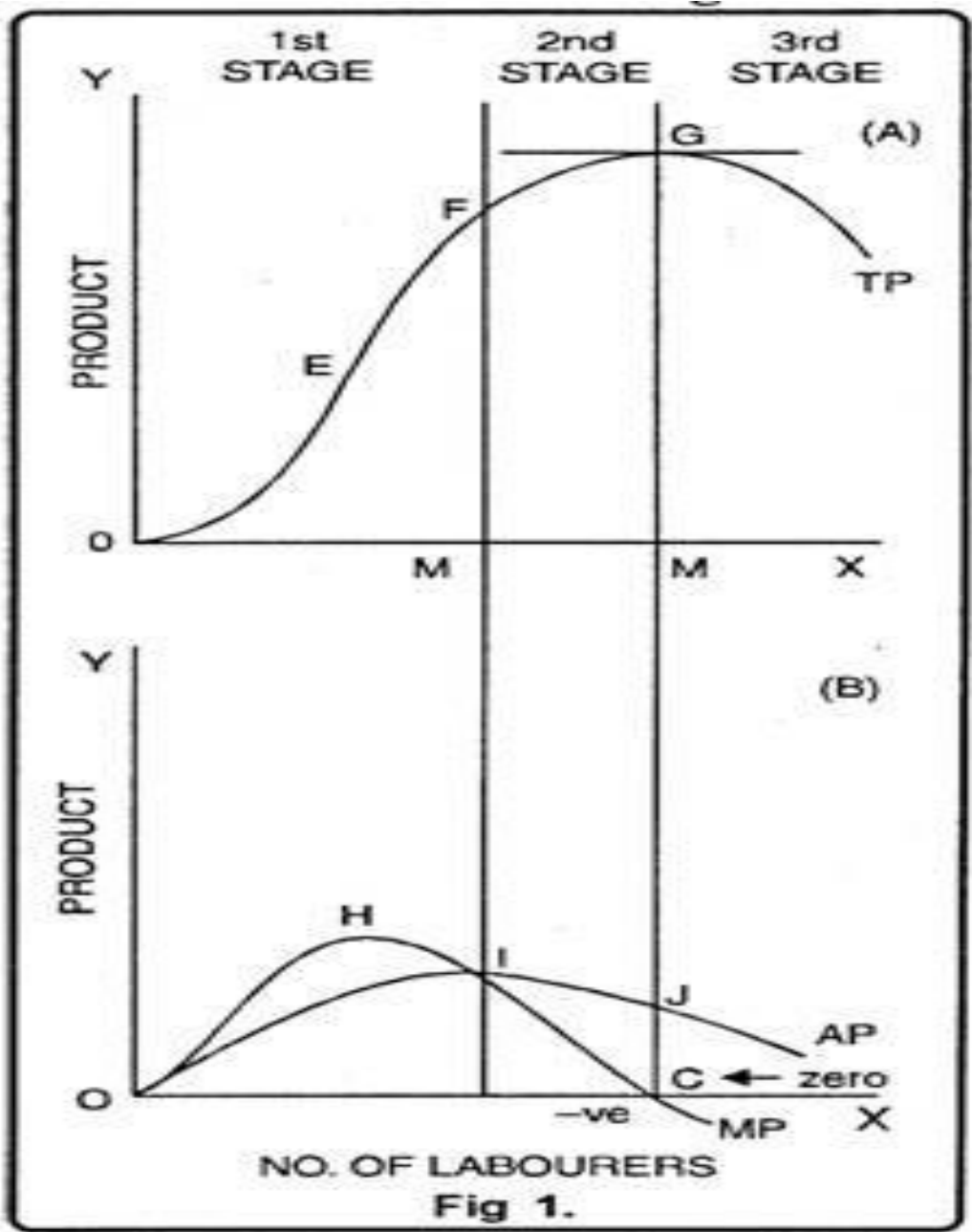| Units of Land | Units of Labour | Total Production | Average Production | Marginal Production | |
|---|---|---|---|---|---|
| 10 Acres | 0 | – | – | – | |
| ,, | 1 | 20 | 20 | 20 | |
| ,, | 2 | 50 | 25 | 30 | 1st stage |
| ,, | 3 | 90 | 30 | 40 | MP > AP |
| ,, | 4 | 120 | 30 | 30 | AP = MP |
| ,, | 5 | 140 | 28 | 20 | |
| ,, | 6 | 150 | 25 | 10 | 2nd stage |
| ,, | 7 | 150 | 21.3 | 0 | MP=0 and TP Maximum |
| ,, | 8 | 140 | 17.5 | –10 | 3rd stage MP < 0 |

From the table 1 it is clear that there are three stages of the law of variable proportion. In the first stage average production increases as there are more and more doses of labour and capital employed with fixed factors (land). We see that total product, average product, and marginal product increases but average product and marginal product increases up to 40 units. Later on, both start decreasing because proportion of workers to land was sufficient and land is not properly used. This is the end of the first stage.

The second stage starts from where the first stage ends or where AP=MP. In this stage, average product and marginal product start falling. We should note that marginal product falls at a faster rate than the average product. Here, total product increases at a diminishing rate. It is also maximum at 70 units of labour where marginal product becomes zero while average product is never zero or negative.

The third stage begins where second stage ends. This starts from 8th unit. Here, marginal product is negative and total product falls but average product is still positive. At this stage, any additional dose leads to positive nuisance because additional dose leads to negative marginal product.

**Graphic Presentation:**

In fig. 1, on OX axis, we have measured number of labourers while quantity of product is shown on OY axis. TP is total product curve. Up to point 'E', total product is increasing at increasing rate. Between points E and G it is increasing at the decreasing rate. Here marginal product has started falling. At point 'G' i.e., when 7 units of labourers are employed, total product is maximum while, marginal product is zero. Thereafter, it begins to diminish corresponding to negative marginal product. In the lower part of the figure MP is marginal product curve.

Fig 1.

Up to point 'H' marginal product increases. At point 'H', i.e., when 3 units of labourers are employed, it is maximum. After that, marginal product begins to decrease. Before point 'I' marginal product becomes zero at point C and it turns negative. AP curve represents average product. Before point 'I', average product is less than marginal product. At point 'I' average product is maximum. Up to point T, average product increases but after that it starts to diminish.

| Total Product | Marginal Product | Average Product |
|---|---|---|
| **Stage I**<br>First increases at increasing rate then at diminishing rate. | Increases in the beginning then reaches a maximum and begins to decrease. | First increases, continues to increase and becomes maximum. |
| **Stage II**<br>Continues to increase at diminishing rate and becomes maximum. | Continues to diminish and becomes equal to zero. | Becomes equal to MP and then begins to diminish. |
| **Stage III**<br>Diminishes | Becomes negative. | Continues to diminish but will always be greater than zero. |

# XXX THE END XXX