C O I - R & U - Very Short - Info & Con

Q.1. Define total product.

Ans. Total product is the sum total of output produced by all units of labour (along with other factors of production).

TP = AP × L

Q.2. What is meant by average product?

Ans. Average product refers to output per unit of the variable factor (labour).

$$AP = \frac{TP}{L}$$

Q.3. Define marginal product.

Ans. Marginal product or marginal physical product is the change in total product as a result of a unit change in the input of a variable factor.

$$MP \text{ or } MPP = TP_n - TP_{n-1}$$

Or

$$MP \text{ or } MPP = \frac{\Delta TP}{\Delta L}$$

Q.4. How is total product derived from the marginal product schedule?

Ans. Total product is the sum total of marginal product corresponding to all levels of employment of the variable factor. TP = ∑MP.

Q.5. When is total output maximum?

Ans. Total output is maximum when marginal product is zero.

Q.6. How is fall in total product related to marginal output?

Or

What will you say about the marginal physical product of a factor when total physical product is falling?

Ans. Marginal product (or marginal physical product) must be negative.

Q.7. Can total product and average product become zero or negative?

Ans. No, total product and average product can never be zero or negative.

Q.8. When total product increases at an increasing rate, what happens to marginal product?

Ans. Marginal product should be increasing.

Q.9. When total product increases at a decreasing rate what happens to marginal product?

Ans. Marginal product should be decreasing.

Q.10. When TP becomes constant, what happens to marginal product?

Ans. Marginal product should be zero.

Q.11. What is the general shape of AP curve?

Ans. It is an ‘inverse U-shape’ curve.

Q.12. What is the general shape of MP curve?

Ans. It is an ‘inverse U-shape’ curve.

P E O S - R & U - Reason-Based Questions

Q.1. Price elasticity of supply measures the direction of change in supply in response to a given change in own price of the commodity.

Ans. False. Price elasticity of supply measures the degree of extension and contraction of supply in response to a given change in own price of the commodity.

Q.2. Zero elasticity of supply refers to a vertical straight line supply curve.

Ans. True. Zero elasticity of supply refers to a vertical straight line supply curve, showing constant supply, no matter what the price is. In this situation, supply does not at all respond to change in price of the commodity.

Q.3. Elasticity of supply = Slope of supply curve.

Ans. False. We know that,

$$\text{Elasticity of supply } (E_s) = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$$\text{Slope of supply curve} = \frac{\Delta P}{\Delta Q}$$

So that, we can write that

$$\text{Elasticity of supply } (E_s) = \frac{1}{\text{Slope of supply curve}} \times \frac{P}{Q}$$

HOTS & Applications

Q.1. Define short run and long run. How is production function specified for the two periods? Give illustrations.

Ans. Short period is a period of time when production can be increased/decreased only through greater/lesser application of the variable factors (like labour). Fixed factors (like machines) continue to be fixed. Time is too short to change these factors.

Short Period Production Function:

$Y = f(x_1, x_2)$

Here, Y : Maximum possible output of a commodity.

x_1 : Amount of factor-1 which is variable. x_2 : Amount of factor-2 which is constant.

Illustration:

40_X = f (5L, 4K)

45_X = f (6L, 4K)

Here, X = Commodity-X; L = Labour (variable factor), K = Capital (fixed factor).

We find that output of commodity-X increases from 40 to 45 units when input of labour is increased from 5 to 6 units, input of capital remaining constant (= 4 units).Long period is a period of time when production can be increased/decreased by increasing/decreasing the use of all factors, so that all factors are variable factors. There is nothing like fixed factors of production.

Long Period Production Function:

$Y = f(x_1, x_2)$

Illustration:

$40_X = f$ (5L, 4K)

$80_X = f$ (10L, 8K)

Implying that output is doubled when both L and K are doubled.

Important it is to note that while studying long period production function, all inputs are changed in the constant ratio.

Short period production function is related to ‘returns to a factor’.
Long period production function is related to ‘returns to scale’.

Q.2. Because of cyclone in a coastal area, fields are flooded. This reduces the productivity of land. How will it affect the supply curve of rice of wheat region?

Ans. A fall in productivity (when fields are flooded owing to cyclone) implies a situation of rise in unit cost of production of wheat. Accordingly, the producer should now be willing to sell less of wheat at the existing price. This would mean a backward shift in supply curve of wheat. Or, supply curve of wheat will shift to the left.

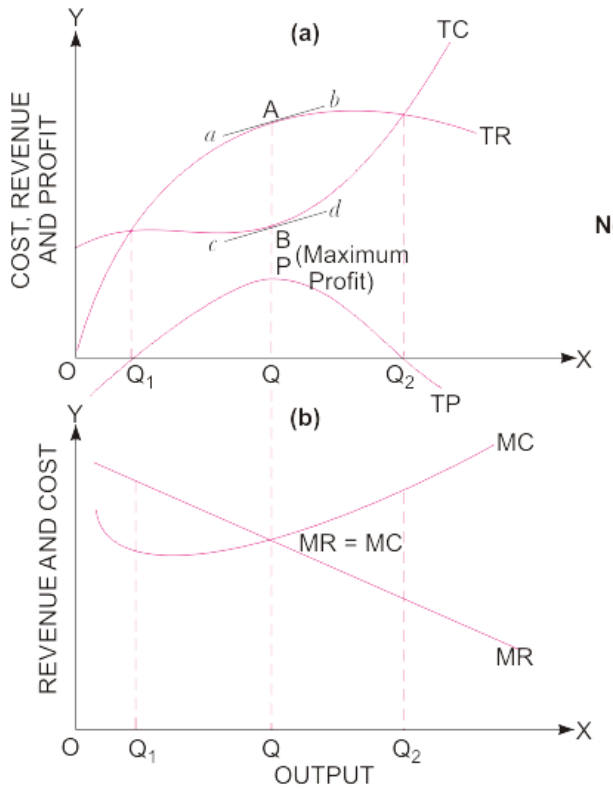
Q.3. Draw a diagram indicating that the difference between TR and TC is maximum only when

i. **MR = MC, and**

ii. **MC is rising.**

Ans.

FIGURE 2



Note: The difference between TR and TC is maximum only when:
(i) MR = MC, and
(ii) MC is rising.

Refer to top half of **Fig. 2.** Corresponding to points A and B, the difference between TR and TC is maximum. (Slope of TR curve at point A) = (Slope of TC curve at point B).

Because, *ab* and *cd* are parallel to each other.

Algebraically, Slope of TR = MR and Slope of TC = MC.

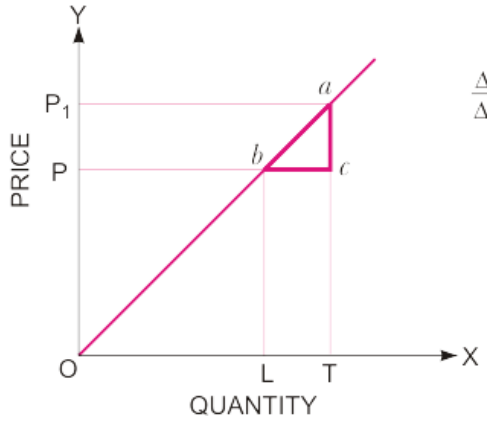
Thus, it is only when MR = MC that the difference between TR and TC is maximum.

Q.4. Elasticity of supply at all points of a straight line upward sloping supply curve shooting from the origin = 1.

Ans. True. Because, at any point on a straight line upward sloping supply curve, slope of supply curve is equal to the ratio So that:

(See **Fig. 3** for illustration.)

FIGURE 3



$$\frac{\Delta P}{\Delta Q}(\text{Slope of Supply Curve}) = \frac{P}{Q}\left(\frac{\text{Price}}{\text{Quantity}}\right)$$

Or

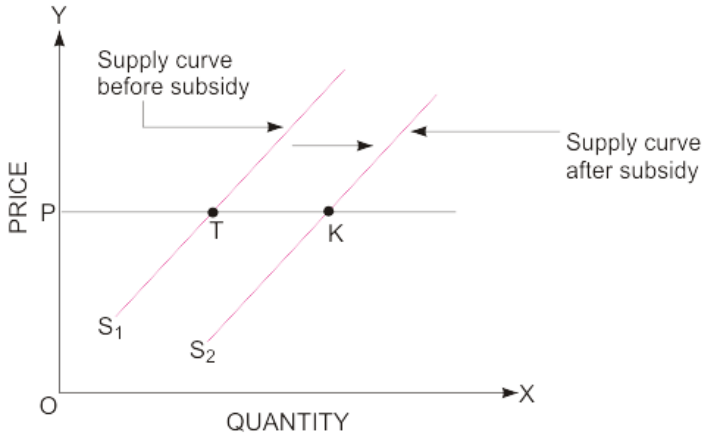
$$\frac{ac}{bc} = \frac{aT}{OT} \quad (\because acb \text{ and } aTO \text{ are similar triangles})$$

Q.5. "Subsidy for the import of defence goods rises from 4% to 6%."

Using a suitable diagram, analyse the impact of the above on the supply of defence goods in the domestic economy.

Ans. When subsidy on the import of defence goods rises from 4% to 6% (other things remaining constant), marginal and average costs of production tend to fall. Accordingly, producers will supply more of defence goods at the existing price, or they will sell the same quantity at a lower price. This implies a forward shift in supply curve to the right or increase in supply. **Fig. 4** illustrates this situation. S_1 is the initial supply curve. When subsidy rises, supply curve will shift forward from S_1 to S_2 .

FIGURE 4



C O I - R & U - Reason-Based Questions

Q.1. Total product (TP) is maximum when marginal product (MP) is zero.

Ans. True. Because:

TP = ΣMP

So that when MP = 0, nothing more is added to TP. Accordingly, corresponding to ‘zero MP’, TP must be maximum.

Q.2. When MP is zero, TP is also equal to zero.

Ans. False. When MP is zero, it implies that there is no addition to TP, or TP stops increasing. Therefore, TP is maximum when MP = 0.

Q.3. In a situation of disguised unemployment, MP can be negative.

Ans. True. In a situation of disguised unemployment, MP can be negative. Because, employment of workers more than what is required reduces the overall efficiency of the workers, so that MP becomes negative.

P F - R & U - Very Short - Info & Con

Q.1. What is meant by production function?

Ans. Production function studies the functional relationship between physical inputs and physical output.

Q.2. What are the fixed factors of production?

Ans. Fixed factors of production are those factors of production the application of which does not change with the change in output.

Q.3. What are the variable factors of production?

Ans. Variable factors of production are those factors of production the application of which changes with the change in output.

Q.4. Define short period.

Ans. Short period is a time period in which, for any change in output, the producer can change only the variable factors while the fixed factors are constant. Scale of output remains constant.

Q.5. Define long period.

Ans. Long period is a time period when the scale of output can be changed. All factors are variable factors in the long run.

Q.6. What is the basic difference between short run production function and long run production function?

Ans. Short run production function is variable proportions type production function. Scale of output remains constant. Long run production function is constant proportions type production function. Scale of output does not remain constant.

Q.7. Spell out the basic difference between the ‘law of variable proportions’ and ‘returns to scale’.

Ans. Law of variable proportions is a short period concept when output can be increased only by increasing the application of the variable factor. Fixed factor (indicating scale of output) remains constant. Returns to scale is a long period concept when output can be increased by increasing the scale of output. Increasing returns, constant returns and diminishing returns tend to operate when the scale of output is expanded, even when all the factors are variable factors.

Q.8. What is meant by returns to a factor?

Ans. Returns to a factor refers to the behaviour of output when only the variable factor of production is changed, fixed factors remaining constant.

Q.9. What is meant by increasing returns to a factor?

Ans. Increasing returns to a factor is a situation when due to increasing application of the variable factor marginal product (MP) of the factor tends to rise.

Q.10. What leads to increasing returns to a factor?

Ans. Fuller utilisation of the fixed factor along with better coordination among different factors leads to increasing returns to a factor.

Q.11. State the law of variable proportions

Ans. Law of variable proportions states that, as more and more of the variable factor is used along with the fixed factor, marginal product of the variable factor must ultimately fall, even when it may initially rise and subsequently stabilise.

Q.12. What leads to a diminishing returns to a factor?

Ans. Over-utilisation of the fixed factor along with poor coordination among different factors leads to diminishing returns to a factor.

R & U - Reason-Based Questions

Q.1. When AP = MP, AP is at its minimum.

Ans. False. When AP = MP, AP is at its maximum In this case, MP curve cuts AP curve from its top.

Q.2. MP starts diminishing from the point of inflexion.

Ans. True. Point of inflexion is a point from where slope of TP changes. As we know, slope of TP = MP. From this point onwards, TP increases at the diminishing rate. Therefore, MP stops increasing at this point. Or, we can say that this is a point from where MP starts diminishing.

Q.3. In the short run production function, factor ratio changes at different levels of output.

Ans. True. In the short run production function, factor ratio changes at different levels of output because only one factor is variable through out the production process.

Q.4. When marginal product decreases, total product always decreases.

Ans. False. This is because falling marginal product implies that total product should be increasing, though at a diminishing rate. It simply implies diminishing slope of TP (total product) curve, not diminishing TP. Total product decreases only when marginal product becomes negative.

Q.5. When there are diminishing returns to a factor, total product increases at decreasing rate.

Ans. True. This is because in a situation of diminishing returns to a factor, marginal product tends to fall. Falling marginal product implies that total product should be increasing, though at a diminishing rate. It simply implies diminishing slope of TP (total product) curve.

Q.6. In the second stage of production, when MP is diminishing TP increases at increasing rate.

Ans. False. Because, second stage of production is the stage of diminishing returns. Diminishing returns occur when MP is diminishing. Diminishing MP implies a situation when TP is increasing at a diminishing rate. Hence, in the second stage of production, when MP is diminishing TP increases at decreasing rate.

Q.7. When 10% increase in all factor inputs causes 12% increase in output, it is situation of increasing returns to scale.

Ans. True. Because, increasing returns to scale occurs when a given percentage increase in all factor inputs causes proportionately greater increase in output. Here, 10% increase in all factor inputs causes 12% increase in output, therefore, it is a situation of increasing returns to scale.

P E - R & U - Very Short - Info & Con

Q.1. Who is a producer?

Ans. A producer is a producing unit using factor inputs to produce goods which have market value.

Q.2. What is meant by producer's equilibrium?

Ans. Producer is said to be in equilibrium when he maximises his profits or minimises his losses.

Q.3. State the two conditions of producer's equilibrium for a competitive firm.

Ans. The two conditions of producer's equilibrium for a competitive firm are: (i) MR = MC and (ii) MC

Q.4. What are gross profits?

Ans. Gross profits are the difference between total revenue and total variable cost.

Gross Profits = TR – TVC

Q.5. What are net profits?

Ans. Net profits are the difference between total revenue and total cost.

Net Profits = TR – TC

Q.6. Define normal profits.

Ans. Profits are said to be normal when: TR = TC or AR = AC.

Q.7. What are extra-normal profits?

Ans. Profits are said to be extra-normal or abnormal when: TR > TC or AR > AC.

Q.8. Define sub-normal profits.

Ans. Sub-normal profits or losses occur when: TR < TC or AR < AC.

R & U - Reason-Based Questions

Q.1. MR = MC is a sufficient condition for producer's equilibrium.

Ans. False. Profits are maximised when:

(i) MR = MC, and

(ii) MC should be rising. Thus, MR = MC is a necessary condition of producer's equilibrium, NOT a sufficient condition.

Q.2. A producer attains his equilibrium in the first stage of production.

Ans. False. Because in the first stage, employment of every additional unit of the variable factor (other things remaining constant) is giving more and more marginal output (rising MP). When MP is rising, MC should be falling. So that, no producer will stop production in this stage of production.

Q.3. A firm sells 5 units of the output at the price of ₹ 40 per unit. The cost of producing that quantity of output is ₹ 180. The firm is earning normal profits in this situation.

Ans. False. Normal profits occur when TR = TC.

TR (total revenue) = Price × Quantity

= ₹ 40 × 5 units

= ₹ 200

TC (total cost) = ₹ 180

Here, 200 > 180. In other words, we can say that, TR > TC. Therefore, the firm is earning abnormal profits in this situation.

Q.4. Equilibrium always refers to a situation when profits are maximised.

Ans. False. During the short period, a firm may be incurring losses, even when:

(i) MR = MC, and

(ii) MC is rising.

Thus, equilibrium refers to a situation when profits are maximised or losses are minimised.

C O S - R & U - Very Short - Info & Con

Q.1. What is meant by supply?

Ans. Supply refers to various quantities of a commodity that a seller is willing to sell corresponding to different possible prices at a given point of time.

Q.2. What is meant by supply schedule?

Ans. Supply schedule is a table showing a relationship between price and quantity supplied of a commodity.

Q.3. What is supply curve?

Ans. Supply curve is a graphic presentation of supply schedule.

Q.4. What is meant by market supply?

Ans. Market supply is a table showing various amounts of a commodity that all the firms in the industry are willing to sell at different possible prices of that commodity.

Q.5. How is the market supply curve derived from individual supply curves?

Ans. Market supply curve is derived as a horizontal summation of individual supply curves.

Q.6. What is supply function?

Ans. The functional relationship between supply and the determinants of supply is known as supply function.

Q.7. What is meant by law of supply?

Ans. The law of supply states that, other things being equal, quantity supplied increases with increase in price and decreases with decrease in price of a commodity.

Q.8. What is meant by change in quantity supplied?

Ans. Extension or contraction of supply due to change in own price of the commodity is known as change in quantity supplied.

Q.9. What is meant by change in supply?

Ans. Increase or decrease in the supply of a commodity due to the factors other than own price is known as change in supply. While increase in supply implies a forward shift in supply curve, decrease in supply implies a backward shift in supply curve.

Q.10. What is meant by extension of supply?

Ans. When a rise in own price of a commodity leads to increase in quantity supplied of a commodity, it is called extension/expansion of supply.

Q.11. What is meant by contraction of supply?

Ans. When a fall in own price of a commodity leads to decrease in quantity supplied of a commodity, it is called contraction of supply.

Q.12. Define increase in supply.

Ans. When the quantity supplied increases due to factors other than own price of the concerned commodity, it is a situation of increase in supply.

Q.13. Define decrease in supply.

Ans. When the quantity supplied decreases due to factors other than own price of the concerned commodity, it is a situation of decrease in supply.

Q.14. What causes an upward movement along a supply curve of a commodity?

Ans. Increase in price of the commodity causes an upward movement along the supply curve of that commodity.

Q.15. What causes a downward movement along a supply curve of a commodity?

Ans. Decrease in price of the commodity causes a downward movement along the supply curve of that commodity.

Q.16. State one reason for a rightward shift in supply curve.

Ans. Due to technological improvement, supply curve shifts to the right.

Q.17. State one reason for a leftward shift in supply curve.

Ans. Due to rise in input prices, supply curve shifts to the left.

Q.18. Give two examples where technological progress leads to shift in the supply curve.

Ans. (i) e-commerce has substantially reduced the cost of marketing, causing supply curve to shift to the right.

(ii) Use of powerloom in place of handloom has enhanced productivity, lowered unit cost of production, causing shift in supply curve to the right.

Q.19. What is meant by market period?

Ans. Market period is a period when supply of a product can be increased only up to the extent of its existing stock.

Q.20. What is the nature of supply curve?

Ans. Supply curve generally slopes upward, showing a positive relationship between price and quantity supplied of a commodity.

C O S - Reason-Based Questions

Q.1. Supply and quantity supplied are identical terms.

Ans. False. Supply refers to various quantities of a commodity that the producers wish to sell at different possible prices of the commodity at a point of time. Where as quantity supplied refers to a specific quantity that the producer is willing to sell at a specific price of the commodity. Therefore, quantity supplied is just an element of supply.

Q.2. Market supply schedule refers to supply schedule of the industry as a whole.

Ans. True. Because sum total of the firms producing a particular commodity in the market is called industry. Therefore, market supply schedule, which by definition is the supply schedule of all the firms in the market producing a particular commodity, also refers to supply schedule of the industry as a whole.

Q.3. Due to improvement of technology, the supply curve of televisions has shifted to the left.

Ans. False. Due to improvement of technology, the supply curve of televisions has shifted to the right, showing greater supply at the same price.

Q.4. If a farmer grows rice and wheat, then due to an increase in the price of wheat, the supply curve of rice shifts to the left.

Ans. True. Increase in price of wheat will shift the supply curve of rice to the left. The farmer will grow less rice, as he would prefer to shift to the production of wheat.

Q.5. When new technique of production reduces the cost of producing stainless steel, the supply curve of stainless steel utensils shifts to the right.

Ans. True. A reduction in the cost of stainless steel raises the supply of stainless steel. When supply of stainless steel increases, the supply of utensils (using stainless steel as the raw material) shall increase implying a shift in supply curve of stainless steel utensils to the right.

P E O S - R & U - Info & Con

Q.1. Define price elasticity of supply.

Ans. Price elasticity of supply measures the degree of extension and contraction of supply in response to a given change in own price of the commodity.

Q.2. Give the formula to measure price elasticity of supply.

Ans.

$$\text{Price elasticity of supply } (E_s) = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Where, ΔQ = Change in quantity supplied; ΔP = Change in price; Q = Initial quantity; P = Initial price.

Q.3. Define perfectly elastic supply.

Ans. Perfectly elastic supply is a situation when a slight change in price causes infinite change in quantity supplied.

Q.4. Define perfectly inelastic supply.

Ans. Perfectly inelastic supply is a situation when quantity supplied remains constant, no matter what the price of the commodity is.

Q.5. When is the supply of a commodity called elastic?

Ans. When percentage change in quantity supplied is greater than the percentage change in own price of commodity, supply is said to be elastic.

Q.6. When is the supply of a commodity called inelastic?

Ans. When percentage change in quantity supplied is less than the percentage change in own of the commodity, supply is said to be inelastic.

Q.7. When is the supply of a commodity called unitary elastic?

Ans. When the percentage change in quantity supplied is exactly equal to percentage change in own of the commodity, supply is said to be unitary elastic.

Q.8. What is the price elasticity of supply associated with a straight line supply curve passing through the origin?

Ans. If a straight line supply curve passes through the origin, price elasticity of supply is equal to unity.

Q.9. Which elasticity of supply is shown by the supply curve parallel to X-axis?

Ans. $E_s = \infty$ (infinity).

Q.10. Which elasticity of supply is shown by the supply curve parallel to Y-axis?

Ans. $E_s = 0$ (zero).

Q.11. Price elasticity of supply of a good is 2.5. Is the supply 'elastic' or 'inelastic' and why?

Ans. Supply is elastic because $E_s > 1$.

Q.12. Price elasticity of supply of a good is 0.6. Is the supply 'elastic' or 'inelastic', and why?

Ans. Supply is inelastic because $E_s < 1$.

Q.13. If two straight line supply curves intersect, which one has higher price elasticity of supply?

Ans. If two straight line supply curves intersect, flatter supply curve has higher price elasticity of supply than the steeper one.