Chapter-03
Production Behaviour and Supply

Very Short Answer Type Questions (1Mark)

1. **Define production function.**

   Ans. Diminishing return to a factor

2. **Define marginal product.**

   Ans. Marginal product is net addition to total product when one additional unit of variable factor is used.

3. **What will be the behavior of total product when marginal product of variable input is falling but is positive?**

   Ans. Total product increases at diminishing rate.

4. **What is the relation between average and marginal product when average product is falling?**

   Ans. MP falls but it falls at faster rate than AP

5. **Define average production.**

   Ans. AP is a per unit output of a variable factor.

6. **What do you mean by fixed factors of production? Give example.**

   Ans. These factors of production which cannot be varied in short period e.g. machine, land.

7. **By which behaviour of marginal product will total product be maximum**

   Ans. When marginal product of a factor is zero, then total product will be maximum.

8. **How does fall in total product affects marginal product?**

   Ans. When total product falls, marginal product becomes negative.

9. **What do you mean by cost?**

   Ans. Cost is the sum of explicit and implicit cost.

10. **Define explicit costs.**

    Ans. Those monetary payments by producer on factor and non factor payments is called explicit cost. Which are not owned by himself.

11. **Which cost curve is parallel to ox-axis? Why?**

    Ans. Total fixed cost because TFC remain constant at all level of output.

12. **What do you mean by implicit costs?**

    Ans. Implicit cost is the cost of self owned resources of producer.

13. **Define marginal cost.**

    Ans. Marginal cost is the net addition to total cost when one additional unit of output is produced.

14. **Why does the difference between average total cost and average variable cost falls with increase in output?**

    Ans. It is because average fixed cost goes on falling with increase in output.

15. **Define Revenue.**

    Ans. Revenue is the amount received from sale of output.

16. **At what rate average and marginal revenue falls, with fall in per unit price of a good?**

    Ans. Marginal revenue falls twice the rate of average revenue.

17. **What will be the behaviour of Average revenue when total revenue increases at constant rate?**

    Ans. Average revenue remains constant.

18. **What do you mean by marginal revenue?**

    Ans. Marginal revenue is net additions to total revenue by sale of one additional unit of output.

19. **What will be the behaviour of total revenue when marginal revenue is zero?**

    Ans. Total revenue will be maximum.

20. **Why does average cost curve and averages variable cost curve never intersect each other?**

    Ans. Because AFC can never be zero at any level of output.

21. **What do you mean by producer's equilibrium?**

    Ans. Producer's equilibrium is a situation where he gets maximum profit.

22. **State any two conditions of producers equilibrium according to marginal revenue and marginal cost approach.**

    Ans. 1. MR = MC

    2. Rising portion of Marginal cost curve intersects marginal revenue curve.

23. **Define supply.**

    Ans. Supply refers to the amount of the commodity that a firm or seller is willing to offer for sale in a given period of time at various prices.

24. **What do you mean by individual supply schedule?**

    Ans. Individual supply schedule is a tabular representation showing various quantities of a commodity which a firm is ready to sell at different prices during a given period of time.

25. **Define Market Supply**

    Ans. It refers the sum of total quantity supplied by all the firms in a market.

26. **Name two determinants of supply.**

    Ans. 1. Number of firms

    2. Change in technology

27. **What is meant by change in supply?**

    Ans. Change in supply refers to increase or decrease in supply of a commodity due to change in factors other than price like technology, price of inputs, Goal of producer, Number of firms etc.

28. **What type of change in price is the cause of upward movement along a supply curve?**

    Ans. Due to increase in price.

29. **What effect does an increase is tax rates have on supply of a commodity?**

    Ans. As a result of increase in tax rates production cost increase, so the profit margin of producer will fall and producer will decrease the supply.

30. **What causes a downward movement along a supply curve?**

    Ans. Decrease in price.

31. **What is meant by leftward shift of supply curve?**

    Ans. Due to change in other factors the supply of a commodity falls at same price than supply curve shifted to leftward.

32. **How does a decrease in price of input effect supply curve of the commodity?**

    Ans. As a result of decrease in price of input production cost falls then producers profit margin will increase so producer will increase the supply of commodity.

33. **Why does a supply curve have a positive slope?**

    Ans. Because of positive relation between price and supply.

34. **What is meant by elasticity of supply?**

    Ans. Price Elasticity of Supply (Es) is a measure of degree of response of supply for a good to change in its price.

35. **What is the price elasticity of supply, if supply curve is parallel to y-axis.**

Ans. Perfectly elastic.

36. **When does the elasticity of supply of commodity called equal to unity?**

    Ans. When percentage change in price is equal to percentage change in supply.

37. **When does the producer increase the supply of a good at given price, give two reasons.**

    Ans. Due to change in other factor like improvement in technology, decrease in price of inputs.

38. **What causes an extension in supply?**

    Ans. Increase in price of a commodity.

39. **If the price of a commodity falls by 10% and, consequently, the quantity supplied decreases by 20%. What will be its price elasticity of supply?**

    Ans. $Es = \dfrac{\%\text{change in quantity}}{\%\text{change in price}} = \dfrac{20\%}{10\%} = 2$

40. **What happens to TP when MP is zero?**

    Ans. TP is maximum.

41. **What happens to MPP when TPP increases at decreasing rate?**

    Ans. MPP falls but remains positive.

42. **As the variable input is increased by one unit, total output falls. What would you say about of marginal productivity labour?**

    Ans. Marginal productivity of labour is negative.

43. **Why MC curve is in short run U-shaped?**

    Ans. MC Curve in short run is U-shaped due to operation of the law of returns to a factor.

44. **Why does fixed cost not influence marginal cost?**

    Ans. Because marginal cost does not include fixed cost.

45. **When a seller sells his entire output at a fixed price, what will be the shape of AR & MR curves?**

    Ans. Both AR & MR are equal and coincide with each other on a horizontal line.

46. **Show that average revenue equals price.**

    Ans.

    $AR = \dfrac{TR}{Q} = \dfrac{P \times Q}{Q} = P = \text{Price}$

47. **What effect does a cost saving technical progress have on the supply curve?**

    Ans. Supply curve will shift to the right.

48. **What effect does an increase in excise tax have on the supply curve?**
Ans. Supply curve will shift to the left.

49. **What happens to TPP when marginal productivity of variable input is negative?**
Ans. TPP falls.

50. **When is TPP maximum in relation to MPP?**
Ans. When MPP is zero.

51. **What happens to MPP when TPP is declining?**
Ans. MPP declines and remains negative.

52. **How does fall in MPP affect TPP?**
Ans. TPP increases at decreasing rate.

53. **What effect does an increase in input price have on the supply curve?**
Ans. The supply curve will shift towards left-hand side.

54. **Why does average cost fall as output rises?**
Ans. AC falls due to operation of the law of increasing returns to a factor as output rises.

55. **Does fixed cost affect marginal cost? Give the answer with reason.**
Ans. No, because fixed cost is not subject to change and it is not considered while calculating MC.

56. **What would be the effect of increase in the output on the TFC?**
Ans. There would not be any effect of increase in the output on the TFC, It will be constant at different levels of production.

57. **If marginal revenue falls, will total revenue fall?**
Ans. It may fall when MR falls and becomes negative. If MR falls but remains positive then TR may increase with diminishing rate.

58. **What is the price elasticity of supply of a commodity whose straight line supply curve passes through the origin forming an angle of 75º?**
Ans. Price elasticity of supply will be equal to one when a straight line supply curve passes through the origin; angle does not matter anything.

Short Answer Type Questions (3-4 Marks)

1. **Explain the likely behaviour of total product under the stage of increasing return to a factor with the help of numerical example.**

   Ans. Increasing return to a factor is the first phase of the Law of return to a factor. When more and more units of a variable factor is combined with fixed factor up to a certain level total physical product increases with increasing rate.

 | Machine | Unit of labour | Total physical product |
   |---------|----------------|------------------------|
   | 1 | 1 | 10 |
   | 1 | 2 | 24 |
   | 1 | 3 | 42 |

2. **With the help of example distinguish between total fixed cost and total variable cost.**

   Ans.

Total fixed cost	Total variable cost
1. Fixed cost remains constant at each level of output ie it do not change with change in quantity.	1. variable cost changes with the change in quantity. It increase or decrease as the output change.
2. It can not be zero when output is zero.	2. it is zero when output is zero
3. Its curve is parallel to X-aixs	3. Its curve is parallel to the curve of total cost.
4. Example :- Rent, wages of permanent staff.	4. Example :- cost of raw material, wages of casual labour.

3. **Draw average cost, average variable cost and marginal cost curves on a single diagram and explain their relations.**

   Ans.
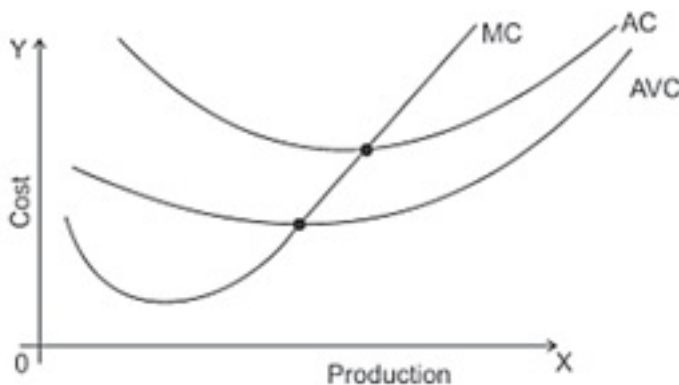
   Relation of AC, AVC and MC

   1. MC interects to AC and AVC at their minimum level
   2. AC and AVC decreases before the interection by MC, but remain greater than MC.
   3. AC and AVC starts to increase after the itersection by MC, and becomes less than MC.
   4. As output increases, AC and AVC tends to be closer but the difference between AC and AVC can naver be zero.

4. **Draw average cost, average variable cost and average fixed cost curves on a single diagram and explain their relation.**

   Ans.
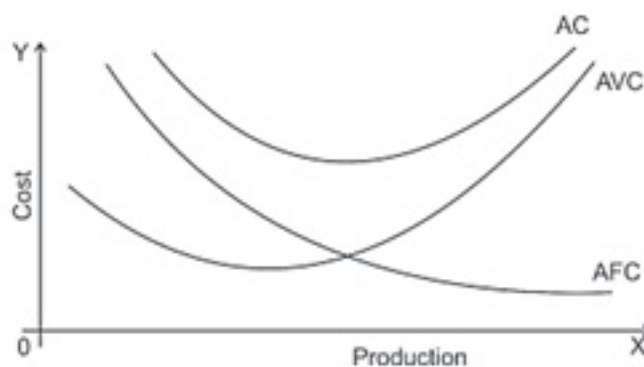
   1. AC is the vertical summation of AVC and AFC
   2. The difference between AC and AVC falls as output increases but the difference of AC and AFC increases.
   3. As output increases AC and AVC tends to be closer but theircurves do not interect each other because AFC always remains more than zero.

5. **Explain the relation between average revenue and marginal revenue when a firm can sell an additional unit or a good by lowering the price.**

Ans.

1. AR and MR both decreases.
2. MR decrease at the rate of twice than AR.
3. MR become zero and negative but AR can never be zero.

6. **Distingush between change in quantity supplied and change in supply.**

   Ans.

Change in quantity supplied	change in supply
1. It refers the change in supply due to change in price of the good.	1. It refer's the change in supply due to the change in the determinents of supply other than price.
2. Determinents of supply other than price remains unchanged.	2. Price of the good remains unchanged.
3. Law of supply apply.	3. Law of supply does not apply.
4. There is upward and downward movement along with supply curve in this situation.	4. supply curve shifted to leftward or rightward under this condition.

7. **Explain how does change in price of input affect the supply of a good.**

   Ans.

   A. **Increase in price of input :** increase in price of input is cause of a decrease in the supply of a good because the production cost of a good will increase due to increase in price of input. It will reduced the profit. So producer will decrease the supply of the good.

   B. **Decrease in price of Input :** Decrease in price of input is a cause of increase in supply because when the price of input decrease the production cost of a good also also decreases. Decrease in cost increases the profit margin. It motivate to producer to increase the supply of the good.

8. **Explain how changes in prices of other products influence the supply of a given product.**

   Ans. The supply of a good is inversly influenced with the change in price of other product which can explain as fallows.

A. **Rise in price of other product** :– When there is rise in the price of other product the production of these product become more profitable due to unchanged cost in comparison of the production of given produce. As a result the producer will produce more quantity of other product so the supply of given good will decrease.

B. **Fall in the price of other product** :– When there is fall in the price of other product the production of these product become less profitable due to unchanged cost in comparison of the production of given product. As a result producer will produce less quantity of other product so the factors of production shifted for the production of given good. It cause an increase in supply of given good.

9. **Explain how technological advancement influence the supply of a given product.**

Ans. Technological advancement brings a positive impact in the supply of a given product. It reduces per unit cost and increase the productivity of given factors of production. Due to these reasons production of given product becomes more profitable.

10. **Explain the law of variable proporation with the help of diagram schedule.**

OR

What is the likely behaviour of total product/marginal product when only one input is increased for increasing production? Use diagram/ schedule.

Ans. Law of variable proportion state the inpact of change in unit of a variable factor on the physical output. When more and more unit of a variable factor combined with fixed factor physical product passes though following phases.
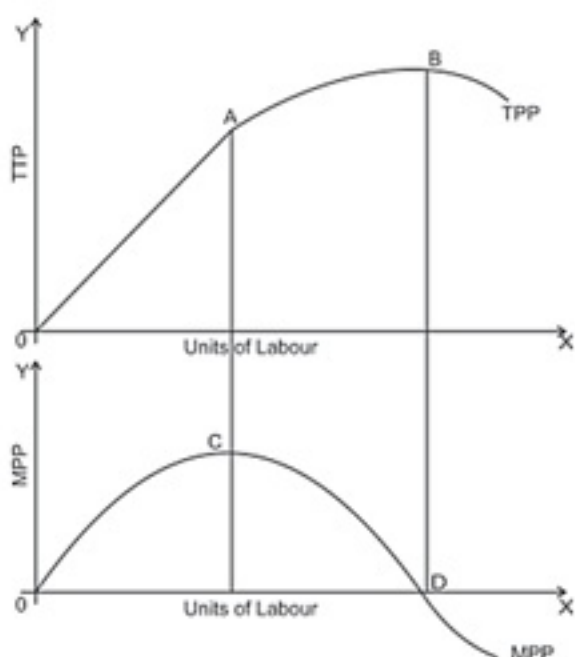
Behaviour of TP

(i) TP increases at an increasing rate

(ii) TP increases at diminishing rate

(iii) TP falls

Behaviour of MP

(i) MP increases and becomes maximum.

(ii) MP decreases and becomes zero.

(iii) MP becomes negative.

Machine	Unit of labour	TPP	MPP
1	1	3	3
1	2	7	4

1	3	12	5
1	4	16	4
1	5	19	3
1	6	21	2
1	7	22	1
1	8	22	0
1	9	21	-1

1. **First Phase :–** TPP increases with increasing rate upto A point. MPP also increase and becomes maximum of point C.
2. **Second Phase :–** TPP increases with diminishing rate and it is maximum on point B. MPP start to decline and becomes zero at D point.
3. **Third Phase :–** TPP starts to decline and MPP becomes negative.
   - Important instruction for giving the answer of above question.
   - Do not use diagram for the explaination of this question if it is instructed to use schedule and do not use schedule if the explaination of this question asked with the help of diagram.
   - Do not explain the behaviour of marginal product with the help of schedule and diagram. If there is instruction to explain only the behaviour of total product.
   - Do not explain the behaviour of total product with help of schedule and diagram if

there is instruction to explain only the behaviour of marginal product.

11. **What is producer's equilibrium? Explain the conditions of produce's equilibrium through the 'marginal cast and marginal revenue' approach. use diagram/schedule.**

Ans. Producer's equilibrium refer's the stage under which with the help of given factor's of production producer attain that level of production of which he is getting maximum profit. The conditions of producer's equilibrium through the marginal cost and marginal revenue approach are as follows.

1. Marginal cost should be equal to marginal revenue.

2. With the increase in output after equilibrium marginal cost should be greater than marginal revenue.

Output	MR	MC
1	4	5
2	4	4
3	4	3
4	4	4
5	4	5

OR

Output	MR	MC
1	10	5
2	8	4
3	6	3
4	4	4
5	2	5
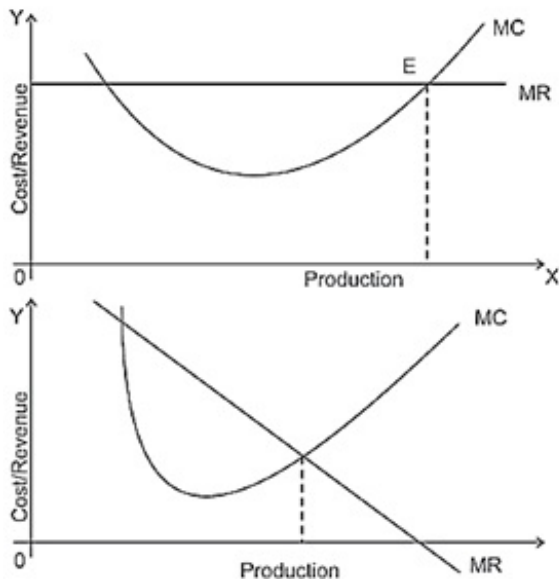
Explanation of conditions :–

1. So long as MC is less than MR, it is profitable for the producer to go on producing more because it adds to its profits. He stops producing more when MC becomes equal to MR.

2. When MC is greater than MR after equilibrium if means the profit will decline if producer will produce more units of the good. Important instruction for giving the answer of the above question

   - Use only one schedule/diagram given as above for the explaination.
   - Do not use diagram for the explaination of this question if it is instructed to use schedule and do not use schedule if the explaination of this question is asked with the help of diagram.

12. **What do you understand by returns to factor? Why do diminishing returns to a factor operate?**

    Ans. Returns to a factor relates to the behavior of total output as one variable input say labour is varied. It is a short run concept. There are three aspects of returns to a factor.

    1. Increasing Returns to a factor,
    2. Constant Returns to a Factor, and
    3. Diminishing Returns to a Factor.

    Diminishing returns to a factor may occur due to following reasons:-

    1. Fixity of the factor: As more and more units of the variable factor continue to be combined with the fixed factor, the later gets over-utilized.
    2. Imperfect Substitution among Factor: Beyond a certain limit, factors of production

can not be substitute for one another e.g. more and more of labour cannot be continuously used in place of additional capital.

13. **What are the factors which give rise to increasing returns to variable factors?**

    Ans.

    1. Fuller utilization of the fixed factors- Generally fixed factors are indivisible and underutilized. With greater application of variable factor these factors are better utilized its MPP tends to rise.

    2. Increased efficiency of variable factor- Application of specialization and division of labour among the units of variable factors leads to greater efficiency and increase in MPP.

14. **Explain the relationship between AC & MC with diagram.**

    Ans. (i) When MC < AC, AC falls.

    (ii) When MC = AC, AC is minimum.

    (iii) When MC > AC, AC rises.

    (iv) MC falls & rises faster than AC.

    (v) Both are obtained from TC.

    $$AC = \frac{TC}{Q}, MC = \frac{\Delta TC}{\Delta Q}$$

    Units Produced
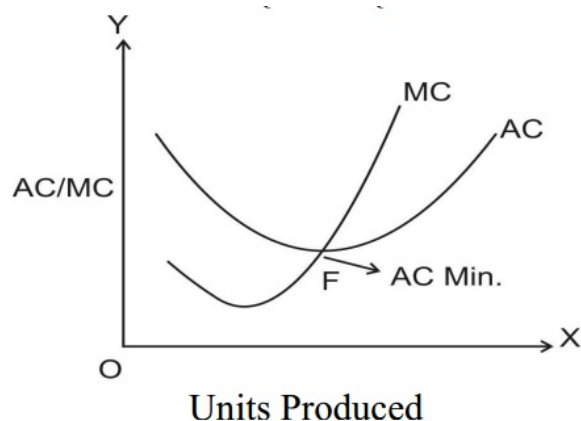
15. **Why is AC curve in the short run U-shaped?**

    Ans. AC curve is U-shaped in short run due to operation of law of returns to factors (i.e., law of variable proportion). Initially production is subject to law of increasing returns (i.e. decreasing cost), then law of constant return (i.e. constant cost) and ultimately to law of diminishing return (i.e. increasing cost). As output is increased, AC first falls, reaches its minimum and then rises. Hence, AC curves become U-shaped.

16. **How do changes in MR affect TR?**

    Ans.

1. If MR increases, TR increases at increasing rate.
2. If MR is constant, TR increases at constant rate.
3. If MR falls, TR increases at diminishing rate.

17. **What is MR? How is it related to AR?**

    Ans. MR refers to the change in TR due to sale of an additional unit.

    Relation –

    1. If AR (Price) is constant, MR = AR
    2. If AR (Price) falls, MR < AR.
    3. If AR (Price) rises, MR > AR.

18. **What will be the price elasticity of supply if the supply curve is a positively sloped straight line?**

    Ans. Es = 1 if the curve starts from the origin point.

    Es>1 if the curve starts from the y-axis and

    E<1 if the curve starts from the x-axis.

19. **Define marginal revenue. State the relation between marginal revenue and average revenue when a firm:**

    (i) is able to sell more quantity of output at the same price.

    (ii) is able to sell more quantity of output only by lowering the price.

    Ans. Marginal revenue is the addition to total revenue from producing one more unit of output.

    1. MR = AR at all levels of the output. (In case of perfect competitive market)
    2. MR will be less than AR at all levels of the output. (In case of monopoly and monopolistic market)

20. **Explain how do the following determine price elasticity of supply:**

    (i) Nature of the good (ii) Time period.

    Ans.

    1. Nature of Commodity - Elasticity of industrial goods is more than that of agricultural goods. Similarly supply of durable goods e.g. table is more elastic than that of perishable goods e.g. vegetables.
    2. Time Period- Generally elasticity of supply is more in the long period than in shorter period of time. The reason is that in the long period, all adjustments to the changed price can be made easily and supply of commodity can be varied accordingly.

Chapter-03

Production Behaviour and Supply

Long Answer Type Questions(6 Marks Each)

1. **In the following table, identify the different phases of the law of variable proportions and explain them with the help of the table and a diagram.**

Variable input (units)	1	2	3	4	5	6	7	8
Total product (units)	2	5	9	12	14	15	15	14

Ans. Law of Variable Proportion states that if we go on using more and more units of a variable factor along with a fixed factor, the total output initially increases at an increasing rate, after that it increases at diminishing rate and finally it declines.

It can be explained through the following three stages:

Units of labour	TPP	MPP	Stages of Produc tion
1	2	2	
2	5	3	Stage I
3	9	4	
4	12	3	
5	14	2	Stage II
6	15	1	
7	15	0	Stage III
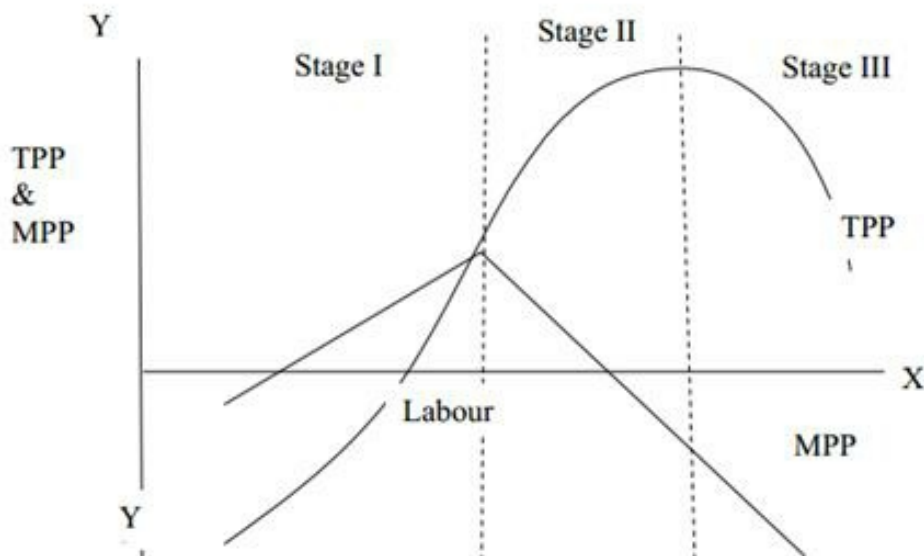
Stage 1:

• TPP increases at an increasing rate.

• MP increases and reaches at its maximum at the end of the stage.

• This is also called stage of increasing returns.

Stage 2:

• TPP increase but at diminishing rate.

• MPP starts decline but remains positive.

• This stage comes to an end when TPP is maximum and MPP is zero.

Stage 3:

• TP starts decline.

• MP becomes negative.

• This is also called stage of decreasing/negative returns.

2. **All the inputs used in production of a good are increased simultaneously and in the same proportion. What are its possible effects on Total Product? Explain with the help of a numerical example.**

Ans. The behaviour of total output in the long run time period is technically termed as Returns to Scale.

There are three possibilities:

1. Increasing Returns to Scale (IRS):- It occurs when a given proportionate increase in all factor inputs (in some constant ratio) causes proportionately greater increase in output.

   For example: Suppose there are only two inputs, labour (L) and Capital (K). Suppose

1K + IL produce 100 units and 2K + 2Lproduce 250 units. Input rises by 100% while the output rises by 150%.

2. Constant Returns to Scale (CRS):- It occurs when a given proportionate increase in all factor inputs causes proportionately equal increase in output. At this stage, economies of scale are counter balanced by diseconomies of scale. For example, suppose 1K+1L produce 100 units and 2K+2L produce 200 units, both inputs and TP rise in the same proportion.

3. Diminishing Returns to Scale (DRS):- It occurs when a given proportionate increase in all factor inputs causes proportionately lesser increase in output.
For example, Suppose 1K+1L produce 100 units and 2K+2L produce 190 units, inputs rise by 100% while the output rise by 90%.

Higher Order Thinking Skills

1. **Why is total variable cost curve parallel to total cost curve?**
   Ans. Total cost is the sum of total fixed cost and total variable cost. TFC remains constant at all levels of output.

2. **Why does average fixed cost fall with increase in output?**
   Ans. AFC can be calculated from TFC. Which remains constant at all level of output.

3. **Why is total fixed cost curve parallel to ox-axis.**
   Ans. TFC remains constant at all levels of output.

4. **Under which situation will MR fall when an additional quantity of a good is sold?**
   Ans. When per unit price falls by selling an additional unit of a good.

5. **What behaviour of per unit price will cause the equality of average and marginal revenue.**
   Ans. Per unit price remains constant.

6. **Give one differences between law of supply and price elasticity of supply.**
   Ans. Law of supply reflects the direction of change in supply where as price elasticity of supply measures the magnitude of change in supply.

7. **What is the price elasticity of supply associated when the supply curve passing through to intersect to x-axis?**
   Ans. Inelastic.

8. **Why does a producer moves downward along a supply curve due to decrease in price of commodity?**
   Ans. Because profit margin of firm (producer) decreases.

9. **What is the price elasticity of supply associated with when a supply curve passes through the origin at 40° angle?**
   Ans. Equal to unity elastic.

10. **When does the supply curve shift rightward while price remains constant.**
    Ans. When the supply of commodity increases due to change in other factors.

11. **What effect does an increase in price of competitive good have on the supply of a**

commodity?

Ans. Supply of the commodity will fall.

12. **How does the imposition of a tax affect the supply curve of a firm?**

    Ans. The supply curve will shift to the left side.

Numerical Problems with Solutions:

1. **Production**
   i. **Answer the following**

Find out APP and MPP							
Labour	1	2	3	4	5	6	7
TPP	40	80	110	130	140	140	130

   Ans.

APP	40	40	36.67	32.5	28	23.33	18.57
MPP	40	40	30	20	10	0	-10

   ii. **Answer the following**

Find out the TPP and APP							
Labour	1	2	3	4	5	6	7
MPP	24	20	16	12	8	0	-8

   Ans.

TPP	24	44	60	72	80	80	72
APP	24	22	20	18	16	13.33	10.28

   iii. **Answer the following**

Calculate the APP and MPP								
Labour	0	1	2	3	4	5	6	7
TPP	0	5	12	20	30	35	40	42

   Ans.

APP	0	5	6	6.66	7.5	7	6.66	6
MPP	-	5	7	8	10	5	5	2

iv. **The following table gives APP of a factor. It is also known that (TPP) total product at O level of employment is O. Determine its total product and marginal product.**

Labour	1	2	3	4	5	6
APP	50	48	45	42	39	35

Ans.

TPP	0	50	96	135	168	195	210
MPP	-	50	46	39	33	27	15

2. **Cost**

i. **Answer the following**

Calculate the TVC, AFC,AVC, and MC.							
Output	0	1	2	3	4	5	6
TC	60	80	100	111	116	130	150

Ans.

TFC	60	60	60	60	60	60	60
TVC	0	20	40	51	56	70	90
AFC	-	60	30	20	15	12	10
AVC	-	20	20	17	14	14	15
MC	-	20	20	11	5	14	20

ii. **Answer the following**

Calculate TC and AVC.						
Output	1	2	3	4	5	6
AFC	60	30	20	15	12	10
MC	32	30	28	30	35	43

Ans.

TC	92	122	150	180	215	258
TFC	60	60	60	60	60	60
TVC	32	62	90	120	155	198

AVC	32	31	30	30	31	33

iii. **Answer the following**

Calculate MC and AC if fixed cost is 40.						
Output	1	2	3	4	5	6
TVC	60	80	90	110	150	216

Ans.

MC	60	20	10	20	40	66
TC	100	120	130	150	190	256
AC	100	60	43.33	37.5	38	42.67

3. **Answer the following**

i. **Revenue**

Find AR and MR.							
Output	1	2	3	4	5	6	7
TR	10	24	33	40	40	36	28

Ans.

AR	10	12	11	10	8	6	4
MR	10	14	9	7	0	-4	-8

ii. **Find out TR and MR.**

Output	10	9	8
AR	6	7	8

Ans.

TR	60	63	64
MR	-	3	1

iii. **Answer the following**

Complete the following table				
Output	1	2	3	4
Price	-	9	-	-

MR	10	-	-	4
TR	-	-	24	-

Ans.

Output	1	2	3	4
Price	10	9	8	7
MR	10	8	6	4
TR	10	18	24	28

Elasticity of Supply:

1. **If price elasticity of supply of a commodity is 5. A producer supplies 500 units of this product at a price of Rs. 5 per unit. How much quantity of this product will be supplied, at the price of Rs. 6 per unit?**

   Ans. $e_s = 5$

P	Q	Δq	=	x-500
5	500	Δp	=	1
6	x	P	=	5
		Q	=	500

   $$e = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

   $$5 = \frac{X-500}{1} \times \frac{5}{500}$$

   $$5 = \frac{X-500}{100}$$

   $5 \times 100 = x - 500$

   $500 = x - 500$

   $500 + 500 = x$

   $x = 1000$ (units)

2. **Due to a 10 per cent rise in the price of a commodity, its quantity supplied rises from 400 units to 450 units. Calculate its price elasticity of supply. Is the supply elastic?**

   Ans. P = 10%

% Change in quantity Supplied $= \dfrac{Change\ in\ quantity}{Original\ quantity} \times 100$

$= \dfrac{50}{400} \times 100$

$= 12.5\%$

$Es = \dfrac{\%\ Change\ in\ Quantity\ Supplied}{\%\ Change\ in\ price}$

$e_s = \dfrac{12.5}{10}$

$e_s = \dfrac{125}{100}$

e_s = 1.25 (Yes, its supply is elastic.)

3. **The quantity supplied of a commodity at a price of Rs. 8 per unit is 400 units. Its price elasticity of supply is 2. Calculate the new price at which its quantity supplied will be 600 units?**

Ans. $e_s = 2$

P	q	Δq	=	200
8	400	Δp	=	x-8
X	600	P	=	8
		q	=	400

$e = \dfrac{\Delta q}{\Delta p} \times \dfrac{p}{q}$

$e_2 = \dfrac{200}{x-8} \times \dfrac{8}{400}$

$2 = \dfrac{4}{x-8}$

2 (X - 8) = 4

2 x - 16 = 4

2 x = 4+16

2 x = 20

x = 10

Hence the new price is Rs. 10

4. **When the price of a commodity rises from Rs.10 to Rs.12 per unit, its quantity supplied rises _by_ 100 units. If es = 2, Calculate itsquantity supplied at increased price.**

Ans. es=2

Δq = 100

Δp = 2

p = 10

$$e = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

$$2 = \frac{100}{2} \times \frac{10}{q}$$

4q = 1000

q = 250 (original quantity)

Quantity supplied at increased price = 250 + 100 = 350 units

5. **If es = 3, A seller supplies 20 units of the commodity at a price of Rs.8 per unit. How much quantity of the commodity will the seller supply when price rises by Rs.2 per unit?**

Ans. e_s = 3

q = 20

p = 8

Δp = 2

$$e = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

$$3 = \frac{\Delta q}{2} \times \frac{8}{20}$$

8 Δq = 120

Δq = 15

(change in quantity)

Quantity supplied at increased price = 20 + 15 = 35 units