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CLASS – 12

ECONOMICS

Introductory Microeconomics

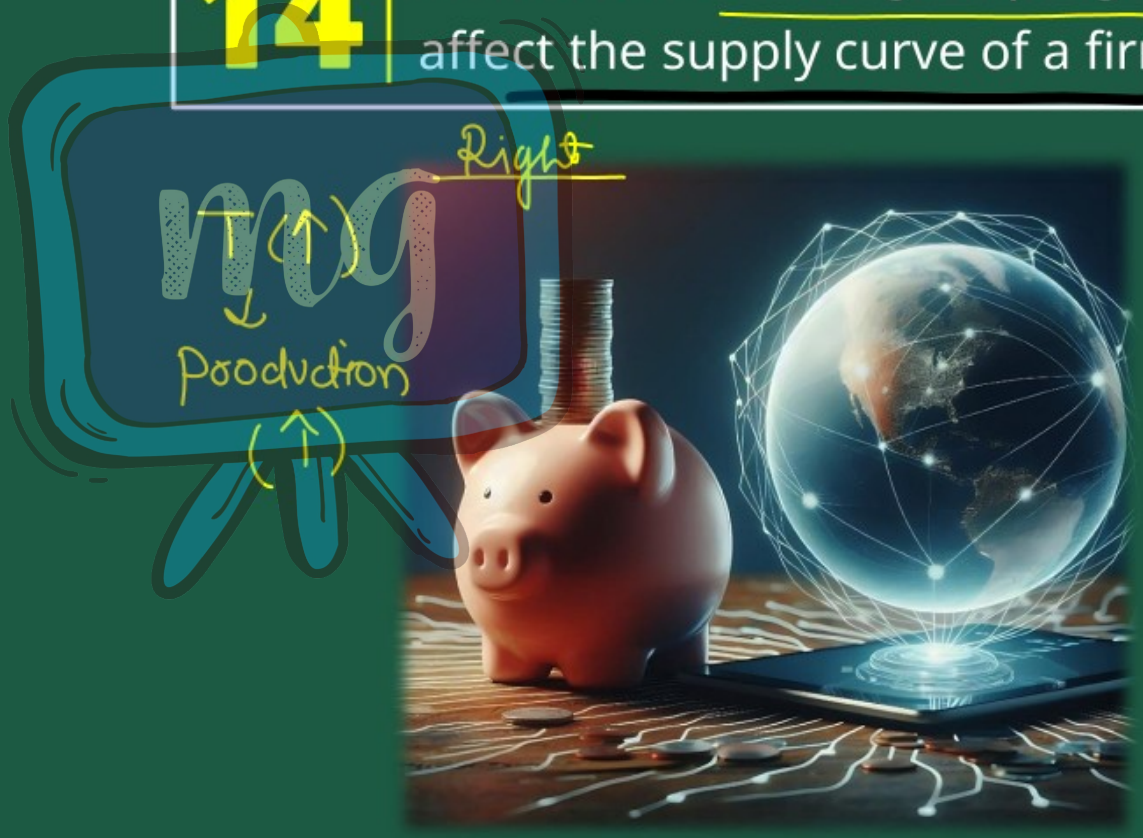
CH-4 : The Theory of the Firm under Perfect Competition

Part – 5

Exercise (Q. 14 - 27)

Vaishnavi Agrawal

14 How does technological progress affect the supply curve of a firm?





14 How does technological progress affect the supply curve of a firm?

Ans :

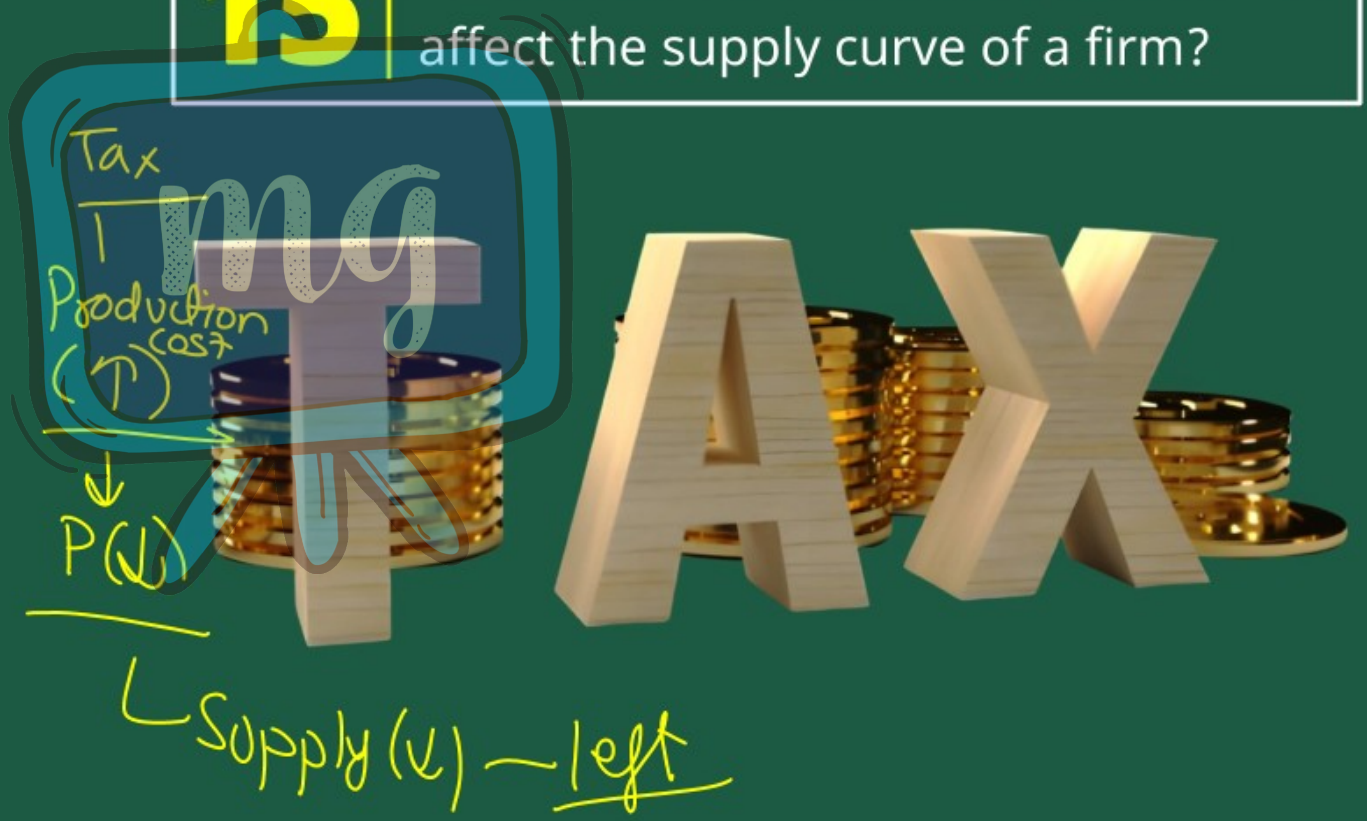
- Technological progress generally shifts a firm's supply curve to the right.
- The firm is willing to supply more at each given price.

EXERCISE



- This is because technological advancements often lead to lower production costs and increased efficiency.
- It allows firms to produce more output with the same or fewer input.

15 How does the imposition of a unit tax affect the supply curve of a firm?



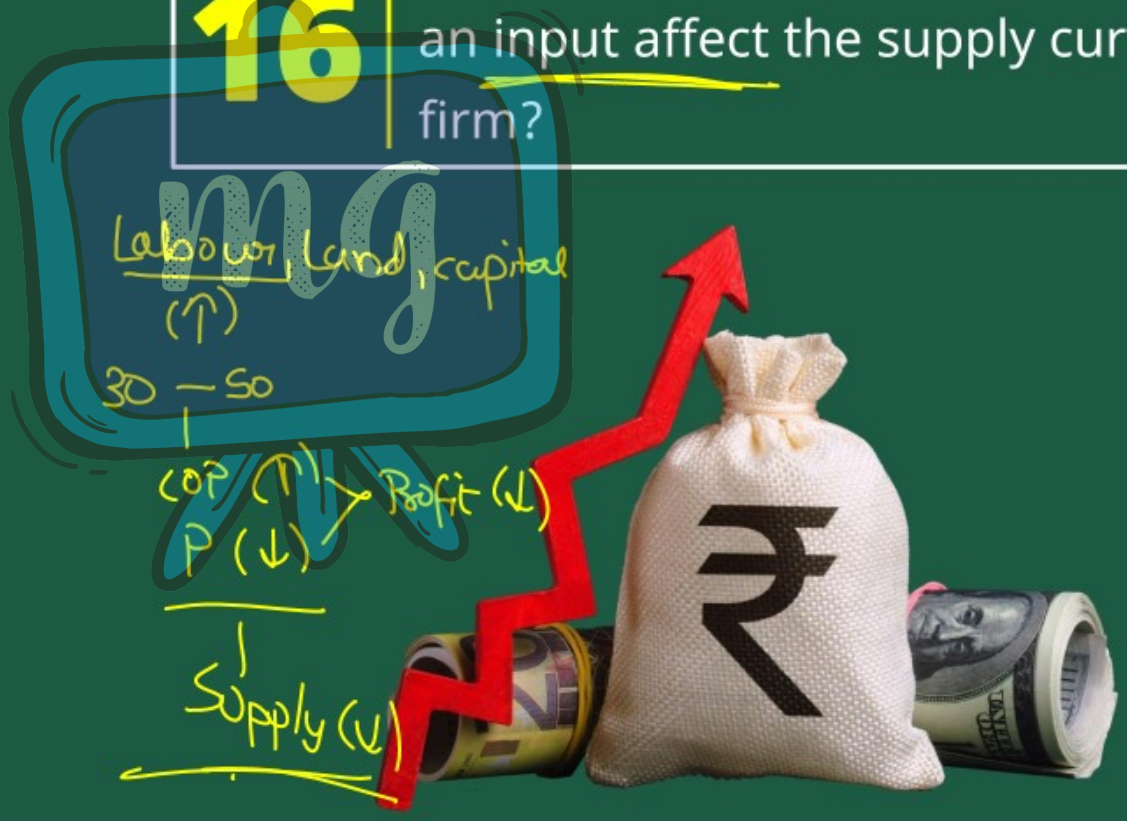


15 How does the imposition of a unit tax affect the supply curve of a firm?

Ans :

- The imposition of a unit tax on a good or service shifts the firm's supply curve to the left.
- This occurs because the tax effectively increases the cost of production for each unit, leading to higher marginal costs and lower profits.

16 How does an increase in the price of an input affect the supply curve of a firm?





16 How does an increase in the price of an input affect the supply curve of a firm?

Ans :

☛ An increase in the price of an input, like raw materials or labor, will shift a firm's supply curve to the left, indicating a decrease in supply.



- This happens because the higher input cost increases production expenses, making it less profitable to produce the same quantity at the original price.
- As a result, the firm will be willing to supply a smaller quantity at each price level.

17 How does an increase in the number of firms in a market affect the market supply curve?





17 How does an increase in the number of firms in a market affect the market supply curve?

Ans :

- An increase in the number of firms in a market causes the market supply curve to shift to the right.
- This is because more firms mean more total quantity supplied at each price level.

18 What does the Price Elasticity of Supply mean? How do we measure it?





18 What does the Price Elasticity of Supply mean? How do we measure it?

Ans :

- Change in Supply due to the change in the factors affecting the supply of the good.
- It measures the responsiveness of quantity supplied to changes in the price of the good.

$$E_S = \frac{\%\ \text{Change in Quantity Supplied}}{\%\ \text{Change in the Price of Good}}$$

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EXERCISE

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19 Compute the total revenue, marginal revenue and average revenue schedules in the following table. Market price of each unit of the good is Rs 10.

TR MR AR

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P × Q

TRn − TRn−1

TR / Q

P	Quantity Sold	TR	MR	AR
10	0	0	—	—
10	1	10	10	10
10	2	20	10	10
10	3	30	10	10
10	4	40	10	10
10	5	50	10	10
10	6	60	10	10

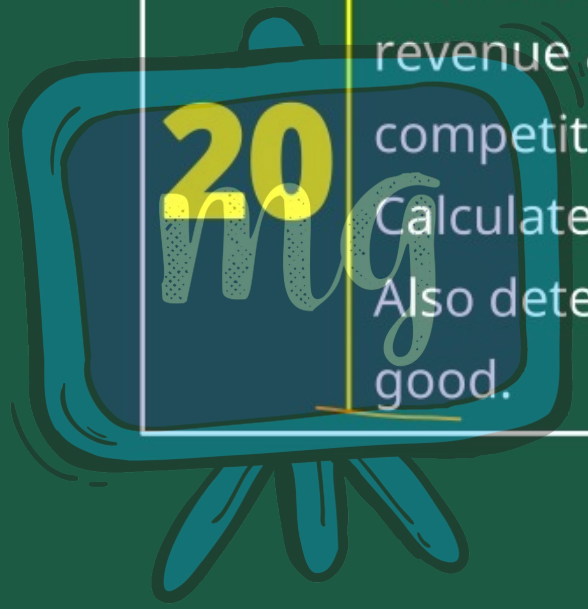
P = AR = MR (Perfect competition)

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The following table shows the total revenue and total cost schedules of a competitive firm.

Calculate the profit at each output level.

Also determine the market price of the good.

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P

TR = P x Q

S = P x 1

P = S

TR - TC

Quantity Sold	TR (Rs)	TC (Rs)	Profit
0	0	5	−5 (loss)
1	5	7	−2 (loss)
2	10	10	0 (Break even)
3	15	12	3
4	20	15	5
5	25	23	2
6	30	33	−3 (loss)
7	35	40	−5 (loss)

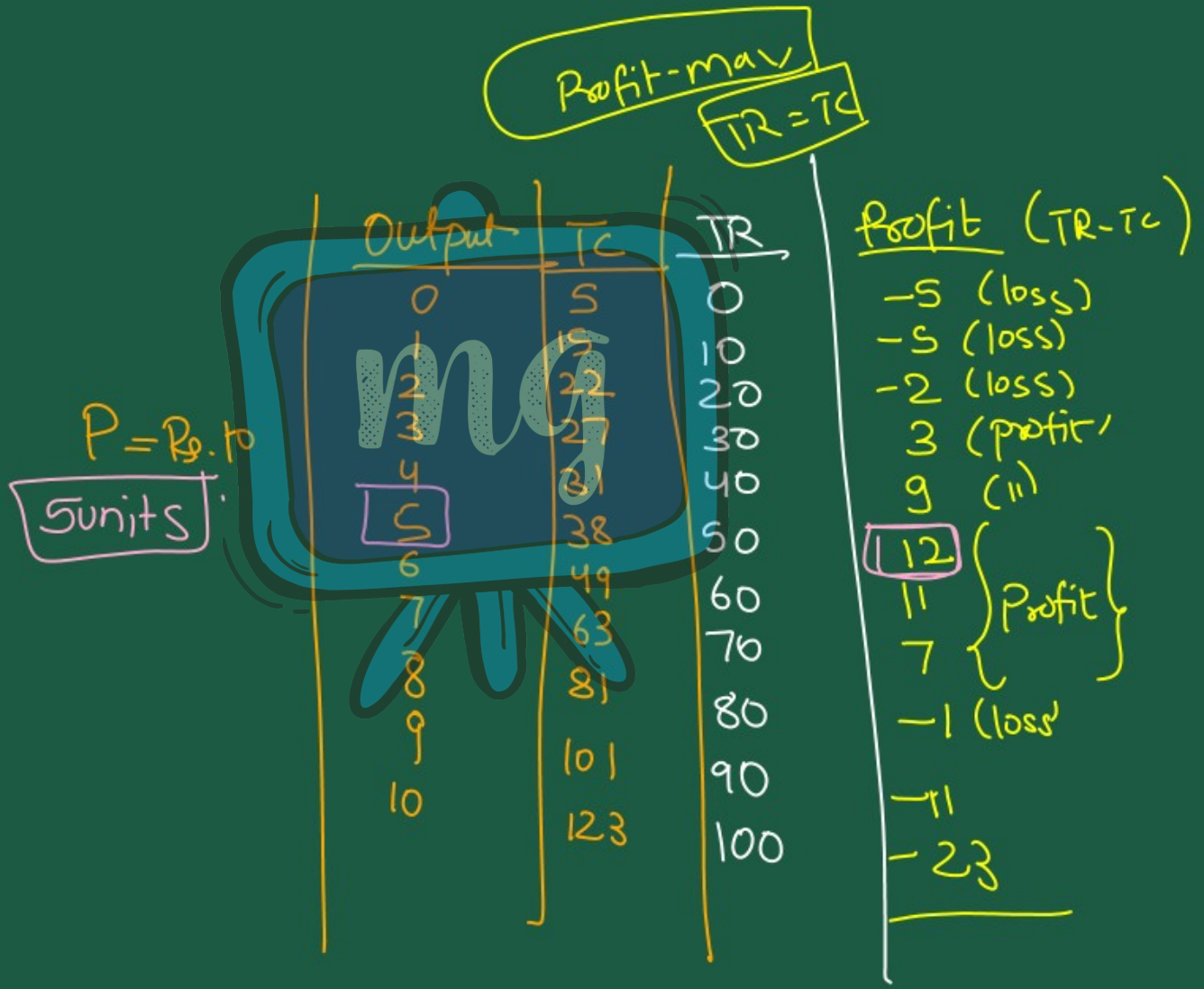
21 The following table shows the total cost schedule of a competitive firm. It is given that the price of the good is Rs 10. P

Calculate the profit at each output level. Find the profit maximising level of output. → Sunits

Output	0	1	2	3	4	5	6	7	8	9	10
TC (Rs)	5	15	22	27	31	38	49	63	81	101	123

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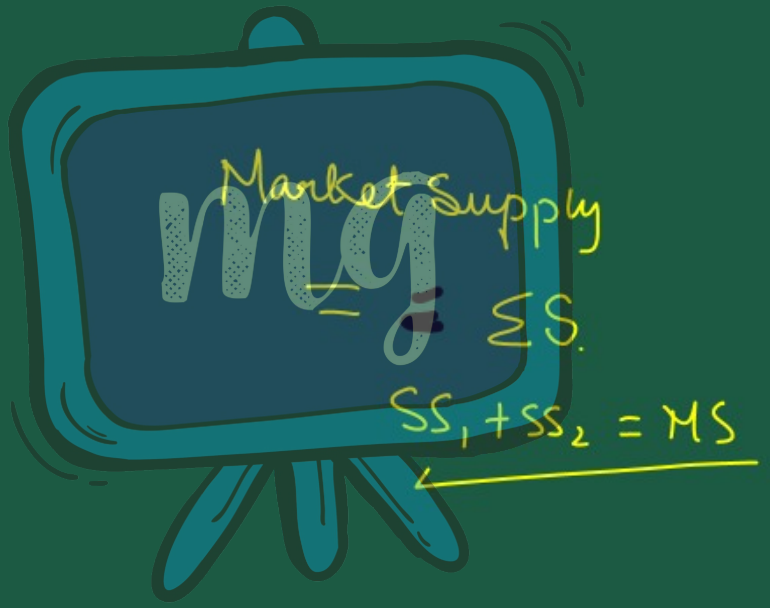


22 Consider a market with two firms. The following table shows the supply schedules of the two firms: the SS_1 column gives the Supply schedule of firm 1 and the SS_2 column gives the supply schedule of firm 2. Compute the market supply schedule.

Price (Rs)	0	1	2	3	4	5	6
SS_1 (units)	0	0	0	1	2	3	4
SS_2 (units)	0	0	0	1	2	3	4
MS	0	0	0	2	4	6	8

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23 Consider a market with two firms. In the following table, columns labelled as SS_1 and SS_2 give the supply schedules of firm 1 and firm 2 respectively. Compute the market supply schedule.

Price (Rs)	0	1	2	3	4	5	6	7	8
SS_1 (kg)	0	0	0	1	2	3	4	5	6
SS_2 (kg)	0	0	0	0	0.5	1	1.5	2	2.5

MS | 0 | 0 | 0 | 1 | 2.5 | 4 | 5.5 | 7 | 8.5

24 There are three identical firms in a market. The following table shows the supply schedule of firm Compute the market supply schedule.

Price (Rs)	0	1	2	3	4	5	6	7	8
SS_1 (units)	0x3	0x3	2x3	4x3	6x3	8x3	10x3	12x3	14x3
X3	0	0	6	12	18	24	30	36	52



25 A firm earns a revenue of Rs 50 when the market price of a good is Rs 10. The market price increases to Rs 15 and the firm now earns a revenue of Rs 150. What is the price elasticity of the firm's supply curve?

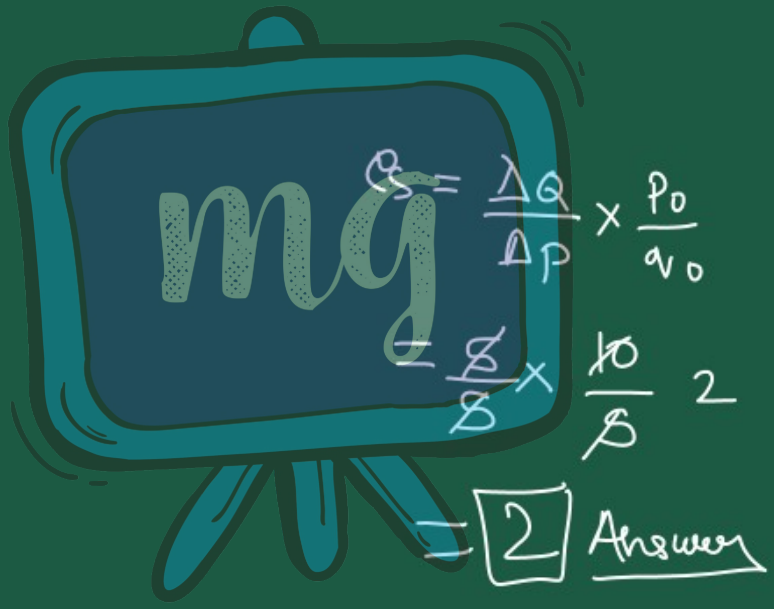
$TR_0 = 50$ $P_0 = 10$ $q_{0} = TR_0/P_0 = 50/10 = 5$ units

$TR_1 = 150$ $P_1 = 15$ $q_1 = TR_1/P_1 = 150/15 = 10$ units.

$P_0 = 10$, $P_1 = 15$ $\Big]\ \Delta P = 5$ $\quad$ $q_0 = 5$, $q_1 = 10$ $\Big]\ \Delta q = 5$

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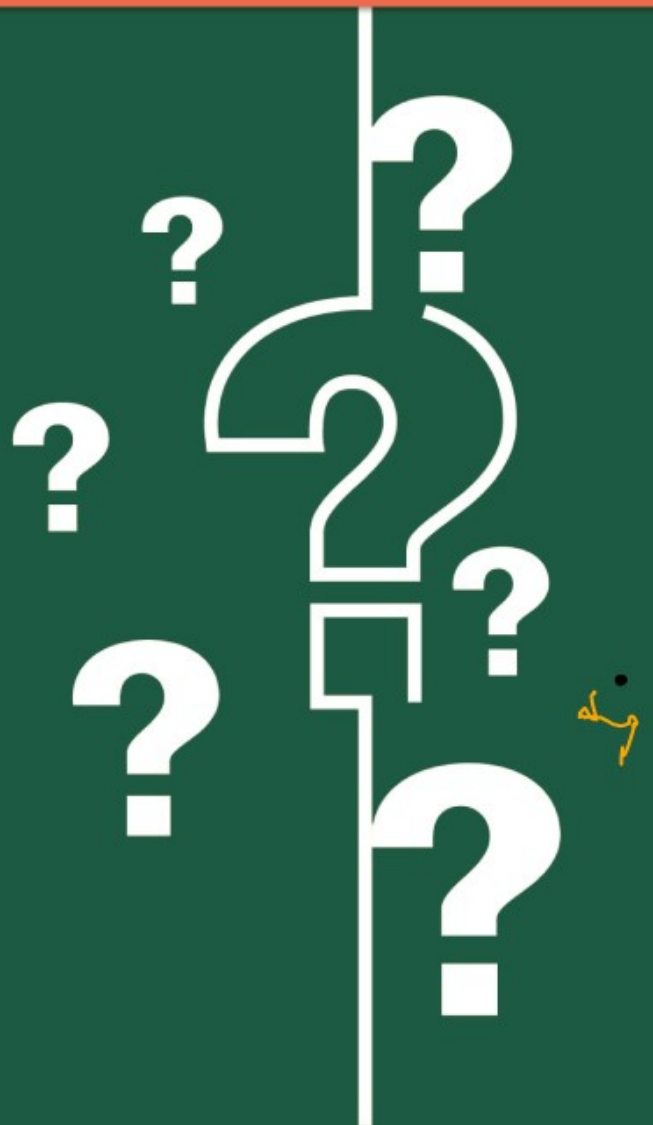
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26 The market price of a good changes from Rs 5 to Rs 20. As a result, the quantity supplied by a firm increases by 15 units. The price elasticity of the firm's supply curve is 0.5. Find the initial and final output levels of the firm.

$P_0 = 5$, $P_1 = 20$, $\Delta P = 15$, $\Delta Q_1 = 15$

$e_S = 0.5$

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

$0.5 = \frac{15}{15} \times \frac{5}{q_0} \Rightarrow q_0 = \frac{50}{5}$

$q_0 = 10$ units

$Q_1 = Q_0 + \Delta Q$

$= 10 + 15 = 25$ units



27 At the market price of Rs 10, a firm supplies 4 units of output. The market price increases to Rs 30. The price elasticity of the firm's supply is 1.25. What quantity will the firm supply at the new price?

$P_0 = 10$ $Q = 4$ $e_S = 1.25$ $Q_1 = 100 + 4 = 104$ units

$\Delta P = 20$ $P_1 = 30$ $Q_1 = ?$

$e_S = \frac{\Delta Q}{\Delta P} \times \frac{P_0}{Q_0} \Rightarrow 1.25 = \frac{\Delta Q}{20} \times \frac{10}{4}$

$1.25 = \frac{\Delta Q}{8}$

$\Delta Q = 1.25 \times 8$

$= 1000 = 100$ units