

NCERT Solutions for Class-XII Economics (Micro)

Chapter-4

Microeconomics Solutions for Class 12 Chapter 4

Q1. What are the characteristics of a perfectly competitive market?

Sol. A highly competitive market reflects the following characteristics.

- (i) There are many retailers and buyers in all categories.
- (ii) Many options for similar products.
- (iii) Traders or buyers are well informed and free to make decisions based on their market knowledge.
- (iv) All products have one type. Because every product has the same properties, the same price can be achieved.
- (v) There is no price control and manufacturers can set prices according to market requirements and available chains.
- (vi) There are no additional costs due to marketing or advertising.
- (vii) All companies are able to enter the market at no cost of transport.

Q2. How are the total revenue of a firm, market price, and the quantity sold by the firm related to each other?

Sol. The total revenue of a company is the sum of all the company's revenue. Market price is the price at which a product is sold on the market. In the best case scenario, a company can control the market price by determining the value of the product being sold. And with that, the company determines its revenue level.

Q3. What is a 'price line'?

Sol. The price line or budget line represents the various combinations and potential values of two potential buyable assets and estimated prices.

Q4. Why is the total revenue curve of a price-taking firm an upward-sloping straight line? Why does the curve pass through the origin?

Sol. In a pricing company, the Average Revenue (AR) is constant. If AR does not change, Marginal Revenue (MR) also does not change. This means that the company's Total Revenue (TR) rises at the same price where the price also does not change. Therefore, we see the TR curve descending as a straight line. If the output level is zero, the TR curve passes from the source.

Q5. What is the relation between market price and average revenue of a price-taking firm?

Sol. The average revenue of a company that takes prices is equal to its market value.

Q6. What is the relation between market price and marginal revenue of a price-taking firm?

Sol. The low-income company of the price-taking company is equal to its market value.

Q7. What conditions must hold if a profit-maximising firm produces positive output in a competitive market?

Sol. The following conditions must be met:

1. The marginal cost should be equal to that of the minimum income. In other words $MC = MR$ at equilibrium output.
2. Lower costs should increase above the estimated income after exceeding the estimated output.
3. The price should be greater or equal to the average variable cost at the equilibrium output level (AVC) at a slower pace.
4. The price should be greater or equal to the average cost at the same exit level over time.

Q8. Can there be a positive level of output that a profit-maximising firm produces in a competitive market at which market price is not equal to the marginal cost? Give an explanation

Sol. Market price and marginal costs should always be the same for a fully competitive company. Therefore, a good output rate will not occur when the market price does not match the marginal cost.

Q9. Will a profit-maximising firm in a competitive market ever produce a positive level of output in the range where the marginal cost is falling? Give an explanation.

Sol. No, this is not possible. In a highly competitive market, the estimated cost curve should continue to rise. Therefore, a for-profit company cannot produce a good product quality when marginal costs fall. To get the best output, marginal costs should go up.

Q10. Will a profit-maximising firm in a competitive market produce a positive level of output in the short run if the market price is less than the minimum of AVC?

Sol. A firm whose goal is to increase profits under the condition that the market price is below the low AVC (medium variable cost) will not be able to produce a product level in the short term because if the market price falls below the minimum AVC level, it shows that continuous production cannot continue and in such a case the company cannot operate.

Q11. Will a profit-maximising firm in a competitive market produce a positive level of output in the long run if the market price is less than the minimum of AC? Give an explanation.

Sol. No, for a highly profitable company operating in a competitive market, producing good product quality over time and the market value under AC (Medium Cost) is not possible, due to the fact that over time operations will go free and out of firms and all firms will earn normal profits. Therefore, the company will lose if the market price falls below the normal cost and in this case the need to stop production.

Q12. What is the supply curve of a firm in the short run?

Sol. A well-competing firm will have a curve to give a total of the rising rate of short-term marginal operating costs (SMCs) where a small amount of variable costs is greater than or equal to and a direct portion of the price axis. in the case where the price is less than the minimum value of the variable cost (AVC).

Q13. What is the supply curve of a firm in the long run?

Sol. Over time there will be no set costs as the supply can be changed by changing all aspects of production. Therefore, in a fully competitive company the supply curve will be the sum of the rising margin of the marginal cost over the lower point of the average cost in the event that the price is above or equal to the minimum average cost and a direct portion of the price. auction in a situation where the price is less than the minimum average cost. In other words it is that part of the cost curve next to the lower point of the middle cost curve.

Q14. How does technological progress affect the supply curve of a firm?

Sol. With improvements in technology, the output of the firm achieved with the same amount of capital and labour increases. This lowers the cost of production and also brings down the marginal cost it takes to produce a given quantity of output. The decrease in the marginal cost leads to a rightward and downward shift in the Marginal Cost (MC) curve. Therefore, the firm's supply curve will also undergo a similar rightward shift.

Q15. How does the imposition of a unit tax affect the supply curve of a firm?

Sol. Unit tax is imposed on per unit of the output which is sold. The impact of unit tax is that the cost of production is increased and as a result there is an increase in marginal cost. Supply falls due to the rising cost which makes the supply curve tilt towards the left.

Q16. How does an increase in the price of an input affect the supply curve of a firm?

Sol. Rise in price of input results in increased cost of production that has a positive impact on rising marginal cost. The impact on MC Curve is that it will shift upward towards left and correspondingly supply curve shifts upwards to the left. There is a negative impact on the supply of the firm as and when input price rises.

Q17. How does an increase in the number of firms in a market affect the market supply curve?

Sol. Increase in number of firms has a direct effect on increasing output of goods. This results in shifting of market supply curve to right.

Q18. What does the price elasticity of supply mean? How do we measure it?

Sol. It is defined as the measure in economics that deals with responsiveness of quantity supplied to a change in price of a good.

$$e_s = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

$$\begin{aligned}
 &= \frac{\Delta Q}{Q} \times 100 \\
 &= \frac{\frac{\Delta P}{P} \times 100}{\frac{\Delta P}{P} \times 100} \\
 &= \frac{\Delta Q}{Q} \times \frac{P}{\Delta P} \\
 &= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}
 \end{aligned}$$

In the above equation

ΔQ = change in quantity supplied

ΔP = change in price

P = Initial price

Q = initial supply

- Q19.** Calculate the total revenue, marginal revenue and average revenue schedules in the following table. Market price of each unit of the good is Rs 10.

Quantity Sold	TR	MR	AR
0			
1			
2			
3			
4			
5			
6			

Sol. The solution is as follows: P= 10

As per the question

Quantity Sold Q (units)	TR = P × Q (Rs)	MR = TR _n – TR _{n-1} (Rs)	AR = Price = Rs.10
0	0	-	
1	10	10 – 0 = 10	10
2	20	20 – 10 = 10	10
3	30	30 – 20 = 10	10
4	40	40 – 30 = 10	10
5	50	50 – 40 = 10	10
6	60	60 – 50 = 10	10

- Q20.** The following table shows the total revenue and total cost schedules of a competitive firm. Calculate the profit at each output level. Determine also the market price of the good.

Quantity Sold	TR (Rs)	TC (Rs)	Profit
0	0	5	

1	5	7	
2	10	10	
3	15	12	
4	20	15	
5	25	23	
6	30	33	
7	35	40	

Sol. The solution is as follows:

Quantity Sold	TR (Rs)	TC (Rs)	Profit = TR – TC	AR = $\frac{TR}{Q}$
0	0	5	–5	–
1	5	7	–2	5
2	10	10	0	5
3	15	12	3	5
4	20	15	–5	5
5	25	23	2	5
6	30	33	–3	5
7	35	40	–5	5

Q21. The following table shows the total cost schedule of a competitive firm. It is given that the price of the good is Rs 10. Calculate the profit at each output level. Find the profit maximising the level of output.

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

Sol. The solution for this question is as follows

Quantity Sold	Price(P) (Rs)	TC (Rs)	TR = P × Q	Profit = TR – TC (Rs)
0	10	5	0	–5
1	10	15	10	–5
2	10	22	20	–2
3	10	27	30	3
4	10	31	40	9

5	10	38	50	12
6	10	49	60	11
7	10	63	70	7
8	10	81	80	-1
9	10	101	90	-11
10	10	123	100	-23

Profit maximization occurs when the difference between revenue and cost is maximum, in the above table it is occurring in 5 units of output and the profit earned is Rs.12

- Q22.** Consider a market with two firms. The following table shows supply schedules of two firms: SS_1 denotes the supply schedule of firm 1 and SS_2 denotes the supply schedule of firm 2. Calculate the market supply schedule.

Quantity Sold	TR (Rs)	SS_2 (units)
0	0	0
1	0	0
2	0	0
3	1	1
4	2	2
5	3	3
6	4	4

Sol. The solution for this question is as follows:

Price (Rs)	SS_1 (units)	SS_2 (units)	Market Supply = $SS_1 + SS_2$
0	0	0	0
1	0	0	0
2	0	0	0
3	1	1	2
4	2	2	4
5	3	3	6
6	4	4	8

- Q23.** 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.)	SS_1 (kg)	SS_2 (kg)
0	0	0
1	0	0
2	0	0
3	1	0
4	2	0.5
5	3	1

6	4	1.5
7	5	2
8	6	2.5

Sol. The solution is as follows:

Price (Rs)	SS ₁ (kg)	SS ₂ (units)	Market Supply = SS ₁ + SS ₂ (kg)
0	0	0	0
1	0	0	0
2	0	0	0
3	1	0	1
4	2	0.5	2.5
5	3	1	4
6	4	1.5	5.5
7	5	2	7
8	6	2.5	8.5

Q24. There are three identical firms in a market. The following table shows the supply schedule of firm 1. Calculate the market supply schedule.

Price (Rs)	SS ₁ (units)
0	0
1	0
2	2
3	4
4	6
5	8
6	10
7	12
8	14

Sol. As per question, when the three firms are identical, all of them will be having the same supply curve. Market supply will be the sum of all three firms supply output

Price (Rs)	SS ₁ (units)	SS ₂ (units)	SS ₃ (units)	Market Supply = SS ₁ + SS ₂ + SS ₃
0	0	0	0	0
1	0	0	0	0
2	2	2	2	6
3	4	4	4	12
4	6	6	6	18
5	8	8	8	24
6	10	10	10	30
7	12	12	12	36
8	14	14	14	42

Q25. A firm earns a revenue of Rs 50 when the market price of a good is Rs 10. The market price increase to Rs 15 and the firm now earns a revenue of Rs 150. What is the price elasticity of the firm's supply curve?

Sol. As per question

At price, $TR_1 = P_1 \times Q_1 = 50$

$$\Rightarrow \frac{TR_1}{P_1} = Q_1$$

$$\Rightarrow \frac{50}{10} = Q_1$$

$$\Rightarrow Q_1 = 5 \text{ units}$$

Similarly, for increased price of Rs.15

At price, $P_2 = \text{Rs.15}$

Total Revenue, $TR_2 = P_2 \times Q_2 = 150$

$$\Rightarrow Q_2 = \frac{TR_2}{P_2}$$

$$\Rightarrow Q_2 = \frac{150}{15}$$

$$\Rightarrow Q_2 = 10 \text{ units}$$

Elasticity of supply is calculated by the following formula Elasticity of supply,

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

Therefore $\Delta Q = Q_2 - Q_1 = 10 - 5 = 5$

$P = P_1 - P_2 = 15 - 10 = 5$

$$\Rightarrow \frac{TR_1}{P_1} = Q_1$$

$$\Rightarrow \frac{50}{10} = Q_1$$

$$\Rightarrow Q_1 = 5 \text{ units}$$

$$e_s = 2$$

Q26. 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.

Sol. The solution for this question is as follows

$e_s = 0.5$ (Elasticity of Supply)

$P_1 = \text{Rs.5}$ (Initial Price)

$P_2 = \text{Rs.20}$ (Final Price)

$$\Delta P = P_2 - P_1$$

$$= 20 - 5$$

$$\Delta P = 15$$

$$\Delta Q = 15$$

$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

$$\Rightarrow 0.5 = \frac{15}{15} \times \frac{5}{Q_1}$$

$$\Rightarrow 0.5 = \frac{5}{Q_1}$$

$$\Rightarrow Q_1 = \frac{5}{0.5} = 10 \text{ units}$$

Initial quantity = 10 units

Final quantity, $Q_2 = \Delta Q + Q_1$

$$= 15 + 10$$

Therefore the total amount of units produced is $Q_2 = 25$ units

Q27. 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?

Sol. The solution for this question is as follows :

Initial Price, $P_1 = \text{Rs.}10$

Initial Output, $Q_1 = 4$ units

Final Price, $P_2 = \text{Rs.}30$

$$\Delta P = P_2 - P_1$$

$$= \text{Rs. } 30 - 10 = \text{Rs.}20$$

Elasticity of supply, $e_s = 1.25$

$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

$$\Rightarrow 1.25 = \frac{\Delta Q}{20} \times \frac{10}{4}$$

$$\Rightarrow \Delta Q = 10 \text{ units}$$

Therefore the final output supplied,

$$Q_2 = \Delta Q + Q_1$$

$$Q_2 = 10 + 4 = 14 \text{ units}$$



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