NCERT Solutions for Class 12 Micro Economics

Chapter 4 – The Theory Of Firm Under Perfect Competition

1.

What are the characteristics of a perfectly competitive market?

Ans: The term "perfectly competitive market " refers to a market in which a large number of buyers and sellers of a homogenous commodity engage in perfect competition, with the industry setting the product's price. Every company sells the goods on a set fee, and there is only one fee that stays in the market.

Characteristics of a market with perfect competition

a. The concept of perfect and free competition:
There are no tests on either the customers or the sellers in a wonderful marketplace. They are free to shop for or advertise to anyone. It indicates that no monopolies exist.

b. Low-cost and Effective Communication and Transportation:
If price adjustments are not made quickly or if the commodity cannot be transported quickly, a uniform rate may not be feasible. Therefore, in a highly competitive industry, affordable and effective shipping and communication methods are essential.

c. Broad Reach:
There are instances when a large market is mistaken for the ideal market. The commodity should have universal and sustained demand when looking at a larger market. The items should be transportable, and communication and transportation methods should be fast enough to expedite the process. There should be a significant division of labor, tranquility, and protection.

d. Numerous Businesses:
In this market, a vast array of businesses work together to make and sell a product. Every company only contributes a little portion of the market's total supply because there are so many different types of organizations; as a result, no single firm has any market electricity. It means

that no company may change the price of the product; instead, everyone must accept the price that has been established with the help of supply and demand in the market. Instead of setting prices, the firms are fee-talkers.

e. Numerous Purchasers:

There are many customers in a highly competitive market, each of whom is concerned with a little portion of the product's overall market share. Because of this, no single buyer can influence the market price that is established by the dynamics of supply and demand.

f. A uniform product:

Every company in a fully competitive market manufactures and distributes the identical goods. It means that every company's products are perfect replacements for one another in terms of quantity, quality, color, length, and many other aspects. A uniform fee is guaranteed due to the homogeneous nature of the products.

g. Free admission and departure:

When new businesses enter the market or existing businesses leave the market, there are no rules in place in a highly competitive market. New businesses will enter the market if there is abnormal revenue, and some existing businesses will leave if there are abnormal losses.

h. Complete understanding between buyers and sellers

Businesses and consumers have great statistics regarding the market in a fantastically competitive marketplace. It suggests that no client or business is unaware of the charge winning in the marketplace. This option implies that customers will switch to other businesses if a firm offers a uniform product at a lower or better price, or they may switch from the company to other businesses that are offering a lower price.

i. Perfect Mobility of Production Factors:

The factors of production, whether geographically or occupationally, are fully cellular in a totally competitive market, leading to component-rate equalization across the board.

j. No Selling or Promotional Fees:

The companies do not suffer any expenditures for advertisements or promotions. In a market with perfect competition, there are no selling costs.

2.

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

Ans: The aggregate of all revenue generated by a company is that company's total revenue. The product is supplied in the market at the market price. Ideally, the company would be able to regulate the market price by regulating the quantity of produce that is sold. In this way, the company establishes its own revenue scale.

3.

What is the 'price line'?

Ans: The many combinations and probable quantities of two commodities that can be bought with a given income and assumed prices are represented by a pricing line, also known as a budget line.

4.

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

Ans: Due to the fact that the rate of AR is constant and MR is also the same as AR, the total revenue curve for a corporation operating in a market that is perfectly competitive is a curve that slopes upward. Because of this, TR can only be prompted by modifying the output that is being provided, as the charge remains unchanged. The increase in TR is roughly proportional to the increase in the amount of output that is being delivered to customers.

By virtue of the fact that the curve passes through the beginning, it can be deduced that regardless of the price level, if the output that is purchased is zero, TR may likewise be zero.
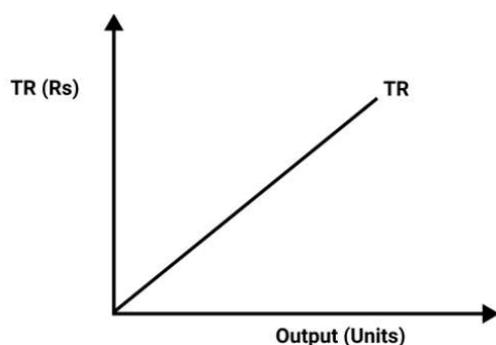
5.

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

Ans: A price-taking firm's Average revenue is proportional to its market price.

6.

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

Ans: A price-taking firm's marginal revenue is proportional to its market price.

7.

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

Ans: Businesses can use the market to sell any amount of output at the same price while the charge remains constant. AR remains constant throughout all output levels, and revenue from each extra unit (MR) is also equal to AR. If an income-maximizing business produces high-quality production (let's call equilibrium output Q*) in a competitive market, the following three requirements must be met:

  i. At Q*, MR and MC must be equal.
  ii. At Q*, MC should be rising or trending higher.
  iii. The price must be higher than or equal to the AVC in the short term. P > AVC at Q*, for example.

Long-term, the price ought to be higher than or equal to LAC.

8.

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 marginal cost? Give an explanation.

Ans: A completely competitive firm should always have the same market price and marginal cost. Therefore, when the market price is less than the marginal cost, there will not be a positive level of output.

9.

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.

Ans: No, in a selection where MC is declining, it isn't always possible for any ideal aggressive corporation to offer an advantageous stage of production. This is due to the fact that, in accordance with one of the scenarios of income maximization, the MC curve must slope upward or have an exceptional slope at the output equilibrium stage.

Let's look at an example: The price and MC are the same at point Z, but MC is declining and has a negative slope. The firm faces fee > MC for any degree of output larger than Oq0, suggesting that increasing the output level can maximize income.

As a result, factor "E" represents the equilibrium point at which a business can operate and manufacture output devices while maximizing profits.

10.

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? Give an explanation.

Ans: A firm that aims to maximize profits under the condition that the market price is less than the minimum AVC (average variable cost) will be unable to produce a certain level of output in the short term. This is because when the market price reaches the minimum AVC, it indicates that further production cannot be sustained, and in such a situation, the firm is unable to operate.

11.

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.

Ans: No, it is not feasible for a profit-maximizing firm that is operating in a competitive market to generate a positive level of output in the long term with a market price that is less than the average cost. This is because, in the long term, all firms will be earning a normal profit, as there will be free entry and exit. Consequently, a company will incur losses if the market price declines below the average cost. Subsequently, the company must cease production.

12.

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

Ans: We will develop a short-run supply curve for an organization. The derivation will be segmented into two distinct parts. When the market cost price meets or exceeds the minimum average variable cost, determine the optimal output level for maximizing the enterprise's profit. When the market cost falls below the minimum average variable cost, we can determine the optimal output level for maximizing the enterprise's profit.
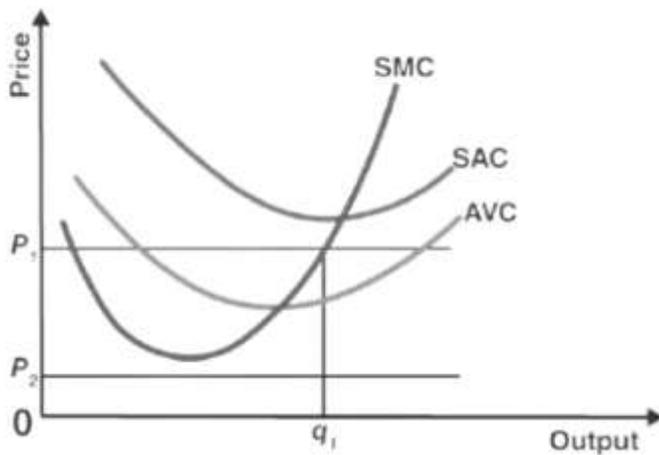
Case 1: The price is equal to or greater than the minimum average variable cost (AVC).
Let us consider that the market cost price is p1, which exceeds the minimum average variable cost. On the ascending segment of the SMC curve, we equate p1 with SMC, leading to the output level q1. It is important to observe that the average variable cost in the first quarter does not surpass the market cost price, p1. Consequently, at q1, all three conditions outlined in section 3 are satisfied. Consequently, when the market cost price is p1, the firm's short-run output level is q1.

Case 2: The price falls below the minimum average variable cost.
Let us consider that the market cost price is p2, which falls below the minimum average variable cost. For a profit-maximizing firm to achieve positive production in the short run, the market cost price, p2, must be at least equal to the average variable cost (AVC) at that specific output level. The AVC demonstrates superior performance compared to p2 in the image. The company is currently not in a position to generate a profit. Consequently, when the market price is p2, the firm will not engage in production.

13.

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

Ans: We will develop a long-run supply curve for a company. The derivation is segmented into two distinct sections when analyzing the short-run curve. When the market cost price meets or exceeds the minimal (long-run) average cost, we begin by identifying the profit-maximizing level of production for the enterprise.

When the market cost price falls below the minimal long-run average cost, we assess the optimal output level for maximizing the enterprise's profit.
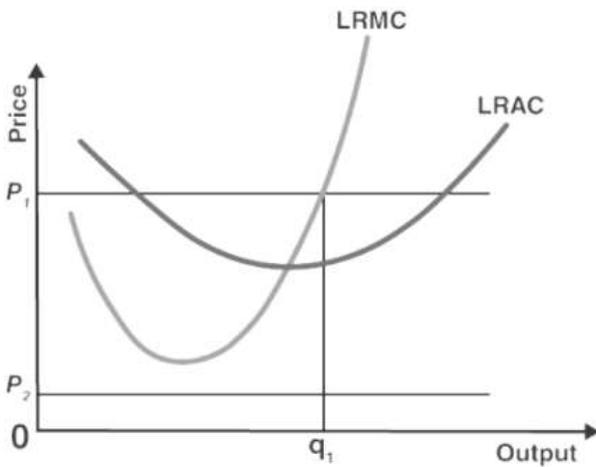
Case 1: A price that meets or exceeds the minimum of the long-run average cost curve

Let us consider that the market cost price is p1, which exceeds the minimum of the long-run average cost. The output degree q1 is derived by setting p1 equal to LRMC on the ascending segment of the LRMC curve.

The LRAC at q1 does not surpass the p1 market cost pricing. Consequently, at q1, all three conditions outlined in section 3 are satisfied. Consequently, when the market cost price is p1, the enterprise's supplies will align with q1 in the long term.

Case 2: Price Falls Below the Minimum of the Long-Run Average Cost

Let us consider that the market cost price is p2, which is below the minimum of the long-run average cost curve. For a profit-maximizing firm to sustain positive production over time, the market cost price, p2, must be greater than or equal to the long-run average cost (LRAC) at that specific output level.

The company is currently not in a position to generate a profit. Consequently, when the market cost price reaches p2, the firm opts not to produce any output. By synthesizing instances 1 and 2, we can arrive at a significant conclusion.

The upward slope of the LRMC curve starting from and above the minimum LRAC, along with the absence of production for all cost prices below the minimum LRAC, represents the long-run supply curve of an enterprise.

14.

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

Ans: With better technology, the company can make more with the same amount of money and workers. This lowers the cost of making things and the marginal cost of making a certain amount

of output. The Marginal Cost (MC) curve moves to the right and down when the marginal cost goes down. As a result, the firm's supply curve will also move to the right in the same way.

15.

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

Ans: The production is subject to unit taxation, which is applied per unit sold. A rise in marginal cost is a direct outcome of the unit tax's effect on production costs. The supply curve shifts to the left as a result of falling supply brought about by increasing costs.

16.

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

Ans: An escalation in input prices elevates manufacturing costs, thereby raising the firm's marginal cost. As a result, the marginal cost curve will shift upward and to the left, while the supply curve will similarly shift leftward and upward. Consequently, a rise in input costs adversely impacts the firm's supply.

17.

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

Ans: The market supply curve is made up of all the supply curves of all the companies in the market added together horizontally. The market supply curve will move to the right if there are more companies in a market. This is because there will be more companies providing more output. Deliveries will go up because there are more suppliers.

18.

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

Ans: The degree to which the amount supplied is responsive to changes in the price of a particular commodity is known as price elasticity of supply (PES) or ()

It can only be represented numerically as follows:

Supply-side price elasticity (e_s)

E_s = Percentage change in quantity supplied / Percentage change in price

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.

QUANTITY SOLD	TR	MR	AR
0			
1			
2			
3			
4			
5			
6			

Ans:

Quantity Sold	$TR = P \times Q$	$MR = TR_n - TR_{n-1}$	$AR = 10$
0	-	-	-
1	10X1= 10	10 - 0 = 10	10
2	10X2 = 20	20 - 10 = 10	10
3	10X3 = 30	30 - 20 = 10	10
4	10X4 = 40	40 - 30 = 10	10
5	10X5 = 50	50 - 40 = 10	10
6	10X6 = 60	60 - 50 = 10	10

20.

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	

Ans:

Quantity Sold	TR	TC	Profit	$AR = \dfrac{TR}{Q}$
0	0	5	0 − 5 = -5	-
1	5	7	5 − 7 = -2	$\dfrac{5}{1} = 5$
2	10	10	10 − 10 = 0	$\dfrac{10}{2} = 5$
3	15	12	15 − 12 = 3	$\dfrac{15}{3} = 5$
4	20	15	20 − 15 = 5	$\dfrac{20}{4} = 5$
5	25	23	25 − 23 = 2	$\dfrac{25}{5} = 5$
6	30	33	30 − 33 = 2	$\dfrac{30}{6} = 5$
7	35	40	35 − 40 = -5	$\dfrac{35}{7} = 5$

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

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

Ans:

Quantity Sold	Price	TC	TR = P×Q	Profit = TR - TC
0	10	5	10×0 = 0	0 – 5 = -5
1	10	15	10×1 = 10	10 – 15 = -5
2	10	22	10×2 = 20	20 – 22 = -2
3	10	27	10×3 = 30	30 – 27 = 3
4	10	31	10×4 = 40	40 – 31 = 9
5	10	38	10×5 = 50	50 – 38 = 12
6	10	41	10×6 = 60	60 – 41 = 11
7	10	63	10×7 = 70	70 – 63 = 7
8	10	81	10×8 = 80	80 – 81 = -1
9	10	101	10×9 = 90	90 – 101 = -11
10	10	123	10×10 = 100	100 – 123 = -23

Where the difference between TR and TC is greatest, the output is optimized for profit. This occurs at 5 output units, where the company makes Rs 12 in profit.

22.

Consider a market with two firms. The following table shows the supply schedules of the two firms: the SS1 column gives the supply schedule of firm 1 and the SS2 column gives the supply schedule of firm 2. Compute the market supply schedule.

PRICE(RS)	SS$_1$(UNITS)	SS$_2$(UNITS)
0	0	0
1	0	0
2	0	0
3	1	1
4	2	2
5	3	3
6	4	4

Ans:

Price	SS$_1$ (units)	SS$_2$ (units)	Market Supply = SS$_1$ + SS$_2$
0	0	0	$0 + 0 = 0$
1	0	0	$0 + 0 = 0$
2	0	0	$0 + 0 = 0$
3	1	1	$1 + 1 = 2$
4	2	2	$2 + 2 = 4$
5	3	3	$3 + 3 = 6$
6	4	4	$4 + 4 = 8$

23.

Consider a market with two firms. In the following table, columns labelled as SS1 and SS2 give the supply schedules of firm 1 and firm 2 respectively. Compute the market supply schedule.

PRICE(RS)	SS$_1$(UNITS)	SS$_2$(UNITS)
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

Ans:

Price	SS$_1$ (kg)	SS$_2$ (kg)	Market Supply = SS$_1$ + SS$_2$
0	0	0	0 + 0 = 0
1	0	0	0 + 0 = 0
2	0	0	0 + 0 = 0
3	1	0	1 + 0 = 0
4	2	0.5	2 + 0.5 = 2.5
5	3	1	3 + 1 = 4
6	4	1.5	4 + 1.5 = 5.5
7	5	2	5 + 2 = 7
8	6	2.5	6 + 2.5 = 8.5

24.

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

Ans:

Price	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

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?

Ans:

At Price, $P_1 = $ Rs 10

Total Revenue, $TR_1 = P_1 \times Q_1 = 50$

$= \dfrac{TR_1}{P_1} = Q_1$

$= \dfrac{50}{10} = Q_1$

$= Q_1 = 5$ Units

At Price, $P_2 = $ Rs15

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

$Q_2 = \dfrac{TR_2}{P_2}$

$Q_2 = \dfrac{150}{15}$

$Q_2 = 10$ Units

Elasticity of supply, $e_s = \dfrac{\Delta Q}{\Delta P} \times \dfrac{P}{Q}$

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

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

$e_s = \dfrac{5}{5} \times \dfrac{10}{5}$

$e_s = 2$

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.

Ans:

Elasticity of Supply, $e_s = 0.5$
Initial Price, $P_1 = Rs\ 5$
Final price, $P_2 = Rs\ 20$
$\Delta P = P_2 - P_1$
$= 20 - 5$
$\Delta P = 15$
$\Delta Q = 15$
$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$
$$0.5 = \frac{15}{15} \times \frac{5}{Q_1}$$
$$0.5 = \frac{5}{Q_1}$$
$$Q_1 = \frac{5}{0.5}$$
$= 10$ units
Initial quantity $= 10$ units
Final quantity, $Q_2 = \Delta Q + Q_1$
$= 15 + 10$
Therefore, $Q_2 = 25$ 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?

Ans:

Initial Price, $P_1 = Rs\ 10$
Initial Output, $Q_1 = 4$ Units
Final Price, $P_2 = Rs\ 30$
$\Delta P = P_2 - P_1$
$= Rs\ 30 - 10 = Rs\ 20$
Elasticity of supply, $e_s = 1.25$
$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$
$$1.25 = \frac{\Delta Q}{20} \times \frac{10}{4}$$
$= 1.25 \times 8 = \Delta Q$
$\Delta Q = 10$ Units
Thus final output supplied, $Q_2 = \Delta Q + Q_1$
$Q_2 = 10 + 4 = 14$ Units