

I Choose the correct answer (each question carries 1 marks)

1. In a perfect competition each firm produces and sells

- a) Heterogeneous products
- b) Homogeneous products
- c) Luxury goods
- d) Necessary goods

Ans: (b) Homogeneous products

2. The increase in total revenue for a unit increase in the output is

- a) Marginal Revenue
- b) Average Revenue
- c) Total Revenue
- d) Fixed Revenue

Ans: (a) Marginal Revenue

3. The firm's profit is denoted by

- a) Σ
- b) Δ
- c) Φ
- d) π

Ans: d) π

4. When the supply curve is vertical, the elasticity of supply is

- a) $es=1$
- b) $es=1$
- c) $es=0$
- d) $ex=\infty$

Ans: c) $es=0$

5. The revenue per unit of output of a firm is called as

- a) TR
- b) MR
- c) AR
- d) None of these.

Ans: c) AR

II Fill in the blanks. (each question carries 1 marks)

1. Price taking behavior is the single most distinguishing characteristic ofmarket

Ans: Perfect competitive market.

2.is a tax that the Government imposes per unit sale of output.

Ans: Unit Tax

3. For a price taking firm Marginal Revenue is equal to.....

Ans: Market price

4. The point of minimum AVC where the SMC curve cuts the AVC curves is called as

Ans: Shut down point

5.cost of some activity is the gain forgone from the second best activity.

Ans: Opportunity cost

III Match the following (each question carries 1 marks)

- | A | B |
|------------------------|-------------------------|
| 1. MR= | a) Perfect information |
| 2. π = | b) Zero profit |
| 3. AR= | c) $\Delta TR/\Delta Q$ |
| 4. Normal profit | d) TR-TC |
| 5. Perfect competition | e) TR/Q |

Ans: 1 – (c); 2 – (d); 3 – (e); 4 – (b); 5 – (a)

IV Answer the following questions in a sentence or a word (each question carries 1 marks)

1. Define Marginal Revenue.

Ans: Marginal Revenue of a firm is defined as the increase in total revenue for a unit increase in the firm's output.

It is obtained by dividing the Change in Total Revenue by Change in quantity.

2. To which side does a supply curve shift due to the technological progress?

Ans: The supply curve shifts to the right due to the technological progress.

3. Write the formula to calculate Average Revenue.

Ans: We calculate Average Revenue, by dividing Total revenue by the quantity sold. The following formula used: $AR = TR/q$

4. What is normal profit?

Ans: The minimum level of profit that is needed to keep a firm in the existing business is called as normal profit.

5. Give the meaning of super normal profit.

Ans: Profit that a firm earns over and above the normal profit is called as super normal profit.

V Answer the following questions in four sentences (each question carries 2 marks)

1. Mention the conditions needed for profit by a firm under perfect competition.

Ans: The following conditions needed for profit by a firm under perfect competition:

- The Price P must be equal to MC
- Marginal cost must be non-decreasing at q_0
- The firm to continue to produce, in the short run, price must be greater than the average variable cost and in the long run, price must be greater than the average cost.

2. Give the meaning of shut down point.

Ans: In the short run, the shut down point is that point of minimum Average Variable Cost where Short run Marginal Cost curve cuts the Average Variable Cost curve. In the long run, the shut down point is the minimum of Long Run Average Cost Curve.

3. Write the meaning of opportunity cost with an example.

Ans: Opportunity cost of some activity is the gain foregone from the second best alternative activity.

For example, you have Rs.10000 which you decide to invest in your family business. What is the opportunity cost of your action? If you do not invest this money, you can either keep it in the house safe which will give you zero return or you can deposit it in either bank A or bank B in which case you get an interest at the rate of 20 percent or 10 percent respectively. So the maximum benefit that you may get from other alternative activities is the interest from the bank A. But this opportunity will no longer be there once you invest the money in your family business. The opportunity cost of investing the money in your family business is therefore the amount of forgone interest from the bank A.

4. Mention the two determinants of a firm's supply curve.

Ans: The two determinants of a firm's supply curve are as follows:

- (a) Technological progress
- (b) Input prices.

5. Give the meaning of price elasticity of supply and write its formula.

VI Answer the following questions in 12 sentences(each question carries 4 marks)

1. Write a short note on profit maximization of a firm under the following conditions

a) $P=MC$

b) MC must be none decreasing at q_0

Ans: A firm always wishes to maximize its profit. The firm would like to identify the quantity q_0 , the firm's profits are less than at q_0 . For profits to be maximum, the following conditions must hold at q_0 .

a) The price P must equal MC ($P = MC$): Profit is the difference between Total Revenue and Total Cost. Both total revenue and total cost increase as output increases. As long as the change in total revenue is greater than the change in total cost, profits will continue to increase.

The change in total revenue per unit increase in output is the marginal revenue and the change in total cost per unit increase in output is the marginal cost.

Therefore, we can conclude that as long as marginal revenue is greater than marginal cost, profits are increasing and as long as marginal revenue is less than marginal cost, profits will fall. It follows that for profits to be maximum, marginal revenue should be equal to marginal cost.

For the perfectly competitive firm, we have established that the $MR=P$. So the firm's profit maximizing output becomes the level of output at which $P=MC$.

b) Marginal cost must be non-decreasing at q_0 : It means that the marginal cost curve cannot slope downwards at the profit maximizing output level. This can be explained with the help of diagram:

In the above diagram, at output levels q_1 and q_4 the market price is equal to the marginal cost. However, at the output level q_1 the marginal cost curve is downward sloping. The q_1 is not profit maximizing output level.

If we observe all output levels left to the q_1 the market price is lower than the marginal cost. But the firm's profit at an output level slightly smaller than q_1 exceeds that corresponding to the output level q_1 . Therefore, q_1 cannot be a profit maximizing output level.

2. Explain the determinants of a firm's supply curve.

Ans: A firm's marginal cost curve is a part of its marginal cost curve. Any factor that affects a firm's marginal cost curve is a determinant of its supply curve. Following are the two factors determining a firm's supply curve:

a) Technological Progress: The organizational innovation by the firm leads to more production of output. That means, to produce a given level of output, the organizational innovation allows the firm to use fewer units of inputs. It is expected that this will lower the firm's marginal cost at any level of output, i.e., there is a rightward shift of the MC curve. As the firm's supply curve is essentially a segment of the MC curve, technological progress shifts the supply curve of the firm to the right. At any given market price, the firm now supplies more quantity of output.

b) Input prices: A change in the prices of factors of production (inputs) also influences a firm's supply curve. If the price of input (eg. wage) increases, the cost of production also increases. The consequent increase in the firm's average cost at any level of output is usually accompanied by an increase in the firm's marginal cost at any level of output which leads to upward shift of the MC curve. That means, the firm's supply curve shifts to the left and the firm produces less quantity of output.

3. Explain the features of perfect competition.

Ans: Perfect competition is a market where there will be existence of large number of buyers and sellers dealing with homogenous products. It is a market with highest level competition.

i) Large number of sellers and buyers: The first condition which a perfectly competitive market must satisfy is concerned with the sellers' side of the market. The market must have such a large number of sellers that no one seller is able to dominate in the market. No single firm can influence the price of the commodity. The sellers will be the firms producing the product for sale in the market. These firms must be all relatively small as compared to the market as a whole. Their individual outputs should be just a fraction of the total output in the market.

There must be such a large number of buyers that no one buyer is able to influence the market price in any way. Each buyer should purchase just a fraction of the market supplies. Further the buyers should have any kind of union or association so that they compete for the market demand on an individual basis.

ii) Homogeneous products: Another prerequisite of perfect competition is that all the firms or sellers must sell completely identical or homogeneous goods. Their products must be considered to be identical by all the buyers in the market. There should not be any differentiation of products by sellers by way of quality, colour, design, packing or other selling conditions of the product.

iii) Free Entry and Free exit for firms: Under perfect competition, there is absolutely no restriction on entry of new firms in the industry or the exit of the firms from the industry which want to leave. This condition must be satisfied especially for long period equilibrium of the industry.

If these four conditions are satisfied, the market is said to be purely competitive. In other words, a market characterized by the presence of these four features is called purely competitive. For a market to be perfect, some conditions of perfection of the market must also be fulfilled.

iv) Price Taker: The single distinguishing character of perfect competition is the price taking behaviour of the firms. A price taking firm believes that if it sets a price above the market price, it will be unable to sell any quantity of the good that it produces. On the other hand, if the firm set the price less than or equal to the market price, the firm can sell as many units of the good as it wants sell. The firms in the perfect competitive market are price takers. That means, the producers will continue to sell their goods and services in the price existing in the market. Firms have no control over the price of the product.

v) Perfect Information: Price taking is often thought to be a reasonable assumption when the market has many firms and buyers have perfect information about the price prevailing in the market. Since all firms produce the same good and all buyers are aware of the market price, the firm in question loses all its buyers if it raises price.

4. Write about Shutdown point, Normal profit and Break-even point.

1) Shutdown point: A firm continues to produce as long as the price remains greater than or equal to minimum of AVC in the short run and LRAC in the longrun.

In the short run, the point of minimum of AVC curve where the SMC curve cuts the AVC curve, below this there is no production.

In the long run, shutdown point is the minimum of LRAC curve.

2) Normal profit: The profit level that is just enough to cover the explicit costs and opportunity costs of the firm is called the normal profit.

It is needed to keep a firm in the existing business. It is a part of firm's TC.

Profit that a firm earns over and above normal profit is called super normal profit.

In the long run firm does not produce anything less than the normal profit. In the shortrun firm produces, even if the profit is less than this level.

3) Break-even point: The point on the supply curve at which a firm earns only normal profit is called break-even point of the firm.

The point of minimum average cost at which the supply curve cuts the LRAC curve (in the short run, SAC curve) is the break-even point of a firm.

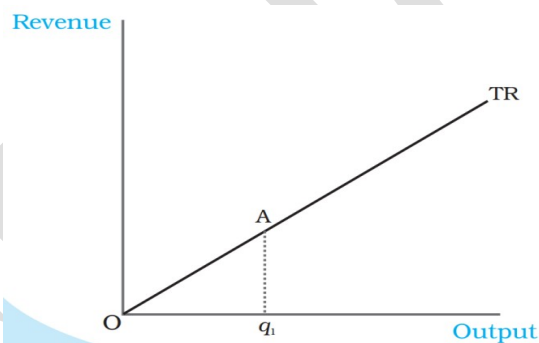
5. Explain the Total Revenue and Average Revenue of a firm under perfect competition with the help of diagrams.

A firm earns revenue by selling the good that it produces in the market.

Total Revenue (TR) of the firm is defined as the market price of the good (p) multiplied by the firm's output (q). Hence, $TR = p \times q$ Consider the following numerical example.

Let the market for candles in perfectly competitive and let the market price of a box of candles is Rs 10. For a candle manufacturer, the following table shows how total revenue is related to output.

Boxes sold	TR
0	0
1	10
2	20
3	30
4	40
5	50
6	60



The total revenue curve of a firm shows the relationship between the total revenue that the firm earns and the output level of the firm. The slope of the curve, Aq_1 / Oq_1 , is the market price. Three observations are relevant here.

First, when the output is zero, the total revenue of the firm is also zero. Therefore, the TR curve passes through point O.

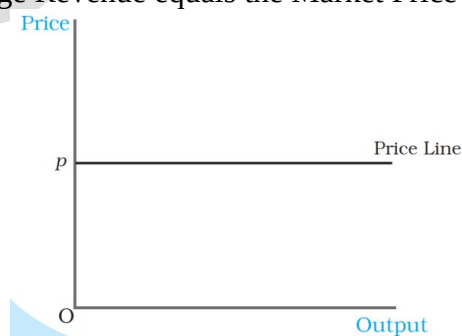
Second, the total revenue increases as the output goes up. Moreover, the equation „ $TR = p \times q$ “ is that of a straight line because p is constant. This means that the TR curve is an upward rising straight line.

Third, consider the slope of this straight line. When the output is one unit (horizontal distance Oq_1), the total revenue (vertical height Aq_1) is $p \times 1 = p$. Therefore, the slope of the straight line is $Aq_1 / Oq_1 = p$

The Average Revenue (AR) of a firm is defined as total revenue per unit of output. If a firm's output is q and the market price is P , then TR equals pxq .

Hence, $AR = TR/q = pxq/q = P$

In other words for a price-taking firm Average Revenue equals the Market Price ($AR=P$)



In the figure, Since the market price is fixed at p , we obtain horizontal straight line, which cuts the Y-axis at a height equal to p . The horizontal line is called the price line. It is also the firm's AR curve under perfect competition.

The price line also depicts the demand curve facing a firm. Notice that the demand curve is perfectly elastic ($e_D = \infty$). It means a firm can sell any amount of good at a price P

VII Answer the following questions in 20 sentences. (Each question carries 6 marks)

1. Explain the short run supply curve of a firm with the help of a diagram.

Ans: Supply of a firm refers to the quantity that it chooses to sell at a given price, given technology and given prices of factors of production. Supply curve of a firm shows the levels of output that the firm chooses to produce corresponding to different values of the market price by keeping technology and prices of factors of production constant.

Short Run Supply Curve of a Firm:

Let us derive a firm's short run supply curve. The derivation of supply curve can be split into two parts viz., firm's profit maximizing output level when the market price is greater than or equal to minimum Average Variable Cost and the firm's profit maximizing output level when the market price is less than the minimum Average Variable Cost.

Case 1: Price or Average Revenue greater than or equal to the minimum AVC:

This can be explained with the help of the following diagram

If the market price is P_1 , which exceeds the minimum of AVC, the firm starts out by equating P_1 with SMC on the rising part of the SMC curve which leads to the output level q_1 . But the AVC at q_1 does not exceed the market price P_1 . Thus, when the market price is P_1 , the firm's output level in the short run is equal to q_1 .

Case -2: Price is less than minimum AVC: If the market price is P_2 which is less than the minimum AVC, at all positive output levels, AVC exceeds P_2 . In other words, it cannot be the case that the firm supplies a positive output. So, if the market price is P_2 , the firm produces zero output.

Combining both the cases, we can conclude that a firm's short run supply curve is the rising part of the Short Run Marginal curve from and above the minimum Average Variable Cost together with zero output for all prices strictly less than the minimum AVC. This can be represented in the following diagram:

In the above diagram, the short run supply curve of a firm, which is based on its short run marginal cost curve and average variable cost is represented by the curve which rises from the minimum point of AVC curve. The bold line represents the short run supply curve.

2. Explain market supply curve with the help of a diagram.

Ans: The market supply curve shows the output levels that firms in the market produce in aggregate corresponding to different values of the market price.

For example, there are firm 1, firm 2, firm 3 in the market. Suppose the price is fixed at p . Then the output produced by these firms in aggregate will be supply of firm 1 + supply of firm 2 + supply of firm 3. So, the market supply at price p is the summation of the supplies of individual firms at that price.

The supply curve geometrically with two firms in the market i.e., firm 1 and firm 2 is given below. The two firms have different cost structures. Firm 1 will not produce anything if the market price is less than P_1 while firm 2 will not produce anything if the market price is less than P_2 . This can be represented in the diagram:

In the above diagram, output is measured in X axis and Price is measured in Y axis. The diagram (a) is the supply curve of firm 1 (S_1), diagram (b) is the supply curve of firm 2 (S_2) and the diagram (c) is the market supply curve (S_m). When the market price is below P_1 , both the firms do not produce the goods. Hence the market supply will be zero. If the market price is greater than or equal to P_1 , but less than P_2 , only firm 1 will produce the goods. In this range, the market supply curve coincides with the supply curve of firm 1. If the market price is greater than or equal P_2 , both firms will have positive output levels. If the price is P_3 , the firm 1 will supply q_1 units of output and firm 2 supplies q_2 units of output. So, the market supply at price P_3 is q_m , where $q_m = q_1 + q_2$. The market supply curve S_m is obtained by taking a horizontal summation of the supply curves of the two firms in the market S_1 and S_2 .

VIII Assignment and project oriented questions. (Each question carries 5 marks)

1. Compute the total revenue, marginal revenue and average revenue schedules from the following table when market price of each unit of goods is Rs.10.

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

Ans:

Hint:

For TR Multiply Price
and Quantity (P×Q);

$$MR = TR_n - TR_{n-1}$$

and

$$AR = TR/Q$$

Quantity sold	TR	MR	AR
0	0	-	-
1	10	10	10
2	20	10	10
3	30	10	10
4	40	10	10
5	50	10	10
6	60	10	10