

# UNIT - 3: PRICE-OUTPUT DETERMINATION UNDER DIFFERENT MARKET FORMS

## LEARNING OUTCOMES

After studying this unit, you would be able to:

- ◆ Describe the characteristics of different market forms namely perfect competition, monopoly, monopolistic competition and oligopoly and cite the main differences among them.
- ◆ Explain how equilibrium price and quantity of output are determined both in the short run and in the long run in different markets.
- ◆ Describe what happens in the long run in markets where firms are either incurring losses or are making economic profits.
- ◆ Illustrate the welfare implications of each of the market forms.

The price of a commodity and the quantity exchanged per time period depend on the market demand and supply functions and the market structure. The market structure characterises the way the sellers and buyers interact to determine equilibrium price and quantity. The existence of different forms of market structure leads to differences in demand and revenue functions of the firms. The market structure mostly determines a firm's power to fix the price of its product. The level of profit maximising price is generally different in different kinds of markets due to differences in the nature of competition. As such, a firm has to closely watch the nature of the market before determining its equilibrium price and output. In this unit, we shall discuss the nature of four of the most important market structures namely, perfect competition, monopoly, monopolistic competition and oligopoly and how these market structures operate to determine short-run and long-run equilibrium price and quantity. We shall start our analysis with perfect competition.



## 3.0 PERFECT COMPETITION

### 3.0.0 Features

Suppose you go to a vegetable market and enquire about the price of potatoes from a shopkeeper. He says potatoes are for ₹ 20 per kg. In the same way, you enquire from many shopkeepers and you get the same answer. What do you notice? You notice the following facts:

- (i) There are large number of buyers and sellers in the potatoes market.
- (ii) All the shopkeepers are selling potatoes at ₹ 20 per kg.
- (iii) Product homogeneity i.e. all the sellers are selling almost the same quality of potatoes in the sense that you cannot judge by seeing the potatoes from which farmer's field do they come from. Such type of market is known as perfectly competitive market.

In general, a perfectly competitive market has the following characteristics:

- (i) There are large number of buyers and sellers who compete among themselves. The number is so large that the share of each seller in the total supply and the share of each buyer in the total demand is too small that no buyer or seller is in a position to influence the price, demand or supply in the market.
- (ii) The products supplied by all firms are identical or are homogeneous in all respects so that they are perfect substitutes. Thus, all goods must sell at a single market price. No firm can raise the price of its product above the price charged by other firms without losing most or all of its business. Buyers have no preference as between different sellers and as between different units of commodity offered for sale; also sellers are quite indifferent as to whom they sell. For example, most agricultural products, cooking gas, and raw materials such as copper, iron, cotton, and steel sheet etc. are fairly homogeneous. In addition, all consumers have perfect information about competing prices.
- (iii) Every firm is free to enter the market or to go out of it. There are no legal or market related barriers to entry and also no special costs that make it difficult for a new firm either to enter an industry and produce, if it sees profit opportunity or to exit if it cannot make a profit.

If the above three conditions alone are fulfilled, such a market is called pure competition. The essential feature of pure competition is the absence of the element of monopoly. Consequently, business combinations of monopolistic nature are not

possible. In addition to the above stated three features of 'pure competition'; a few more conditions are attached to perfect competition. They are:

- (iv) There is perfect knowledge of the market conditions on the part of buyers and sellers. Both buyers and sellers have all information relevant to their decision to buy or sell such as the quantities of stock of goods in the market, the nature of products and the prices at which transactions of purchase and sale are being entered into.
- (v) Perfectly competitive markets have very low transaction costs. Buyers and sellers do not have to spend much time and money finding each other and entering into transactions.
- (vi) Under perfect competition, all firms individually are price takers. The firms have to accept the price determined by the market forces of total demand and total supply. The assumption of price taking applies to consumers as well. When there is perfect knowledge and perfect mobility, if any seller tries to raise his price above that charged by others, he would lose his customers.

While there are few examples of perfect competition which is regarded as a myth by many, the agricultural products, financial instruments (stock, bonds, foreign exchange), precious metals (gold, silver, platinum) approach the condition of perfect competition.

### 3.0.1 Price Determination under Perfect Competition

**Equilibrium of the Industry:** An industry in economic terminology consists of a large number of independent firms. Each such unit in the industry produces a homogeneous product so that there is competition amongst goods produced by different units. When the total output of the industry is equal to the total demand, we say that the industry is in equilibrium; the price then prevailing is equilibrium price. A firm is said to be in equilibrium when it is maximising its profits and has no incentive to expand or contract production.

As stated above, under competitive conditions, the equilibrium price for a given product is determined by the interaction of the forces of demand and supply for it as is shown in figure 14 in the next page.

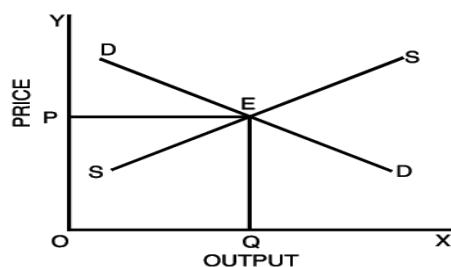


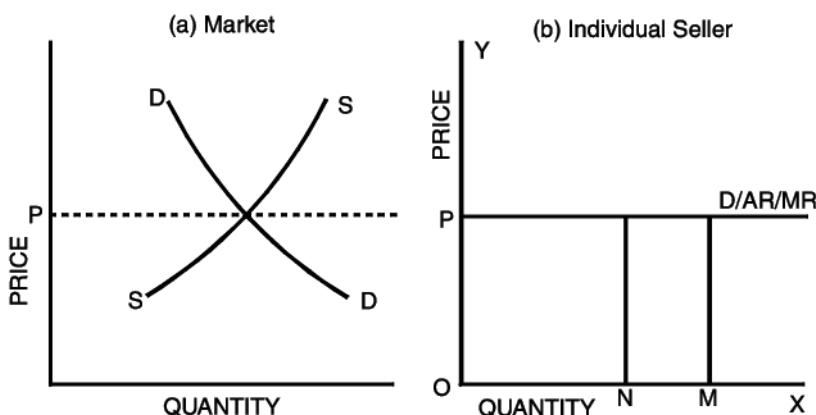
Fig. 14: Equilibrium of a competitive industry

In Fig. 14, OP is the equilibrium price and OQ is the equilibrium quantity which will be sold at that price. The equilibrium price is the price at which both demand and supply are equal and therefore, no buyer who wanted to buy at that price goes dissatisfied and none of the sellers is dissatisfied that he could not sell his goods at that price. It may be noticed that if the price were to be fixed at any other level, higher or lower, demand remaining the same, there would be no equilibrium in the market. Likewise, if the quantities of goods were greater or smaller than the demand, there would not be equilibrium in the market.

**Equilibrium of the Firm:** The firm is said to be in equilibrium when it maximizes its profit. The output which gives maximum profit to the firm is called equilibrium output. In the equilibrium state, the firm has no incentive either to increase or decrease its output.

Firms in a competitive market are price-takers. This is because there are a large number of firms in the market who are producing identical or homogeneous products. As such these firms cannot influence the price in their individual capacities. They have to accept the price determined through the interaction of total demand and total supply of the commodity which they produce.

This is illustrated in the following figure:



**Fig. 15: The firm's demand curve under perfect competition**

The market price OP is fixed through the interaction of total demand and total supply of the industry. Firms have to accept this price as given and as such they are price-takers rather than price-makers. They cannot increase the price above OP individually because of the fear of losing its customers to other firms. They do not try to sell the product below OP because they do not have any incentive for lowering it. They will try to sell as much as they can at price OP.

As such, P-line acts as demand curve for the firm. Because it is a price taker, the demand curve D facing an individual competitive firm is given by a horizontal line at the level of market price set by the industry. In other words, the demand curve of each firm is perfectly

(or infinitely) elastic. The firm can sell as much or as little output as it likes along the horizontal price line. Since price is given, a competitive firm has to adjust its output to the market price so that it earns maximum profit. Let us see in table 4 where demand and supply schedule for the industry were as follows:

**Table 4: Equilibrium price for industry**

Price (₹)	Demand (units)	Supply (units)
1	60	5
2	35	35
3	20	45
4	15	55
5	10	65

Equilibrium price for the industry is determined through the interaction of demand and supply is ₹ 2 per unit. The individual firms will accept ₹ 2 per unit as the price and sell different quantities at this price. Let us consider the case of firm 'X'. Firm X's quantity sold, total revenue, average revenue and marginal revenue are as given in Table 5.

**Table 5: Trends in Revenue of a Competitive Firm**

Price (₹)	Quantity Sold	Total Revenue	Average Revenue	Marginal Revenue
2	8	16	2	2
2	9	18	2	2
2	10	20	2	2
2	11	22	2	2
2	12	24	2	2

Firm X's price, average revenue and marginal revenue are equal to ₹ 2. Thus, we see that in perfectly competitive market a price-taking firm's average revenue, marginal revenue and price are equal. As a result, when the firm sells an additional unit, its total revenue increases by an amount equal to its price.

AR = MR = Price.

**Conditions for equilibrium of a firm:** As discussed earlier, a firm, in order to attain equilibrium position, has to satisfy two conditions as below: (Note that because competitive firms take price as fixed, this is a rule for setting output, not price).

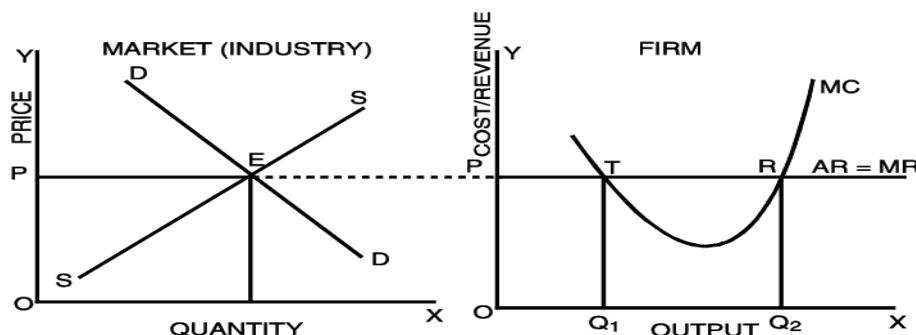
- (i) The marginal revenue should be equal to the marginal cost. i.e.  $MR = MC$ . If  $MR$  is greater than  $MC$ , there is always an incentive for the firm to expand its production

further and gain by selling additional units. If  $MR < MC$ , the firm will have to reduce output since an additional unit adds more to cost than to revenue. Profits are maximum only at the point where  $MR = MC$ . Because the demand curve facing a competitive firm is horizontal, so that  $MR = P$ , the general rule for profit maximization can be simplified. A perfectly competitive firm should choose its output so that marginal cost equals price.

- (ii) The  $MC$  curve should cut  $MR$  curve from below. In other words,  $MC$  should have a positive slope.

### **Short-Run Profit Maximization by a Competitive Firm**

We shall begin with the short-run output decision and then move on to the long run. In the short run, a firm operates with a fixed amount of capital and must choose the levels of its variable inputs so as to maximize profit.

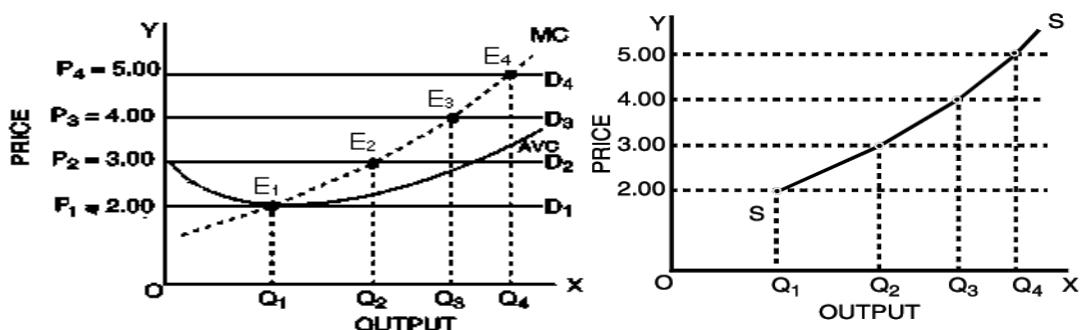


**Fig. 16: Equilibrium position of a firm under perfect competition**

In figure 16, DD and SS are the industry demand and supply curves which intersect at E to set the market price as OP. The firms of perfectly competitive industry adopt OP price as given and consider P-Line as demand (average revenue) curve which is perfectly elastic at P. As all the units are priced at the same level, MR is a horizontal line equal to AR line. Note that MC curve cuts MR curve at two places T and R respectively. But at T, the MC curve is cutting MR curve from above. T is not the point of equilibrium as the second condition is not satisfied. The firm will benefit if it goes beyond T as the additional cost of producing an additional unit is falling. At R, the MC curve is cutting MR curve from below. Hence, R is the point of equilibrium and OQ<sub>2</sub> is the equilibrium level of output.

### **3.0.2 Short run supply curve of the firm in a competitive market**

One interesting thing about the MC curve of a firm in a perfectly competitive industry is that it depicts the firm's supply curve. This can be shown with the help of the following figure:



**Fig. 17: Marginal cost and supply curves for a price-taking firm**

Suppose the market price of a product is ₹ 2. Corresponding to it we have  $D_1$  as demand curve for the firm. At price ₹ 2, the firm supplies  $Q_1$  output because here  $MR = MC$ . If the market price is ₹ 3, the corresponding demand curve is  $D_2$ . At ₹ 3, the quantity supplied is  $Q_2$ . Similarly, we have demand curves  $D_3$  and  $D_4$  and corresponding supplies are  $Q_3$  and  $Q_4$ . The firm's marginal cost curve which gives the marginal cost corresponding to each level of output is nothing but firm's supply curve that gives various quantities the firm will supply at each price.

For prices below AVC, the firm will supply zero units because the firm is unable to meet even its variable cost. For prices above AVC, the firm will equate price and marginal cost. When price is high enough to meet the AVC, a firm will decide to continue its production. In fig. 17, at price ₹ 2, the AVC of the firm is covered and therefore, the firm need not shutdown. Thus, in perfect competition, the firm's marginal cost curve above AVC has the identical shape of the firm's supply curve.

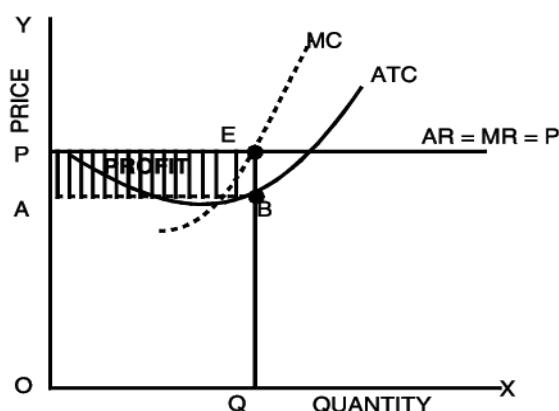
### 3.0.3 Can a competitive firm earn profits?

In the short run, a firm will attain equilibrium position and at the same time, it may earn supernormal profits, normal profits or losses depending upon its cost conditions. Following are the three possibilities:

**Supernormal Profits:** There is a difference between normal profits and supernormal profits. When the average revenue of a firm is just equal to its average total cost, a firm earns normal profits or zero economic profits. It is to be noted that here a normal percentage of profits for the entrepreneur for his managerial services is already included in the cost of production. When a firm earns supernormal profits, its average revenues are more than its average total cost. Thus, in addition to normal rate of profit, the firm earns some additional profits. The following example will make the above concepts clear:

Suppose the cost of producing 1,000 units of a product by a firm is ₹ 15,000. The entrepreneur has invested ₹ 50,000 in the business and the normal rate of return in the

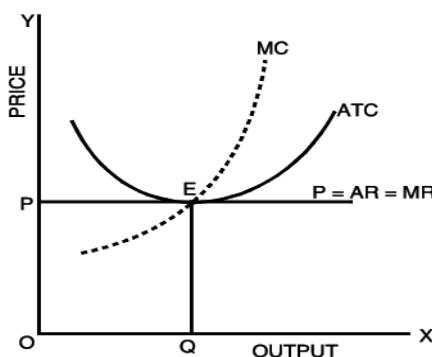
market is 10 per cent. That is, the cost of self owned factor (capital) used in the business or implicit cost is ₹ 5000/-. The entrepreneur would have earned ₹ 5,000 (10% of ₹ 50,000) if he had invested it elsewhere. Thus, total cost of production is ₹ 20,000 (₹ 15,000 + ₹ 5,000). If the firm is selling the product at ₹ 20, it is earning normal profits because AR (₹ 20) is equal to ATC (₹ 20). If the firm is selling the product at ₹ 22 per unit, its AR (₹ 22) is greater than its ATC (₹ 20) and it is earning supernormal profit at the rate of ₹ 2 per unit.



**Fig. 18: Short run equilibrium: Supernormal profits of a competitive firm**

Figure 18 shows the revenue and cost curves of a firm which earns supernormal profits in the short run. MR (marginal revenue) curve is a horizontal line and MC (marginal cost) curve is a U-shaped curve which cuts the MR curve at E. The firm is in equilibrium at point E where marginal revenue is equal to marginal cost. OQ is the equilibrium output for the firm. At this level of output, the average revenue or price per unit is EQ and average total cost is BQ. The firm's profit per unit is EB (AR-ATC). Total profits are ABEP. ( $EB \times OQ$ ;  $OQ = AB$ ). Applying the principle  $\text{Total Profit} = \text{TR} - \text{TC}$ , we find total profit by finding the difference between OPEQ and OABQ which is equal to ABEP.

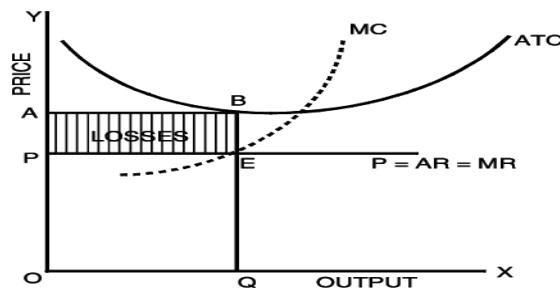
**Normal profits:** When a firm just meets its average total cost, it earns normal profits. Here  $AR = ATC$ .



**Fig. 19: Short run equilibrium of a competitive firm: Normal profits**

The figure shows that  $MR = MC$  at E. The equilibrium output is OQ. At this level of output, price or AR covers full cost (ATC). Since  $AR = ATC$  or  $OP = EQ$ , the firm is just earning normal profits. Applying  $TR - TC$ , we find that  $TR - TC = \text{zero}$  or there is zero economic profit.

**Losses:** The firm can be in an equilibrium position and still makes losses. This is the situation when the firm is minimising losses. For all prices above the minimum point on the  $AVC$  curve, the firm will stay open and will produce the level of output at which  $MR = MC$ . When the firm is able to meet its variable cost and a part of fixed cost, it will try to continue production in the short run. If it recovers a part of the fixed costs, it will be beneficial for it to continue production because fixed costs (such as costs towards plant and machinery, building etc.) are already incurred and in such case it will be able to recover a part of them. But, if a firm is unable to meet its average variable cost, it will be better for it to shutdown. This shutdown may be temporary. When the market price rises, the firm resumes production.



**Fig. 20: Short run equilibrium of a competitive firm: Losses**

In figure 20, E is the equilibrium point and at this point  $AR = EQ$  and  $ATC = BQ$  since  $BQ > EQ$ , the firm is having per unit loss equal to BE and the total loss is ABEP.

### ILLUSTRATION 2

"Tasty Burgers" is a small kiosk selling Burgers and is a price-taker. The table below provides the data of 'Tasty Burgers' output and costs in Rupees.

Quantity	Total Cost	Fixed Cost	Variable Cost	Average Variable Cost	Average Fixed Cost	Marginal Cost
0	100					
10	210					
20	300					
30	400					
40	540					
50	790					
60	1060					

*Q1. If burgers sell for ₹ 14 each, what is Tasty Burgers' profit maximizing level of output?*

*Q2. What is the total variable cost when 60 burgers are produced?*

*Q3. What is average fixed cost when 20 burgers are produced?*

*Q4. Between 10 to 20 burgers, what is the marginal cost?*

### SOLUTION

**Let us try to solve each of these questions.**

First of all it is better to fill the blanks in the Table.

Since the total cost when zero product is produced is ₹ 100, the total fixed cost of "Tasty Burgers" will be ₹ 100/-.

We fill the data now:

Quantity	Total Cost	Fixed Cost	Variable Cost	Average Variable Cost	Average Fixed Cost	Marginal Cost (₹ TC)	Marginal Cost
0	100	100	-	-	-	-	-
10	210	100	110	11	10.0	110	11
20	300	100	200	10	5.0	90	9
30	400	100	300	10	3.33	100	10
40	540	100	440	11	2.50	140	14
50	790	100	690	13.80	2.0	250	25
60	1060	100	960	16	1.66	270	27

Now let us answer the questions.

**Ans 1:** The price of Burger is ₹ 14. Since it is given that "Tasty Burger" is price-taker, it is a perfectly competitive firm. In a perfectly competitive market all the products are sold at the same price, that means AR = MR. In order to find out the profit maximizing level of output, MR should be equal to MC. Here AR = MR = ₹ 14. From the table we can see that MR (14) = MC (14) when 40 burgers are produced. Therefore, the profit maximising level of output of burgers is 40 units.

**Ans 2:** The Total Variable Cost at 60 burgers is ₹ 960.

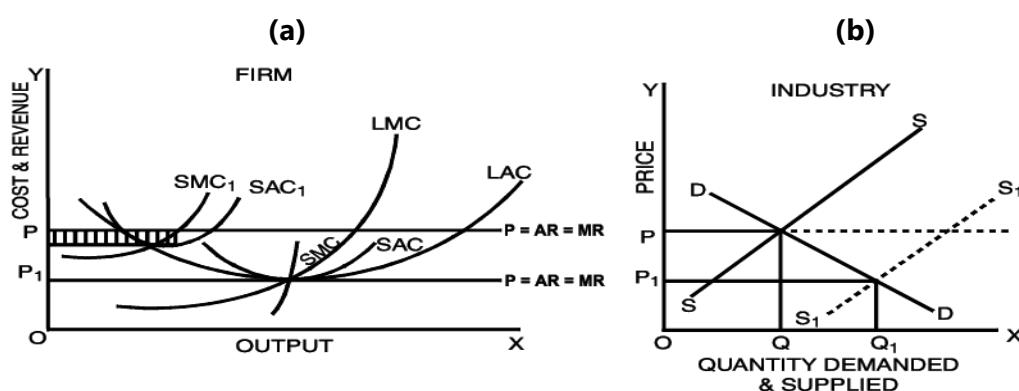
**Ans 3:** The Average Fixed Cost at 20 burgers is ₹ 5.

**Ans 4:** Between 10 to 20 burgers, the Marginal Cost is ₹ 9.

### 3.0.4 Long Run Equilibrium of a Competitive Firm

In the short run, one or more of the firm's inputs are fixed. In the long run, firms can alter the scale of operation or quit the industry and new firms can enter the industry. In a market with entry and exit, a firm enters when it believes that it can earn a positive long run profit and exits when it faces the possibility of a long-run loss. Firms are in equilibrium in the long run when they have adjusted their plant so as to produce at the minimum point of their long run ATC curve, which is tangent to the demand curve defined by the market price. In the long run, the firms will be earning just normal profits, which are included in the ATC. If they are making supernormal profits in the short run, new firms will be attracted into the industry; this will lead to a fall in price (a downward shift in the individual demand curves) and an upward shift of the cost curves due to increase in the prices of factors as the industry expands. These changes will continue until the ATC is tangent to the demand curve. If the firms make losses in the short run, they will leave the industry in the long run. This will raise the price and costs may fall as the industry contracts, until the remaining firms in the industry cover their total costs inclusive of normal rate of profit.

In figure 21, we show how firms adjust to their long run equilibrium position. As in the short run, the firm faces a horizontal demand curve. If the price is  $OP$ , the firm is making supernormal profits working with the plant whose cost is denoted by  $SAC_1$ . If the firm believes that the market price will remain at  $OP$ , it will have incentive to build new capacity and it will move along its LAC. At the same time, new firms will be entering the industry attracted by the excess profits. As the quantity supplied in the market increases, the supply curve in the market will shift to the right and price will fall until it reaches the level of  $OP_1$  (in figure 21a) at which the firms and the industry are in long run equilibrium.



**Fig. 21: Long run equilibrium of the firm in a perfectly competitive market**

The condition for the long run equilibrium of the firm is that the marginal cost should be equal to the price and the long run average cost i.e.  $LMC = LAC = P$ .

The firm adjusts its plant size so as to produce that level of output at which the LAC is the minimum possible. At equilibrium, the short run marginal cost is equal to the long run marginal cost and the short run average cost is equal to the long run average cost. Thus, in the long run we have,

$$SMC = LMC = SAC = LAC = P = MR$$

This implies that at the minimum point of the LAC, the corresponding (short run) plant is worked at its optimal capacity, so that the minima of the LAC and SAC coincide. On the other hand, the LMC cuts the LAC at its minimum point and the SMC cuts the SAC at its minimum point. Thus, at the minimum point of the LAC the above equality is achieved.

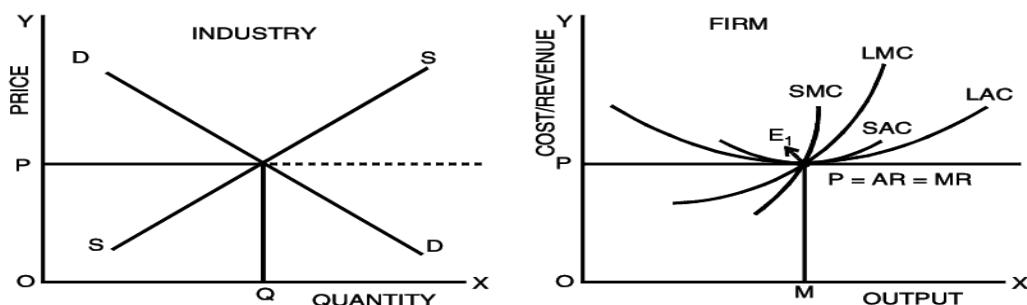
### 3.0.5 Long Run Equilibrium of the Industry

A long-run competitive equilibrium of a perfectly competitive industry occurs when three conditions hold:

All firms in the industry are in equilibrium i.e. all firms are maximizing profit.

No firm has an incentive either to enter or exit the industry because all firms are earning zero economic profit or normal profit.

The price of the product is such that the quantity supplied by the industry is equal to the quantity demanded by consumers.



**Fig. 22: Long run equilibrium of a competitive industry and its firms**

Figure 22 shows that in the long-run  $AR = MR = LAC = LMC$  at  $E_1$ . In the long run, each firm attains the plant size and output level at which its cost per unit is as low as possible. Since  $E_1$  is the minimum point of LAC curve, the firm produces equilibrium output OM at the minimum (optimum) cost. A firm producing output at optimum cost is called an optimum firm. In the long run, all firms under perfect competition are optimum firms having optimum size and these firms charge minimum possible price which just covers their marginal cost.

Thus, in the long run, under perfect competition, the market mechanism leads to optimal allocation of resources. The optimality is shown by the following outcomes associated with the long run equilibrium of the industry:

- (a) The output is produced at the minimum feasible cost.
- (b) Consumers pay the minimum possible price which just covers the marginal cost i.e.  $MC = AR$ . ( $P = MC$ )
- (c) Plants are used to full capacity in the long run, so that there is no wastage of resources i.e.  $MC = AC$ .
- (d) Firms earn only normal profits i.e.  $AC = AR$ .
- (e) Firms maximize profits (i.e.  $MC = MR$ ), but the level of profits will be just normal.
- (f) There is optimum number of firms in the industry.

In other words, in the long run,

$LAR = LMR = P = LMC = LAC$  and there will be optimum allocation of resources.

It should be remembered that the perfectly competitive market system is a myth. This is because the assumptions on which this system is based are never found in the real world market conditions.



## 3.1 MONOPOLY

The word 'Monopoly' means "alone to sell". Monopoly is a situation in which there is a single seller of a product which has no *close substitute*. Pure monopoly is never found in practice. However, in public utilities such as transport, water and electricity, we generally find a monopoly form of market.

### 3.1.0 Features of Monopoly Market

The following are the major features of the monopoly market:

- (1) **Single seller of the product:** In a monopoly market, there is only one firm producing or supplying a product. This single firm constitutes the industry and as such there is no distinction between firm and industry in a monopolistic market. Monopoly is characterized by an absence of competition.
- (2) **Barriers to Entry:** In a monopolistic market, there are strong barriers to entry. The barriers to entry could be economic, institutional, legal or artificial.
- (3) **No close-substitutes:** A monopoly firm has full control over the market supply of a product or service. A monopolist is a price maker and not a price taker. The monopolist generally sells a product which has no close substitutes. In such a case, the cross elasticity of demand for the monopolist's product and any other product is

zero or very small. The price elasticity of demand for monopolist's product is also less than one. As a result, the monopolist faces a steep downward sloping demand curve.

- (4) **Market power:** A monopoly firm has market power i.e. it has the ability to charge a price above marginal cost and earn a positive profit.

While to some extent all goods are substitutes for one other, there may be essential characteristics in a good or group of goods which give rise to gaps in the chain of substitution. If one producer can so exclude competition that he controls the supply of a good, he can be said to be 'monopolist' – a single seller.

### 3.1.1 How do monopolies arise?

The fundamental cause of monopoly is barriers to entry; in effect other firms cannot enter the market. A few reasons for occurrence and continuation of monopoly are:

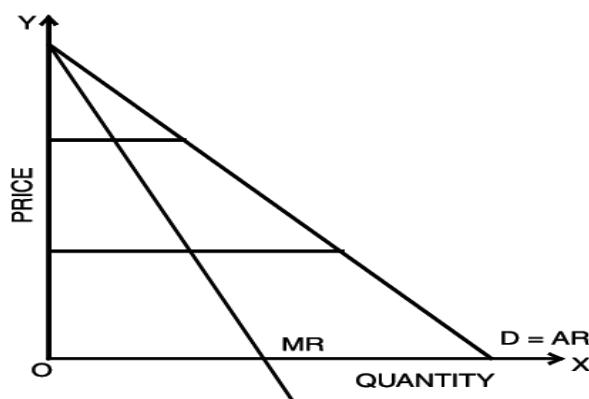
- (1) Strategic control over a scarce resources, inputs or technology by a single firm limiting the access of other firms to these resources.
- (2) Through developing or acquiring control over a unique product that is difficult or costly for other companies to copy.
- (3) Governments granting exclusive rights to produce and sell a good or a service.
- (4) Patents and copyrights given by the government to protect intellectual property rights and to encourage innovation.
- (5) Business combinations or cartels (illegal in most countries) where former competitors cooperate on pricing or market share.
- (6) Extremely large start-up costs even to enter the market in a modest way and requirement of extraordinarily costly and sophisticated technical know-how discourage firms from entering the market.
- (7) Natural monopoly arises when there are very large economies of scale. A single firm can produce the industry's whole output at a lower unit cost than two or more firms could. It is often wasteful (for consumers and the economy) to have more than one such supplier in a region because of the high costs of duplicating the infrastructure. For e.g. telephone service, natural gas supply and electrical power distribution.
- (8) Enormous goodwill enjoyed by a firm for a considerably long period creates difficult barriers to entry.
- (9) Stringent legal and regulatory requirements effectively discourage entry of new firms without being specifically prohibited.

- (10) Firms use various anti-competitive practices often referred to as predatory tactics, such as limit pricing or predatory pricing intended to do away with existing or potential competition.

In real life, pure monopolies are not common because monopolies are either regulated or prohibited altogether. But, one producer may dominate the supply of a good or group of goods. Earlier, in public utilities, e.g. transport, water, electricity generation etc. monopolistic markets existed so as to reap the benefits of large scale production. But these markets have been deregulated and opened to competition over a period of time. In India, Indian Railways has monopoly in rail transportation. There is government monopoly over production of nuclear power.

### 3.1.2 Monopolist's Revenue Curves

In the absence of government intervention, a monopolist is free to set any price it desires and will usually set the price that yields the largest possible profit. Since the monopolist firm is assumed to be the only producer of a particular product, its demand curve is identical with the market demand curve for the product. The market demand curve, which exhibits the total quantity of a product that buyers will offer to buy at each price, also shows the quantity that the monopolist will be able to sell at every price that he sets. If we assume that the monopolist sets a single price and supplies all buyers who wish to purchase at that price, we can easily find his average revenue and marginal revenue curves.



**Fig. 23: A monopolist's demand curve and marginal revenue curve**

Suppose the straight line in Fig. 23 is the market demand curve for a particular product 'A'. Suppose M/s. X and Co. is the only producer of the product A so that it faces the entire market demand. The firm faces a downward sloping demand curve, because if it wants to sell more it has to reduce the price of the product.

We have tabulated hypothetical values of price and quantity in Table 6 and have computed the amounts of average, total and marginal revenue corresponding to these levels.

**Table 6 Average revenue, Total revenue and Marginal revenue for a Monopolist**

<b>Quantity sold</b>	<b>Average Revenue (₹) (AR = P)</b>	<b>Total Revenue (₹) (TR)</b>	<b>Marginal Revenue (₹) (MR)</b>
0	10.00	0	
1	9.50	9.50	9.50
2	9.00	18.00	8.50
3	8.50	25.50	7.50
4	8.00	32.00	6.50
5	7.50	37.50	5.50
6	7.00	42.00	4.50
7	6.50	45.50	3.50
8	6.00	48.00	2.50
9	5.50	49.50	1.50
10	5.00	50.00	.50
11	4.50	49.50	(-).50

If the seller wishes to charge ₹ 10 he cannot sell any unit as no buyer would be willing to buy at such a high price. Alternatively, if he wishes to sell 10 units, his price cannot be higher than ₹ 5. Because the seller charges a single price for all units he sells, average revenue per unit is identical with price, and thus the market demand curve is the average revenue curve for the monopolist.

In perfect competition, average and marginal revenue are identical, but this is not the case with monopoly since the monopolist knows that if he wishes to increase his sales he will have to reduce the price of the product. Consider the example given. If the seller wishes to sell 3 units, he will have to reduce the price from ₹ 9 to ₹ 8.50. The third unit is sold for ₹ 8.50 only. This adds ₹ 8.50 to the firm's revenue. But, in order to sell the 3rd unit, the firm had to lower the price of all 3 units from ₹ 9 to ₹ 8.50. It thus receives ₹ .50 less on each of the 2 units it could have sold for ₹ 9. The marginal revenue over the interval from 2 to 3 units is thus ₹ 7.50 only. Again, if he wishes to sell 4 units, he will have to reduce the price from ₹ 8.50 to ₹ 8. The marginal revenue here will be ₹ 6.50 only. It must reduce price to sell additional output. So the marginal revenue on its additional unit sold is lower than the price, because it gets less revenue for previous units as well (it has to reduce price to the same amount for all units). The relationship between AR and MR of a monopoly firm can be stated as follows:

- (i) AR and MR are both negatively by sloped (downward sloping) curves.

- (ii) The slope of the MR curve is twice that of the AR curve. MR curve lies half-way between the AR curve and the Y axis. i.e. it cuts the horizontal line between Y axis and AR into two equal parts.
- (iii) AR cannot be zero, but MR can be zero or even negative.

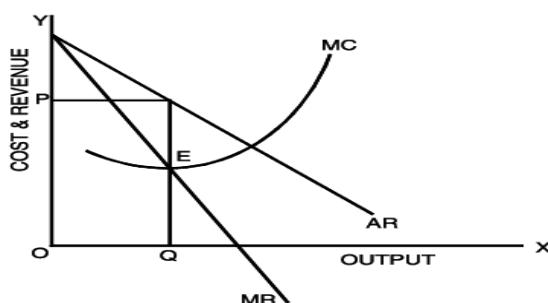
Monopolies are mainly of two types: Simple monopoly where the monopolist charges uniform price from all buyers. For example, Indian Railways charging same fare from all AC 3Tier passengers and discriminating monopoly where the monopolist charges different prices from different buyers of the same good or service for eg. Dynamic fare charged by Indian Railways in specific trains. We shall look into equilibrium of a simple monopolist.

### **3.1.3 Profit maximisation in a Monopolised Market: Equilibrium of the Monopoly Firm**

Firms in a perfectly competitive market are price-takers so that they are only concerned about determination of output. But this is not the case with a monopolist. A monopolist has to determine not only his output but also the price of his product. As under perfect competition, monopolists' decisions are based on profit maximisation hypothesis. Although cost conditions, i.e. AC and MC curves, in competitive and monopoly markets are generally identical, revenue conditions differ. Since a monopolist faces a downward sloping demand curve, if he raises the price of his product, his sales will go down. On the other hand, if he wants to increase his sales volume, he will have to be content with lower price. A monopolist will try to reach the level of output at which profits are maximum i.e. he will try to attain the equilibrium level of output. Since firm and industry are identical in a monopoly setting equilibrium of the monopoly firm signifies equilibrium of the industry. We shall discuss how a monopoly firm decides its output and price in the short run and in the long run.

#### **Short run Equilibrium**

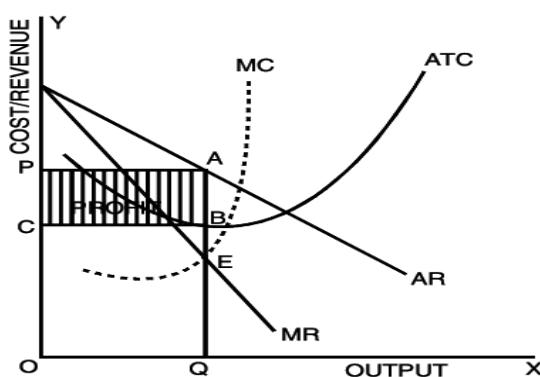
**Conditions for equilibrium:** The twin conditions for equilibrium in a monopoly market are the same as that of a firm in a competitive industry. Graphically, we can depict these conditions in figure 24.



**Fig. 24: Equilibrium of a monopolist (Short run)**

The figure shows that MC curve cuts MR curve at E. That means, at E, the equilibrium output is OQ. The ordinate EQ extended to the demand curve (AR curve) gives the profit maximising equilibrium price OP. Thus the determination of output simultaneously determines the price which a monopolist can charge.

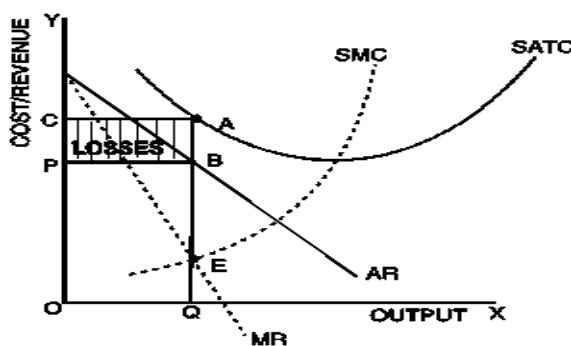
In order to know whether the monopolist is making profits or losses in the short run, we need to introduce the average total cost curve. The following figure shows two possibilities for a monopolist firm in the short run.



**Fig. 25: Firm's equilibrium under monopoly: Maximisation of profits**

Figure 25 shows that MC cuts MR at E to give equilibrium output as OQ. At OQ, the price charged is OP. At output level OQ, the price per unit is QA (=OP) and the cost per unit is BQ. Therefore, the economic profit per unit given by AR – ATC is AB (AQ-BQ). The total profit is ABCP.

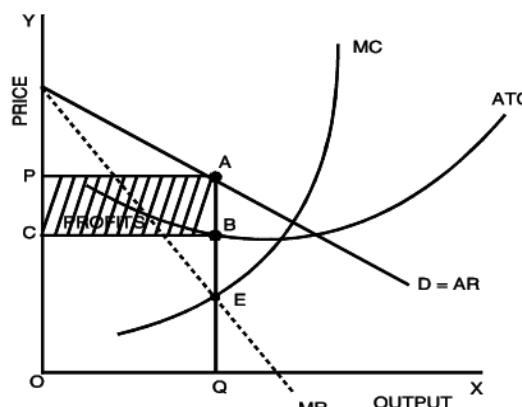
*Can a monopolist incur losses?* One of the misconceptions about a monopoly firm is that it makes profits at all times. It is to be noted that there is no certainty that a monopolist will always earn an economic or supernormal profit. It all depends upon his demand and cost conditions. If a monopolist faces a very low demand for his product and the cost conditions are such that  $ATC > AR$ , he will not be making profits, rather, he will incur losses. Figure 26 depicts this position.



**Fig. 26: Equilibrium of the monopolist: Losses in the short run**

In the above figure, MC cuts MR at E. Here E is the point of loss minimisation. At E, the equilibrium output is OQ and the equilibrium price is OP. The average total cost (SATC) corresponding to OQ is QA. Cost per unit of output i.e. QA is greater than revenue per unit which is BQ. Thus, the monopolist incurs losses to the extent of AB per unit or total loss is ABCP. Whether the monopolist stays in business in the short run depends upon whether he meets his average variable cost or not. If he covers his average variable cost and at least a part of fixed cost, he will not shut down because he contributes something towards fixed costs which are already incurred. If he is unable to meet even his average variable cost, he will shutdown.

*Long Run Equilibrium:* Long run is a period long enough to allow the monopolist to adjust his plant size or to use his existing plant at any level that maximizes his profit. In the absence of competition, the monopolist need not produce at the optimal level. He can produce at a sub-optimal scale also. In other words, he need not reach the minimum of LAC curve; he can stop at any point on the LAC where his profits are maximum.



**Fig. 27: Long run equilibrium of a monopolist**

However, one thing is certain, the monopolist will not continue if he makes losses in the long run. He will continue to make super normal profits even in the long run as entry of outside firms is blocked.

### 3.1.4 Price Discrimination

Consider the following examples.

The family doctor in your neighbourhood charges a higher fee from a rich patient compared to the fee charged from a poor patient even though both are suffering from viral fever. Why?

Electricity companies sell electricity at a cheaper rate for home consumption in rural areas than for industrial use. Why?

The above cases are examples of price discrimination. What is price discrimination? Price discrimination occurs when a producer sells a specific commodity or service to different buyers at two or more different prices for reasons not associated with differences in cost.

Price discrimination is a method of pricing adopted by a monopolist to earn abnormal profits. It refers to the practices of charging different prices for different units of the same commodity.

Further examples of price discrimination are:

- ◆ Railways separate high-value or relatively small-bulk commodities which can bear higher freight charges from other categories of goods.
- ◆ Some countries dump goods at low prices in foreign markets to capture them.
- ◆ Some universities charge higher tuition fees from evening class students than from other scholars.
- ◆ A lower subscription is charged from student readers in case of certain journals.
- ◆ Lower charges on phone calls at off peak time.

Price discrimination cannot persist under perfect competition because the seller has no influence over the market determined price. Price discrimination requires an element of monopoly so that the seller can influence the price of his product.

**Conditions for price discrimination:** Price discrimination is possible only under the following conditions:

- I. The seller should have some control over the supply of his product i.e. the firm should have price-setting power. Monopoly power in some form is necessary (not sufficient) to discriminate price.
- II. The seller should be able to divide his market into two or more sub-markets.
- III. The price-elasticity of the product should be different in different sub-markets. The monopolist fixes a high price for his product for those buyers whose price elasticity of demand for the product is less than one. This implies that, when the monopolist charges a higher price from them, they do not significantly reduce their purchases in response to high price.
- IV. It should not be possible for the buyers of low-priced market to resell the product to the buyers of high-priced market i.e there must be no market arbitrage.

Thus, we note that a discriminating monopolist charges a higher price in a market which has a relatively inelastic demand. The market which is highly responsive to price changes is charged less. On the whole, the monopolist benefits from such discrimination.

A numerical example will help you understand price-discrimination more clearly.

Suppose the single monopoly price is ₹ 30 and the elasticities of demand in markets A and B are respectively 2 and 5. Then,

$$\text{MR in market A} = \text{AR}_A \left( \frac{e-1}{e} \right)$$

$$= 30 \left( \frac{2-1}{2} \right)$$

$$= 15$$

$$\text{MR in market B} = \text{AR}_B \left( \frac{e-1}{e} \right)$$

$$= 30 \left( \frac{5-1}{5} \right)$$

$$= 24$$

It is thus clear that the marginal revenues in the two markets are different when elasticities of demand at the single price are different. Further, we see that the marginal revenue in the market in which elasticity is high is greater than the marginal revenue in the market where elasticity is low. Therefore, it is profitable for the monopolist to transfer some amount of the product from market A where elasticity is less and therefore marginal revenue is low, to market B where elasticity is high and marginal revenue is large. Thus, when the monopolist transfers one unit from A to B, the loss in revenue (₹ 15) will be more than compensated by gain in revenue (₹ 24). On the whole, the gain in revenue will be ₹ 9 (24-15). It is to be noted that when some units are transferred from A to B, the price in market A will rise and it will fall in B. This means that the monopolist is now discriminating between markets A and B. Again, it is to be noted that there is a limit to which units of output can be transferred from A to B. Once this limit is reached and once a point is reached when the marginal revenues in the two markets become equal as a result of transfer of output, it will no longer be profitable to shift more output from market A to market B. When this point of equality is reached, the monopolist will be charging different prices in the two markets – a higher price in market A with lower elasticity of demand and a lower price in market B with higher elasticity of demand.

#### **Objectives of Price discrimination:**

- (a) to earn maximum profit
- (b) to dispose off surplus stock
- (c) to enjoy economies of scale

- (d) to capture foreign markets and
- (e) to secure equity through pricing.

Price discrimination may take place for reasons such as differences in the nature and types of persons who buy the products, differences in the nature of locality where the products are sold and differences in the income level, age, size of the purchase, time of purchase.

Price discrimination may be related to the consumer surplus enjoyed by the consumers. Prof. Pigou classified three degrees of price discrimination. Under the first degree price discrimination, the monopolist separates the market into each individual consumer and charges them the price they are willing and able to pay and thereby extract the entire consumer surplus. Doctors, lawyers, consultants etc., charging different fees, prices decided under 'bid and offer' system, auctions, and through negotiations are examples of first degree price discrimination.

Under the second degree price discrimination, different prices are charged for different quantities of sold. The monopolist will take away only a part of the consumers' surplus. The two possibilities are: a) Different consumers pay different price if they buy different quantity. Larger quantities are available at lower unit price. For example, a family pack of soaps or biscuits tends to cost less per kg than smaller packs. b) Each consumer pays different price for consecutive purchases. For example, suppliers of services such as telephone, electricity, water, etc., sometimes charge higher prices when consumption exceeds a particular limit.

Under the third degree price discrimination, price varies by attributes such as location or by customer segment. Here the monopolist will divide the consumers into separate sub-markets and charge different prices in different sub-markets. Examples: Dumping, charging different prices for domestic and commercial uses, lower prices in railways for senior citizens, etc.

### **Equilibrium under price discrimination**

Under simple monopoly, a single price is charged for the whole output; but under price discrimination the monopolist will charge different prices in different sub-markets. First of all, the monopolist has to divide his total market into various sub-markets on the basis of differences in elasticity of demand. For the sake of making our analysis simple we shall explain a case where the total market is divided into two sub-markets.

In order to reach the equilibrium position, the discriminating monopolist has to make three decisions:

- (1) How much total output should he produce?
- (2) How the total output should be distributed between the two sub-markets? and

(3) What prices he should charge in the two sub-markets?

The same marginal principle will guide his decision to produce a total output as that which guides a perfect competitor or a simple monopolist. In other words, the discriminating monopolist will compare the marginal revenue with the marginal cost of the output. But he has to find out first, the aggregate marginal revenue of the two sub-markets taken together and compare this aggregate marginal revenue with marginal cost of the total output. Aggregate marginal revenue curve is obtained by summing up laterally the marginal revenue curves of the sub-markets.

In figure 28,  $MR_a$  is the marginal revenue curve in sub-market A corresponding to the demand curve  $D_a$ . Similarly,  $MR_b$  is the marginal revenue in sub-market B corresponding to the demand curve  $D_b$ . Now, the aggregate marginal revenue curve AMR, which has been shown in Panel (iii) of figure 28 has been derived by adding up laterally  $MR_a$  and  $MR_b$ . The marginal cost curve of the monopolist is shown by the curve MC in Panel (iii) of figure 28.

The discriminating monopolist will maximize his profits by producing the level of output at which marginal cost curve (MC) intersects the aggregate marginal revenue curve (AMR). It is manifest from the diagram (iii) that profit maximizing output is OM, for only at OM aggregate marginal revenue is equal to the marginal cost of the whole output. Thus, the discriminating monopolist will decide to produce OM level of output.

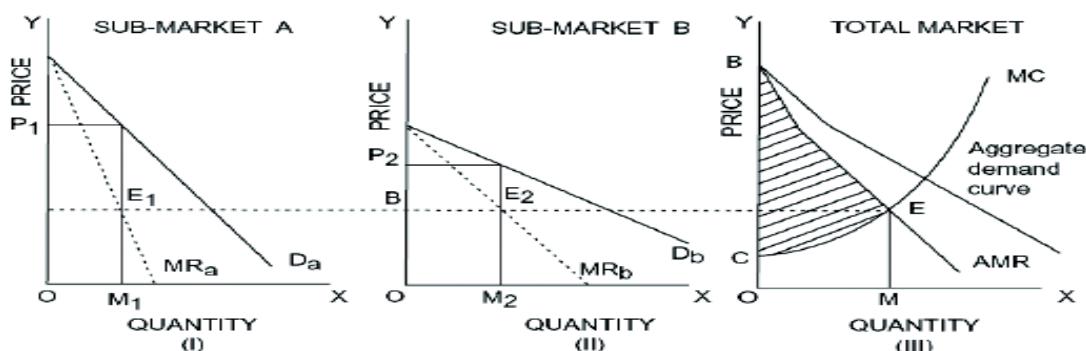
Once the total output to be produced has been determined, the next task for the discriminating monopolist is to distribute the total output between the two sub-markets. He will distribute the total output OM in such a way that the marginal revenues in the two sub-markets are equal. The marginal revenues in the two sub-markets must be equal if the profits are to be maximized. If he is so allocating the output into two markets that the marginal revenues in the two are not equal, then it will pay him to transfer some amount from the sub-market in which the marginal revenue is less to the sub-market in which the marginal revenue is greater. Only when the marginal revenues in the two markets are equal, it will be unprofitable for him to shift any amount of the good from one market to the other.

For the discriminating monopolist to be in equilibrium it is essential not only that the marginal revenues in the two sub-markets should be the same but that they should also be equal to the marginal cost of the whole output. Equality of marginal revenues in the two markets with marginal cost of the whole output ensures that the amount sold in the two sub-markets will together be equal to the whole output OM which has been fixed by equalizing aggregate marginal revenue with marginal cost. It will be seen from figure (iii) that at equilibrium output OM, marginal cost is ME.

Now, the output OM has to be distributed in the two markets in such a way that the marginal revenue from them should be equal to the marginal cost (ME) of the whole output. It is clear from the diagram (i) that  $OM_1$  must be sold in the sub-market A, because marginal

revenue  $M_1E_1$  at amount  $OM_1$  is equal to marginal cost  $ME$ . Similarly,  $OM_2$  must be sold in sub-market B, since marginal revenue  $M_2E_2$  of amount  $OM_2$  is equal to the marginal cost  $ME$  of the whole output. To conclude, demand and cost conditions being given, the discriminating monopolist will produce total output  $OM$  and will sell amount  $OM_1$  in sub-market A and amount  $OM_2$  in sub-market B. It should be noted that the total output  $OM$  will be equal to  $OM_1 + OM_2$ .

Another important thing which the discriminating monopolist has to discover is what prices will be charged in the two sub-markets. It is clear from the demand curve that amount  $OM_1$  of the good can be sold at price  $OP_1$  in sub-market A. Therefore, price  $OP_1$  will be set in sub-market A. Like wise, amount  $OM_2$  can be sold at price  $OP_2$  in sub-market B. Therefore, price  $OP_2$  will be set in sub-market B. Further, it should be noted that price will be higher in market A where the demand is less elastic than in market B where the demand is more elastic. Thus, price  $OP_1$  is greater than the price  $OP_2$ .



**Fig. 28: Fixation of total output and price in the two sub-markets by the discriminating monopolist**

Price discrimination is usually resorted to by a monopolist to secure higher profit and to acquire and sustain monopoly power. There is loss of economic welfare as the price paid is higher than marginal cost. Price discrimination also results in reduced consumer surplus. However, there are some favourable outcomes as well. The increase in revenue due to price discrimination will enable some firms to stay in business who otherwise would have made a loss. By peak load pricing, firms having capacity constraints will be able to spread its demand to off-peak times resulting in better capacity utilization and reduction in costs of production. Many essential services (e.g. railways) cannot be profitably run unless price discrimination is followed. Some consumers, especially, poor consumers, will benefit from lower prices as they would not have been able to purchase the good or service if uniform high prices are charged for all consumers.

### 3.1.5 Economic effects of Monopoly

- (1) Monopoly is often criticized because it reduces aggregate economic welfare through loss of productive and allocative efficiency.
- (2) Monopolists charge substantially higher prices and produce lower levels of output than would exist if the product were produced by competitive firms.
- (3) Monopolists earn economic profits in the long run which are unjustifiable.
- (4) Monopoly prices exceed marginal costs and therefore reduces consumer surplus. There is a transfer of income from the consumers to the monopolists. Not only that consumers pay higher prices, but they would also not be able to substitute the good or service with a more reasonably priced alternative.
- (5) Monopoly restricts consumer sovereignty and consumers' opportunities to choose what they desire.
- (6) Monopolists may use unjust means for creating barriers to entry to sustain their monopoly power. They often spend huge amount of money to maintain their monopoly position. This leads increases average total cost of producing a product.
- (7) A monopolist having substantial financial resources is in a powerful position to influence the political process in order to obtain favourable legislation.
- (8) Very often, monopolists do not have the necessary incentive to introduce efficient innovations that improve product quality and reduce production costs.
- (9) Monopolies are able to use their monopoly power to pay lower prices to their suppliers.
- (10) The economy is also likely to suffer from 'X' inefficiency, which is the loss of management efficiency associated with markets where competition is limited or absent.

Since monopolies are exploitative and generate undesirable outcomes in the economy, a number of steps are taken by governments to prevent the formation of monopolies and to regulate them if they are already present.



### 3.2 IMPERFECT COMPETITION - MONOPOLISTIC COMPETITION

Consider the market for soaps and detergents. Among the well known brands on sale are Lux, Vivel, Cinthol, Dettol, Liril, Pears, Lifebuoy Plus, Dove etc. Is this market an example of perfect competition? Since all the soaps are almost similar, one might think that this is an

example of perfect competition. But, on a close inspection we find that though these products are technically and functionally similar, each seller produces and sells a product which is different from those of his competitors. For example, whereas Lux is claimed to be a beauty soap, Liril is associated more with freshness. Dettol soap is placed as antiseptic and Dove claims to ensure young smooth skin. The practice of product and service differentiation gives each seller a chance to attract business to himself on some basis other than price. This is the monopolistic part of the market situation. Thus, this market contains features of both the markets discussed earlier – monopoly and perfect competition. In fact, this type of market is more common than pure competition or pure monopoly. The industries in monopolistic competition include clothing, manufacturing and retail trade in large cities. There are many hundreds of grocery shops, shoe stores, stationery shops, restaurants, repair shops, laundries, manufacturers of women's dresses and beauty parlours in a medium sized or large city.

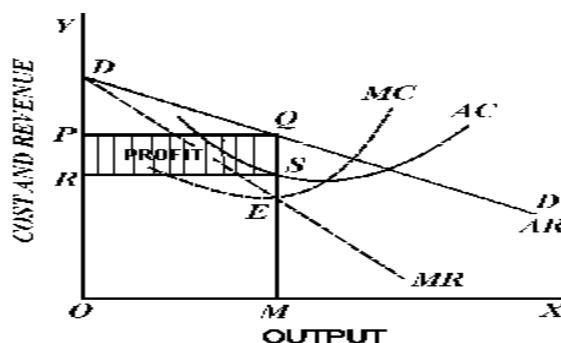
### **3.2.0 Features of Monopolistic Competition**

- (i) **Large number of sellers:** In a monopolistically competitive market, there are large number of independent firms who individually have a small share in the market.
- (ii) **Product differentiation:** In a monopolistic competitive market, the products of different sellers are differentiated on the basis of brands. Because competing products are close substitutes, demand is relatively elastic, but not perfectly elastic as in perfect competition. Firms use size, design, colour, shape, performance, features and distinctive packaging and promotional techniques to make their products different. Such differentiation may be true or fancied. Brands are generally so much advertised that a consumer starts associating the brand with a particular manufacturer and a type of brand loyalty is developed. Product differentiation gives rise to an element of monopoly to the producer over the competing products. Because of absence of perfect substitutability, the producer of an individual brand can raise the price of his product knowing that he will not lose all the customers to other brands. However, since all brands are close substitutes of one another; the seller who increases the price of the product will lose some of his customers to his competitors. Thus, this market is a blend of monopoly and perfect competition.
- (iii) **Freedom of entry and exit:** Barriers to entry are comparatively low and new firms are free to enter the market if they find profit prospects and existing firms are free to quit.
- (iv) **Non-price competition:** In a monopolistically competitive market, firms are often in fierce competition with other firms offering a similar product or service, and therefore try to compete on bases other than price, for example: they indulge in

aggressive advertising, product development, better distribution arrangements, efficient after-sales service and so on. A key base of non-price competition is a deliberate policy of product differentiation. Sellers attempt to promote their products not by cutting prices but by incurring high expenditure on publicity and advertisement and other sales promoting techniques. This is because price competition may result in price – wars which may throw a few firms out of market or reduce the profit margins.

### 3.2.1 Price-Output Determination under Monopolistic Competition: Equilibrium of a Firm

In a monopolistically competitive market, since the product is differentiated, each firm does not face a perfectly elastic demand for its products. Each firm makes independent decisions about price and output. Each firm is a price maker and is in a position to determine the price of its own product. As such, the firm is faced with a downward sloping demand curve for its product. Generally, the less differentiated the product is from its competitors, the more elastic this curve will be.



**Fig. 29: Short run equilibrium of a firm under monopolistic competition: Supernormal profits**

The firm depicted in figure 29 has a downward sloping but flat demand curve for its product. The firm is assumed to have U-shaped short run cost curves.

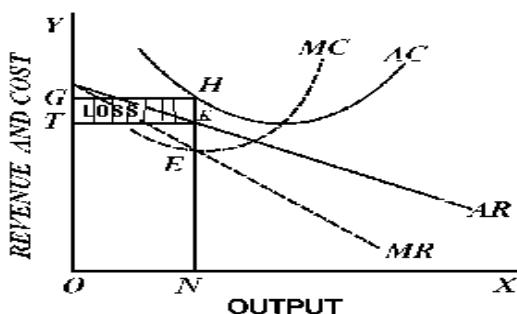
**Conditions for the Equilibrium of an individual firm:** The conditions for price-output determination and equilibrium of an individual firm may be stated as follows:

- (i)  $MC = MR$
- (ii) MC curve must cut MR curve from below.

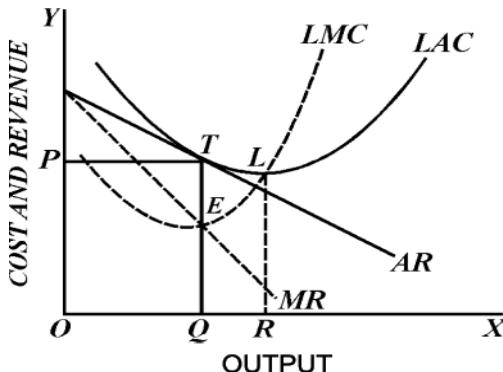
Figure 29 shows that MC cuts MR curve at E. At E, the equilibrium price is OP and the equilibrium output is OM. Since per unit cost is SM, per unit supernormal profit (i.e. price - cost) is QS (or PR) and the total supernormal profit is PQSR.

It is also possible that a monopolistically competitive firm may incur losses in the short run. This is shown in fig. 30. The figure shows that per unit cost (HN) is higher than price OT (or KN) of the product of the firm and the loss per unit is KH (HN-KN). The total loss is GHKT.

What about long run equilibrium of the firm? If the firms in a monopolistically competitive industry earn supernormal profits in the short run, there will be an incentive for new firms to enter the industry. As more firms enter, profits per firm will go on decreasing as the total demand for the product will be shared among a larger number of firms. This will happen till all supernormal profits are wiped away and all firms earn only normal profits. Thus, in the long run all firms under monopolistic competition will earn only normal profits.



**Fig. 30: Short run equilibrium of a firm under Monopolistic Competition – With losses**



**Fig. 31: The long-term equilibrium of a firm in monopolistic competition**

Figure 31 shows the long run equilibrium of a firm in a monopolistically competitive market. The average revenue curve touches the average cost curve at point T corresponding to quantity Q and price P. At equilibrium (i.e.  $MC = MR$ ) supernormal profits are zero, since average revenue equals average costs. All firms are earning zero economic profits or just normal profits.

In case of persisting losses, in the long run, the loss making firms will exit from the market and this will go on till the remaining firms make normal profits only.

It is to be noted that an individual firm which is in equilibrium in the long run, will be operating at levels at which it does not fully realize economies of large scale production. In other words, the plants are not used to optimum capacity. However, any attempt to produce

more to secure the advantage of least cost production will be irrational since the price reduction to sell the larger output will exceed the cost reduction made possible. If output is increased up to R in the above figure, we find that average total cost will be greater than average revenue. Thus, a monopolistically competitive firm which is in equilibrium in the long run is at a position where it has excess capacity. That is, it is producing a lower quantity than its full capacity level. The firm in figure 31 could expand its output from Q to R and reduce average costs. But it does not do so because in doing so, the firm would reduce average revenue more than it reduces average costs. It implies that, firms in monopolistic competition are not of optimum size and there exists excess capacity (QR in our example above) of production with each firm.

The following table presents a comparison of the three market forms we have discussed so far:

**Table 7: Comparison of Perfect Competition, Monopoly and Monopolistic Competition**

Perfect Competition	Monopoly	Monopolistic Competition
Large number of buyers and large number of firms in the industry	Single seller, no difference between firm and industry	Large number of buyers and large number of firms in the industry
Homogenous products which are perfect substitutes	No close substitutes	Differentiated products which are close substitutes, but not perfect substitutes
Insignificant market share	Command over the whole market	Each firm is small relative to the market
Competition among firms is perfect	Absence of competition	Imperfect competition
Complete absence of monopoly	High degree of monopoly power prevails	Some degree of monopoly power due to product differentiation
Free entry and exit	Strong barriers to entry	Free entry and exit
Price-taker	Price maker	Some control over price
Price is equal to marginal cost	Price is higher than marginal cost	Price is higher than marginal cost
Price less than other market forms	High equilibrium price	Price is high compared to perfect competition
Demand curve is infinitely elastic	Downward sloping and highly inelastic demand curve	Downward sloping and more elastic demand curve

MR and AR represented by the same curve	MR starts at the same point as AR, and is twice steep when compared to AR	MR starts at the same point as AR, and is twice steep when compared to AR
TR straight line positively sloping through the origin	TR inverted U shaped	TR inverted U shaped
No price discrimination-same price for all units	Can practice price discrimination by selling a product at different prices	Depends on the extent of monopoly power the firm has
No supernormal profits in the long run	Supernormal profits both in the short run and long run	No supernormal profits in the long run
No selling costs	Generally low selling costs, only for informing the consumers	Due to severe competition, selling costs are vital to persuade buyers
Price being given, decides only quantity of output	Decides on both price and output	Decides on both price and output
Product is produced at the minimum average cost	Produced at the declining portion of average cost curve	Produced at the declining portion of average cost curve
Equilibrium quantity is highest and produced at least cost	Equilibrium quantity less than other market forms	Equilibrium quantity less than optimal, there is excess capacity
No consumer exploitation	Consumers can be exploited by charging high prices	Consumers are influenced through price and non price competition
Efficient allocation of resources	Inefficient allocation of resource	Inefficient allocation of resource
No wastage of resources	Wastage of resource	Huge wastage of resources for advertisements



### 3.3 OLIGOPOLY

We have studied price and output determination under three market forms, namely, perfect competition, monopoly and monopolistic competition. However, in the real world economies we find that many of the industries are oligopolistic. Oligopoly is an important form of imperfect competition. Oligopoly is often described as 'competition among the few'. Prof. Stigler defines oligopoly as that "situation in which a firm bases its market policy, in part, on the expected behaviour of a few close rivals". In other words, when there are few (two to ten) sellers in a market selling homogeneous or differentiated products, oligopoly is

said to exist. Oligopolies mostly arise due to those factors which are responsible for the emergence of monopolies. Unlike monopoly where a single firm enjoys absolute market power, under oligopoly a few firms exercise their power to keep possible competitors out.

Consider the example of cold drinks industry or automobile industry. There are a handful firms manufacturing cold drinks in India. Similarly, there are a few firms in the automobile industry in India. Airlines industry, petroleum refining, power generation and supply in most of the parts of the country, mobile telephony and Internet service providers are other examples of oligopolistic market. These industries exhibit some special features which are discussed in the following paragraphs.

### GAME THEORY IN OLIGOPOLY

Theory of Games provide a different approach to the analysis of strategic behavior of the oligopolists under uncertainty. It was developed by **Von Neumann and Oskar Morgentern** in 1944. The subject of Games Theory is rational behavior in situations of conflicts- military combat, political rivalry, struggles of firms for sales and profits. Economic theory situations of duopoly and oligopoly often fit into this category.

Oligopolistic firms also select strategies in the face of uncertainty as to how their rivals will respond to their actions.

### Types of Oligopoly

**Pure Oligopoly or Perfect Oligopoly** occurs when the product is homogeneous in nature, e.g. Aluminium industry. This type of oligopoly tends to process raw materials or produce intermediate goods that are used as inputs by other industries. Notable examples are petroleum, steel, and aluminium. Differentiated or imperfect oligopoly occurs when goods sold is based on product differentiation, e.g. Talcum powder.

**Open and Closed Oligopoly:** In an open oligopoly market new firms can enter the market and compete with the existing firms. But, in closed oligopoly entry is restricted.

**Collusive and Competitive Oligopoly:** When few firms of the oligopoly market come to a common understanding or act in collusion with each other either in fixing price or output or both, it is collusive oligopoly. When there is absence of such an understanding among the firms and they compete with each other, it is called competitive oligopoly.

**Partial or Full Oligopoly:** Oligopoly is partial when the industry is dominated by one large firm which is considered or looked upon as the leader of the group. The dominating firm will be the price leader. In full oligopoly, the market will be conspicuous by the absence of price leadership.

**Syndicated and Organized Oligopoly:** Syndicated oligopoly refers to that situation where the firms sell their products through a centralized syndicate. Organized oligopoly refers to

the situation where the firms organize themselves into a central association for fixing prices, output, quotas, etc.

### 3.3.0 Characteristics of Oligopoly Market

The oligopolistic industry is dominated by a small number of large firms, each of which is comparatively large relative to the total size of the market. These large firms exercise considerable control over the market. An oligopoly market may have a large number of firms along with very large firms, but most of the market share will be enjoyed by the few large firms and therefore they conquer and retain market control. There are strong barriers to entry (refer barriers to entry discussed under monopoly).

**Strategic Interdependence:** The most important feature of oligopoly is interdependence in decision-making of the few firms which comprise the industry. Since there are only few sellers, there will be intense competition among them. Under oligopoly, each seller is big enough to influence the market. A firm has to necessarily respond to its rivals' actions, and simultaneously the rivals also respond to the firm's actions. This is because when the number of competitors is few, any change in price, output or product by a firm will have direct effect on the fortunes of the rivals who will then retaliate by changing their own prices, output or advertising technique as the case may be. It is, therefore, clear that an oligopolistic firm must consider not only the market demand for its product, but also the reactions of other firms in the industry to any major decision it takes. An oligopoly firm that does not consider its rivals' behaviour or incorrectly assumes them is likely to suffer a setback in its profits.

**Importance of advertising and selling costs:** A direct effect of interdependence of oligopolists is that the firms have to employ various aggressive and defensive marketing weapons to gain greater share in the market or to maintain their share. For this, firms have to incur a good deal of costs on advertising and other measures of sales promotion. Therefore, there is great importance for advertising and selling costs in an oligopoly market. It is to be noted that firms in such type of market avoid price cutting and try to compete on non-price basis because if they start undercutting one another, a type of price-war will emerge which will drive a few of them out of the market as customers will try to buy from the seller selling at the cheapest price.

**Group behaviour:** The theory of oligopoly is a theory of group behaviour, not of mass or individual behaviour and to assume profit maximising behaviour on the oligopolists' part may not be very valid. There is no generally accepted theory of group behaviour. The firms may agree to pull together as a group in promotion of their common interest. The group may or may not have a leader. If there is a firm which acts as a leader, it has to get others to follow it. These are some of the concerns of the theory of group behaviour. But one thing is

certain. Each oligopolist closely watches the business behaviour of the other oligopolists in the industry and designs his moves on the basis of some assumptions of how they behave or are likely to behave.

### 3.3.1 Price and Output Decisions in an Oligopolistic Market

Oligopoly, in fact, describes the operation of a number of large corporations in the world. The operations of these markets are characterized by strategic behaviour of a small number of rival firms. As mentioned above, the extent of power as well as profits depends to a great extent on how rival firms react to each other's decisions. If the behaviour is less competitive, that is, if the rival firms behave in a cooperative manner, firms will enjoy market power and can charge prices above marginal cost.

An oligopolistic firm has to behave strategically when it makes a decision about its price. It has to consider whether rival firms will keep their prices and quantities constant, when it makes changes in its price and/or quantity. When an oligopolistic firm changes its price, its rival firms will retaliate or react and change their prices which in turn would affect the demand of the former firm. Therefore, an oligopolistic firm cannot have sure and determinate demand curve, since the demand curve keeps shifting as the rivals change their prices in reaction to the price changes made by it. Now when an oligopolist does not know his demand curve, what price and output he will fix cannot be ascertained by economic analysis. However, economists have established a number of price-output models for oligopoly market depending upon the behaviour pattern of other firms in the market. Different oligopoly settings give rise to different optimal strategies and diverse outcomes. Important oligopoly models are:

- (i) It is assumed by some economists that oligopolistic firms ignore their interdependence and make their decisions independently. When interdependence is ignored, the demand curve becomes definite and the equilibrium output is found out by equating marginal cost and marginal revenue.
- (ii) Some economists assume that an oligopolist is able to predict the reaction pattern of his competitors and on the basis of his prediction; he makes decisions relating to price and quantity. In Cournot model, the firms' control variable is output in contrast to price. They do not collude. In Stackelberg's model, the leader commits to an output before all other firms. The rest of the firms are followers and they choose their outputs so as to maximize profits, given the leader's output. According to Bertrand model, price is the control variable for firms and each firm independently sets its price in order to maximize profits.
- (iii) The third approach is that oligopolists enter into agreement and try to pursue their common interests. They jointly act as a monopoly organization and fix their prices in

such a manner that their joint profits are maximized. They will then share the profits, market or output among them as agreed. Entering into collusion or forming a cartel is generally considered illegal because it restricts trade and creates situations which are close to monopoly. However, in reality, we find a number of cartels operating in the world economy who collude formally or in a tacit manner. Organisation of Petroleum Exporting Countries (OPEC) is the best example of such type of agreement among oligopolists.

### 3.3.2 Price Leadership

Cartels are often formed in industries where there are a few firms, all of which are similar in size. A group of firms that explicitly agree (collude) to coordinate their activities is called a cartel. Most cartels have only a subset of producers. If the participating producers stick to the cartel's agreements, the cartel will have high market power and earn monopoly profits especially when the demand for the product is inelastic.

But it is possible that there is a dominant or a large firm surrounded by a large number of small firms. If these firms are numerous or too unreliable, the large firm has to decide how to set its price, taking into account the behaviour of these fringe firms. One strategy is to adopt a 'live and let live philosophy'. Specifically, the dominant firm accepts the presence of fringe firms and sets the price to maximize its profit, taking into account the fringe firms' behaviour. This is called price-leadership by dominant firm. Another type of price leadership is by a low cost firm. Here, the price leader sets the price in such a manner that it allows some profits to the followers also. Then there could be barometric price leadership under which an old, experienced, largest or most respected firm acts as a leader and assesses the market conditions with regard to the demand, cost, competition etc. and makes changes in price which are best from the view point of all the firms in the industry. Whatever price is charged by the price leader is generally accepted by the follower firms.

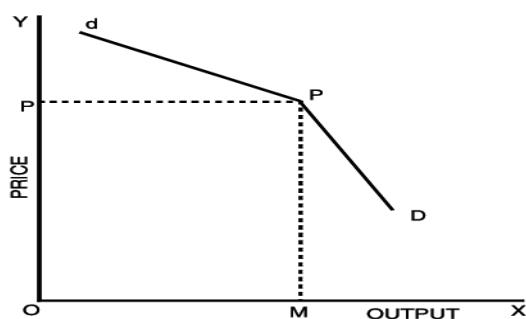
Thus, we find that fixing of price under oligopoly is very tricky affair and involves a number of assumptions regarding the behaviour of the oligopolistic group.

### 3.3.3 Kinked Demand Curve

It has been observed that in many oligopolistic industries prices remain sticky or inflexible for a long time. They tend to change infrequently, even in the face of declining costs. Many explanations have been given for this price rigidity under oligopoly and the most popular

explanation is the kinked demand curve hypothesis given by an American economist Paul A. Sweezy. Hence this is called Sweezy's Model.

The demand curve facing an oligopolist, according to the kinked demand curve hypothesis, has a 'kink' at the level of the prevailing price. It is because the segment of the demand curve above the prevailing price level is highly elastic and the segment of the demand curve below the prevailing price level is inelastic. A kinked demand curve  $dD$  with a kink at point P is shown in Fig. 32.



**Fig. 32: Kinked Demand Curve under oligopoly**

The prevailing price level is MP and the firm produces and sells output OM. Now the upper segment  $dP$  of the demand curve  $dD$  is relatively elastic and the lower segment  $PD$  is relatively inelastic. This difference in elasticities is due to the particular competitive reaction pattern assumed by the kinked demand curve hypothesis. This assumed pattern is :

Each oligopolist believes that if it lowers the price below the prevailing level its competitors will follow him and will accordingly lower prices, whereas if it raises the price above the prevailing level, its competitors will not follow its increase in price.

This is because when an oligopolistic firm lowers the price of its product, its competitors will feel that if they do not follow the price cut, their customers will run away and buy from the firm which has lowered the price. Thus, in order to maintain their customers they will also lower their prices. The lower portion of the demand curve  $PD$  is price inelastic showing that very little increase in sales can be obtained by a reduction in price by an oligopolist. On the other hand, if a firm increases the price of its product, there will be a substantial reduction in its sales because as a result of the rise in its price, its customers will withdraw from it and go to its competitors which will welcome the new customers and will gain in sales. These happy competitors will have therefore no motivation to match the price rise. The oligopolist who raises its price will lose a great deal and will therefore refrain from increasing price. This behaviour of the oligopolists explains the elastic upper portion of the demand curve ( $dP$ ) showing a large fall in sales if a producer raises his price. Briefly put, the effect of a price cut on the quantity demanded of the product of an oligopolistic firm depends upon whether its

rivals retaliate by cutting their prices. Similarly, the effect of a price increase on the quantity demanded of the oligopolistic firm's product depends upon whether its rivals respond by raising their prices as well.

Each oligopolist will, thus, adhere to the prevailing price seeing no gain in changing it and a kink will be formed at the prevailing price. Thus, rigid or sticky prices are explained by the kinked demand curve theory. Oligopolistic firms often have a strong desire for price stability. Although costs or demand change, oligopolistic firms are reluctant to modify the price set by it.

### **3.3.4 Other Important Market Forms**

Other important market forms are:

**Duopoly**, a sub set of oligopoly, is a market situation in which there are only two firms in the market.

**Monopsony** is a market characterized by a single buyer of a product or service and is mostly applicable to factor markets in which a single firm is the only buyer of a factor.

**Oligopsony** is a market characterized by a small number of large buyers and is mostly relevant to factor markets.

**Bilateral monopoly** is a market structure in which there is only a single buyer and a single seller i.e. it is a combination of monopoly market and a monopsony market.

## **SUMMARY**

- The features of various types of market form are summarised in the table given below:

### **Classification of Market Forms**

<b>Form of Market Structure</b>	<b>Number of Firms</b>	<b>Nature of product</b>	<b>Price Elasticity of Demand of a firm</b>	<b>Degree of Control over price</b>
(a) Perfect competition	Large number of firms	Homogeneous	Infinite	None
(b) Monopoly	One	Unique product without close substitute	Small	Very Considerable

(c)	Imperfect Competition				
	i) Monopolistic Competition	Large number of firms	Differentiated products	Large	Some
	ii) Oligopoly	Few Firms	Homogeneous or differentiated product	Small	Some

### Perfect Competition

- ◆ A market is said to be perfectly competitive if it has large number of buyers and sellers, homogeneous product, free entry and exit, perfect mobility of factors of production, perfect knowledge about the market conditions, insignificant transaction costs, no government interference and absence of collusion.
- ◆ A firm is in equilibrium when its  $MC = MR$  and  $MC$  curve cuts the  $MR$  curve from below.
- ◆ In the short run, firms may be earning normal profits, supernormal profits or making losses at the equilibrium price.
- ◆ In the long-run all the supernormal profits or losses get wiped away with entry or exit of the firms from the industry and all firms earn only normal profit.
- ◆ in the long run, in perfect competition, the market mechanism leads to an optimal allocation of resources.

### Monopoly

- ◆ Monopoly is an extreme form of imperfect competition with a single seller of a product which has no close substitute.
- ◆ Since the monopolist firm is the only producer of a particular product, its demand curve is identical with the market demand curve for the product.
- ◆ Since a monopoly firm has market power it has the ability to charge a price above marginal cost and earns a positive economic profit.
- ◆ The fundamental cause of monopoly is barriers to entry; in effect other firms cannot enter the market.
- ◆ In the long-run, the supernormal profit will be continued because entry is restricted.
- ◆ One of the important features of monopoly is price discrimination, i.e. charging different prices for the same product from different buyers.

- ◆ Price charged will be higher in the market where the demand is less elastic and lower in the market where the demand is more elastic.
- ◆ Under the first degree price discrimination, the monopolist separates the market into each individual consumer and charges them the price they are willing and able to pay and thereby extract the entire consumer surplus.
- ◆ Under the second degree price discrimination different prices are charged for different quantities of sold.
- ◆ Under the third degree price discrimination, price varies by attributes such as location or by customer segment.
- ◆ In the absence of competition, the monopolist need not produce at the optimal level.
- ◆ Since monopolies are exploitative and generate undesirable outcomes in the economy, a number of steps are taken by governments to regulate and to prevent the formation of monopolies.
- ◆ In real life, pure monopolies are not common because monopolies are either regulated or prohibited altogether.

### **Imperfect Competition**

- ◆ Imperfect competition is an important category wherein the individual firm exercises control over the price to a smaller or larger degree depending upon the degree of imperfection present.

### **Monopolistic Competition**

- ◆ It refers to the market situation in which many producers produce goods which are close substitutes of one another.
- ◆ The essential feature of monopolistic competition is the existence of large number of firms, product differentiation, non price competition, high selling costs and freedom of entry and exit of firms.
- ◆ In monopolistic competition, the features of monopoly and perfect competition are partially present.
- ◆ Demand curve is highly elastic and a firm enjoys some control over the price.
- ◆ Firms in monopolistic competition are not of optimum size and there exists excess capacity with each firm.

### Oligopolistic Competition

- ◆ Oligopoly is also referred to as 'competition among the few' as a few big firms produce and compete in this market.
- ◆ There are different types of oligopoly like pure and differentiated oligopoly, open and closed oligopoly, collusive and competitive oligopoly, partial and full oligopoly and syndicated and organized oligopoly.
- ◆ The main characteristics of oligopoly are strategic interdependence, importance of advertising and selling costs and group behaviour. Different oligopoly settings give rise to different optimal strategies and diverse outcomes.
- ◆ Price-leadership can be by dominant firm, a low cost firm or it can be barometric price leadership.
- ◆ A group of firms that explicitly agree (collude) to coordinate their activities is called a cartel.
- ◆ Paul A. Sweezy propounded the kinked demand curve model of oligopoly. The price will be kept unchanged for a long time due to fear of retaliation and price tend to be sticky and inflexible.
- ◆ Other important market forms are : Duopoly, Monopsony, Oligopsony and Bilateral monopoly.

## TEST YOUR KNOWLEDGE

### Multiple Choice Questions

1. In the table below what will be equilibrium market price?

<b>Price (₹)</b>	<b>Demand (tonnes per annum)</b>	<b>Supply (tonnes per annum)</b>
1	1000	400
2	900	500
3	800	600
4	700	700
5	600	800
6	500	900
7	400	1000
8	300	1100

- (a) ₹2  
(b) ₹3  
(c) ₹4  
(d) ₹5
2. Assume that when price is ₹20, the quantity demanded is 9 units, and when price is ₹19, the quantity demanded is 10 units. Based on this information, what is the marginal revenue resulting from an increase in output from 9 units to 10 units?  
(a) ₹20  
(b) ₹19  
(c) ₹10  
(d) ₹1
3. Assume that when price is ₹20, the quantity demanded is 15 units, and when price is ₹18, the quantity demanded is 16 units. Based on this information, what is the marginal revenue resulting from an increase in output from 15 units to 16 units?  
(a) ₹18  
(b) ₹16  
(c) -₹12  
(d) ₹28
4. Suppose a firm is producing a level of output such that  $MR > MC$ , what should be firm do to maximize its profits?  
(a) The firm should do nothing.  
(b) The firm should hire less labour.  
(c) The firm should increase price.  
(d) The firm should increase output.
5. Marginal Revenue is equal to:  
(a) The change in price divided by the change in output.  
(b) The change in quantity divided by the change in price.  
(c) The change in  $P \times Q$  due to a one unit change in output.  
(d) Price, but only if the firm is a price searcher.

6. Suppose that a sole proprietorship is earning total revenues of ₹ 1,00,000 and is incurring explicit costs of ₹ 75,000. If the owner could work for another company for ₹ 30,000 a year, we would conclude that :
- (a) The firm is incurring an economic loss.
  - (b) Implicit costs are ₹ 25,000.
  - (c) The total economic costs are ₹ 1,00,000.
  - (d) The individual is earning an economic profit of ₹ 25,000.
7. Which of the following is not an essential condition of pure competition?
- (a) Large number of buyers and sellers
  - (b) Homogeneous product
  - (c) Freedom of entry
  - (d) Absence of transport cost
8. What is the shape of the demand curve faced by a firm under perfect competition?
- (a) Horizontal
  - (b) Vertical
  - (c) Positively sloped
  - (d) Negatively sloped
9. Which is the first order condition for the profit of a firm to be maximum?
- (a)  $AC = MR$
  - (b)  $MC = MR$
  - (c)  $MR = AR$
  - (d)  $AC = AR$
10. Which of the following is not a characteristic of a "price-taker"?
- (a)  $TR = P \times Q$
  - (b)  $AR = Price$
  - (c) Negatively – sloped demand curve
  - (d) Marginal Revenue = Price
11. Which of the following statements is false?
- (a) Economic costs include the opportunity costs of the resources owned by the firm.

- (b) Accounting costs include only explicit costs.
- (c) Economic profit will always be less than accounting profit if resources owned and used by the firm have any opportunity costs.
- (d) Accounting profit is equal to total revenue less implicit costs.
12. With a given supply curve, a decrease in demand causes
- (a) an overall decrease in price but an increase in equilibrium quantity.
- (b) an overall increase in price but a decrease in equilibrium quantity.
- (c) an overall decrease in price and a decrease in equilibrium quantity.
- (d) no change in overall price but a reduction in equilibrium quantity.
13. It is assumed in economic theory that
- (a) decision making within the firm is usually undertaken by managers, but never by the owners.
- (b) the ultimate goal of the firm is to maximise profits, regardless of firm size or type of business organisation.
- (c) as the firm's size increases, so do its goals.
- (d) the basic decision making unit of any firm is its owners.
14. Assume that consumers' incomes and the number of sellers in the market for good A both decrease. Based upon this information, we can conclude, with certainty, that the equilibrium:
- (a) price will increase.
- (b) price will decrease.
- (c) quantity will increase.
- (d) quantity will decrease.
15. If supply increases in a greater proportion than demand
- (a) The new equilibrium price and quantity will be greater than the original equilibrium price and quantity.
- (b) The new equilibrium price will be greater than the original equilibrium price but equilibrium quantity will be higher.
- (c) The new equilibrium price and quantity will be lower than the original equilibrium price and quantity.

- (d) *The new equilibrium price will be lower than the original equilibrium and the new equilibrium quantity will be higher.*
16. *Assume that in the market for good Z there is a simultaneous increase in demand and the quantity supplied. The result will be:*
- (a) *an increase in equilibrium price and quantity.*
  - (b) *a decrease in equilibrium price and quantity.*
  - (c) *an increase in equilibrium quantity and uncertain effect on equilibrium price.*
  - (d) *a decrease in equilibrium price and increase in equilibrium quantity.*
17. *Suppose the technology for producing personal computers improves and, at the same time, individuals discover new uses for personal computers so that there is greater utilisation of personal computers. Which of the following will happen to equilibrium price and equilibrium quantity?*
- (a) *Price will increase; quantity cannot be determined.*
  - (b) *Price will decrease; quantity cannot be determined.*
  - (c) *Quantity will increase; price cannot be determined.*
  - (d) *Quantity will decrease; price cannot be determined.*
18. *Which of the following is not a condition of perfect competition?*
- (a) *A large number of firms.*
  - (b) *Perfect mobility of factors.*
  - (c) *Informative advertising to ensure that consumers have good information.*
  - (d) *Freedom of entry and exit into and out of the market.*
19. *Which of the following is not a characteristic of a perfectly competitive market?*
- (a) *Large number of firms in the industry.*
  - (b) *Outputs of the firms are perfect substitutes for one another.*
  - (c) *Firms face downward-sloping demand curves.*
  - (d) *Resources are very mobile.*
20. *Which of the following is not a characteristic of monopolistic competition?*
- (a) *Ease of entry into the industry.*
  - (b) *Product differentiation.*
  - (c) *A relatively large number of sellers.*

- (d) A homogeneous product.
21. Monopoly may arise in a product market because
- (a) A significantly important resource for the production of the commodity is owned by a single firm.
  - (b) The government has given the firm patent right to produce the commodity.
  - (c) The costs of production and economies of scale makes production by a single producer more efficient.
  - (d) All the above.
22. Oligopolistic industries are characterized by:
- (a) a few dominant firms and substantial barriers to entry.
  - (b) a few large firms and no entry barriers.
  - (c) a large number of small firms and no entry barriers.
  - (d) one dominant firm and low entry barriers.
23. Price-taking firms, i.e., firms that operate in a perfectly competitive market, are said to be "small" relative to the market. Which of the following best describes this smallness?
- (a) The individual firm must have fewer than 10 employees.
  - (b) The individual firm faces a downward-sloping demand curve.
  - (c) The individual firm has assets of less than ₹ 20 lakhs.
  - (d) The individual firm is unable to affect market price through its output decisions.
24. For a price-taking firm:
- (a) marginal revenue is less than price.
  - (b) marginal revenue is equal to price.
  - (c) marginal revenue is greater than price.
  - (d) the relationship between marginal revenue and price is indeterminate.
25. Monopolistic competition differs from perfect competition primarily because
- (a) in monopolistic competition, firms can differentiate their products.
  - (b) in perfect competition, firms can differentiate their products.
  - (c) in monopolistic competition, entry into the industry is blocked.
  - (d) in monopolistic competition, there are relatively few barriers to entry.

26. The long-run equilibrium outcomes in monopolistic competition and perfect competition are similar, because in both market structures
- (a) the efficient output level will be produced in the long run.
  - (b) firms will be producing at minimum average cost.
  - (c) firms will only earn a normal profit.
  - (d) firms realise all economies of scale.
27. Which of the following is the distinguishing characteristic of oligopolies?
- (a) A standardized product
  - (b) The goal of profit maximization
  - (c) The interdependence among firms
  - (d) Downward-sloping demand curves faced by firms.
28. In which form of the market structure is the degree of control over the price of its product by a firm very large?
- (a) Monopoly
  - (b) Imperfect Competition
  - (c) Oligopoly
  - (d) Perfect competition
29. Average revenue curve is also known as:
- (a) Profit Curve
  - (b) Demand Curve
  - (c) Average Cost Curve
  - (d) Indifference Curve
30. Under which of the following forms of market structure does a firm have no control over the price of its product?
- (a) Monopoly
  - (b) Monopolistic competition
  - (c) Oligopoly
  - (d) Perfect competition

31. *Discriminating monopoly implies that the monopolist charges different prices for his commodity:*
- (a) *from different groups of consumers*
  - (b) *for different uses*
  - (c) *at different places*
  - (d) *any of the above.*
32. *Price discrimination will be profitable only if the elasticity of demand in different sub-markets is:*
- (a) *uniform*
  - (b) *different*
  - (c) *less*
  - (d) *zero*
33. *In the context of oligopoly, the kinked demand hypothesis is designed to explain*
- (a) *Price and output determination*
  - (b) *Price rigidity*
  - (c) *Price leadership*
  - (d) *Collusion among rivals.*
34. *The firm in a perfectly competitive market is a price-taker. This designation as a price-taker is based on the assumption that -*
- (a) *the firm has some, but not complete, control over its product price.*
  - (b) *there are so many buyers and sellers in the market that any individual firm cannot affect the market.*
  - (c) *each firm produces a homogeneous product.*
  - (d) *there is easy entry into or exit from the market place.*
35. *Suppose that the demand curve for the XYZ Co. slopes downward and to the right. We can conclude that*
- (a) *the firm operates in a perfectly competitive market.*
  - (b) *the firm can sell all that it wants to at the established market price.*
  - (c) *the XYZ Co. is not a price-taker in the market because it must lower price to sell additional units of output.*

- (d) the XYZ Co. will not be able to maximise profits because price and revenue are subject to change.
36. If firms in the toothpaste industry have the following market shares, which market structure would best describe the industry?

Market share	(% of market)
Toothpaste	18.7
Dentipaste	14.3
Shinibright	11.6
I can't believe its not toothpaste	9.4
Brighter than white	8.8
Pastystuff	7.4
Others	29.8

- (a) Perfect competition.  
 (b) Monopolistic competition.  
 (c) Oligopoly.  
 (d) Monopoly.
37. The kinked demand curve model of oligopoly assumes that
- (a) the response (of consumers) to a price increase is less than the response to a price decrease.  
 (b) the response (of consumers) to a price increase is more than the response to a price decrease.  
 (c) the elasticity of demand is constant regardless of whether price increases or decreases.  
 (d) the elasticity of demand is perfectly elastic if price increases and perfectly inelastic if price decreases.
38. A firm encounters its "shutdown point" when:
- (a) average total cost equals price at the profit-maximising level of output.  
 (b) average variable cost equals price at the profit-maximising level of output.  
 (c) average fixed cost equals price at the profit-maximising level of output.  
 (d) marginal cost equals price at the profit-maximising level of output.

39. Suppose that, at the profit-maximizing level of output, a firm finds that market price is less than average total cost, but greater than average variable cost. Which of the following statements is correct?
- (a) The firm should shutdown in order to minimise its losses.
  - (b) The firm should raise its price enough to cover its losses.
  - (c) The firm should move its resources to another industry.
  - (d) The firm should continue to operate in the short run in order to minimize its losses.
40. When price is less than average variable cost at the profit-maximising level of output, a firm should:
- (a) produce where marginal revenue equals marginal cost if it is operating in the short run.
  - (b) produce where marginal revenue equals marginal cost if it is operating in the long run.
  - (c) shut down, since it will lose nothing in that case.
  - (d) shut down, since it cannot even cover its variable costs if it stays in business.
41. A purely competitive firm's supply schedule in the short run is determined by
- (a) its average revenue.
  - (b) its marginal revenue.
  - (c) its marginal utility for money curve.
  - (d) its marginal cost curve.
42. One characteristic not typical of oligopolistic industry is
- (a) horizontal demand curve.
  - (b) too much importance to non-price competition.
  - (c) price leadership.
  - (d) a small number of firms in the industry.
43. The structure of the toothpaste industry in India is best described as
- (a) perfectly competitive.
  - (b) monopolistic.
  - (c) monopolistically competitive.

- (d) oligopolistic.
44. The structure of the cold drink industry in India is best described as
- (a) perfectly competitive.
  - (b) monopolistic.
  - (c) monopolistically competitive.
  - (d) oligopolistic.
45. Which of the following statements is incorrect?
- (a) Even a monopolistic firm can have losses.
  - (b) Firms in a perfectly competitive market are price takers.
  - (c) It is always beneficial for a firm in a perfectly competitive market to discriminate prices.
  - (d) Kinked demand curve is related to an oligopolistic market.
46. Under perfect competition, in the long run, there will be no \_\_\_\_\_.
- (a) normal profits
  - (b) supernormal profits.
  - (c) production
  - (d) costs.
47. When \_\_\_\_\_, we know that the firms are earning just normal profits.
- (a)  $AC = AR$
  - (b)  $MC = MR$
  - (c)  $MC = AC$
  - (d)  $AR = MR$
48. When \_\_\_\_\_, we know that the firms under perfect competition must be producing at the minimum point of the average cost curve and so there will be productive efficiency.
- (a)  $AC = AR$
  - (b)  $MC = AC$
  - (c)  $MC = MR$

- (d)  $AR = MR$
49. When \_\_\_\_\_, there will be allocative efficiency meaning thereby that the cost of the last unit is exactly equal to the price consumers are willing to pay for it and so that the right goods are being sold to the right people at the right price.
- (a)  $MC = MR$
  - (b)  $MC = AC$
  - (c)  $MC = AR$
  - (d)  $AR = MR$
50. Agricultural goods markets depict characteristics close to
- (a) perfect competition.
  - (b) oligopoly.
  - (c) monopoly.
  - (d) monopolistic competition.
51. Which of the following is not a characteristic of a competitive market?
- (a) There are many buyers and sellers in the market.
  - (b) The goods offered for sales are largely the same.
  - (c) Firms generate small but positive supernormal profits in the long run.
  - (d) Firms can freely enter or exit the market.
52. Which of the following markets would most closely satisfy the requirements for a perfectly competitive market?
- (a) Electricity
  - (b) Cable television
  - (c) Cola
  - (d) Milk
53. Which of the following statements is accurate regarding a perfectly competitive firm?
- (a) Demand curve is downward sloping
  - (b) The demand curve always lies above the marginal revenue curve
  - (c) Average revenue need not be equal to price
  - (d) Price is given and is determined by the equilibrium in the entire market

54. The market for hand tools (such as hammers and screwdrivers) is dominated by Draper, Stanley, and Craftsman. This market is best described as
- Monopolistically competitive
  - a monopoly
  - an oligopoly
  - perfectly competitive
55. A market structure in which many firms sell products that are similar but not identical is known as
- monopolistic competition
  - monopoly
  - perfect competition
  - oligopoly
56. When an oligopolist individually chooses its level of production to maximize its profits, it charges a price that is
- more than the price charged by either monopoly or a competitive market
  - less than the price charged by either monopoly or a competitive market
  - more than the price charged by a monopoly and less than the price charged by a competitive market
  - less than the price charged by a monopoly and more than the price charged by a competitive market.
57. In the long-run equilibrium of a competitive market, firms operate at
- the intersection of the marginal cost and marginal revenue
  - their efficient scale
  - zero economic profit
  - all of these answers are correct
58. Which of the following is not a characteristic of a monopolistically competitive market?
- Free entry and exit
  - Abnormal profits in the long run
  - Many sellers
  - Differentiated products

59. In a very short period market:

- (a) the supply is fixed
- (b) the demand is fixed
- (c) demand and supply are fixed
- (d) none of the above

60. Time element was conceived by

- (a) Adam Smith
- (b) Alfred Marshall
- (c) Pigou
- (d) Lionel Robinson

61. Total revenue =

- (a) price  $\times$  quantity
- (b) price  $\times$  income
- (c) income  $\times$  quantity
- (d) none of the above

62. Average revenue is the revenue earned

- (a) per unit of input
- (b) per unit of output
- (c) different units of input
- (d) different units of output

63. AR can be symbolically written as:

- (a)  $MR / Q$
- (b) Price  $\times$  quantity
- (c)  $TR / Q$
- (d) none of the above

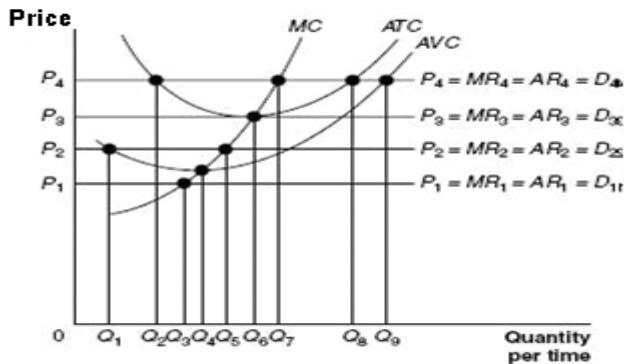
64. AR is also known as:

- (a) price

- (b) *income*  
(c) *revenue*  
(d) *none of the above*
65. *Marginal revenue can be defined as the change in total revenue resulting from the:*  
(a) *purchase of an additional unit of a commodity*  
(b) *sales of an additional unit of a commodity*  
(c) *sale of subsequent units of a product*  
(d) *none of the above*
66. *When  $e > 1$  then MR is*  
(a) *zero*  
(b) *negative*  
(c) *positive*  
(d) *one*
67. *When  $e = 1$  then MR is*  
(a) *positive*  
(b) *zero*  
(c) *one*  
(d) *negative*
68. *When  $e < 1$  then MR is*  
(a) *negative*  
(b) *zero*  
(c) *positive*  
(d) *one*
69. *In Economics, the term 'market' refers to a:*  
(a) *place where buyer and seller bargain a product or service for a price*  
(b) *place where buyer does not bargain*  
(c) *place where seller does not bargain*

- (d) *none of the above*
70. *Under perfect competition a firm is the \_\_\_\_\_*
- (a) *price-maker and not price-taker*
  - (b) *price-taker and not price-maker*
  - (c) *neither price-maker nor price-taker*
  - (d) *none of the above*
71. *A Monopolist is a*
- (a) *price-maker*
  - (b) *price-taker*
  - (c) *price-adjuster*
  - (d) *none of the above*
72. *Price discrimination is one of the features of \_\_\_\_\_*
- (a) *monopolistic competition*
  - (b) *monopoly*
  - (c) *perfect competition*
  - (d) *oligopoly*
73. *Under monopoly, the degree of control over price is:*
- (a) *none*
  - (b) *some*
  - (c) *very considerable*
  - (d) *none of the above*
74. *Generally, perishable goods like butter, eggs, milk, vegetables etc., will have*
- (a) *regional market*
  - (b) *local market*
  - (c) *national market*
  - (d) *none of the above*

75. At price  $P_1$ , the firm in the figure would produce



- (a) Zero output
- (b)  $Q_3$ .
- (c)  $Q_5$ .
- (d)  $Q_6$ .

76. Secular period is also known as

- (a) very short period
- (b) short period
- (c) very long period
- (d) long period

77. Stock exchange market is an example of

- (a) unregulated market
- (b) regulated market
- (c) spot market
- (d) none of the above

78. The market for the ultimate consumers is known as

- (a) whole sale market
- (b) regulated market
- (c) unregulated market
- (d) retail market

79. The condition for pure competition is
- (a) large number of buyer and seller, free entry and exist
  - (b) homogeneous product
  - (c) both (a) and (b)
  - (d) large number of buyer and seller, homogeneous product, perfect knowledge about the product
80. Pure oligopoly is based on the \_\_\_\_\_ products
- (a) differentiated
  - (b) homogeneous
  - (c) unrelated
  - (d) none of the above
81. In oligopoly, when the industry is dominated by one large firm which is considered as leader of the group, Then it is called:
- (a) full oligopoly
  - (b) collusive oligopoly
  - (c) partial oligopoly
  - (d) syndicated oligopoly
82. When the products are sold through a centralized body, oligopoly is known as
- (a) organized oligopoly
  - (b) partial oligopoly
  - (c) competitive oligopoly
  - (d) syndicated oligopoly
83. When the monopolist divides the consumers into separate sub markets and charges different prices in different sub-markets it is known as
- (a) first degree of price discrimination
  - (b) second degree of price discrimination
  - (c) third degree of price discrimination
  - (d) none of the above.

84. Under \_\_\_\_\_ the monopolist will fix a price which will take away the entire consumers' surplus.
- (a) second degree of price discrimination
  - (b) first degree of price discrimination
  - (c) third degree of price discrimination
  - (d) none of the above.
85. Price discrimination is related to
- (a) time
  - (b) size of the purchase
  - (c) income
  - (d) any of the above
86. The firm and the industry are one and the same in \_\_\_\_\_
- (a) Perfect competition
  - (b) Monopolistic competition
  - (c) Duopoly
  - (d) Monopoly
87. The demand curve of a monopoly firm will be \_\_\_\_\_
- (a) Upward sloping
  - (b) Downward sloping
  - (c) Horizontal
  - (d) Vertical
88. If the average cost is higher than the average revenue then the firm incurs \_\_\_\_\_
- (a) Normal profit
  - (b) Abnormal profit
  - (c) Loss
  - (d) No profit, no loss
89. Which of the following statements is correct?
- (a) Price rigidity is an important feature of monopoly.
  - (b) Selling costs are possible under perfect competition.

- (c) Under perfect competition factors of production do not move freely as there are legal restrictions.
- (d) An industry consists of many firms.
90. Which of the following statements is incorrect?
- (a) Under monopoly there is no difference between a firm and an industry.
- (b) A monopolist may restrict the output and raise the price.
- (c) Commodities offered for sale under a perfect competition will be heterogeneous.
- (d) Product differentiation is peculiar to monopolistic competition.
91. For market the essential condition is –
- (a) A particular geographical place
- (b) Control of the government
- (c) Close contact between buyers and sellers
- (d) None of these
92. Assume that when Price is ₹ 10, the quantity demanded is 5 units and when Price is ₹ 12 the quantity demanded is 4 units. Based on this information, what is the Marginal Revenue resulting from increase in output from 4 units to 5 units.
- (a) ₹ 5
- (b) ₹ 4
- (c) ₹ 2
- (d) ₹ 3
93. Average revenue is equal to.
- (a) The change in P & Q due to a one unit change in output.
- (b) Nothing but price of one unit of output.
- (c) The change in quantity divided by change in price.
- (d) Graphically it denotes the firm's supply curve.
94. Example of a commodity said to have an International Market.
- (a) Perishable Goods.
- (b) High Value and Small Bulk Commodities.
- (c) Product whose trading is restricted by government.

- (d) Bulky Articles.
95. Weekly market is example of \_\_\_\_\_ Market:
- (a) Regulated Market
  - (b) Spot Market
  - (c) Forward Market
  - (d) Unregulated Market
96. Conditions for equilibrium of a firm are:
- (a)  $MR = MC$
  - (b)  $MC$  should cut  $MR$  from below.
  - (c)  $MR = AR$  and  $MC$  should cut  $MR$  from below.
  - (d)  $MR = MC$  and  $MC$  should have a positive slope.
97. Natural Monopoly arises when
- (a) There is enormous goodwill enjoyed by a firm.
  - (b) There are stringent legal and regulatory requirement.
  - (c) There are very large Economies of Scale.
  - (d) There are Business Combinations and Cartels.
98. Price Discrimination cannot persist under the following market form:
- (a) Perfect Competition
  - (b) Monopoly
  - (c) Monopolistic
  - (d) Oligopoly
99. Sweezy's Model explains the concept of price rigidity relating to following market form:
- (a) Oligopoly Market
  - (b) Perfect Competition Market
  - (c) Monopoly Market
  - (d) Monopolistic Market
100. Combination of Monopoly Market and Monopsony Market is called as:
- (a) Duopoly Market

- (b) *Oligopoly Market*  
 (c) *Bilateral Monopoly Market*  
 (d) *Monopolistic Market*
101. Price varies by attributes such as location or by Customer Segment is \_\_\_\_\_ degree of Price Discrimination.
- (a) *First*  
 (b) *Second*  
 (c) *Third*  
 (d) *Fourth*

## ANSWERS

1.	(c)	2.	(c)	3.	(c)	4.	(d)	5.	(c)	6.	(a)
7.	(d)	8.	(a)	9.	(b)	10.	(c)	11.	(d)	12.	(c)
13.	(b)	14.	(d)	15.	(d)	16.	(c)	17.	(c)	18.	(c)
19.	(c)	20.	(d)	21.	(d)	22.	(a)	23.	(d)	24.	(b)
25.	(a)	26.	(c)	27.	(c)	28.	(a)	29.	(b)	30.	(d)
31.	(d)	32.	(b)	33.	(b)	34.	(b)	35.	(c)	36.	(c)
37.	(b)	38.	(b)	39.	(d)	40.	(d)	41.	(d)	42.	(a)
43.	(c)	44.	(d)	45.	(c)	46.	(b)	47.	(a)	48.	(b)
49	(c)	50.	(a)	51.	(c).	52.	(d)	53.	(d)	54.	(c)
55.	(a)	56.	(d)	57.	(d)	58.	(b)	59.	(a)	60.	(b)
61.	(a)	62.	(b)	63.	(c)	64.	(a)	65.	(b)	66.	(c)
67.	(b)	68.	(a)	69.	(a)	70.	(b)	71.	(a)	72.	(b)
73.	(c)	74.	(b)	75.	(a)	76.	(c)	77.	(b)	78.	(d)
79.	(c)	80.	(b)	81.	(c)	82.	(d)	83.	(c)	84	(b)
85.	(d)	86.	(d)	87.	(b)	88.	(c)	89.	(d)	90.	(c)
91.	(c)	92	(c)	93	(b)	94	(b)	95	(d)	96	(d)
97	(c)	98	(a)	99	(a)	100	(c)	101	(c)		