

Unit- I : Market structure: Perfect competition and Monopoly, Monopolistic competition and Oligopoly

1. Explain the classification of the market structure?
2. What is a perfect competition? Explain its feature.
3. Illustrate the supply curve of a competitive firm
4. How can an industry attain short run under perfect competitions?
5. How can an industry attain long run under perfect competitions?
6. What does monopoly mean? What are the features of monopoly market?
7. What are the types / source of monopoly?
8. Explain price and output determination in the short run under monopoly.
9. Explain price and output determination in the long run under monopoly.

Q.1. Explain the classification of the market structure.

Market is a place where goods and services are bought and sold. It is the place where goods are traded in. market is classified into two major classifications. Perfect competition and Imperfect competition. Under imperfect competition monopoly, monopolistic and oligopoly market come.

1. Perfect competition:

It is a market structure where large number sellers and buyers are involved in buying and selling of goods at equilibrium price which is fixed by the industry. Good sold in this market are homogenous in nature and have no substitutes. Sellers are price takers as they sell their products at equilibrium price only. This market is hypothetical and is myth as no such market exists actually. It is based on number of hypothetical conditions like no transport cost, no advertisement cost, full knowledge of markets among buyers and sellers etc.

2. Imperfect competition:**a. Monopoly:**

it is a market structure where only single seller exists with number of buyers. The goods sold by monopolist have no close substitute so cross elasticity of demand is zero in this market. The goods sold are generally of special kind. Monopolist, being the single seller, carries price discrimination and sells the same product to many buyers at different rates. There are many types of monopoly such as legal, natural, technical, pure monopoly.

b. Monopolistic competition:

It is a market where there are many sellers and buyers who are engaged in selling and buying goods. This market is a combination of perfect competition and monopoly. Prof. Chamberlin gave term 'Group' to this market as it has independent policies still competes in the open market. No entry is restricted in this market. This market deals in differentiation goods which are not exactly identical. Selling cost is the main feature of this market as without advertisement this market cannot sustain.

C. Oligopoly:

This market structure has a few sellers and many buyers. The sellers in this market have interdependence policies and compete with each other with competitive nature. Survival is difficult in this market as competition is tough and there is reaction of each seller for other seller's action of policies. Price rigidity is the main feature of this market. Cartel is an example of such as market.

Q.2.What is perfect competition and explains its features?

Perfect competition refers to the market structure where competition among the sellers and the buyers exists in its most perfect form. In such a market, there is a single price, which is determined by the interaction of demand and supply.

- 1.**Many Sellers** : There are many sellers or firms selling a commodity in the market. Their number is so large that any single seller or firm cannot influence a given market price. So an individual seller or a **firm is a price-taker**.
- 2.**Many Buyers** : There are many actual buyers. Their number is so large that any single buyer cannot influence a given market price. This is because his individual demand is a very small fraction in the total market demand so **buyer is also a price-taker**.
- 3.**Homogeneous Products** : All firms or producers produce and sell **identical products** i.e. same in respect of size, shape, color, packaging, etc. So there is no difference in between various products, which are perfect substitutes for each other.
- 4.**Free Entry and Exit**:-There is perfect freedom for new firms or sellers to enter a market or an industry without any legal, economic, or any other type of restrictions or barriers, Likewise, the existing producers or sellers are free to leave the market.
- 5.**Perfect Knowledge**:-There is perfect knowledge on the part of the buyers and sellers regarding the market conditions especially regarding the prevailing market price and quantity of supply. So a single price would prevail (exists) for a commodity in the entire market.
- 6.**Perfect Mobility of Factors of Production**:- The factors of production are perfectly free to move from one firm to another or from one industry to another or from one region to another or from one occupation to another. This ensures freedom of entry and exit for individuals and firms.
- 7.**Transport Costs**:-It is assumed that there are **no transport costs**. The transport costs incurred by buyers and sellers to take the advantage of price changes, in a market, are ignored.

8.Non-Intervention by the Government:-It is assumed that the **government does not interfere** with the working of a market economy, i.e. it does not interfere with the economic activities in the form of controls on the supply of raw materials, tariffs, subsidies, rationing, licensing etc.

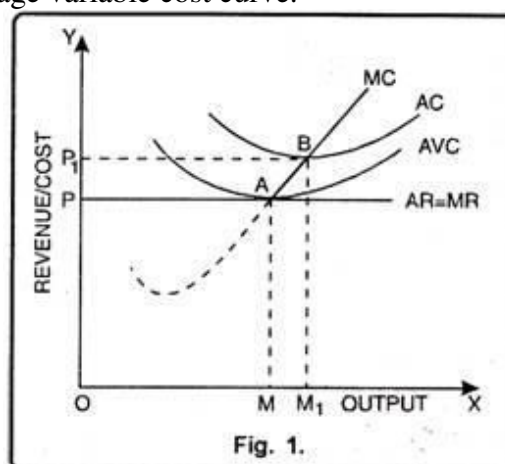
Q.3. Illustrate supply curve of a competitive firm.

Supply curve can be divided into two parts as: Short run and Long run.

A. Short Run Supply Curve of a Firm :

Short run is a period in which supply can be changed by changing only the variable factors, fixed factors remaining the same. That way, if the firm shuts down, it has to bear fixed costs. That is why in the short run, the firm will supply commodity till price is either greater or equal to average variable cost. Thus a firm will continue supplying the commodity till marginal cost is equal to price or average revenue. Under perfect competition average revenue is equal to marginal revenue, so the firm will produce up to that point where marginal revenue and marginal cost are equal.

Short run supply curve of a perfectly competitive firm is that portion of marginal cost curve which is above average variable cost curve.

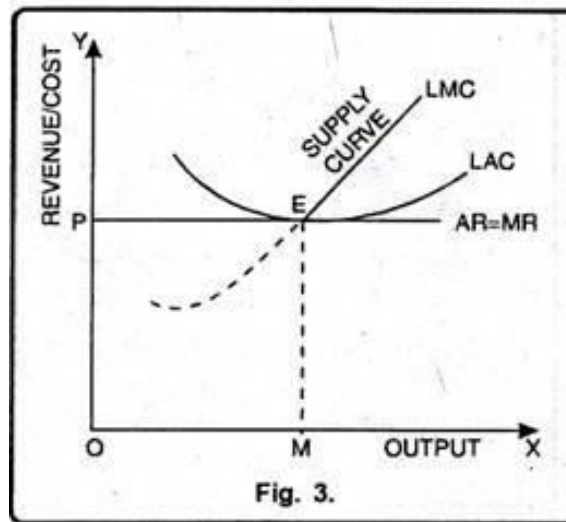


From above figure it is clear that there is no supply if price is below OP . At priceless that OP the firm will not be covering its average variable cost (AVC). At OP price OM is the supply. In this case firm's marginal revenue and marginal cost cut each other at A , OM is equilibrium output. If price goes up to OP_1 the firm will produce OM_1 output. This is firm's short run supply curve starts from A upwards i.e. line AB .

B. Long Run Supply Curve of Firm :

Long run is a period in which supply can be changed by changing all the factors of production. There is no distinction between fixed and variable factors. In the long run firm produces only at minimum average cost. In this situation long run marginal cost, marginal revenue, average revenue, and average cost are equal i.e. $LMC=LMR=LAR=LAC$.

So that position of marginal cost curve will determine the supply curve which is above the minimum average variable cost. The point where minimum average cost is equal to marginal cost is called optimum production. Thus long run supply curve of a firm is that portion of its marginal cost curve that lies above the minimum point of the average cost curve.



In the above figure firm is in equilibrium at point E where $LMR=LMC=LAR$. LAC is minimum corresponding to this point. This point E is also called point because at this point $LMR=LMC=LAR$ minimum LAC. That portion of LMC which is above E is called long run supply curve.

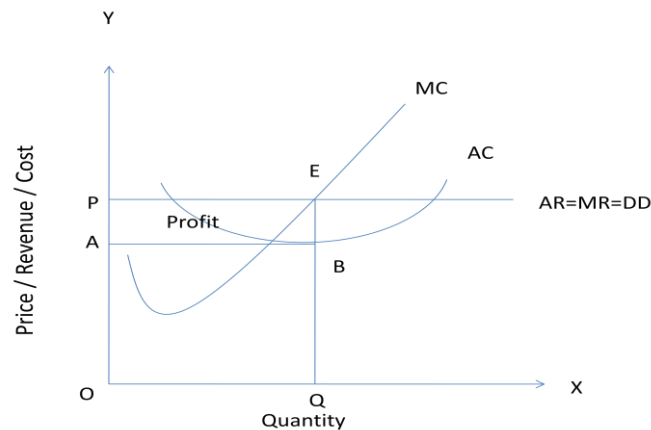
Q.4. How can an firm / industry attain Short run under perfect competitions?

Short Run equilibrium : Short-run is a period of time in which all factors of production cannot be changed. Some factor will remain fixed. In short period equilibrium following two conditions should be satisfied for the firm.

1. The Marginal Revenue (MR) is equal to Marginal Cost (MC) i.e. $MR=MC$
2. The Marginal Cost (MC) curve should cut Marginal Revenue (MR) curve from below.

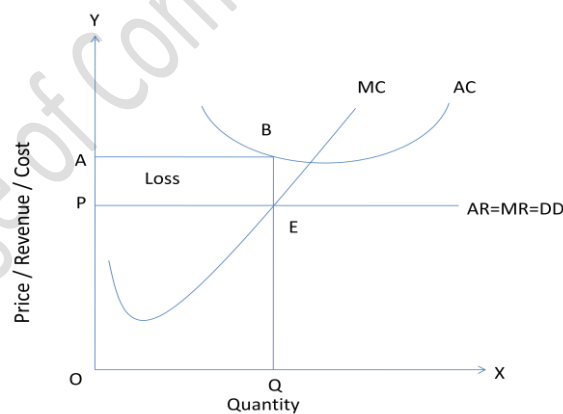
In the short run different following equilibrium position are settled down.

A. Super Normal Profit ($AR > AC$): Super normal profit is also known as Abnormal Profit. The firm is in equilibrium at point E where $MR=MC$. With OQ as the equilibrium output. OP is the price. Average Revenue is EQ and Average Cost is BQ. Therefore profit can be calculated as follow :



$$\begin{aligned}
 \text{Profit} &= \text{Total Revenue (TR)} - \text{Total Cost (TC)} \\
 \text{Total Revenue (TR)} &= \text{Average Revenue} \times \text{Quantity} \\
 &= EQ \times OQ \\
 &= \mathbf{OPEQ} \\
 \text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\
 &= BQ \times OQ \\
 &= \mathbf{OABQ} \\
 \text{Profit} &= \text{TR} - \text{TC} \\
 &= \text{Area OPEQ} - \text{Area OABQ} \\
 \mathbf{\text{Profit}} &= \mathbf{\text{Area APEB}}
 \end{aligned}$$

B. Loss (AR < AC) : When Average cost is more than Average Revenue firm makes loss. The loss of firm shown in following figure :

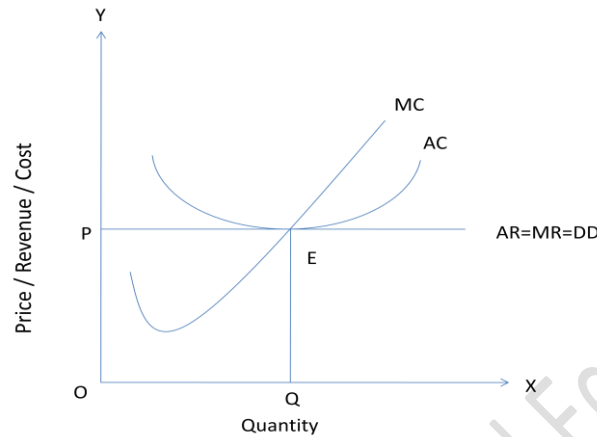


$$\text{Loss} = \text{Total Cost (TC)} - \text{Total Revenue (TR)}$$

$$\begin{aligned}
 \text{Total Revenue (TR)} &= \text{Average Revenue} \times \text{Quantity} \\
 &= EQ \times OQ \\
 &= \mathbf{OPEQ} \\
 \text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\
 &= BQ \times OQ \\
 &= \mathbf{OABQ} \\
 \text{Loss} &= \text{TC} - \text{TR} \\
 &= \text{Area OABQ} - \text{Area OPEQ} \\
 \mathbf{\text{Loss}} &= \mathbf{\text{Area PABE}}
 \end{aligned}$$

Average revenue is less than Average cost ($AR < AC$) the firm is making loss. Thus firm in above figure suffer losses which are PABE.

C. Normal Profit ($AR = AC$) : The firm at equilibrium will make normal profit if at equilibrium point $AR=AC$ i.e. AC curve is tangent to AR.



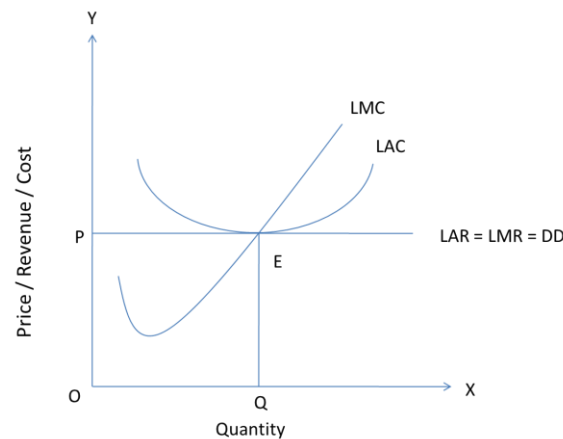
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 \text{Total Revenue (TR)} &= \text{Average Revenue} \times \text{Quantity} \\
 &= EQ \times OQ \\
 &= \text{OPEQ} \\
 \text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\
 &= EQ \times OQ \\
 &= \text{OPEQ}
 \end{aligned}$$

Hence Total Revenue (TR) = Total Cost (TC) i.e. Area OPEQ = Area OPEQ the firm is making normal profit.

Q.5. How can an firm/ industry attain long run under perfect competitions?

Long Run Equilibrium : Long run is a period on which all factors of production are variable. When some firms are earning super normal profit ($AR > AC$) in the short run it attracts large number of firms into the industry. As a result output increases resulting in fall in market price and supernormal profit will be wiped away and the normal profit will continue in the long run.

When some firm suffers losses ($AR < AC$) in the short run they start leaving industry in the long run. Reduction in the number of firms leads to contraction of industry's output. As a result price increases and due to this all losses will be wiped away and only normal profit will continue in the long run.



In long run the firm is in equilibrium at the point where the $LMC = LMR$ at the same time $LAC = LAR$. If it is assumed that all the firms are facing the similar cost conditions all the firms are in equilibrium at the point where all will earn only normal profit with $LAC = LMC = LAR = LMR$

Q.6. What does monopoly mean? What are the features of monopoly market?

The word 'Monopoly' is derived from two words 'Mono' which means single and 'Poly' which means sellers. Hence monopoly is a market situation in which there is one seller of product who controls the entire market supply'

1. **Single producer or seller:** Monopoly is the market structure where only one seller is involved in business activities. He has full control over his business. He is the sole authority to take decision regarding production and pricing policies.
2. **No Distinction between Firm and the industry:** In this market there is no distinction between firm and industry as it is featured with one seller. There are no competitors. So the distinction between firm and industry disappears.
3. **No close substitute:** Monopoly market does not face competition there is no close substitute available for his product. The monopolist produces all the output in a market.
4. **Absence of competition:** There is no competition for monopoly. So the product sold by monopolist has no substitute or complementary product. **Cross elasticity of demand is zero in monopoly market.**
5. **Price maker:** Monopoly is a price maker being having control over his business. He does carry price discrimination by charging various prices to different consumers.
6. **Complete control :** Monopoly has complete control over the production and market supply. Decision about production is the sole decision of his. Entry to new firms are restricted.
7. **Downward Sloping demand curve :** Monopolist faces a downward sloping demand curve which indicates that it can sell more at a lower price.

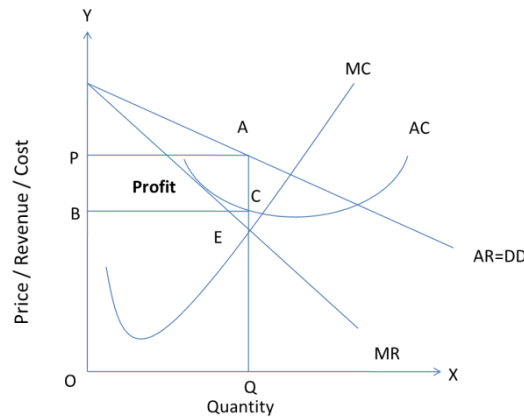
Q.7. Explain the types/ Sources of Monopoly in brief.

1. **Pure/ Perfect Monopoly** : A Pure or perfect monopoly is one, which has no close substitutes. Such type of monopoly is very rare.
2. **Imperfect Monopoly** : Imperfect monopoly is one, which has remote substitute in the market. Such type of monopoly is very common.
3. **Legal Monopoly** : Legal monopoly exists due to some statutory regulations like Patents, Trademarks, copyrights etc.
4. **Natural Monopoly** : Natural monopoly arises as a result of natural advantages like good location, minerals, Natural resources, goodwill etc. E.g Tea of Assam
5. **Technological Monopoly** : It arises because of some technological advantages like use of capital goods, new methods of production etc.
6. **Joint Monopoly** : When many firms come together and form associations like pools, cartels, syndicates etc. it is termed as Joint Monopoly. They come together for mutual cooperation and carrying joint business.
7. **Public Monopoly** : When the production of goods and services are fully owned and controlled by the Govt. it is termed as Public Monopoly. However the main aim of the government is not to earn profits but to provide services. Hence they are also termed as Welfare monopolies. For e.g Indian Railways, M.S.E.B etc.
8. **Private Monopoly** : When the production is owned, managed & controlled by the private entrepreneurs, it is termed as the Private monopolies. The aim of such monopoly is to earn maximum profits.
9. **Simple Monopoly** : A Simple Monopoly charges uniform price (single price) to all customers. Monopolist cannot set a price to maximize his profit. It is termed as Simple Monopoly.
10. **Discriminating Monopoly** : Discriminating Monopoly charges different prices to different customers for the same products or service. For e.g M.S.E.B charges lower rate for domestic consumption and higher rate for commercial consumption.

Q.8. Explain price and output determination in the short run under monopoly.

Short Run Equilibrium :

1. **Super Normal Profit** : If the Average Revenue (AR) is greater than Average Cost (AC) ($AR > AC$) the monopoly firm will earn supernormal profit. Profit of monopolist is shown in following diagram.



$$\text{Profit} = \text{Total Revenue (TR)} - \text{Total Cost (TC)}$$

$$\begin{aligned}\text{Total Revenue (TR)} &= \text{Average Revenue} \times \text{Quantity} \\ &= AQ \times OQ \\ &= \text{OPAQ}\end{aligned}$$

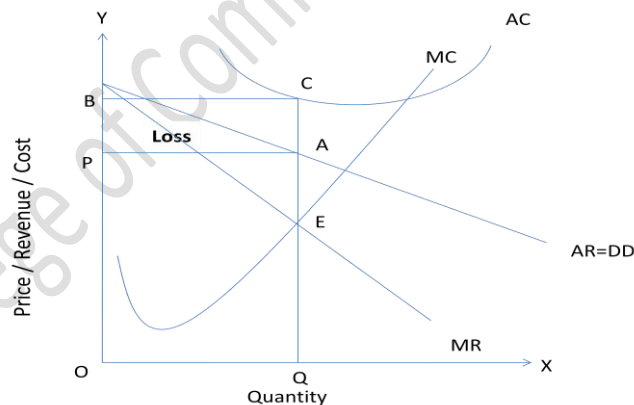
$$\begin{aligned}\text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\ &= CQ \times OQ \\ &= \text{OBCQ}\end{aligned}$$

$$\begin{aligned}\text{Profit} &= \text{TR} - \text{TC} \\ &= \text{Area OPAQ} - \text{Area OBCQ}\end{aligned}$$

$$\text{Profit} = \text{Area BPAC}$$

Hence the monopolist enjoys supernormal profit of BPAC and this is also as monopoly profit.

2.Losses : If the Average Revenue (AR) is less than Average Cost (AC) ($AR < AC$) the monopoly firm will suffer from losses. Loss of monopolist is shown in following diagram.



$$\text{Loss} = \text{Total Cost (TC)} - \text{Total Revenue (TR)}$$

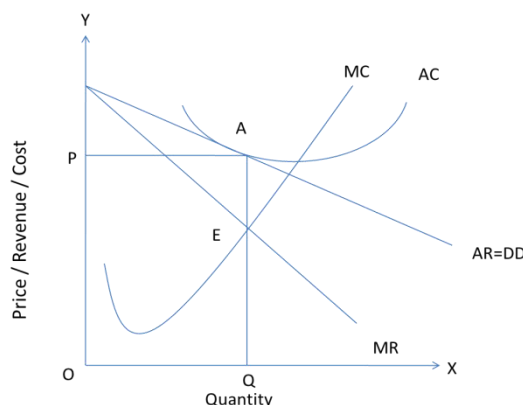
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$$\begin{aligned}\text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\ &= CQ \times OQ \\ &= \text{OBCQ}\end{aligned}$$

$$\begin{aligned}\text{Loss} &= \text{TC} - \text{TR} \\ &= \text{Area OBCQ} - \text{Area OPAQ}\end{aligned}$$

$$\text{Profit} = \text{Area PBCA}$$

- 3. Normal Profit :** The monopoly firm at equilibrium will make normal profit if at equilibrium point $AR=AC$ i.e. AC curve is tangent to AR.



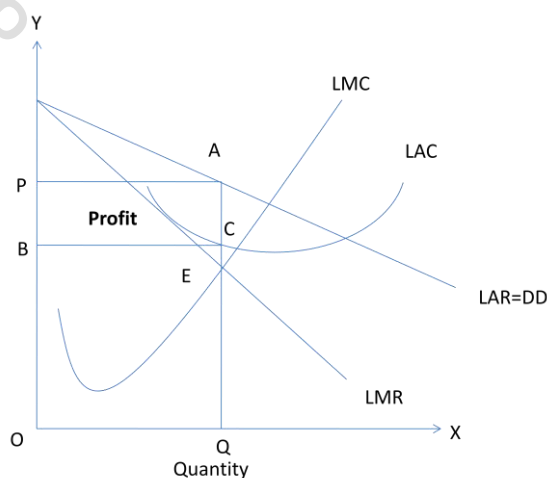
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$$\begin{aligned}\text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\ &= AQ \times OQ \\ &= \text{OPAQ}\end{aligned}$$

Monopoly firm in short run may also earn normal profit if SAC is tangent to the AR at equilibrium point (E). If in short run monopolist firm earn normal profit monopolist will not produce the output. Monopolist always wants supernormal profit.

Q.9. Explain price and output determination in the long run under monopoly.

Long Run Equilibrium : Monopoly is associated with profits and it is called monopoly profit. This applies to the long run equilibrium under monopoly. The monopolist will always make profit in the long run where monopolist is not under pressure to operate on the existing plant scale.



Above diagram shows the profit of monopolist in long run. Monopolist produced and sold OQ quantity at price OP. For this output long run average cost (LAC) is CQ and total cost is OBCQ while total revenue OPAQ. In long run monopolist earn profit area BPAC.

Unit II. : Market structure: Pricing and Output Decisions under imperfect completion.

1. Explain features / characteristics of monopolistic competitions.
2. Explain the short run equilibrium of a firm under monopolistic competitions.
3. Explain the long run equilibrium of a firm under monopolistic competitions.
4. Discuss the role of advertising in monopolistic competition.
5. Explain the features of the oligopoly in brief
6. Explain the Price and Output Determination Under collusive oligopoly market. / Illustrate Cartel in the model oligopoly.
7. Explain the Paul Sweezy model of price rigidity. / Explain the kinked Demand Curve Model.
8. Explain the types of Price Leadership.
9. Distinguish between perfect competitions and monopolistic competitions.
10. Distinguish between Monopoly and monopolistic competitions.

Q.1. What are the features / characteristics of monopolistic competition?

Monopolistic competition was introduced by Prof. E.H. Chamberlin and Prof. Mrs. Joan Robinson. Monopolistic competition is the **type of market structure where there exist monopoly on one side and perfect competition on other side**. Simply we can also say that it is a mixture of monopoly and perfect competition.

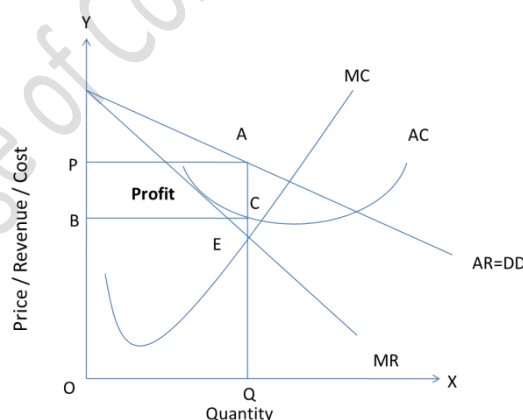
- 1.Large number of firm :** In a Monopolistic competition there is **relatively large number of firms** each satisfying a small share of the market demand for the product. As there are large number of firms there exists stiff competition between them. But the size of the firm will be relatively small.
- 2.Product Differentiation :** In a Monopolistic competition the products produced by various firms are not identical but **slightly different from each other**, which means the products are not same but are similar and hence their prices are not much different. They are close substitutes of each other.
- 3.Selling Cost :** Firms in Monopolistic competition incur expenditure to promote sales, which is called as 'Selling Cost'. **Selling cost is incurred in the form of advertisement** like on T.V., Radio, Press, Exhibitions, free samples etc. Selling cost tries to influence consumers demand and promote sales.

- 4.Free entry and exist :** In a Monopolistic competition it is easy for the new firms to enter and the existing firm to leave it. Free entry means that when in the industry existing firms are making supernormal profit new firms enter in the industry and the losses will compel them to leave the industry or group.
- 5.Absence of Interdependence :** Under Monopolistic competition firms are large but not their size. They are too small. It means every firm has its own policies like production, output, price policy etc. Thus **the policy of an individual firm cannot influence the policy of other firms** which means all firms are independent but not interdependent.
- 6.Concept of Group :** In Monopolistic Competition the word 'industry' loses its significance as **Prof. Chamberlin has used the word 'Group'** which means number of producers whose goods are fairly close substitutes.
- 7.Nature of Demand Curve :-**In a Monopolistic competition the demand curve slopes downward from left to right, which an individual firms can sell more by lowering price. **DD curve of monopolistic always slopes negatively.**

Q.2. Explain the Short Run Equilibrium under Monopoly Market.

A firm under monopolistic completion faces three situations i.e. supernormal profit, loss, and normal profit.

- 1. Super Normal Profit :** If the Average Revenue (AR) is greater than Average Cost (AC) ($AR > AC$) the monopoly firm will earn supernormal profit. Profit of monopolistic firm is shown in following diagram.



$$\text{Profit} = \text{Total Revenue (TR)} - \text{Total Cost (TC)}$$

$$\text{Total Revenue (TR)} = \text{Average Revenue} \times \text{Quantity}$$

$$= AQ \times OQ = \text{Area OPAQ}$$

$$\text{Total Cost (TC)} = \text{Average Cost} \times \text{Output}$$

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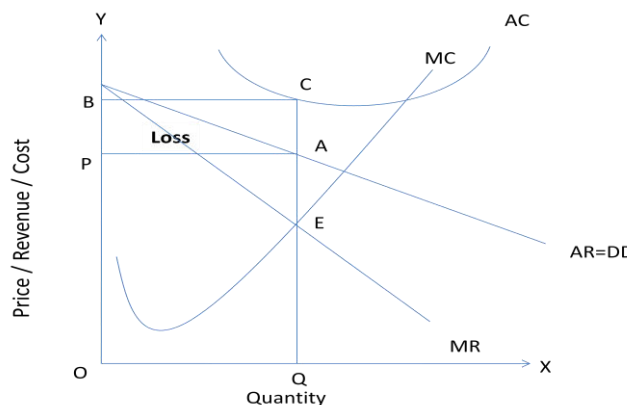
$$\text{Profit} = \text{TR} - \text{TC}$$

$$= \text{Area OPAQ} - \text{Area OBCQ}$$

$$\text{Profit} = \text{Area BPAC}$$

Hence the monopolist enjoys supernormal profit of BPAC and this is also as monopoly profit.

2. Losses : If the Average Revenue (AR) is less than Average Cost (AC) ($AR < AC$) the monopoly firm will suffer from losses. Loss of monopolistic firm is shown in following diagram.



$$\text{Loss} = \text{Total Cost (TC)} - \text{Total Revenue (TR)}$$

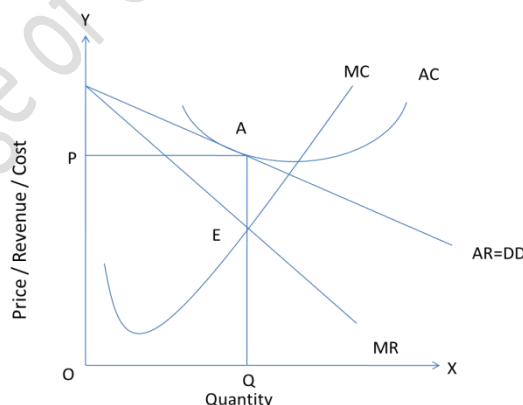
$$\begin{aligned} \text{Total Revenue (TR)} &= \text{Average Revenue} \times \text{Quantity} \\ &= AQ \times OQ \\ &= \text{Area OPAQ} \end{aligned}$$

$$\begin{aligned} \text{Total Cost (TC)} &= \text{Average Cost} \times \text{Output} \\ &= CQ \times OQ \\ &= \text{Area OBCQ} \end{aligned}$$

$$\begin{aligned} \text{Loss} &= \text{TC} - \text{TR} \\ &= \text{Area OPAQ} - \text{Area OBCQ} \end{aligned}$$

$$\text{Profit} = \text{Area PBCA}$$

4. Normal Profit : The monopolistic firm at equilibrium will make normal profit if at equilibrium point $AR=AC$ i.e. AC curve is tangent to AR.



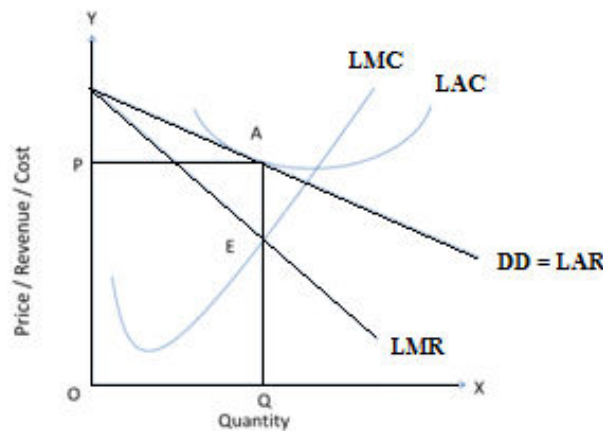
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Monopolistic firm in short run may also earn normal profit if SAC is tangent to the AR at equilibrium point (E). If in short run monopolist firm earn normal profit monopolist will not produce the output. Monopolist always wants supernormal profit.

Q.3. Explain the Long Run Equilibrium under Monopolistic competition.

In long run firms working under monopolistic completion earn only normal profits. The equilibrium of a firm under monopolistic completion is shown in the figure below.



Above diagram shows the normal profit of monopolistic firm in long run. Monopolistic firm produced and sold OQ quantity at price OP. For this output long run average cost (LAC) is AQ and total cost is OQAP while total revenue OQAP. In long run monopolist earn profit area BPAC.

Q.4. Discuss the role of advertising in monopolistic competition.

A monopolistic firm produces close substitute products and therefore each firm in order to attract consumers towards their product and increase their market share invests heavily on advertisement. It may result in increase in profits. Firms that sell highly differentiated consumer goods such as perfumes, soft drinks etc. spend between 10 to 20 % of revenue on advertising.

Debate over role of advertising in monopolistic completion.

The Critique of Advertising : It is criticized that firms advertise in order to influence consumer's tastes. Much advertising is psychological rather than informational.

Example. Advertisement of a brand of wrist watch. The advertisement shown in newspaper and television does not tell the viewer about the price or quality of product. Instead it might show a group of youngsters wearing the watch in their friends groups and they make impression on others. The goal of the advertisement is to convey a subconscious message "You too can impress others and be happy, if only you wear our product" Critics say that such advertisements create a desire in the consumers unnecessary and increase the competition in the market.

The Defence of Advertising : Defenders of advertisement say that firms use advertising to provide information to consumers. Advertising also conveys the message about price of product, location of store etc. which is convenient to consumer.

Advertising makes consumers more fully informed about product and firm. In addition advertisement allows new firms to enter more easily because advertisement gives entrants a way to attract customers from competitors.

Q.5. Explain the features of the oligopoly in brief.

Oligopoly is a market situation where there are only few sellers in a given line at production. **Mr. Feller defines Oligopoly as “Competition among the few”.** In this type of market the firm may be producing either homogeneous products or may be having product differentiation in the given line of production.

Features:-

- 1. Few Sellers:-**Under Oligopoly there are few sellers producing or supplying either homogeneous products or differentiated products.
- 2. Interdependence:-**The firms have a high degree of interdependence in their business policies about fixing of price and determination of output.
- 3. Advertisement & selling cost :-**Advertisement and selling cost have strategic importance to the firms under oligopoly. Each firm tries to attract maximum number of consumers towards its products by spending huge amount of money on advertisement and publicity.
- 4. High Cross elasticity's of demand:-**Under Oligopoly the firms have a high degree of cross elasticity's of demand. So there is always a fear of retaliation by the rivals. For e.g. if coke reduces its price by 2 Rs. Pepsi may retaliate by reducing its price by 3 Rs.
- 5. Constant Struggle:-**Competition is of unique type in a Oligopolistic market. Here competition consists of constant struggle of rivals against rivals (competitors).
- 6. Lack of Uniformity:-**In Oligopoly the size of the firms are not uniform. Some firms are very big in size and some firms are very small in size. Uneven sizes of firms are found in this market.
- 7. Price Rigidity:-**In Oligopoly market each firm sticks to its own price. This is because it is in constant fear of retaliation by the rivals if it reduces the price.
- 8. Kinked Demand Curve:-**According to Mr. Paul Sweezy firm is an Oligopolistic market have Kinky demand curve. This is because when a firm changes its price the other firms also change their price. Hence the demand curve of an Oligopolistic is not definite it goes on changing.

Three Important Models of Oligopoly are as :

- (1) Price and output determination under collusive oligopoly.
- (2) Price and output determination under non-collusive oligopoly.
- (3) Price leadership model.

Q.6. Explain the Price and Output Determination Under collusive oligopoly market. / Illustrate Cartel in the model oligopoly.

Collusive Oligopoly : The term '*collusion*' implies to 'play together'. When firms under oligopoly agree formally not to compete with each other about price or output, it is called *collusive oligopoly*. The firms may agree on setting output quota, or fix prices or limit

product promotion or agree not to 'poach' in each other's market. The completing firms thus form a 'cartel'. The members of firms behave as if they are a single firm.

There are two forms of cartel:

1. Cartel aiming at joint profit maximization

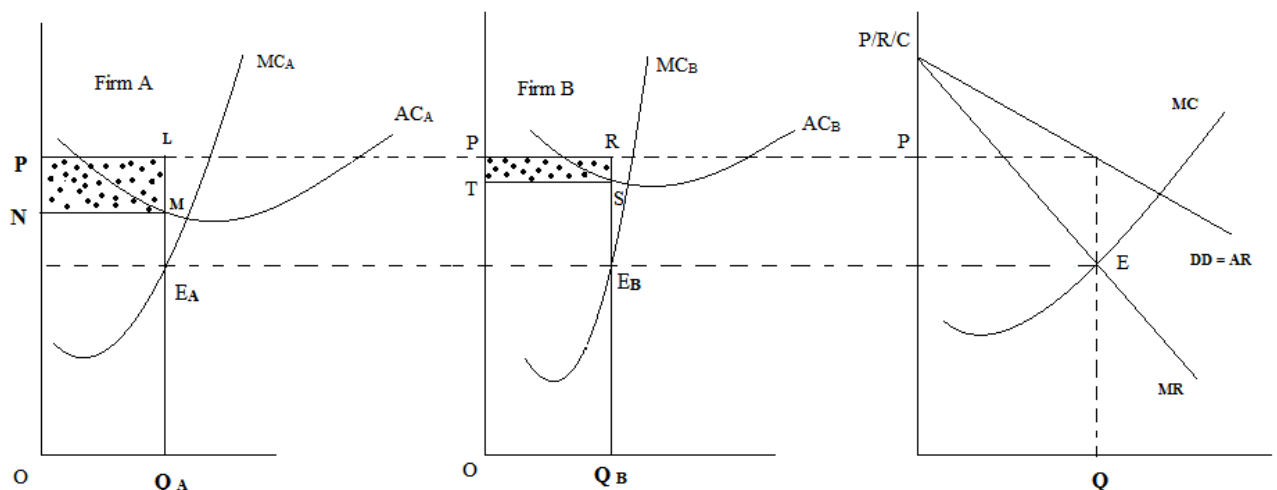
2. Cartel aiming at sharing of the market

Each of the form of the model is discussed below :

1. Cartel aiming at joint profit maximization :

In this form of cartel the aim is to maximize joint industry profits. A **central administrative agency decides total quantity to be produce, price, allocation of output among each firm and distribution of profit** among each firm.

In order to maximize joint profits central agency will apply marginal list rule i.e. equate industry marginal cost and industry marginal revenue curve.



In above figure the industry demand curve DD consisting of two firms. Marginal cost curve (MC) is obtained by the horizontal summation of MC_A and MC_B. So the MR curve and MC curve which are identical. The cartel's MR curve intersects the MC curve at point E. Profits are maximized at output OQ, where MC = MR. The cartel will set a price OP, at which OQ, output will be produced and demanded.

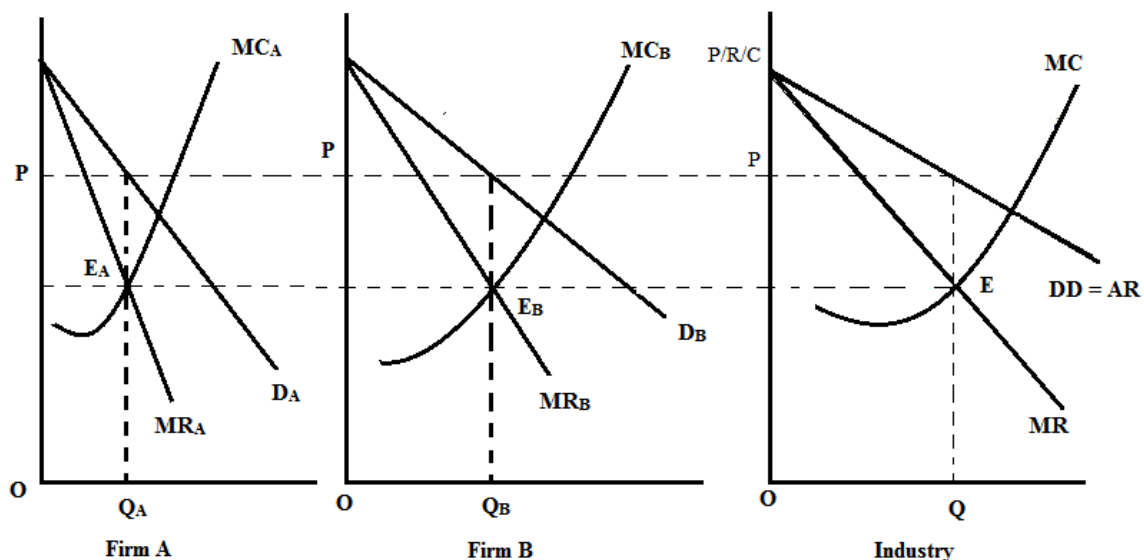
Once the allocation is done in such a way that the marginal cost of each firm is equal, i.e. MC_A = MC_B = MR. The total output produced by firm A and B would be determined points E_A and E_B respectively. Thus firm A produce OQ_A and firm B produce OQ_B level of output. Therefore total output is the sum of individual output of A and B i.e. OQ = OQ_A + OQ_B.

It is considered that firm A is low cost firm then firm A makes profits equal to PNML while firm B makes profit PRST. The maximum joint profit is obtained by summing the individual profit of the firm.

2. Cartel aiming at sharing of the market :

In this form of cartel members firms agree not only to a **common price but also agree on the quantity** which they can sell in the market.

If there is are only two firms in the cartel each firm will sell half of the total market demand at that price. The quotas of market share are decided by bargaining between the firms. This is graphically shown below.



Consider two firms A and B form a cartel in industry. DD is the market demand curve and MR is the corresponding marginal revenue curve. MC curve obtained by the horizontal summation of MC_A and MC_B . at the equilibrium point E, where $MC=MR$ the cartel will achieve maximum profits. The total equilibrium output will be OQ and price OP.

The total output of firm A will be OQ_A and of firm B will be OQ_B . Thus total output in the industry will be,

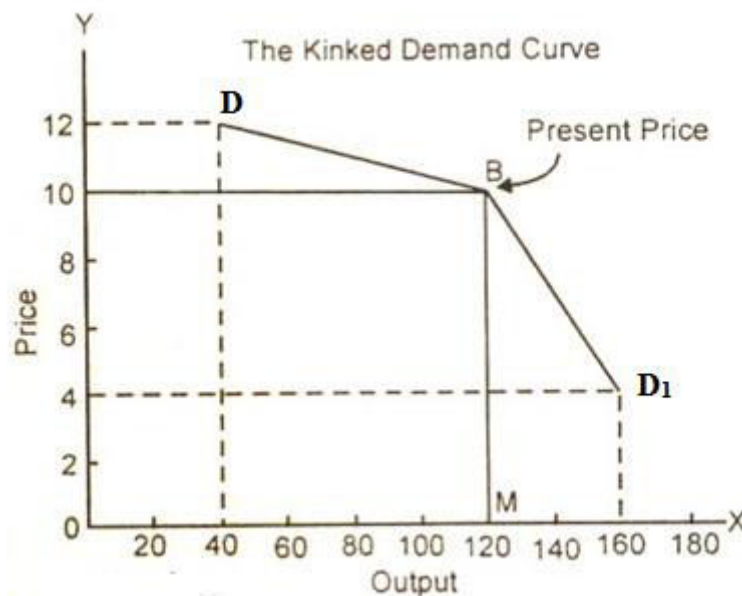
$$OQ = OQ_A + OQ_B$$

The total output OQ is obtained by drawing a line parallel to X- axis from point E that intersect MC_A at point E_A and MC_B at point E_B . Thus each firm sells output at monopoly price OP. This is called as market sharing cartel.

Q.7. Explain the Paul Sweezy model of price rigidity. / Explain the kinked Demand Curve Model.

The *Kinked demand curve* model was developed by Paul Sweezy (1939). According to him, the firms under oligopoly try to avoid any activity which could lead to price wars among them. The firms mostly make efforts to operate in non price competition for increasing their respective shares of the market and their profit. An analytical device which is used to explain the oligopolistic price rigidity is the Kinked Demand Curve.

Mr. Paul Sweezy used two demand curve concepts to explain the model. These are reproduced below:

Diagram:

In the above diagram DD is a kinked demand curve. It is made up of two segments DB and BD. The demand curve is kinked or has a bend at point B. The kink is formed at the prevailing market price level BM (10). The segment of the demand curve above the prevailing price level is highly elastic (DB) and the segment of the demand curve below the prevailing price level is fairly inelastic (BD₁). This is explained now in brief.

Explanation:

Price increase. If an oligopolistic raises the price of his products from 10 per unit to 12 per unit, he loses a large part of the market and his sale comes down to 40 units from 120 units. There is a loss of 80 units in sale as most of his customers are now purchasing goods from his competitor firms who are selling the goods at 10 per units. So an increase in price above the prevailing level-shows that the demand curve to the left of and above point B is fairly elastic.

Price reduction. If an oligopolistic reduces the prices of its goods below the prevailing price level BM (10 per unit) for increasing his sales, his competitors will also match price changes so that their customers do not go away from them. Let us assume that Oligopolist has lowered the price to 4 per unit. Its competitors in the industry match the price cut. The sale of the oligopolist with a big price cut of 6 per unit has increased by only 40 units ($160 - 120 = 40$). The firm does not gain as the total revenue decreases with the price cut. The BD portion of the demand curve which lies on the right side and below point B is fairly inelastic.

Rigid Prices. The firms in the oligopolist market have no incentive to raise or lower the prices of the goods. They prefer to sell the goods at the prevailing price level due to reaction function. The price BM (10 per unit) will, therefore, tend to remain stable or rigid, as every member of the oligopoly does not see any gain by lowering or raising the price of his goods.

8. Explain the types of Price Leadership.

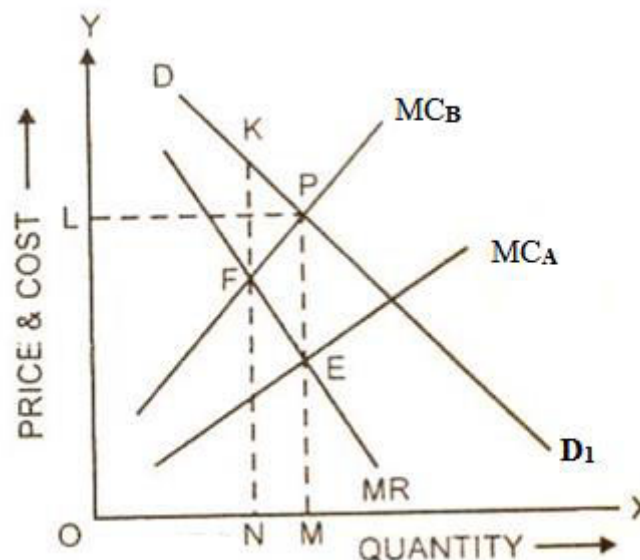
Price leadership is a form of collusion in which one firm sets the price and other firms in the market follow it. Hence it is called as price leadership.

Assumptions:

- (a) There are two firms A and B in the market.
- (b) The output produced by the two firms is homogeneous.
- (c) The firm 'A' being the low cost firm or a dominant firm acts as a leader firm.
- (d) Both of the firms face the same demand curve.
- (e) Each of the two firms has an equal share in the market.

The price and output determination under price leadership is now explained with the help of the diagram below.

Diagram:



In above figure DD_1 is the demand curve which is faced by each of the two firms. MR is the marginal revenue curve of each firm. MC_A is the marginal cost of firm A and MC_B is the marginal cost of firm B. It is assumed that the firm A is a low cost firm than firm B. As such the MC_A lies below MC_B .

The leader firm using the marginalistic rule of $MC = MR$ is in equilibrium at point E. The firm A maximizes profits by selling output OM and setting price MP . The firm B is in equilibrium at point F where $MC_B = MR$. The firm B maximizes profits by producing ON output and selling it at NK price. The firm B has to compete firm A in the market, if the firm B fixes the price NK per unit, it will not be able to compete with firm A which is selling goods at MP price per unit.

Hence, the firm B will be compelled to follow the leader firm A. The firm B will also charge MP price per unit as set by the firm A. The firm B will also produce QM output like

the firm A. Thus both the firms will charge the same price MP and sell each of them OM output. The total output will thus be twice of OM.

The firm A being the low cost firm will maximize profits by selling OM output at MP price. The profits of the firm B is lower than of firm A because its costs of production is higher than of firm A.

Q.9. Distinguish between perfect competitions and monopolistic competitions.

Q.10. Distinguish between Monopoly and monopolistic competitions.

MARKETS STRUCTURE

	Perfect Competition	Monopoly	Monopolistic competition	Oligopoly
Numbers	Large sellers and large buyers	Single seller and large buyers	Many sellers and many buyers	A few sellers and large buyers
Product	Homogeneous	Particular or specialist	Heterogeneous	Homogeneous or heterogeneous
price	Equilibrium price(fixed by industry where Demand =Supply)	Price discrimination	Independent pricing policy	Interdependent pricing policy
Seller	A price taker	A price maker	A price dictator	Price imitator
Demand curve	Horizontal to X axis	Slopes downward (Steeper)	Slopes downward(Flatter)	Kink demand curve(Price Rigidity)
Known as	Perfect competition	Imperfect competition	Imperfect competition	Imperfect competition
existence	It is unreal market	It is restricted	It is in existence	It is existence
Entry and exit	Free entry and exit	No entry	Free entry and exit	Entry prohibited
Special feature	Assumption based	Remote competitors	Group concept (Chamberlin)	Price rigidity (to stop competitors)
Substitutes	Number of	No substitute	Number of	A few

Module – III

Pricing and Market failure

Q1. What is meant by full-cost pricing? Analyze the merits and demerits of full cost pricing.

Q.2. Explain the Markup pricing / Cost Plus Pricing.

Q. 3. Explain the Marginal Cost Pricing .

Q.4. Define Price Discrimination with its types.

Q.5. Discuss the various degrees of price discrimination?

Q.6. How is the transfer price of an intermediate product determined?

Q.7. What is Multiple Product Pricing?

Q.1. What is meant by full-cost pricing? Analyze the merits and demerits of full cost pricing.

Full cost pricing (Cost plus pricing) is a price setting method under which the direct material cost, direct labour cost, selling and administrative cost and overheads costs for a product are added together and a markup percentage is added to it in order to derive the price of the product.

The pricing formula is :

$$\text{Full Cost Price} = \frac{\text{Total production cost} + \text{Selling and adminisation cost} + \text{Markup}}{\text{Number of units expected to sell}}$$

AB C International expects to incur the following costs in its business in the upcoming year :

Total Production Cost : Rs.2,500,000

Total Sales and administration costs = Rs.1,000,000

The company wants to earn a profit of Rs.100,000 during that time. Also ABC expects to sell 200,000 units of its product. Based on this calculate the price by using full cost pricing method.

$$\text{Full Cost Price} = \frac{2,500,000 + 1,000,000 + 100,000}{200,000}$$

Full Cost price = Rs.18 price per unit

Advantages:

- i. It is simple to derive as the cost of production records are there
- ii. It considers the likely profit and added

iii. It can be increased and justified when cost of production increases

Demerits:

- i. This *price* varies from seller to seller and it is not uniform
- ii. It does not consider price elasticity of demand while pricing
- iii. It is estimated so can be incorrect too.

Q.2. Explain the Markup pricing / Cost Plus Pricing .

In this method a standard markup or profit margin is added to the product costs. Markup is the difference between the cost of a product or service and its selling price and is often expresses as a percentage.

Example : XYZ company Ltd. Expects annual sales of 1,00,000 units and variable cost per unit is Rs.10. Fixed Cost is RS 5,00,000. Company wishes to earn 20% markup on selling price or 25 % on cost.

$$\text{Cost Per unit} = \text{Variable Cost} + \frac{\text{Fixed Cost}}{\text{Unit Cost}}$$

$$\text{Cost Per unit} = 10 + \frac{500000}{100000}$$

$$\text{Cost Per unit} = \text{RS } 15$$

Now company wants 20% markup on selling price

$$\text{Selling Price} = \frac{\text{Unit Cost}}{(1 - \text{Desireed mark up})}$$

$$\text{Selling Price} = \frac{\text{Unit Cost}}{(1 - 20\%)}$$

$$\text{Selling Price} = \frac{\text{Unit Cost}}{(1 - 0.2)}$$

$$\text{Selling Price} = \frac{15}{(0.8)}$$

$$\text{Selling Price} = \text{Rs. } 18.75$$

Company wants 25% markup on unit cost,

$$\text{Selling Price} = \text{Unit costs} + (15 \times 25\%)$$

$$\text{Selling Price} = 15 \times 3.75$$

$$\text{Selling Price} = 18.75$$

Advantages of markup pricing

1. It recovers costs as rapidly as possible.
2. It is simple method to practice.
3. It is for buyers and sellers.

Disadvantages.

1. It ignores current demand.
2. It ignores consumers perception of price.
3. it is difficult to estimate exact sales.
4. It does not consider competition.

Q. 3. Explain the Marginal Cost Pricing .

Under this pricing fixed costs are ignored and pricing is determined on the basis of marginal costs, it is the cost of the additional unit of a product. It is the price determined on the basis of marginal or variable costs. Under marginal pricing price is set equal to the marginal cost. This approach typically relates to short-term price setting situations.

Advantages of marginal cost pricing :

- 1. Add profits :** Some customers are price sensitive. Thus such group of customers will buy products from a company that follows marginal cost pricing.
- 2. Market entrance :** A company can use this pricing method if it is willing to sacrifice profit in short run and gain entry in to market.
- 3. Accessory sales :** If customers are willing to buy product accessories at strong margin then company uses marginal cost pricing to sell a product on an ongoing basis and then earn profits from the later sales.

Disadvantages of Marginal cost pricing method :

- 1. Long Term pricing :** This method is not suitable for long term price setting because it results in prices that do not include a company fixed expenses.
- 2. Ignore market prices :** Companies that use this method have to give away an big amount of margin that it would have earned if it had set price near market price.
- 3. Customer Loss :** A company using this method if is willing to change the pricing method find it difficult to change because the customers have become used to the marginal prices set by the company.

Q4. Define Price Discrimination with its types.

Price discrimination refers to a situation in which a monopolist charges different prices for different unit of same commodity purchased by the buyer during a period of time. According to Mrs. Joan Robinson Price discrimination refers to the act of selling the same articles, produced under a single control at different prices to different buyer.

1) Personal Discrimination:- A Monopolist may charge different prices to different buyers of the same products or service depending upon the capacity to pay. For E.g – A Doctor may charge higher fees from a Rich patient and lower fees from Poor patient.

2) Use of Discrimination: - Monopolist may charge different price depending on the use of the product. For E.g. – M.S.E.B charges higher rate for commercial consumption and lower rate for domestic consumption.

3) Trade Discrimination/ based on the nature of commodities:- Discrimination may be used based on the nature of commodities. For E.g.- Indian Railways may collect lower freight for goods like medicines, which are necessities, and higher freight for luxury goods.

4) Based on quality of services and comforts:- In this case discrimination is based on quality of services and comforts. For E.g.-Indian Railways may charge higher fare for 1st class and lower fare for 2nd class.

5) Territorial /Local / Regional Discrimination:- In this case discrimination is done on the basis of Geographical area. For E.g. Telephone companies may charge a lower rate for local calls and higher rates for S.T.D or I.S.D calls.

6) Based on time:- In this case time is used as the basis of discrimination. For E.g.MTNL charges Telephone calls at full rate from 7am. to 7pm. half rate from 7pm. to 10 pm. and quarter rate from 10 pm. to 7am.

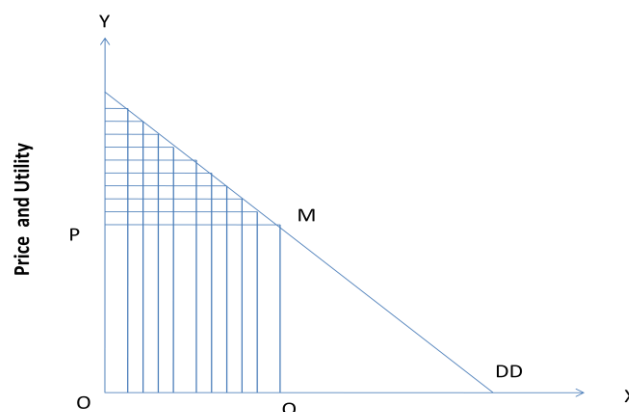
7) Discrimination based on Age:- In this case Age is used as the basis of discrimination. For E.g – Half Ticket and Full Ticket

Q.5. Discuss the various degrees of price discrimination?

Prof. Pigou has described 3 degrees of Price Discrimination in his economics of welfare. They are discussed as under :-

1. First degree Price Discrimination :-

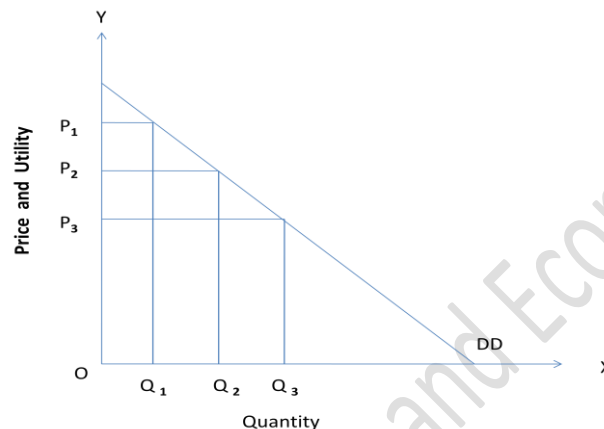
In the first degree it is also known as Perfect price discrimination. Price discrimination of the first degree is said to occur when the monopolist **charges different prices to different buyers** for each different unit of the same product. The price charged for each unit is set in accordance with the marginal utility and thus what price a buyer is prepared to pay for it. The entire consumer's surplus is converted into monopolist revenue and profit.



In diagram it can be observed that the seller is charging different units of a commodity. There is no consumer surplus since the price charged will be equal to marginal utility and thus there is no consumer surplus.

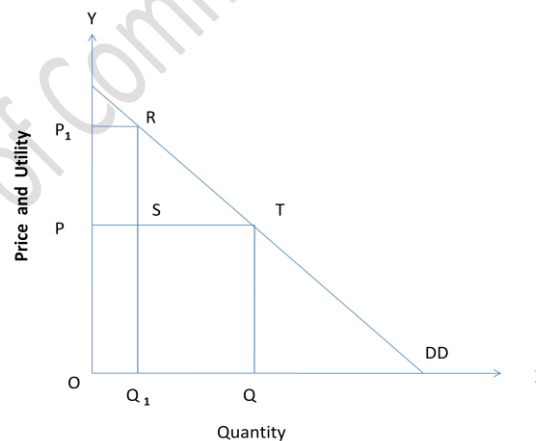
2. Second degree Price Discrimination:-

The Second degree of Price discrimination works by charging different prices for different quantities or “blocks” of the same goods or service. In this, the monopolist takes away only a part consumer’s surplus. The units in particular block will be uniformly priced as shown below.



3. Third degree Price Discrimination:-

It is the most common type of price discrimination in which the firm divides its total output into many sub markets and sets different prices in each market in relation to the demand elasticity’s.



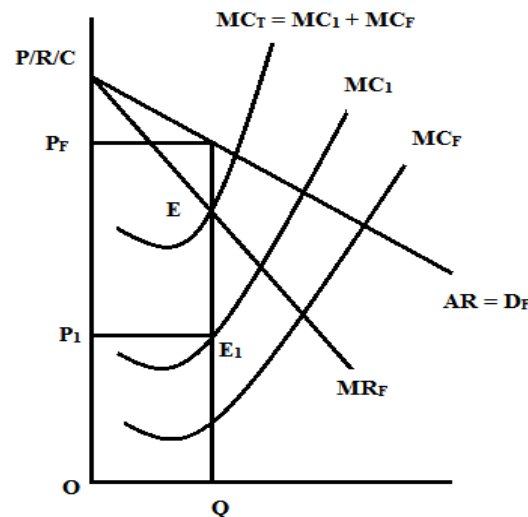
At price OP monopolist earn total revenue is OQ. If the seller increased the price to OP_1 selling OQ_1 output. The monopolist will be earning extra revenue shown by the area PSRP1. In this manner monopolist will maximize his profit.

Q.6. How is the transfer price of an intermediate product determined ?

The firm may produce intermediate goods and final products. Accordingly firm have to fixed the prices of both intermediate goods and final products. Transfer pricing refers to the pricing of the intermediate products.

A. Transfer pricing without external market :

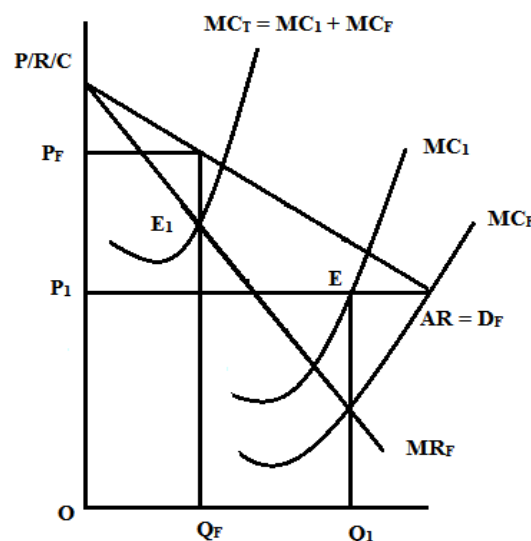
When there is no external market the firm will face the problem of fixing price of the intermediate products produced by the division and the firm uses the entire output. In this case the intermediate product division produces exactly what the final product division requires since it cannot sale any excess amount produced in the external market. Therefore price is to be properly fixed by the management so as to maximize profit of the firm.



The firm maximizing profit by equating Marginal Revenue (MR_F) with the MC_T and this happens at point E where the firm will produce OQ of output. The intermediate division thus produces OQ output at P_1 price. The transfer price P_1 is equal to its marginal cost $MC_1 = P_1$. The firm will charge OP_F the price of the final product. At this transfer price the intermediate division will supply the product which enables the firm to produce the final product OQ at the equilibrium point.

B. Transfer pricing with a competitive external market.

When intermediate division is allowed to sale its product in the external market which is perfectly competitive, the intermediate product division is not under the compulsion to sale its product to the parent firm. The final product division is also not bound buy the quantities produced by its intermediate division. There can be excess supply of the product which can be sold outside at competitive price.

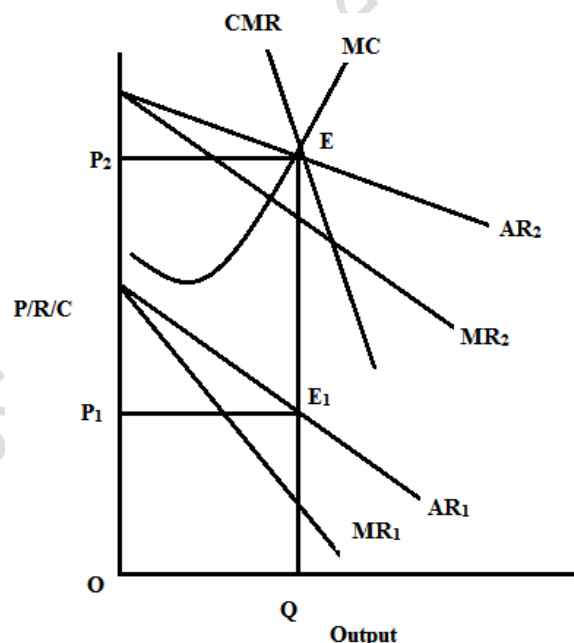


Under this situation the intermediate division of the firm is one of the many competitive firms producing and selling the same product at competitive prices. Thus the firm faces a horizontal demand curve with $MR=P$ and its equilibrium is determined when competitive price is equal to the MC of the division. Profit maximizing firm will produce and sale the quantity of the final product where $MC_T = MR_F$. The intermediate product division will produce OQ_1 and sale OQ_F to the final product division and the excess in the external market at P_1 price.

Q7. What is Multiple Product Pricing?

The traditional theory of price determination is based on the assumption that the firm produces a single homogeneous product. But firms usually produce more than one product. When firms produce several products, managers must consider the interrelationships between those products. The producers in multi product pricing may sell different types or models of a commodity in different markets depending on elasticity of demand and thus make a profit.

The demand and marginal revenue curves for these products are different for the firm. The problem is the pricing of these multiple products of the firm when their demand curves are different while costs are not separated product wise. The simple rule is to solve this problem is combined marginal revenue of these two markets must be equal to the marginal cost of producing the output of both the products.



In above diagram the demand curves for two products are AR_1 and AR_2 and their marginal revenue curves are MR_1 and MR_2 . The combined marginal revenue (CMR) is ,

$$CMR = MR_1 + MR_2$$

This CMR intersects MC curve at point E and thus equilibrium output is OQ. The price to be charged by the firm for these two products will be different as it is based on the demand curves the firm is facing for these products. Price corresponding to OQ output will be OP_2 for product 2 and product 1 the price will be OP_1 . These prices will maximize the firm's total profit from sale of equilibrium output in the market.

Module- IV Capital budgeting

- What is capital budgeting? Explain its need/significance/importance.
- Explain the stages or process to be followed in capital budgeting
- Explain the methods of capital budgeting (Project appraisal methods)
- Calculation of Payback period from given information.

Q.1. DISCUSS THE MEANING AND IMPORTANCE OF CAPITAL BUDGETING?

Capital Budgeting is a process involving planning, analysis, evaluation and selection of the most profitable project for investing the funds available to the firms. Capital budgeting refers to systematic investment programme. It is related to a decision making procedures involved in long term investment.

1) **Profitability** :- A right investment decision can yield large returns, while an incorrect investment decisions can yield low returns. Capital budgeting can help to select most profitable projects for investing the funds available to the firm.

2) **Limited Resources** :- Since capital resources are limited and investment opportunities are plenty and varied in terms of returns, so there is need for thoughtful, wise and correct investment decisions. Capital budgeting assure optimal utilization of resources by avoiding waste through a close coordination between various processes of the business.

3) **Future Cost Structure** :- The future activities and position of the firm depends on capital budgeting. Capital budgeting decisions have long term effects for the firm as they provide the framework for the course of future actions and performance.

4) **Worth Maximization of the Shareholders** :- The main aim of this process is to avoid over investment and under investment in fixed assets. By selecting the most profitable capital project, the management can maximize the worth of equity shareholders' investment

5) **Managerial Decision Making** :- The expected rate of return depends on capital budgeting. Therefore capital budgeting has become one of the most important areas of managerial decision making.

Q.2. Stages or Process of Capital Budgeting

Since project planning is a complex process, it consists of several stages.

1. Identifying new investment proposals: It is the initial stage of Project Planning where management has to discover the new investment opportunities for deciding the most profitable investment. It is the role of manager to choose the most profitable project with due consideration of Government Policies, competing industries, geographical advantage, technologies and material availability and demand conditions existed etc.

2. Classifying Projects: In this stage, Project is classified on the basis of Replacement of cost reduction, innovations to be brought, introduction of products or expansion of markets, maintenance etc. investment in all these categories are evaluated under project planning.

3. Analysis of cost advantage: In this stage, the funds available for disposal or spending and the expected cash flow is considered. Cash flow refers to the changes in revenues and cost of capital. Many methods are used by the manager to forecast the cash flow to know the pace of earning over the years of project.

4. Measurement of investment worth: In this stage, feasibility study is carried to know the profit or returns derivable over the period of time. Here various aspects of a project like financial, technical, marketing and economic are considered and analyzed to know the validity and viability of the project.

5. Selection of the project :On the basis of ranking done of projects, decision is taken and finally project is selected. Priority is given to the most profitable project. Project satisfying all the objectives of project planning is selected in this stage.

6. Implementation: In this stage, the project is implemented by designing plant, installing equipment and machines and appointing new staff accordingly. Here the project is brought under the actual working.

7. Review of performance: It is the final stage, where the project is reviewed and evaluated on the basis of pre-planning. Deviations are found for correction and care is taken not to commit mistakes again occurred in implementation. With this stage project planning gets over.

Q.3.Explain the Project appraisal methods and investment decisions OR Explain the methods of Capital budgeting.

1. Pay-back method:The simplest and widely accepted of project evaluation is pay-back period or pay-out or pay-off period. It is the period or number of years required to recover the original cash outlay invested in a project. This method is also known as cash-to-cash method. Every project generates annual cash flows. Therefore it is seen which project investment amount is recovered soon and accordingly that projects is ranked first. The formula used in this calculation is:

$$\text{Pay Back Period} = \frac{\text{Initial Investment Outlay}}{\text{Annual Cash Inflow}}$$

2. Net present Value method or Discounted Cash Flow Method: In this method, the investors take investment decision on the basis of net present value. It is also known as discounted present value method. Here the fact is considered that the amount of money received today is more valuable than the one received after year or years. The intention behind is that the money received today can be invested to earn certain amount of interest.

The present value of an investment proposal is the difference between the total of present values of the estimated annual cash flows over the life of the project and initial investment of the project. It is calculated as:

If NPV is positive, the project will be accepted

If NPV is negative, the project is rejected

If NPV is zero, there will be indifference in selecting the project in the choice.

3.Internal rate of return (IRR) method: Under this method, time factor and opportunity cost of investment is considered. This method is based on the technique of discounting cash flow. It is the discount rate which equates the discounted present value of its expected future marginal yields with the investment cost of project. IRR is the annual expected rate of profit over the life of the machine from the investment in a project. It is the rate of discount which equates the present value of the income stream over the life of the machine with the net cash investment.

CASE STUDIES :

Q.4. Calculate Payback period and rank the most appropriate project.

Project	Initial investment	Annual Cash Flow
A	2,00,000	50000
B	3,00,000	20,000
C	4,20,000	85,000
D	5,00,000	120000

Solution:

Payback period:

It is the period in which initial investment done is recovered. All the projects chosen need to be tested on the basis of payback of period to choose the best of it. The project having minimum payback period is ranked first.

Payback period = Initial investment/ Capital inflow

Project	Calculation	Payback period	Rank
A	200000/50000	4 years	1 st
B	300000/20000	6 years	4 th
C	420000/85000	4.9 (4years and Nine months)	3 rd
D	500000/120000	4.1 (4 years and one month)	2 nd

Conclusion:

As Project 'A' takes less time to recover the investment is done on it. It is ranked 1st project followed by Project B, C and D.

Practical problems on Payback period

Q.5. Calculate Payback period and rank the most appropriate project.

Project	Initial investment	Annual Cash Flow
A	4	0.5
B	6	1.5
C	7	0.7
D	6	2.0
E	5	1.0
F	6	1.0

Type -1

Q. calculate PBP from the given information and rank the projects accordingly

Projects	Original investments	Annual cash inflow	Life (expected)
A	4,50,000	2,20,000	5
B	3,50,000	1,80,000	5
C	3,00,000	1,90,000	6
D	3,80,000	2,10,000	7
E	3,60,000	2,00,000	8

Q2. Calculate PBP from the given information and rank the projects accordingly

Projects	Original investments	Annual cash inflow	Life (expected)
A	3,50,000	1,80,000	5
B	1,50,000	1,10,000	5
C	2,00,000	90,000	6
D	1,80,000	20,000	7

E	1,40,000	25000	8
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Q3. Project A, B,C,D,E and F involve initial cash outlay of Rs. 20,000, Rs. 6,000, Rs.8,000, Rs, 12000 and Rs.15,000.

Income generated by project A, B,C,D,E is 4000, 3000 , 2000, 3000 and 4500

1. Find out Payback period and state which project is most desirable

TYPE –II

Q With the help of following inflation calculate the payback period:

Original investment is Rs. 5, 00,000

Year	Cash inflow
1	1,00,000
2	1, 80,000
3	1,90,000
4	1,35,000
5	45,000

Q With the help of following inflation calculate the payback period:

Original investment is Rs. 2, 50,000

Year	Cash inflow 'A'
1	85,000
2	1,00,000
3	95,000
4	25,000
5	30,000

TYPE- III

Q With the help of following inflation calculate the payback period:

Original investment of project 'A' is Rs. 2, 00,000

Original investment of project 'B' is Rs. 1,50,000

Year	Cash inflow 'A'	Cash flow 'B'
1	35,000	75,000
2	75,000	25,000
3	80,000	45,000
4	15,000	35,000
5	25,000	30,000

1. calculate payback period for the projects and suggest the most desirable project by comparing their PBP

Q With the help of following inflation calculate the payback period:

Original investment of project 'A' is Rs. 80,000

Original investment of project 'B' is Rs. 90,000

Year	Cash inflow 'A'	Cash flow 'B'
1	15,000	20,000
2	25,000	21,000
3	35,000	22,000
4	40,000	45,000
5	20,000	34,000

calculate payback period for the projects and suggest the most desirable project by comparing their PBP