F.Y.B.COM.
SEMESTER - II
BUSINESS ECONOMICS - II
SUBJECT CODE : UBCOMFSII.3

(Revised Syllabus from Academic Year 2019-20 to IDOL Students)

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CONTENTS

Unit No.	Title	Page No.

❖❖❖❖

SYLLABUS
FYBCOM - BUSINESS ECONOMICS -II

SEMESTER - II

Unit 1: Market Structure: Perfect Competition and Monopoly

Perfect competition and Monopoly models as two extreme cases - profit maximisation and the competitive firm's supply curve - Short run and long run equilibrium of a firm and of industry - Monopoly - Sources of monopoly power – short run and long run equilibrium of a firm under Monopoly

Unit 2: Pricing and Output Decisions under Imperfect Competition

Monopolistic competition: Competitive and Monopolistic elements of monopolistic competition- equilibrium of firm under monopolistic competitions, monopolistic verses perfect competition, excess capacity and inefficiency, debate over role of advertising, (topics to be taught using case studies from real life examples)

Oligopolistic Market: Key attributes of oligopoly- Collusive and non-collusive oligopoly market, Price rigidity, Cartels and price leadership models (with practical examples)

Unit 3: Pricing practices

Cost oriented pricing methods: cost –plus (full cost)/mark-up pricing, marginal cost pricing, Mark up pricing, discriminating pricing, multiple – product pricing - transfer pricing (case studies on how pricing methods are used in business world)

Unit 4: Evaluating capital projects

Meaning and importance of capital budgeting- steps in capital budgeting- Techniques of Investment appraisal: payback period method, net present value method, and internal rate of return method (with numerical examples)

II

Additional References:

1) Mehta, P.L.: Managerial Economics – Analysis, Problem and Cases (S. Chand & Sons, N. Delhi, 2000)

2) Hirchey .M., Managerial Economics, Thomson South western (2003)

3) Salvatore, D.: Managerial Economics in a global economy (Thomson South Western Singapore, 2001)

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UNIT- I

Unit - 1

PERFECT COMPETITION

Unit Structure :

1.0 OBJECTIVES

- To understand the meaning and features of perfectly competitive market.

- To study the concept of profit maximisation of firm under perfect competition.

- To understand the short run and long run equilibrium of a firm.

- To understand the equilibrium of a firm and industry under perfect competition**.**

1.1 MEANING

The theory of perfect competition has originated in the late-19th century. The first laborious definition of perfect competition and resultant some of its main results was given by Léon Walras. Then later in the 1950s, the theory was further redefined by Kenneth Arrow and Gérard Debreu. But in reality, markets are never perfect.

A perfectly competitive market is a hypothetical in nature. In this market producers are large in number; however, they may face many competitor firms selling highly similar types of goods, in which case they often act as price takers. Agricultural markets are commonly used as an example.

A perfectly competitive firm is also known as a price taker because the pressure of competing firms in the market forces other firms to accept the price prevailing in the market. If a firm in a perfectly competitive market try to raise the price of its product in the market it will lose all of its shares in the market. The market price in the perfect competition is determined by the market supply and market demand in the entire market and not by the individual firm or seller in the market. Further in this chapter we will try to discuss the price determination and equilibrium of the firm and industry under perfect competition.

1.2 FEATURES OF PERFECT COMPETITION

Perfect competition can be generally understood by its following important features:

1. **Large number of buyers and sellers:** The very first important feature of perfect competition is its number of participants i.e. number of buyers and sellers. Both buyers and sellers are large in number under perfect competition. The existence of these large number of buyers and sellers makes no influence over price of the product. Therefore, the individual firm under perfect competition is a price taker because he has no influence over the price. Whatever price the market demand and market supply collectively decide every firm is expected to follow the same.

2. **Homogeneous or Similar products:** The second important feature of perfect competition is the commodity which is being sold in the market. It means that the product or commodity which is sold in perfect competition is similar or identical in nature. As the product are identical or similar in nature the firm has no control over the price of the product because products are perfect substitute for one another. No firm can try to charge different price to consumer then the market price due to homogeneous factor of product.

3. **Free entry and exit of firm:** There are no restriction to the entry and exit of firm in the market. The condition of free entry and free exit of a firm applies only in the long run, in short run firms can neither change the size of their plants, nor new firms can enter or old firm can leave the market. If the existing old firm earns super normal profit in the short run will attract the new firm to enter in the market in the long run.

4. **Complete market information:** It is assumed that there is a perfect knowledge about the market situation to both buyers and seller in the perfect competition. A perfect knowledge or complete information about the market demand and market supply, price etc. This allows the firms and buyer to take appropriate decision to influence the market demand and supply collectively.

5. **Prefect mobility of factors of production:** Under perfect competition the factors of production are assumed to be freely mobile. Factors of production such as labour and capital are assumed to be mobile. The mobility of factors helps the firm to adjust the market demand with the change in market supply.

6. **No transportation cost:** It is assumed that there is no transportation cost under perfect competition. It applies when the production area and sales market take place in a small geographical area or in the same area. For example, agriculture products are sold in the same village or town which requires no transportation cost.

Check your Progress :

1) Why uniform price exist in perfect competition?
2) Why we don't consider transportation cost?

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1.3 PROFIT MAXIMISATION

Profit is the main objective of any firm into business. Each and every firm tries to makes maximum possible profit into the business. Firm earns profit when Total revenue which has earned subtracted from the Total cost which he has bare for the production.

To state $\pi = TR - TC$

Where π = Profit, TR = Total Revenue, TC = Total Cost.

Total revenue (TR) is the total revenue firm earned after the sale of his product. To state
TR = P × Q

Where, TR is Total Revenue, P = Price per unit, Q = Quantity per unit sold.

Total Cost (TC) is the total cost which a firm spend to produce the product. We obtain it by multiplying the quantity of output produce by the average cost.
TC = Q ×AC

Average revenue (AR) is the revenue generated by selling per unit of output.
AR = TR
　　Q

Where AR is the Average Revenue.

Hence if, $P \times Q = \dfrac{TR}{Q} = AR$

Therefore, we can say that,

P = AR

Therefore, we say that the price under perfect competition is equal to the average revenue which a firm earns in a market.

A firm in a perfectly competitive market tries to maximize his profits. In the short-run, it is possible for a firm to earn profits which can be positive, negative, or zero. Economic profits which the firm earns will be zero in the long-run.

In the short-run, if a firm earns negative economic profit, it is said that he should continue to operate his business if its price exceeds its average variable cost and he should shut down if its price is below its average variable cost.

The marginal revenue (MR) is the change in total revenue from an additional unit of output sold in the market for which the firm bares Marginal cost.

$MR = \dfrac{\Delta TR}{\Delta Q}$

Marginal Cost (MC) is the additional cost which a firm spends to produce the additional unit of output.

$MC = \dfrac{\Delta TC}{\Delta Q}$

In order to maximize the profits in a perfectly competitive market, the firms set the price where the marginal revenue equal to marginal cost (MR=MC). The MR curve is the slope of the revenue curve, which is also equal to the demand curve (DD), price (P) and the Marginal and Average Revenue curve. Therefore, In the short-term, it is possible for a firm to earn economic profits to be positive, zero, or negative. When price is greater than average total cost, the firm is making a profit. When price is less than average total cost, the firm is making a loss in the market.
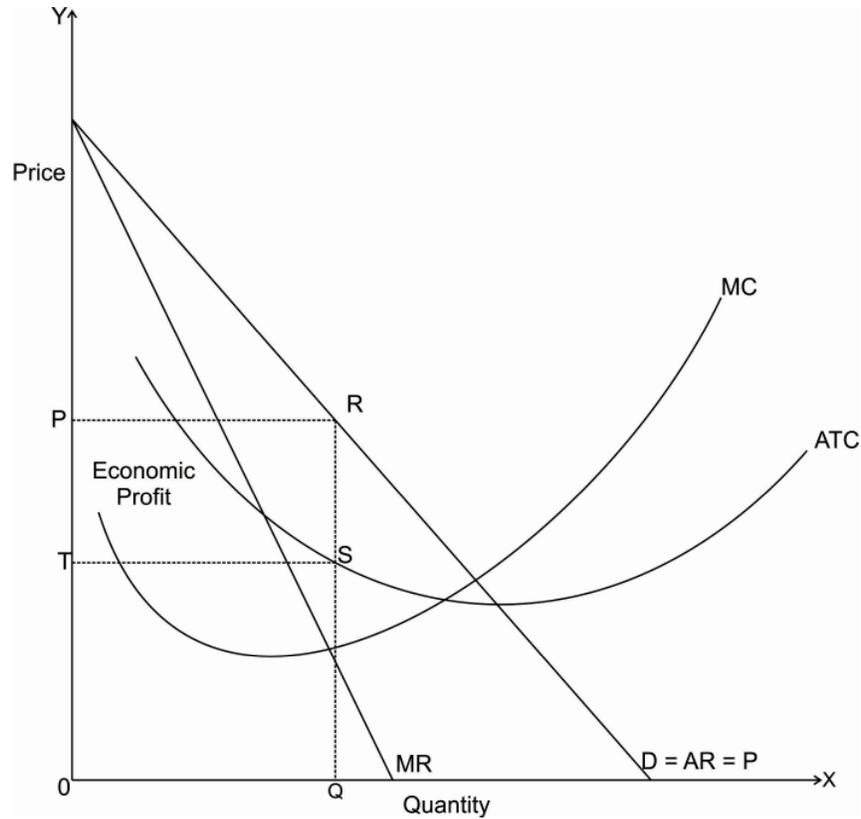
Diagram 1.1

Perfect Competition in the Short Run: In the short run, it is possible for an individual firm to make an economic profit. This state is shown in the above Diagram 9.1, as the price or average revenue, denoted by P, is above the average cost denoted by AR.

In the long-run, if firms try to earning positive economic profits, more and firms will enter into perfectly competitive market are, which will shift the supply curve to the right of the original place. As the supply curve shifts to the right, the equilibrium price of the firm will go down. As the price goes down, the economic profits will decrease until they become zero.

When the price is less than the average total cost of the production, at that time the firms are making a loss. In the long-run, if firms in a perfectly competitive market are earning negative economic profits, then more firms will leave the market and which in turn will shift the supply curve left of the diagram. As the supply curve shifts to the left, the price will rise. As the price rises, the economic profits will increase until they become zero.

Inthe long-run, companies that are engaged in a perfectly competitive market will earn zero economic profits. The long-run equilibrium point for a perfectly competitive market occurs where the demand curve (price)(P) intersects the marginal cost (MC) curve at the minimum point of the average cost (AC) curve.
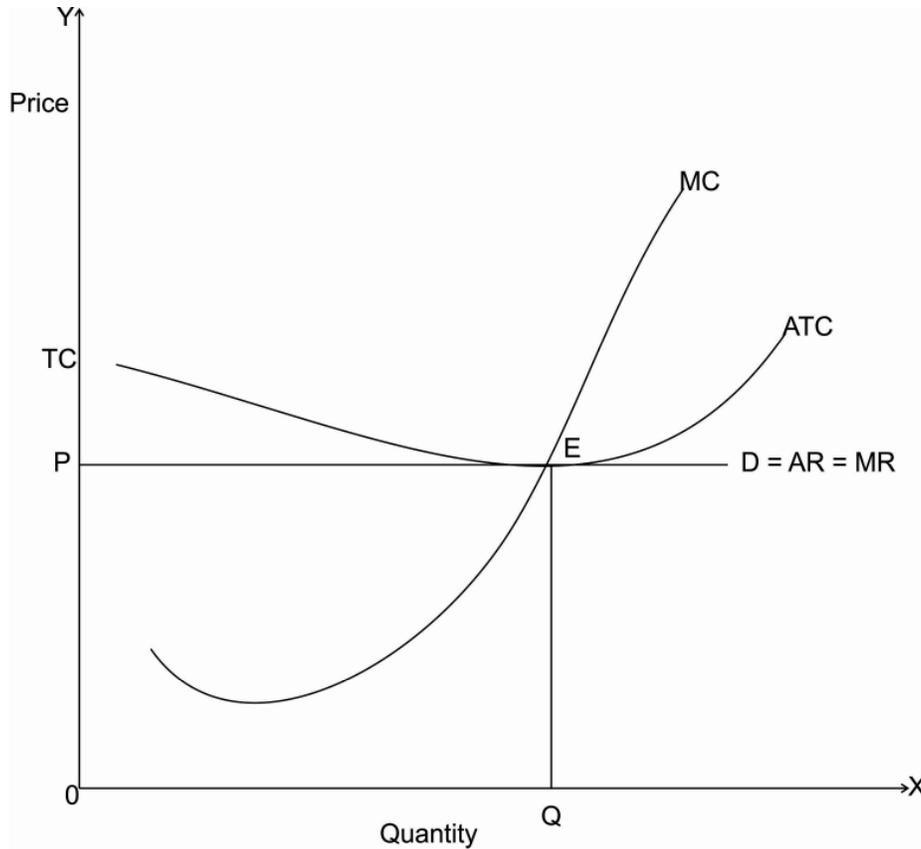
Diagram 1.2

Perfect Competition in the Long Run: In the long-run, economic profit cannot be constant. The entry of new firms in the market will cause the demand curve of each individual firm to shift the demand curve downward, bringing down the price, the average revenue (AR) and marginal revenue curve (MR). In the long-run, the firm will make zero economic profit. Its horizontal demand curve will touch its average total cost curve at its lowest point (E).

The firm is at equilibrium at the point (E) where Marginal revenue (MR) is tangent to Marginal cost (MC).

1.4 SHORT- RUN EQUILIBRIUM OF A FIRM UNDER PERFECT COMPETITION

The short run is a period of time within which the firms can change their level of output only by increasing or decreasing the amounts of variable factors such as labour and raw material, while fixed factors like capital equipment, machinery, etc. remains unchanged.

In other words, short run is the conceptual time period where at least one factor of production is fixed in amount while other factors are variable.

A firm in short run is in equilibrium at a point where Marginal Revenue (MR) is equal Marginal Cost (MC) i.e. MR=MC and where MC is increasing at the point or MC is cutting MR from below.

The firm under perfect competition operates under the U-shaped cost curve. Since marginal revenue is the same as price or average revenue under perfect competition, the firm will equalise marginal cost with price to attain the equilibrium level of output.

A firm under perfect competition in short run being in equilibrium does not necessarily earn profit. The firm determines the equilibrium level of output and price and tries to earn excess profit, normal profit or may even incur loss. The Diagram 9.3 which is given below will explain the firm's equilibrium situation in the short run.
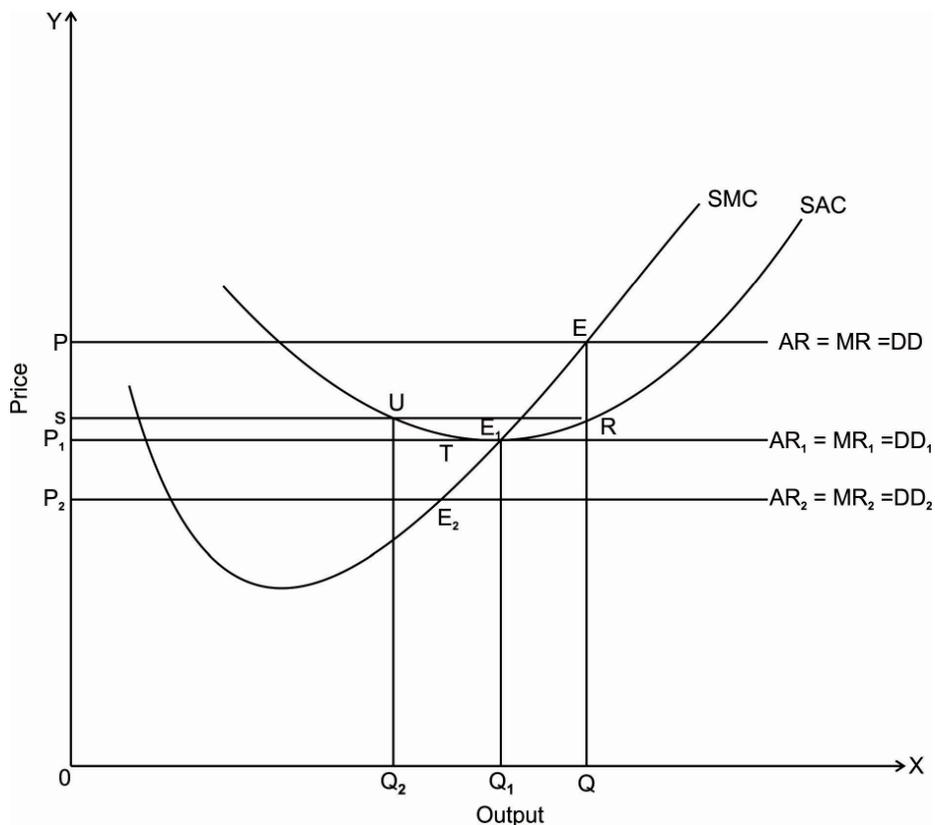

Diagram 1.3

In the above fig Level of output is determined on the X axis and price on the Y axis.

The firm may face excess profit, normal profit or even loss can be understood by the given fig above.

1. **Excess Profit:** OP is the price at which the firm sell its OQ level of output. Where, E is the is the equilibrium point where

Marginal Cost is equal to Marginal Revenue (MR=MC) and where MC is increasing which fulfils the condition.

Now to determine the firm's level of profit we calculate:

Profit = TR-TC

Where, TR = P ×Q

Where, TR is the total revenue which a firm earns by selling the output, P, is the price per unit sold and Q is the quantity sold.

So, in the above fig,

TR = OP × OQ = OQEP.

TC = Q × Revenue/ Cost.

Where, TC is the total cost

TC = OQ × OQRS

Therefore,

Profit = TR – TC

     = OQEP – OQRS

     =SREP

       Thus, the firm in the short run when the price is OP is at the equilibrium and earns SREP amount of profit which is the excess profit which is also called as super normal profit.

2. **Normal Profit:** the perfect competitive firm may also earn normal profit in the short run if he fails to earn the super normal profit. In the above fig 9.3 if the firm is in equilibrium at the point E1 where OP1 is the price and OQ1 is the level of output. The firm is at the position where he earns normal profit.

    Profit = TR – TC

    Where, TR = P ×Q

          = OP1 ×OQ1

          = OQ1E1P1

    TC = Q × Revenue/ Cost

       = OQ1 × E1P1

       = OQ1E1P1

    Therefore,

    Profit = TR – TC

        = OQ1E1P1 - OQ1E1P1

        = Normal Profit.

      Thus, the firm at price OP1 earns Normal profit.

      Normal profit is the profit which a firm must get to survive into the business where he can produce the same level of output in future with the amount of revenue he earns. It is a situation of no profit no loss. If the firm unable to make a normal profit he may go into loss.

3. **Loss or Sub-normal profit:** when a firm fails to earn even normal profit and still continue to operate his business by incurring into loss. Such situation can be explained as flow:

The firm is equilibrium at the point E2 where OP2 is the market price and OQ2 is the level of output.

Profit = TR – TC

Where, TR = P ×Q

      = OP2 × OQ2

      = OQ2E2P2

    TC = Q × Revenue/ Cost

      = OQ2 × US

      =OQ2US

   Loss = P2E2US

4. **Shut down point:** When the firm not even able to earn variable cost he better tries to shut down his business or stops operating for that particular time.
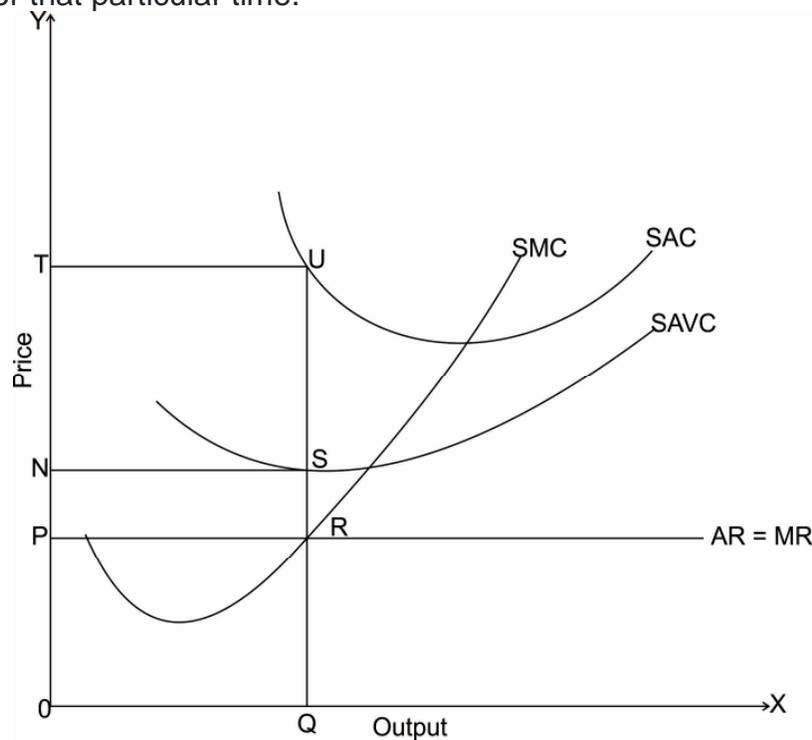
Diagram 1.4

In the above Diagram 9.4 when the price is OP, the firm produces the equilibrium level of output which is OQ at that price and at that volume of output the firm total revenue (TR) is OQRP and his Total Variable Cost (TVC) is OQSN so the loss which firm gets in terms of variable cost is PRSN. His total loss is PRUT of which PRSN is variable cost and NSUT is the fixed cost. At this time, it is better for a firm to either shut down his business or to wait for a time when the price goes up for his commodity where at least he can cover up his Total Variable Cost. It is because that variable cost enables the firm to operate in his business.

Check your Progress :

1) What do you mean by shut down point of firm?
2) What is normal profit?
3) What is super normal profit?
4) What is subnormal profit?

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1.5 LONG RUN EQUILIBRIUM OF A FIRM

The long run is a period of time which is sufficiently long to allow the firms to make changes in all factors of production. Therefore, it is said that in the long run, all factors of production are variable and no factors are fixed. So in the long run the firms, can increase or decrease their output by changing their capital equipment; they may expand or contract their old plants or replace the old lower-capacity plants by the new higher-capacity plants or add new plants in the business or the firms can contract their output level by reducing their capital equip-ment; they may allow a part of the existing capital equipment to wear out without replacement or sell out a part of the capital equipment

Besides, in the long run, new firms can enter the industry to compete the existing firms. Moreover, the firms can leave the industry in the long run. The long-run equilibrium then refers to the situation when free and full adjustment in the capital equip-ment as well as in the number of firms has been allowed to take place. It is therefore long-run average and marginal cost curve which are relevant for deciding about equilibrium output in the long run. Moreover, in the long run, it is the average total cost which is of determining importance, since all costs are variable and none fixed.

As explained above, a firm is in equilibrium under perfect competition when marginal cost is equal to price i.e. MC = P. But for the firm to be in long-run equilibrium, besides marginal cost being equal to price, the price must also be equal to average cost (P = MC).

For, if the price is greater or less than the average cost, there will be tendency for the firms to enter or leave the industry. If the price is greater than the average cost, the firms will try to earn more than normal profits. These supernormal profits will attracts the new firms to enter into the industry.

With the entry of new firms in the industry, the price of the product will go down as a result of the increase in supply of output and also the cost will go up as a result of more intensive competition for factors of production will be generated. The firms will continue entering the industry until the price is equal to average cost so that all firms are earning only normal profits.

These can be explained with the help of the following Diagram 9.5 given below:

Diagram 1.5

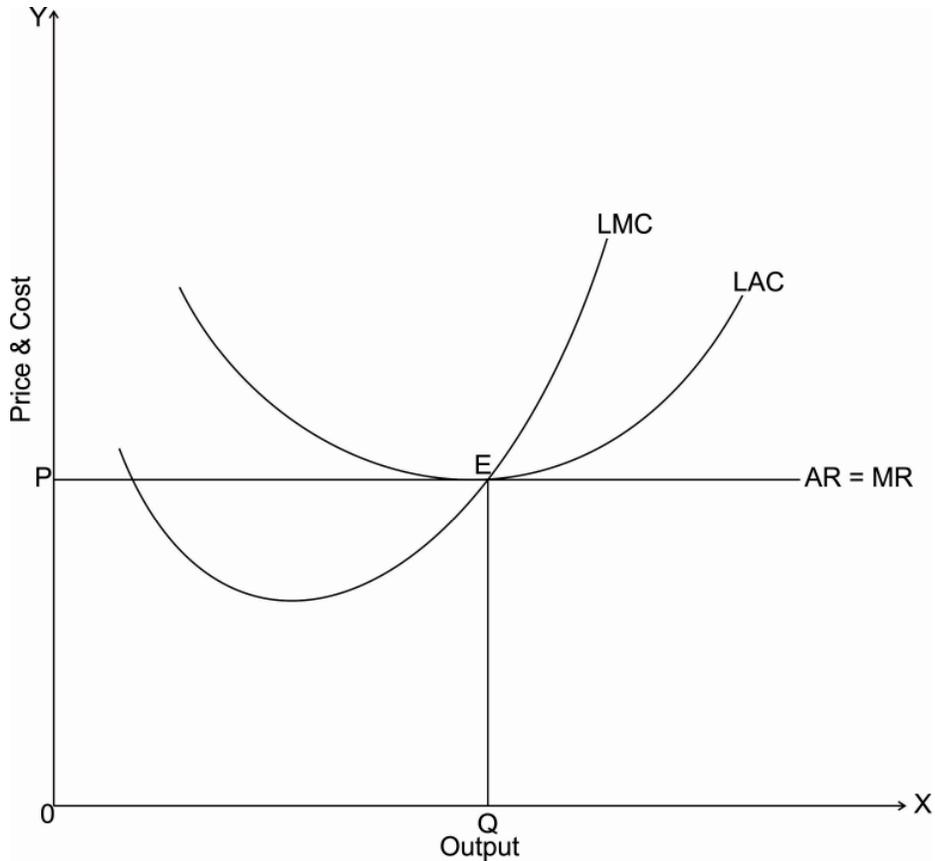Diagram 1.5 represents the equilibrium condition of firm under perfect competition. The firm in the long-run equilibrium is at a price OP and quantity of output is OQ where the equilibrium point is E. at the equilibrium point MR = MC. As said the firm earns normal profit in the long run so,

Profit = TR- TC
= OQEP – OQEP
Therefore, the firm earns normal profit in the long run where,
P= AR= MR= AC= MC.

1.6 EQUILIBRIUM OF A FIRM AND INDUSTRY UNDER PERFECT COMPETITION

As we have already studied the equilibrium conditions of both firm and industry. A firm is in equilibrium when it has no tendency to change its level of output. It needs neither expansion nor contraction. It wants to earn maximum profits in by equating its marginal cost with its marginal revenue, i.e. MC = MR. An industry is in equilibrium only in the long run. The following Diagram 9.6 will explain the condition of the equilibrium of a firm and industry.

The MC curve must equal the MR curve (MC=MR). This is the first order and necessary condition. But this is not a sufficient condition which may be fulfilled yet that the firm may not be in equilibrium. The second order condition says that under perfect competition, The MC curve must cut the MR curve from below and after the point of equilibrium it must be above the MR. the MR curve of a firm coincides with the AR curve. The MR curve is horizontal to the X- axis. Therefore, the firm is in equilibrium when MC=MR=AR (Price).
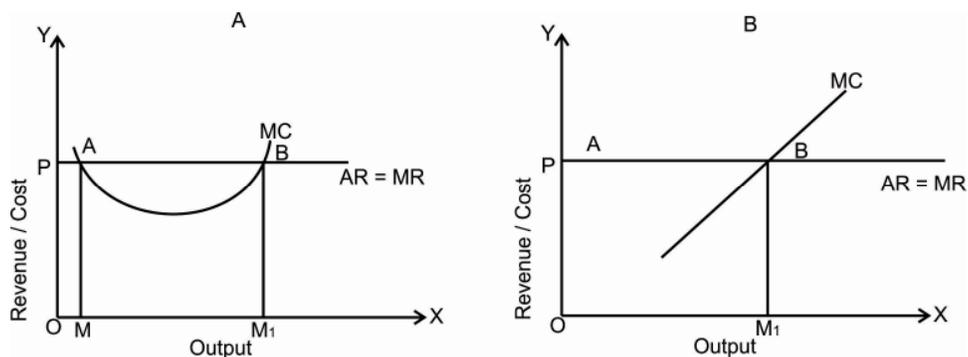
Diagram 1.6

In Diagram 9.6 (A), the MC curve cuts the MR curve first at point A. It satisfies the condition of MC = MR, but it is not a point of maximum profits because after point A, the MC curve is below the MR curve. It does not pay the firm to produce the minimum output OM when it can earn larger profits by producing beyond OM.

Point B is of maximum profits where both the conditions are satisfied. Between points A and B., it pays the firm to expand its output because it's MR > MC. It will, however, stop further production when it reaches the OM1 level of output where the firm satisfies both the conditions of equilibrium.

If it has any plans to produce more than OM1 it will be incurring losses, for its marginal cost exceeds its marginal revenue

beyond the equilibrium point B. The same conclusions hold good in the case of a straight-line MC curve as shown in Diagram 9.6. (B)

1.7 SUMMARY

In this unit we have discussed the perfect competition market in detail. The theory of perfect competition has originated in the late-19th century. The first laborious definition of perfect competition and resultant some of its main results was given by Léon Walras. Then later in the 1950s, the theory was further redefined by Kenneth Arrow and Gérard Debreu. But in reality, markets are never perfect. A perfectly competitive firm is also known as a price taker because the pressure of competing firms in the market forces other firms to accept the price prevailing in the market. If a firm in a perfectly competitive market try to raise the price of its product in the market it will lose all of its shares in the market. It has also discussed the features of perfect competition market in detail. The current unit also study the equilibrium of the firm under short run and long run market conditions.

1.8 QUESTIONS

1. What is perfect competition? Explain the features of it in detail.
2. Explain how a firm gets profit maximisation under perfect competition.
3. Explain the short run equilibrium of the firm under perfect competition.
4. Discuss the long run equilibrium of the firm under perfect competition.

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Unit - 1A

MONOPOLY

Unit Structure :

1A.0 Objectives
1A.1 Meaning of monopoly
1A.2 Features of monopoly
1A.3 Sources of monopoly power
1A.4 Equilibrium of a monopoly firm
1A.5 Summary
1A.6 Questions

1A.0 OBJECTIVES

- To understand the meaning and features of monopoly market.
- To study the sources of monopoly power.
- To understand the equilibrium of a firm under monopoly market.

1A.1 MEANING

The word monopoly has been derived from the combination of two words i.e., 'Mono' and 'Poly'. Mono refers to a single and poly to control. Monopoly market is said to exist when one firm or a single firm is a sole producer or seller of a product in a market which has no close substitutes.

Prof. Bober rightly remarks, "The privilege of being the only seller of a product does not by itself make one a monopolist in the sense of possessing the power to set the price. As the one seller, he may be a king without crown"

According to Koutsoyiannis "Monopoly is a market situation in which there is a single seller. There are no close substitutes of the commodity it produces, there are barriers to entry". -

A seller in a monopoly market is known as monopolist. A monopolist is a price maker not a price taker in the market where he is the only or a sole seller in the market, where he has control over it. A monopolist can control both the price as well as the supply of a commodity to earn profit. But it is said that if a firm is a rational monopolist, he will control only one at a time.

1A.2 FEATURES OF MONOPOLY

The following are some features of monopoly market:

1. **Single Seller and Large Number of Buyers:** As said above monopoly market is run by a single seller known as monopolist. The monopolist's firm is the only firm in the market; it is an industry as well. But the number of buyers is assumed to be large.
2. **No Close Substitutes:** Another important feature of monopoly market is that there shall not be any close substitutes for the product sold by the monopolist in the market. The cross elasticity of demand between the product of the monopolist and others must be negligible or zero.
3. **Difficulty of Entry of New Firms:** There are either natural or artificial restrictions on the entry of firms into the monopoly market.
4. **Price Maker:** Under the monopoly market, the monopolist has the full control over the supply of the commodity. But due to large number of buyers, demand of any one buyer constitutes an infinitely small part of the total demand. Therefore, buyers have to pay the fixed amount of price fixed by the monopolist.
5. **No distinction between the firm and industry:** Under monopoly market firm being the single seller is the firm as well as industry. So there is no need to understand the firm and industry separately.

1A.3 SOURCES OF MONOPOLY POWER

The monopoly has numerous factors which gives monopoly power to the monopolist.

1. Natural monopoly power: Some monopolist gets monopoly power naturally by the product they produce which is naturally available to them. A natural monopoly is a type of monopoly that exists due to the high start-up costs of conducting a business in a specific industry. A company with a natural monopoly might be the only provider or a product or service in an industry or geographic location in the whole market which gives him the monopoly power naturally. Natural monopolies are allowed when a single company can supply a product or service at a lower cost than any potential competitor in the market.

2. Product differentiation: The product which is being sold in the monopoly market is differentiated product which has no close substitute in the market. In a perfectly competitive market, every product is perfectly homogeneous and a perfect substitute for any other product in the market. With a monopoly, there is great to

absolute product differentiation in the sense that there is no available substitute for a monopolized good. The monopolist is the sole supplier of the commodity in the market.

3. Legal protection: Legal is an artificial power which a firm has to protect this product from various market competition and make a product unique or different. Legal protection is in the form of copy rights, patent rights, trade marks etc. which gives the firm the monopoly power and make his product different from the other product in the market.

4. Barriers to Entry: Barriers to entry are factors and circumstances that prevent entry into market by would-be competitors and limit new companies from operating and expanding within the market. Monopolies have relatively high barriers to entry due to its natural and artificial barriers. The barriers must be strong enough to prevent or discourage any potential competitor from entering into the market.

5. Control over the resources: As the firm is the only seller in the market, he has sole control over the resources which is use for production of the product. The source of control comes either from the natural or legal power.

1A.4 EQUILIBRIUM OF A MONOPOLY FIRM

The Equilibrium condition of a firm under Monopoly is the same as those under perfect competition. Where the marginal cost (MC) is equal to the marginal revenue (MR) and the MC curve cuts the MR curve from below. We will understand Equilibrium of Monopolies in short run and in long run in detail.

Short run equilibrium condition: There are two possibilities for a firm's Equilibrium in Monopoly. These are:

The firm earns normal profits or excess profit – If the total cost < the total revenue

It incurs losses – If the total cost > the total revenue

Normal Profits or Excess Profit: At Excess profit the firm is in equilibrium at the point E where the Marginal Cost is equal to Marginal Revenue (MR = MC). At this equilibrium point OP is the Price and OQ is the level of Output. Firms profit is determined when,
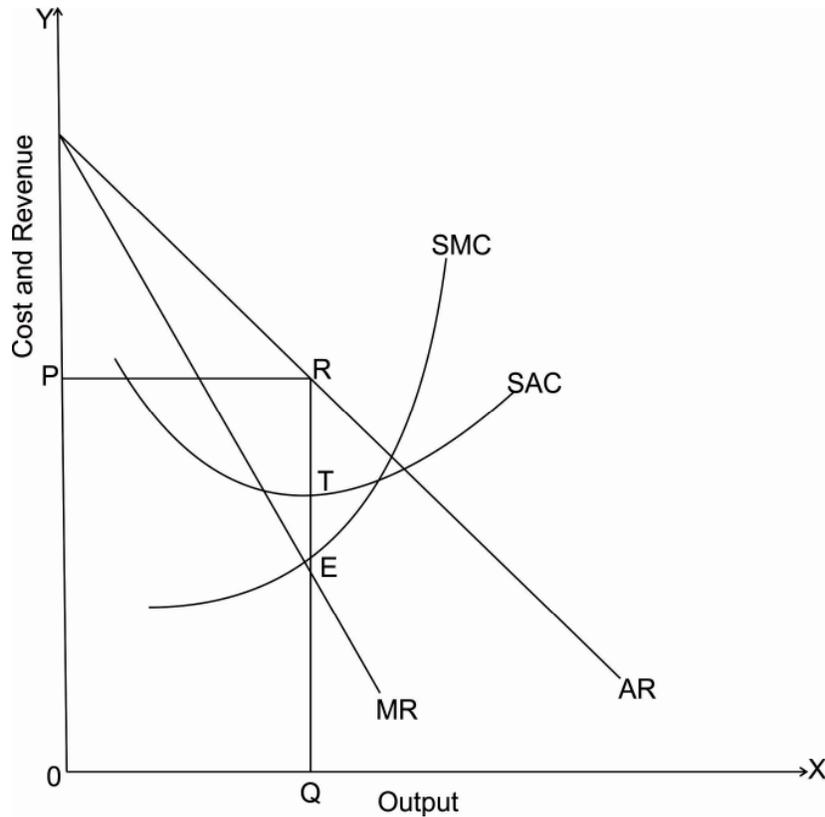
Diagram 1A.1

Profit = TR – TC
Where, TR = P ×Q
= OP × OQ
       = OQRP
     TC = Q × AC
       = OQ × QT
       = OQTS

Therefore, Profit = OQRP – OQTS
           = STPR

Thus, the firm earns the excess profit. TR > TC

Loss condition: A firm under monopoly may also face a problem of getting loss. As in perfect competition even in monopoly the cost of the firm is divided into fixed cost and variable cost. It is essential for a firm to receive at least the variable cost to function in the market. The loss condition of a monopoly firm can be explained below with the help of the fig 1A.2.
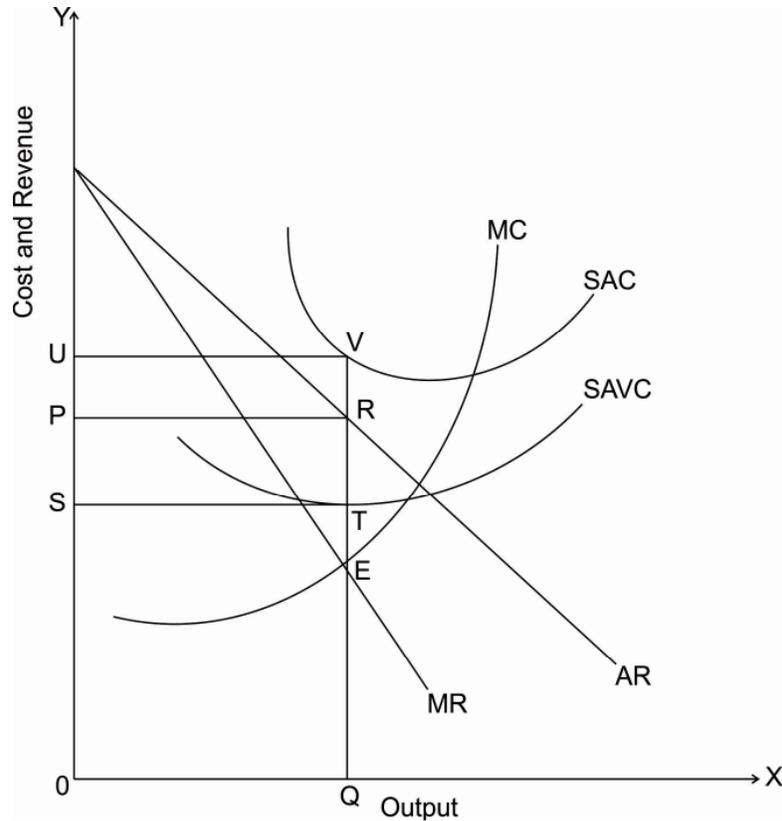
Diagram 1A.2

Profit = TR – TC
Where, TR = P × Q
        = OP × OQ
        = OQRP
   TC = Q × AC
       = OQ × VU
       = OQVU

Therefore, Loss = OQRP – OQVU
            = PRVU

Thus, the firm earns the excess profit. TR <TC

Long run equilibrium condition: In the long-run, a monopolist can contrast all the inputs. Therefore, to determine the equilibrium of the firm, we need only two cost curves – the AC and the MC. Further, since the monopolist exits the market if he is operating at a loss, the demand curve must be tangent to the AC curve or lie to the right and intersect.

A monopolist usually earns excess profit in the long run. This can be understood by the following fig 1A.3.
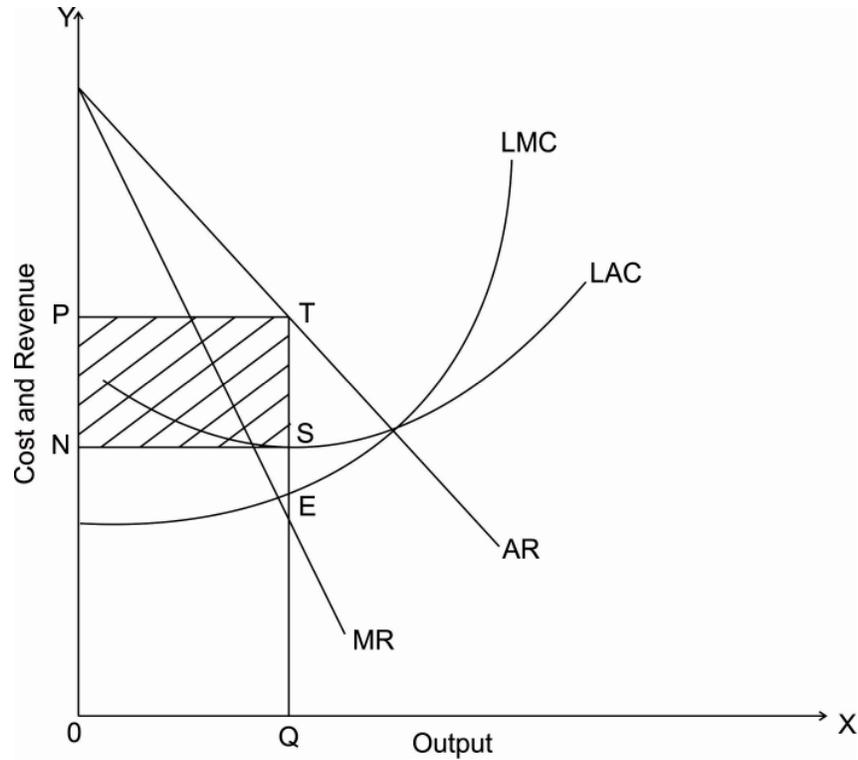
Diagram 1A.3

Profit = TR – TC
Where, TR = P × Q
    = OP × OQ
    = OQTP
  TC = Q × AC
    = OQ × QS
    = OQSN

Therefore, Profit = OQTP – OQSN
      = NSTP
Thus, the firm earns the excess profit. TR > TC in the long run.

Check your Progress :

1) Define Monopoly.
2) List out the sources of monopoly power.
3) List out the important features of monopoly market.

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1A.5 SUMMARY

This unit studies the monopoly market in detail. The word monopoly has been derived from the combination of two words i.e., 'Mono' and 'Poly'. Mono refers to a single and poly to control. Monopoly market is said to exist when one firm or a single firm is a sole producer or seller of a product in a market which has no close substitutes. The unit has also discussed the features and sources of monopoly. The unit has also discussed the equilibrium of monopoly firm during short run and long run.

1A.6 QUESTIONS

1. What is monopoly? Explain the features of monopoly in detail.
2. Define monopoly. Discuss the various sources of monopoly power.
3. Explain the short run and klong run equilibrium of a monopoly firm in detail.

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Unit - 2

MONOPOLISTIC COMPETITION

Unit Structure :

2.0 OBJECTIVES

- To understand the characteristics features of monopolistic competition and study determination of price and output in the short run and in the long run

- To study the differences between perfect competition and monopolistic competition

- To understand the difference between selling and production cost and also to understand the importance of selling cost and its effects

- To understand how excess capacity is created under monopolistic competition

- To study the role of advertising along with advantages and disadvantages with real life examples

2.1 FEATURES OF MONOPOLISTIC COMPETITION

Perfectly competitive market and monopoly market are extreme and therefore not easy to find in real world.

In the real world the market that we find either have many sellers selling variety of products (such as toothpaste, textile or cloth market) called monopolistic competition. Or few sellers having dominant position in the market (such as airlines, mineral water) called oligopoly market.

Monopolistically competitive market is the market which has some characteristics of perfect competition and some of monopoly. Even though there are many sellers under monopolistic competition, each seller has its monopoly but still there is a competition due to product differentiation. Prof. Edward Chamberlin introduced the concept of monopolistic competition in his book Theory of Monopolistic Competition.

Features of monopolistic competition

- **Fairly large number of sellers-** In monopolistic competition there are many sellers. Therefore an individual seller cannot influence the market. Every seller to a certain extent follow an independent policy in price and output.

- **Fairly large number of buyers-** There are fairly large number of buyers in a monopolistically competitive market.

- **Close substitute products-** Under monopolistic competition sellers sold products which are close substitutes of each other. For eg. Soaps, pens etc.

- **Free entry and exit-** There are no restrictions on entry and exit of the firm under monopolistic competition. If existing firms are making supernormal profit, new firms can enter in to the market but they have to enter with a close substitute product. Similarly firms who are making loss can leave the market. Therefore in the long run firm who remains in the market will make only normal profit.

- **Selling cost-** As close substitute products are available in monopolistic competition, firms have to spend money for increasing sale of their product in the market. This cost is called as selling cost. It includes all expenditures of the firm which can increase their sale. It is in the form of T.V, newspaper advertisement, hoardings, exhibitions, distribution of free samples, discounts offered on products etc.

- **Product differentiation-** As goods are close substitutes of each other, it is necessary to have an independent identity of each product. Variety of factors on which goods can be differentiated are brand name, design, size, color, packing, taste, advertisement policy, after sales services etc. Due to product differentiation, firm can have some degree of monopoly.

- **Nature of demand curve-** The demand curve of a monopolistically competitive firm is more elastic. ie demand curve is flatter than it is under monopoly. This is because of the availability of close substitute products, where an increase in price of one commodity reduces its sale by a greater amount. Following diagram explains the shape of demand curve under monopolistic competition.
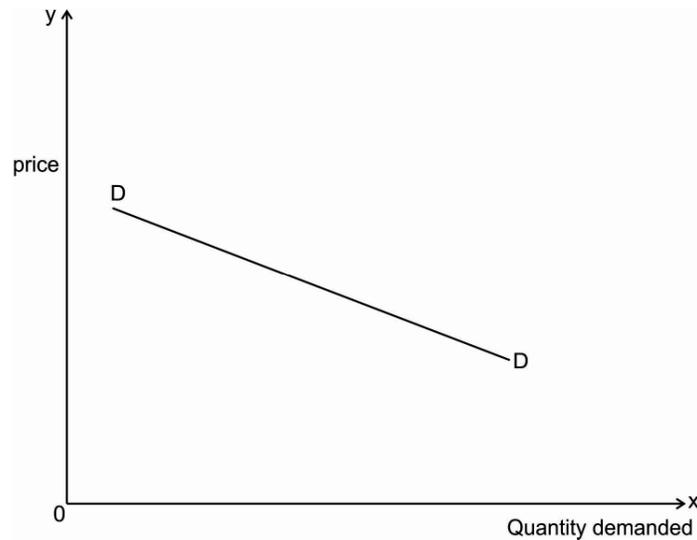
Diagram 2.1

- **Concept of group-** Prof. E. Chamberlin introduced the concept of group under monopolistic competition. Group includes those products which are close substitutes in economic and technical sense. The group will be in equilibrium in the long run when all firms in the group make normal profit.

Product differentiation

Product differentiation is one of the characteristics of monopolistic competition. Products are close substitutes of each other due to small differences in them. In case of products like soaps, garments, tooth paste etc. variety of products are available but each product is different from another due to following factors.

- **Brand name-** Brand name develops loyalty of public towards the product. Firms name itself is the name of its product. Raymond cloth, LG TV, Colgate toothpastes are some of the examples of branded products. Brand name helps to differentiate between the products.

- **Design-** On the basis of design products can be differentiated. Fridge, cars, furniture are some of the products which are purchased on the basis of design.

- **Size-** Firm produces their product in different sizes so that consumers can consume their most preferred size. Various sizes of product include economy size, family size, extra-large etc.

- **Color-** Customers would like to purchase various products on the basis of their color. Products like fridge, cupboard, tooth brush etc. are consumed on the basis of their color.

- **Taste and perfume-** Products like soaps, toothpaste, face powder, shampoo etc. are purchased on the basis of their taste and perfume.

- **Salesmanship-** People prefer products of a particular company because of the positive attitude of the salesman, their good behavior, their cooperation etc.

- **After sales services-** Customers consider after sales services while consuming a product. This is because products like TV, fridge, water purifier have a warranty period during which company provide free services to their customers. Thus the quality of after sales services is very important.

Due to above factors consumers have some loyalty to their products. Loyalty towards product gives some degree of monopoly to the firm. Product differentiation allows firms to charge different prices for their products. Under monopolistic competition it is necessary for the firm to maintain monopoly power over loyal customers.

2.2 EQUILIBRIUM OF A FIRM UNDER MONOPOLISTIC COMPETITION IN THE SHORT RUN AND IN THE LONG RUN

Short run equilibrium of a firm under monopolistic competition:
Monopolistically competitive firm can operate with supernormal profit, normal profit or loss in the short run. Following diagrams explains all the three cases.

- **Excess profit**
Given the demand curve and cost curves of a firm, firm would produce profit maximizing level of output at that point where MR=MC. This is the equilibrium level of output for the firm.
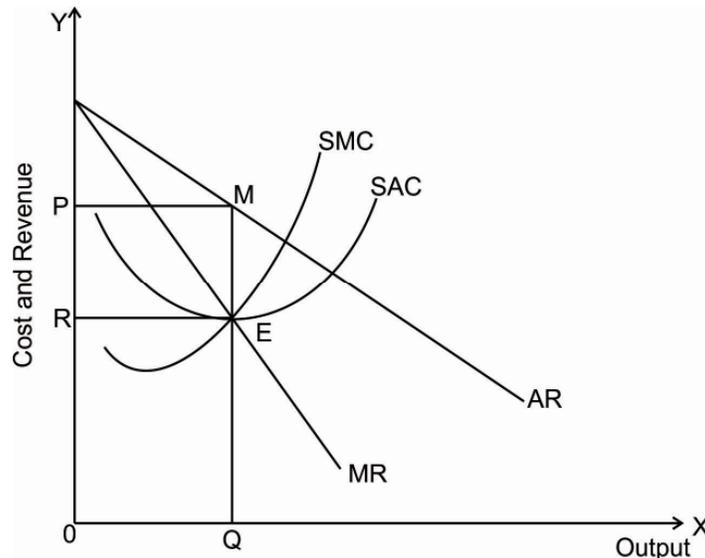
Diagram 2.2

On the X axis we measure output and on the Y axis we measure cost and revenue. AR and MR are the average and marginal revenue curves which are more elastic or flatter. SAC and SMC are the short run average and marginal cost curves. Firms equilibrium point is E and equilibrium level of output is OQ. Thus the price determined is OP or QM.

In the above diagram with price OP and output OQ, TR= OQMP, TC=OQER. As TR>TC, Excess profit = REMP (OQMP-OQER)

- **Normal profit**
    Condition for normal profit is very rare. Due to change in demand and cost conditions, sometimes it is possible for the firm to just cover its cost of production ie the case of normal profit.
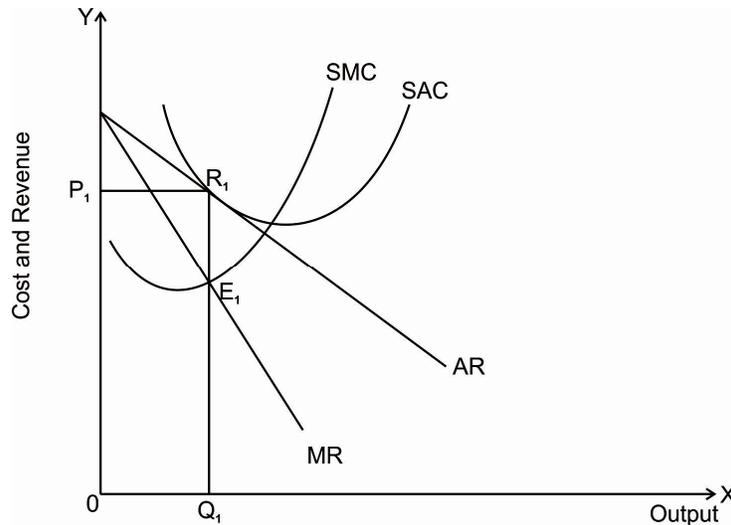
Diagram 2.3

With given revenue and cost curves firm is in equilibrium at point E1, with the intersection of MR and MC curves. Output= OQ1, Price= OP1, TR= $OQ_1R_1P_1$

TC= $OQ_1R_1P_1$. As TR=TC, the firm will make normal profit.

- **Loss**
    Due to demand and cost conditions it is also possible that firm may operate with loss. With the help of following diagram we can explain the case of loss.

Diagram 2.4

With given revenue and cost curves, firm is in equilibrium at point at point E2, where MR and MC curves intersects.

Equilibrium output= OQ2 and equilibrium price = OP2. TR= $OQ_2L_2P_2$, TC=$OQ_2N_2M_2$. As TC>TR, firm will make loss. Loss= P2L2N2M2

In the short run when the firm incurs loss, it has to decide whether to continue with the business or not. As long as the firm is able to cover its total variable cost, it will continue with the business and when TR<TVC, firm should stop its operations.

Long run equilibrium of a firm under monopolistic competition:

In the long run it is possible for the firm to make all necessary changes in its fixed factors of production. As all costs are variable, firm cannot continue to operate with loss. As there is free entry and free exit, due to supernormal profits earned by the existing firms, more firms will enter the market and firms which cannot cover the cost of production will leave the market. More firms who are entering the market reduces the share of existing firms and therefore in the long run all firms will make only normal profit. The case of normal profit can be discussed with the help of following diagram.
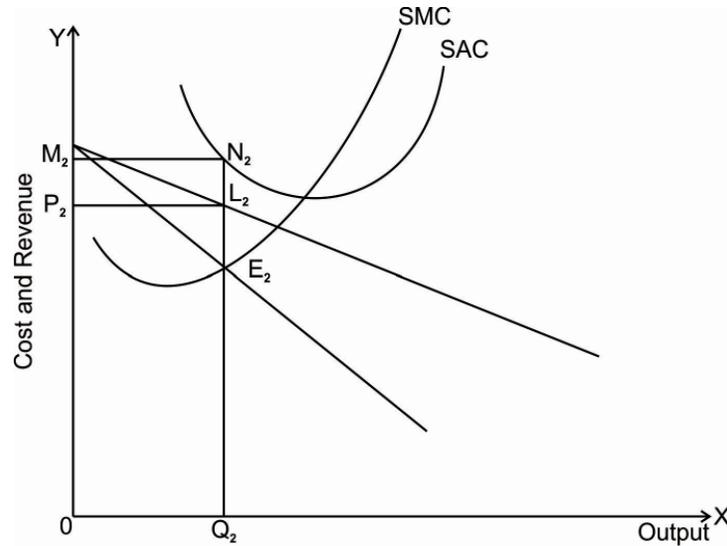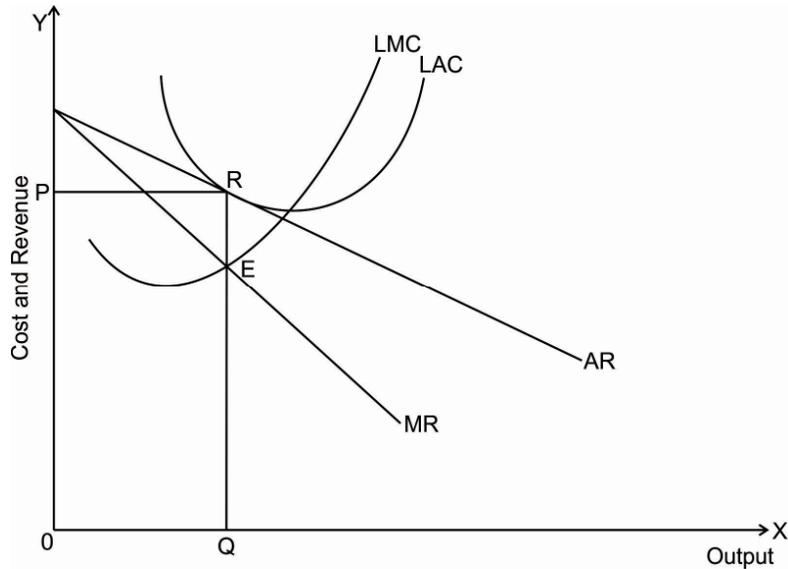
Diagram 2.5

With given revenue and cost curves, equilibrium point is E where MR and MC curves intersects. Equilibrium output= OQ, price= OP TR= OQRP TC= OQRP. As TR=TC, there is a normal profit.

2.3 PRODUCTION COST AND SELLING COST

Production cost includes all those expenditures incurred by the firm to produce a commodity and to reach to shops. It includes rent on land, wages and salaries paid to workers, interest on capital. Depreciation charges, taxes etc. The objective of production cost is to produce a commodity.

On the other hand the purpose of selling cost is to increase the sale of its product in the market. Due to the availability of substitutes, selling cost is very important for the firm under monopolistic competition. Through selling cost firms try to spread the message regarding how their product is better than the other products available in the market.

Selling costs are incurred in various forms like T.V advertisement, newspaper advertisement, pamphlets, hoardings, distribution of free samples, gifts, discounts offered on products, exhibitions, after sales services etc.

The concept of production and selling cost can be explained with the help of following diagram.
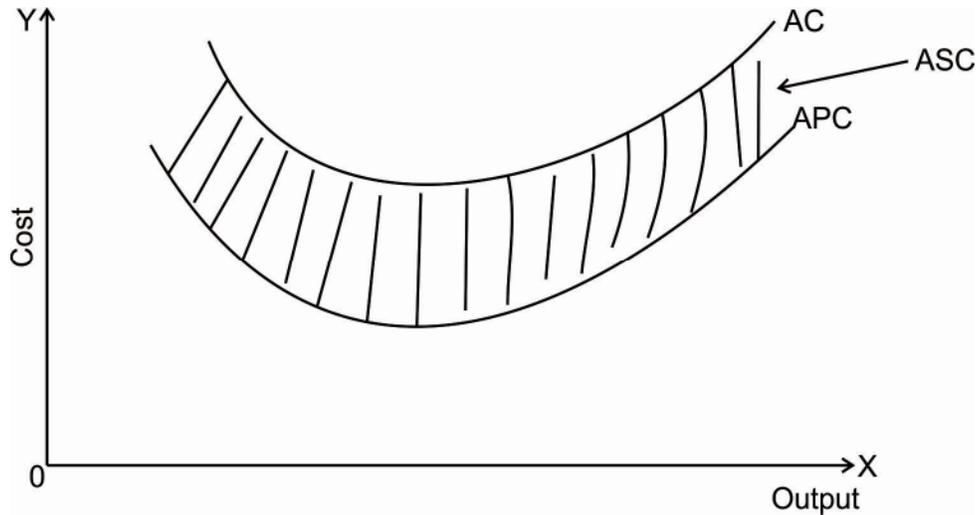
Diagram 2.6

As shown in the diagram, the difference between Average Cost (AC) and Average Production Cost (APC) is the Average Selling Cost (ASC).

Selling cost:
Selling cost is one of the important features of monopolistic competition. Under perfect competition, as there are homogeneous goods there is no need for selling cost. Similarly under monopoly due to the absence of substitute products, selling cost is not required. But in case of monopolistic competition as close substitute products are available, firm has to incur selling cost. Thus the cost incurred by the firm to promote their product in the market or to increase the demand for the product in the market is called the selling cost. Various forms of incurring selling cost are as follows-

- **Advertising**- this is the main form of selling cost. Through advertisement the firm is trying to show how their product is superior to other products that are available in the market. Advertisement can be through T.V, radio, newspaper, hoardings, distribution of pamphlets etc.

- **Exhibitions**- exhibitions can be held at local, state, national and an international level. The purpose of exhibition is to increase the sale of the product.

- **Window dressing**- various products like garments, electronic items, and other consumer durables are displayed to the consumers to provide some idea about the product and also to attract the consumers.

- **Free samples**- in case of goods like soaps, tea, biscuits, oil, hand wash etc. Companies distribute free samples to attract the large number of customers.

- **Gifts**- various gifts are offered by the companies on purchase of a specific amount.

- **Discounts**- another way of attracting large number of customers is to offer them large discounts. Once the market for the product is established, the discount may be withdrawn.

- **After sales services**- good after sales services play an important role in gaining goodwill of the customers. Along with better after sales services, warranty period, relation with customers etc. are also important to have greater sale of their product in the market.

Effects of selling cost

Selling cost affects the consumers demand. It makes people aware of the existing commodity and also inform them how their product is better than substitutes available in the market. Effect of selling cost on demand can be explained with the help of following diagrams.
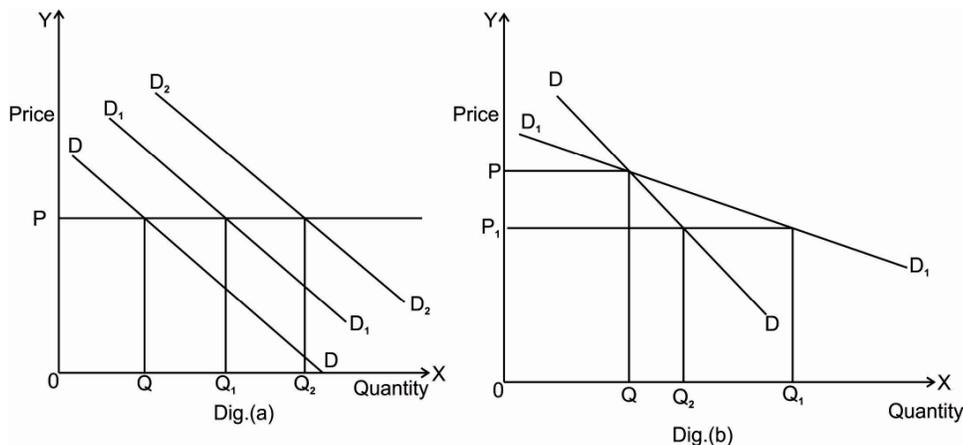
Diagram 2.7

In the above diagrams X axis measures quantity demanded and Y axis measures price. In the first diagram DD is the initial demand curve with price OP and output OQ. Due to selling cost demand curve shifts to the right to D_1D_1 and further to D_2D_2. The producer is able to sell more quantity OQ_1 and OQ_2 at the same price OP.

Second diagram shows that DD is the original demand curve without selling cost with price OP and quantity OQ. If selling cost is incurred, demand curve will become more elastic. ie D1D1. If firm reduces price to OP1, its demand will increase to OQ2. But at the same time firm incurs the selling cost, it will be able to sell more i.e. OQ_1 at price OP_1.

Effect of selling cost on profit

Effect of selling cost on profit can be explained with the help of following diagram
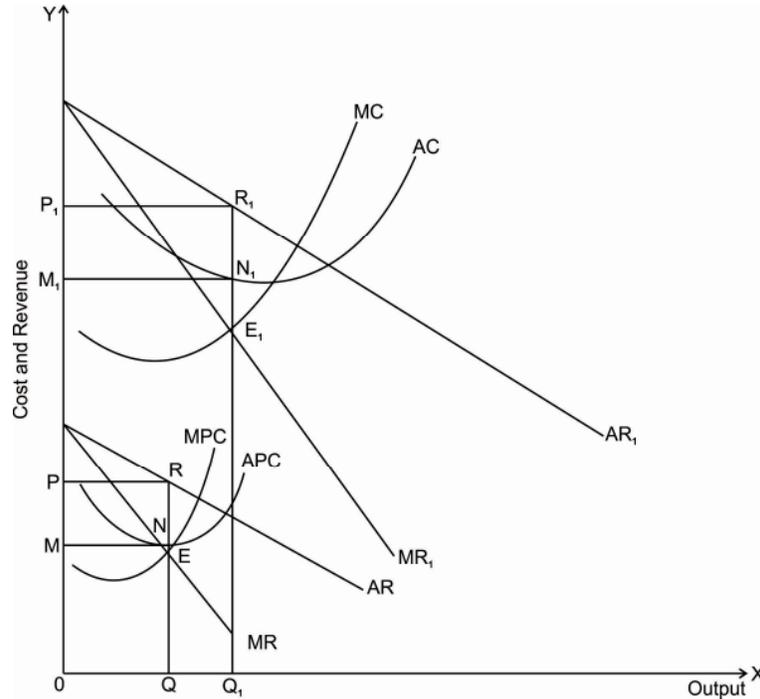
Diagram 2.8

In the above diagram X axis represents output and Y axis represents cost and revenue. If we consider a case without selling cost, AR and MR are the downward sloping curves starting at a lower side of Y axis. APC and MPC are the average and marginal production curves. Initial equilibrium point is E where MPC curve and MR curves intersect. Equilibrium output= OQ and price = OP, TR = OQRP, TC = OQNM as TR>TC, profit = MNRP.

If the firm incur selling cost, demand for goods will increase and therefore AR curve shifts upward to AR_1. Correspondingly MR curve will also shift to MR_1. Adding selling cost in production cost we have the average and marginal cost curves. New equilibrium point is E1. Output = OQ_1, price = OP_1, TR = $OQ_1R_1P_1$, TC = $OQ_1N_1M_1$. TR>TC, therefore profit = $M_1N_1R_1P_1$.

This shows that due to selling cost demand for commodity increases from OQ to OQ1. An increase in demand raises the price from OP to OP1. And therefore profit after selling cost is also greater than the level of profit before selling cost. $MNRP < M_1N_1R_1P_1$

2.4. ROLE OF ADVERTISEMENT

Due to the availability of close substitute products, advertisement or selling cost plays an important role under monopolistic competition. These advertisements are undertaken

through exhibitions, T.V, hoardings, discounts, distribution of free samples etc. The purpose of selling cost is to increase the sale of commodity in the market. It also encourages competition among the firms producing close substitute products.

There are many advertisements which gives an information about the availability of various products in the market and also inform them about quality and uses of the product. Advertisement also specifies the benefits of using a particular product. Such advertisements are called informative or educative advertisement. On the other hand there are some advertisements who distort consumer's preferences by misleading them to purchase certain commodities. Such advertisements are called manipulative or competitive advertisement.

There are debates over its role which is discussed as follows-

Arguments for advertisement or benefits of advertisement:

- Advertisement creates awareness amongst the consumers about the availability of various products, their advantages and disadvantages, price of the product etc.
- Advertisement generally increases the demand for the product and thereby increases the level of investment and employment.
- Successful advertisement which leads to increase in demand will lead to increase in production of the firm and thereby greater benefits of economies of scale.
- Advertisement directly provides information to the consumers and thus eliminates middlemen.
- If the advertisement is genuine and people are happy with the quality of the product, firms will succeed in building a brand loyalty among the consumers.

Arguments against advertisement or disadvantages of advertisement:

- Advertisement creates temptation to spend money on those goods which are sometimes not required.
- In order to attract consumers, sometimes producer explains false qualities of their product where the consumers do not have any source of verifying. In this way advertisement misleads the consumers.
- Advertising costs are added to the production cost of the firm and therefore price of the product will also be high.
- Advertising cost leads to psychological dissatisfaction to many poor people for whom it is not affordable to consume advertised product.

- If an advertisement is not successful in increasing demand for a product, advertisement expenditure will be considered as wastage.
- Posters on wall for advertisement spoils the beauty of specific areas.
- Due to attractive advertisement many people consume food items (junk food) in large quantity.
- Advertisements by the financial institutions offering loans at a concessional rate for consumption of specific goods divert peoples mind to consume such goods. But at the time of repayment of loan if they face some problem, it leads to stress, family problems etc.
- In most of the advertisements female models are shown. In some cases there is an exploitation of these models.

Check your Progress :

1) Suppose there are fairly large numbers of a firm producing detergent powder. Each firm spends huge amount of money on advertisement to increase the sale of their product in the market. Identify the market structure for the detergent powder.
2) Explain the role of advertisement.
3) If you want to sale of your product under the monopolistically competitive market, there is a need of selling cost. Justify your answer.

2.5 WASTAGES UNDER MONOPOLISTIC COMPETITION

There are different types of wastages under monopolistic competition. These are discussed below.

1. **Excess capacity**- Excess capacity is created under monopolistic competition the equilibrium of a firm under monopolistic competition is attained at a less than optimum level of output. This means that the resources are not fully utilized and therefore this underutilization of existing capacity leads to excess capacity. Following diagram explains the case of excess capacity.
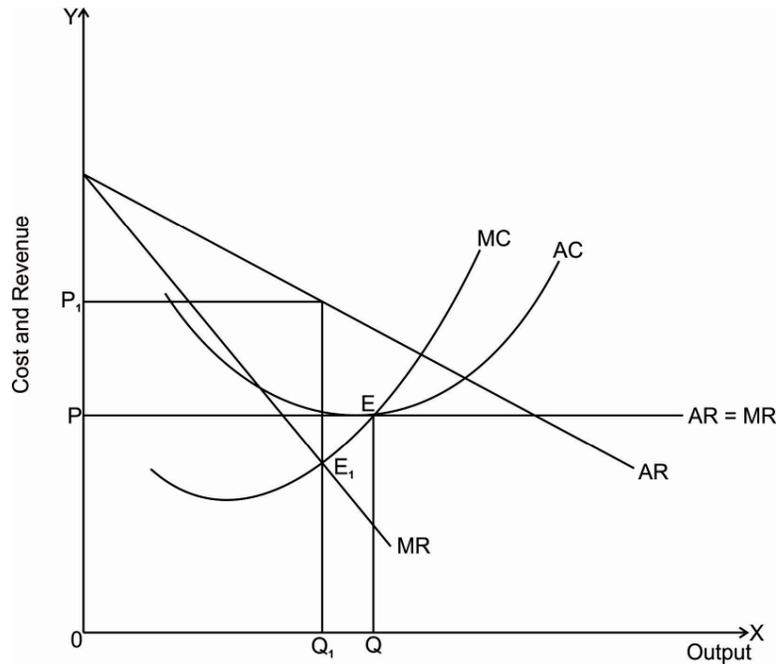
Diagram 2.9

In the above diagram horizontal AR and MR curve indicates perfect competition and downward sloping AR and MR curves indicates monopolistic competition. It is clear from the diagram that equilibrium under perfect competition is attained at point E with price OP and output OQ. Whereas equilibrium under monopolistic competition is attained at point E1, with price OP1 and output OQ1. This shoes that firm under perfect competition produces optimum level of output (OQ) with minimum cost and thus charges lower price (OP). On the other hand under monopolistic competition produces less than optimum level of output (OQ1) and sells at a higher price (OP1). As firm produces less than optimum level of output, Q1Q capacity of the form is unused. This is the excess capacity of the firm under monopolistic competition.

- As there is underutilization of a capacity, it leads to the problem of unemployment.
- If the firm is not successful in increasing demand for their product in the market, all firms expenditure in the form of selling cost will be a wastage.
- Heavy expenditure on advertisement will increase the prices of goods and services and therefore there is an exploitation of the consumers.

2. **Unemployment-** as the production capacity of a firm is not fully utilized under monopolistic competition, the problem of unemployment occurs in case of monopolistic competition.

3. **Exploitation of the consumer-** Due to product differentiation, firm has to incur selling cost under monopolistic competition. Therefore the consumers have to pay higher price for the product and this leads to exploitation of the consumers.

4. **Selling cost-**Under monopolistic competition firm undertakes huge expenditure on advertising their product in order to increase the sale of their product in the market. If the firm is not successful in increasing the sale of their product in the market, this expenditure is considered as the wasteful expenditure.

5. **Lack of specialization-** as there are many firms, producing close substitute products, there is a very little scope for specialization. Thus the advantages of large scale production are not possible.

2.6 SUMMARY

This unit studies the monopolistically competitive market. It includes the features of monopolistic competition. The concept of monopolistic competition was introduced by professor chambertin. Monopolistic competition is a more realistic market structure in which we live. This unit discusses the equilibrium of a firm in the short run and in the long run. It concentrates on product differentiation and also explains the factors that leads to product differentiation.

This unit explains selling cost as an important feature of monopolistic competition. It shows the effects of selling cost on demand for a commodity and profit of the firm with the help of diagrams. It also explains excess capacity and wastages under monopolistic competition.

2.7 QUESTIONS

1. Discuss the features of monopolistic competition.
2. Write a note on product differentiation.
3. Explain the short run equilibrium of a firm under monopolistic competition.
4. Discuss the long run equilibrium of a firm under monopolistic competition.
5. Bring out distinguish between production cost and selling cost.
6. What are the various forms of selling cost.
7. Explain with the help of diagram effects of selling cost.
8. Discuss the effect of selling cost on profit.
9. Discuss the role of advertising.
10. What are the arguments for and against advertising.
11. Write a note on wastages under monopolistic competition.

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Unit - 2A

OLIGOPOLISTIC MARKET

Unit Structure :

2A.0   Objectives
2A.1   Features of oligopoly
2A.2   Collusive and non-collusive oligopoly
2A.3   Summary
2A.4   Questions

2A.0 OBJECTIVES

- To understand the features of oligopoly
- To understand the difference between collusive and non-collusive oligopoly models
- To understand the types of collusions
- To understand the price leadership, its types and limitations.

2A.1 OLIGOPOLY MARKET CAN BE WELL UNDERSTOOD WITH THE HELP OF FOLLOWING CHARACTERISTICS-

- **Few sellers-** In case of oligopoly market there are few sellers. The number of sellers is not more than 10. In case if there are more than ten sellers, few sellers are dominant and others are insignificant.

- **Homogeneous or differentiated products**- goods which are sold under oligopoly are either homogeneous or differentiated. Differentiation is in the form of brand name, design, color etc.

- **Entry is possible but difficult-** In case of oligopoly a new firm can enter the market but in reality, it is difficult because of the technological, financial and other barriers

- **Interdependence-** as there are few firms under oligopoly, a single firm is not in a position to take any decision about price and output independently. Any decision taken by one firm has the reactions from the rival firms or competitive firms. Different firms will have different decisions. Thus the firms are interdependent. Therefore it is necessary for the firm to take in to consideration the possible reactions of the rival firms.

- **Uncertainty-** as the firms are interdependent for deciding the price and output, it creates the atmosphere of uncertainty. If one

seller increases his output to capture large share of the market, others will react in the same way. If one seller increases the price of his product, others will not follow him due to the fear of losing the market. On the other hand if one seller reduces the price, others will also reduce their prices. But how much price reduction they will do is uncertain. This means that an oligopolist is uncertain about the reactions of the competitive firms.

- **Indeterminateness of the demand curve**- in case of perfect competition price is determined in the market with demand and supply factors and the firm is a price taker therefore demand curve of the firm is perfectly elastic (parallel to x axis). In case of monopoly a single seller decides the price for his commodity and accordingly sells his output. Thus the demand curve of the monopolist slopes downward. And the demand curve is steeper as the substitute products are not available. Under monopolistic competition as close substitute products are available, demand curve is downward sloping and more elastic or flatter. This means that under perfect competition, monopoly and monopolistic competition there is a definite shape of the demand curve.

In case of oligopoly due to interdependence of firms and the uncertainty aspect

Demand curve do not have a definite shape. It loses its determinateness.

The demand curve under oligopoly is kinky as shown in the following diagram.
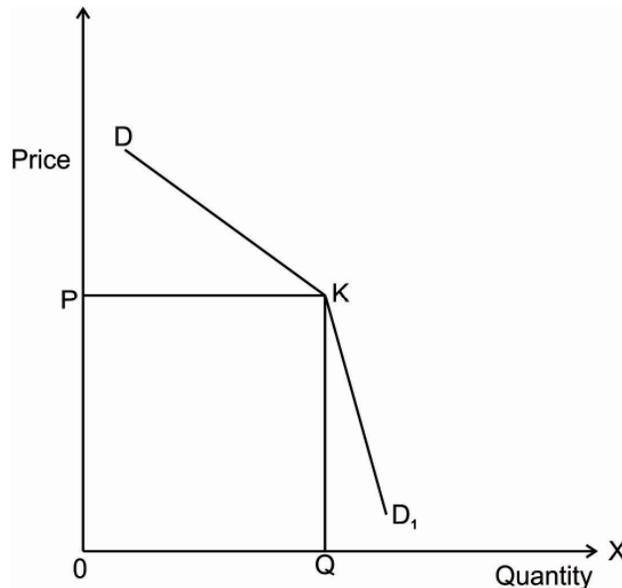
Diagram 2A.1

Check your Progress :

1) Suppose there are two firms which are interdependent on each other for taking any decision related to price and output. There is also and uncertainty in the market. Identify the market structure.
2) Give few examples of firms operating under Oligopoly.

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2A.2 COLLUSIVE AND NON- COLLUSIVE OLIGOPOLY

The oligopoly market faces the problem of price determination because of the continuous reactions of the rival firms. Due to differentiate products, competition in the oligopoly market is also high. An oligopoly can be collusive or non -collusive.

Non collusive oligopoly
In case of non- collusive oligopoly, firms behave independently, even though they are interdependent. interdependence of the firm leads to stiff competition among the rivals. In this case the behavior of the Seller depends on how he thinks his competitors will react to his decision making. In case of non- collusive oligopoly firm while deciding price for its product assumes that rival firms will keep their price and output constant and will not react to any change in price and output introduced by the firm. A very good example of non -collusive oligopoly is sweezy's kinked demand curve model.

Collusive oligopoly- collusive oligopoly prevails when the firms working under oligopoly market enter into an agreement regarding uniform price and output policy to avoid uncertainty arising due to interdependence of the firm and to avoid high level of competition.

The agreement may be either formal (open) or tacit (secret). As the open agreement to form monopolies are illegal in most of the countries agreements between the oligopolists are tacit.

Collusions are of two types:
• a. Cartel and b. price leadership

In case of collusive oligopoly, price fixing takes place when all firms in the market try to control supply, to achieve a monopoly

like situation. In this type of oligopoly, firms aim at maximizing collective profit rather than individual profit.

Collusive and non- collusive models are discussed below.

Price rigidity- kinked demand curve model (non- collusive oligopoly model)

Kinky demand curve model or kinked demand curve hypothesis was given by an American economist Paul M. Sweezy and Oxford economist Hall and Hitch.

Interdependence and uncertainty aspect of oligopoly leads to indeterminateness of the demand curve. In case of oligopoly price is rigid or inflexible because oligopolists are not interested in changing their price even though economic conditions undergo a change.

In order to explain price and output determination under oligopoly with product differentiation economists often used kinked demand curve model. This model is explained by taking an example of extremely limited case of oligopoly i.e. Duopoly, where there are only two firms. Therefore there are two demand curves as shown in the following diagram.
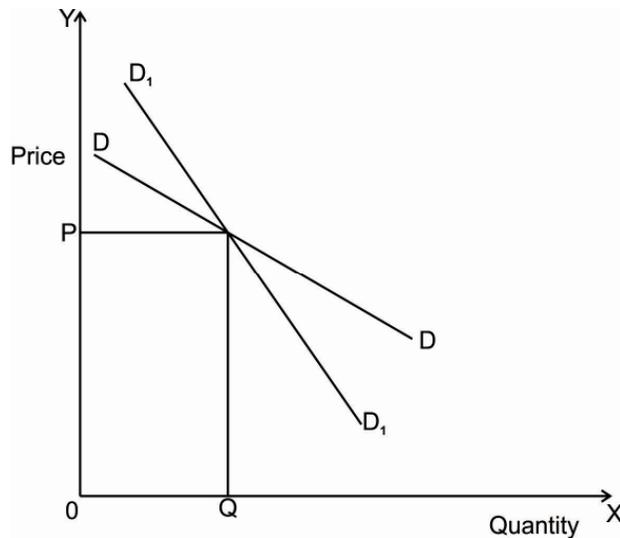
Diagram 2A.2

As shown in Diagram 2A.2 above there are two demand curves DD of firm A and D1D1 of firm B. Demand curve DD is more elastic where as demand curve D_1D_1 is less elastic. These two demand curves intersect at point K. Thus the prevailing price is OP and quantity is OQ. As shown in the diagram the demand curve faced by an oligopolist is DKD_1. This demand curve has a kink at point K because the upper segment of demand curve (segment DK is more elastic) and the lower segment of the demand

curve (segment KD_1) is less elastic. This difference in elasticities is because of the reactions of the competitive firms.

An oligopolists believes that if he reduces the price below prevailing price, his competitors will also reduce their prices and if he increases the price above prevailing price, his competitors will not increase their prices.

- **Increase in price-** If an oligopolistic increases the price above prevailing price his competitors will not increase their price. Therefore, demand for his goods will fall substantially. This is because due to increase in price his customers will go to his competitors who have not increased their prices. Due to this the demand curve above prevailing price is more elastic.

- **Reduction in price-** If an oligopolistic reduces the price below prevailing price, his competitors will follow him and also reduce their prices due to the fear of losing their customers. Due to quick reactions of the oligopolists, whoever reduces the price, demand for his goods increases by a very little amount. Therefore the demand curve below prevailing price is less elastic.

Therefore DKD_1 is the kinked demand curve under oligopoly. Due to differences in elasticity, a demand curve has a kink at point K. Thus the demand curve under oligopoly is called kinky demand curve.

Rigid price- With an increase in price, there is a fear of losing the market and there is a very little benefit by reducing the price. Therefore an oligopolist is not interested in changing their price. Thus price remains rigid or sticky under oligopoly.

Equilibrium of a firm
Equilibrium of a firm occurs when MR= MC. In case of oligopoly the demand curve or the average revenue curve has a kink at a particular prevailing price. Therefore the MR curve of the firm has a discontinuous portion as shown in the following diagram.
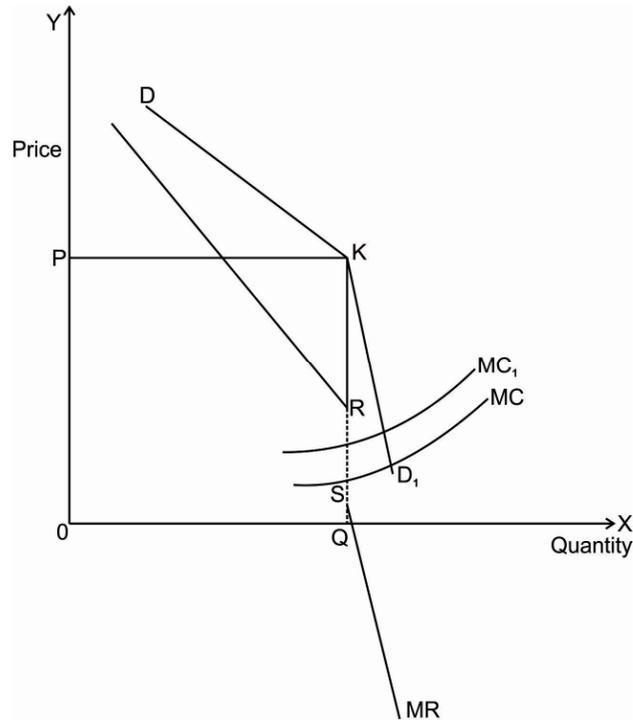
Diagram 2A.3

In the above diagram DKD_1 is the kinked demand curve under oligopoly. The demand curve has the kink at point K. Therefore MR curve which lies half way between AR curve and Y-axis has a discontinuous portion RS. MR curve is discontinuous because of the Kink to the demand curve. Discontinuous portion of the MR curve depends on the difference in elasticities. Larger is the difference in elasticities, longer will be the discontinuous portion of the MR curve. MC is the marginal cost curve which passes through discontinuous portion of the MR curve. Equilibrium of the oligopoly form is achieved at a point where MR=MC. Therefore equilibrium output is OQ and price is QK or OP. If MC increases or decreases, there will be upward or downward Movement in the marginal cost curve over the discontinuous portion of the MR curve. This will keep price and output level constant at OP and OQ respectively.

Therefore the price remains rigid. If an oligopolistic increases price over DK portion of the kinked demand curve, the Rivals will not follow due to the fear of losing the market. Due to this oligopolists will not increase price above OP. Similarly, no oligopolist is interested in reducing the price because in this case due to the continuous reactions of the rivals, demand increases by a very small amount. Thus the demand curve is inelastic.

Collusive oligopoly models:

In case of oligopoly there is interdependence of the firms and there is also, uncertainty. In order to avoid uncertainty arising out of interdependence, firms generally enter into an agreement to follow a uniform price and output policy. This type of agreement

helps firms to avoid price wars and also stiff competition. The agreement may be either formal (open) or tacit (secret). Open agreements are illegal in most of the countries. Thus, the agreements to form monopolies are in the form of tacit agreements. This type of oligopoly is called collusive oligopoly. OPEC (Organization of Petroleum Exporting Countries) is the best example of this type of oligopoly. There are two types of collusions. They are- a. cartel and b. price leadership Cartel- Cartel is an agreement among the competitive firms to earn higher profits. Cartels are formed in oligopoly market where the number of sellers is few and they are selling homogeneous or differentiated products. In this agreement, the member firms may agree on price fixing, market share division of profits etc. The cartels are of two types - centralized cartel and market sharing cartel. In case of centralized cartel there is a common Sales Agency which alone undertakes the selling operations for all the forms who are party to the agreement. Here the Central Administrative agency decides the product price, distribution of output, profit sharing for all the firms. All firms agree to surrender their rights to Central Administrative Agency for earning maximum joint profits. This is known as perfect cartel. Agreement under centralized cartel can be discussed with the help of following diagram.
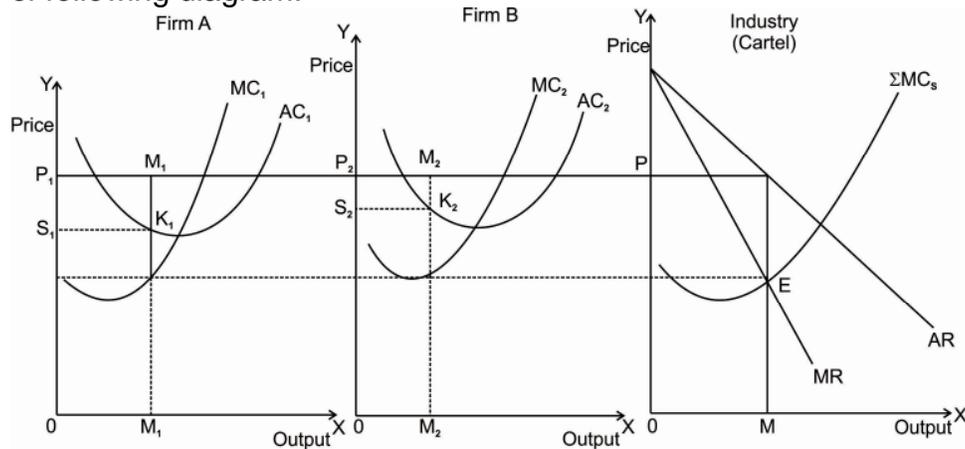
Diagram 2A.4

In the about figure first two diagrams shows the case of two firms A and Band third diagram explains the case of industry. Formation of cartel leads to Monopoly power and therefore AR and MR of industry are downward sloping. As shown in figure 3, summation MC is the marginal cost curve for an industry, which is being derived by adding horizontally the marginal cost of curves of two firms MC1 and MC2. Total industries output is produced at a point where summation MC= MR. Therefore, total output is OM and the market price is OP. This is the price set by the centralized authority.

Firm A sells OM_1 output and Firm B cells OM_2 output. OM1+OM2=OM. Market price is charged by both the firms.

therefore, price of firm A is OP1 and price of firm B is OP 2. Profit for firm A is $S_1K_1M_1P_1$ and profit for firm B is $S_2K_2M_2P_2$. This shows that firm A produces and sells greater quantity as compared to firm B and thus makes higher profits.

A type of cartel discussed above is very rare. In the real world we generally have loose type of cartel. Here we have two types of market sharing. They are-

a. Market sharing by non- price competition and
b. Market sharing by output quota

a. Market sharing by non- price competition- In case of oligopoly, due to interdependence of firms and uncertainty, price is rigid i.e. firms follow a particular price and there is no tendency either to increase or to reduce the price. At a uniform price firms are free to produce and sell that level of output which will maximize their profits. Here even though the firms are following same price they are free to change the style of their product, style of advertising the product, additional facilities or discounts may be given. If all member firms have identical cost, they will be agreeing to uniform monopoly price and this price will maximize their joint profits. But if their costs are different, cartel price will be decided by the bargaining between the firms. If low cost firms are interested in charging lower price cartel may break away.

b. Market sharing buy output quota- In this case an oligopoly firm enters in to an agreement regarding quota of output to be produced and sold by each of the firm at a particular agreed price.

If the cost of production is same for all the firms and firms are producing homogeneous product, a monopoly element will exist and all firms will share the market equally and charge the maximum possible price. On the other hand, if the cost of production is different for different firms, market share of the firms will differ. These differences are dependent on the bargaining power of the firms. The Quota of output shared by the firm depends on the past records and negotiation skills.

Another method for market sharing quota is to divide the markets region wise. In this case firms are free to decide the price and to bring changes in their product. When there are cost differences between the firms all types of cartels are unstable.

Price leadership:
Price leadership is one way of avoiding unnecessary competition. In case of price leadership one firm decides the price and the other follow it. Firms who decides the price will be the leader and the others are followers.

There are different types of price leadership. They are discussed below:

1) Price leadership by a low-cost firm- In this case a firm with lower cost of production becomes the leader. Here a firm with low cost sets a price and the other firms with higher cost of production accept the price. While deciding price, low cost firm has to ensure that this price brings some profits to the high cost firms.

2) Price leadership by a dominant firm - In this case one of the firms in the oligopoly market may be producing a large portion of the total output. Such a firm will become dominant, who can influence other firms in the market. As other firms are small they cannot have impact on the market. The dominant firm fixes a price which maximizes its own profit. Thus, the other firms will follow the price set by the dominant firm and accordingly adjust their output.

3) Barometric price leadership - In this type of price leadership an old experienced and most respected firm in the market becomes the leader. This firm study the changes in market conditions like demand for the product, cost conditions, level of competition etc. and decides such a price which protects the interest of all. A leader firm decides the price which is beneficial to all and other firms Follow the Leader.

4) Exploitative or aggressive price leadership - Here a large and dominant firm establishes its leadership through aggressive price policy and forces the other firms to follow the price set by him. If the firm's do not agree with the price, aggressive firms may threaten the other firms to keep them out of the market.

Price leadership by a dominant firm In case of price leadership by a dominant firm, one of the large and dominant firm in the industry sets the price and the other small firms follow the price set by the dominant firm. Following diagram explains the price leadership by a dominant firm.
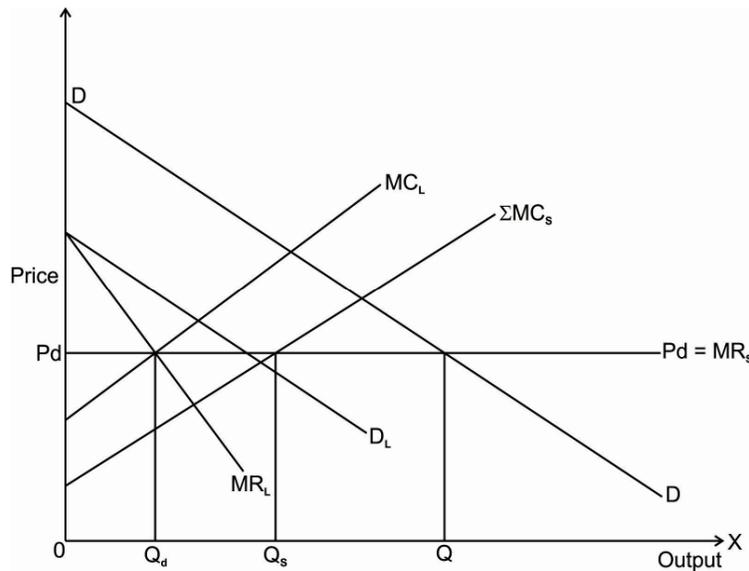
Diagram 2A.5

In the above diagram DD is the demand curve of a market at and DL is the demand curve of a dominant firm, MR_L is the marginal revenue curve and MC_L is the marginal cost of the dominant firm. The dominant firm will maximize their profit when $MR_L = MC_L$. Therefore, the price set by the dominant firm is Pd and the output of the dominant firm is Qd. As the small firms in the market are price takers, they follow price Pd which is set by the dominant firm. for the small firms, price set by the dominant firm becomes their marginal revenue, Pd =MRs. The small firms or followers will maximize their profit when MRs = summation MCs. Thus, the output of small firms is Qs. Thus, in the market consumers pay price Pd and consume quantity Q. Out of this total quantity Q the share of dominant firm is Qd and the share of small firms is Qs. Whether the price leadership is successful or not depends on various factors. It is expected that the leader or dominant firm is fully aware of the reactions of the small firms. If the leader firm takes the decision with incomplete information, firms' leadership may not be successful. Some of the limitations of the price leadership are as follows-

1) Non price competition - There is a possibility that even though the small firms are following the price set by dominant firm, they may also follow various non-price competition methods, which are in the form of discounts, after sales services etc. In this case non price competition may lead to reduction in prices to protect their own market share.

2) Product differentiation - In case of oligopoly, if the firms are selling differentiated products, it is difficult to have the leadership. This is because each firm will incur selling cost in order to attract more customers. Selling cost is in the form of TV on newspaper

advertising, giving free samples, discount, etc. This situation forces the leader firm to enter into the competition and protect its market share.

3) Difference in the cost of production - Cost of production for each of the firm is different. In case of price leadership if the low cost firm becomes leader and sets the price, which other forms in the industry have to follow. In this case for a dominant firm it is difficult to follow the price set by low cost firm. If the firms with a lower cost enter into non price competition it may lead to open competition by all the firms. On the other hand, if high cost firm becomes the leader for setting the price it has to set high price for its product in order to cover the cost firms who are not ready to accept this high price may try to enter into non- price competition to enlarge their market.

2A.3 SUMMARY

This unit explains the characteristics of oligopoly market. It explains two types of oligopoly models that is collusive oligopoly and non-collusive oligopoly.

Non collusive oligopoly model is discussed with the help of Paul sweezy's kinky demand curve. It explains why price remain rigid under oligopoly. Equilibrium of a firm under oligopoly market is also explained with the help of intersection of discontinuous marginal revenue curve under oligopoly and marginal cost curve.

Collusive oligopoly is discussed with the help of cartels and price leadership.

Two types of cartels are discussed that is centralised cartels and market sharing cartels.

Two types of market sharing are
1) Market sharing by non-price competition and
2) Market sharing bye quota.

Four types of price leaderships are explained in this unit. They are
1) Price leadership by high cost firm
2) Price leadership by low cost firm
3) Barometric price leadership
4) Aggressive or exploitative price leadership

2A.4 QUESTIONS

1. Discuss the features of oligopoly market.
2. What is oligopoly? Explain its characteristics.
3. Explain why price is rigid under oligopoly?
4. Discuss kinky demand curve under oligopoly.
5. Explain the collusive oligopoly models
6. Write a note on cartel.
7. What is price leadership? Explain its various types.
8. Discuss the price leadership by a dominant firm.
9. Discuss price leadership along with limitations.
10. Explain non-collusive oligopoly model.

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Unit - 3

PRICING METHODS

Unit Structure :

3.0   Objectives
3.1   Cost –Plus (Full Cost)/Mark-Up Pricing Method
3.2   Marginal Cost Pricing Method
3.3   Multiple – Product Pricing Method
3.4   Summary
3.5   Questions

3.0 OBJECTIVES

1) To study the concept of Cost plus pricing.
2) To study the concept of marginal cost pricing.
3) To study the concept of multiple – product pricing.

3.1 COST – PLUS PRICING / FULL COST PRICING / MARKUP PRICING

Cost-plus pricing is also called as full cost pricing or mark-up pricing. Two famous economist of Oxford University Hall and Hitch developed this concept of pricing. This is the most commonly adopted method of pricing. It is used by a company or firm to determine the selling price of their product. Cost-plus pricing is a very simple method for setting the prices of goods and services.

According to this method price of a commodity is determined by taking into consideration Average Fixed Cost (AFC), Average Variable Cost (AVC) and Normal Profit Margin (NPM) or markup percentage. This markup percentage is nothing but profit. In other words price is determined by adding a fixed mark-up to the cost of producing the product. This method is generally used by manufacturing firms. Thus, it is imperative to have an accurate information of average costs.

∴ **P = AFC + AVC + NPM**
Example :
If variable cost of a product is ₹100, average fixed cost is ₹200 and desired markup is 50% on cost. The price will be calculated as follows:
P = 100 + 200 + (0.5 × 300)
   = 300 + 150
   = ₹450

Advantages/Merits

1] This method is simple and easy for the firms to implement, no matter how many products the firm produces.

2] It promises fair returns to both producers and consumers.

3] It is less time consuming as it requires less data for calculation i.e. (AFC and AVC).

4] It is easy to apply.

5] This method guarantees stability in prices when cost of production remains stable.

6] This method provides a logical reasoning for increase in prices because prices increase as a result of increase in costs.

7] It lessens the cost of decision making as price can be calculated just by using one formula.

Disadvantages / Demerits

1] This method concentrates only on cost of production and profit margin, and completely overlooks demand and preferences by consumer.

2] It disregards the role of competition in the market.

3] It makes use of historical data rather than replacement value.

4] It is very difficult to estimate precisely the average variable cost and average total cost and distribute it between the various products produced by the firm.

5] Few economist are of the opinion that pricing should be based on marginal cost rather than average costs.

Despite of all the demerits, in reality many firms use this method because of following reasons.

1] If the price is more than the average cost, firms would make supernormal profits and this will interest the competitor's to enter in to the market.

2] It difficult to get correct information about MR and MC and therefore many firms use full cost pricing method.

Case Studies – Pricing Methods

1] Suppose the firm has capacity to produce 1000 units. It uses 70% of its capacity and is considered as the standard output. The total variable cost incurred is ₹1400 and the overhead cost is ₹700. The mark up decided by the firm is 25%.

Estimate the price per unit.
Standard output is = 700 units
           i.e. 70% of its capacity

Total Variable Cost   = ₹1400
∴ Average Variable cost   = ₹1400 / 700 = 2
Overhead Cost   = ₹700
∴ Average Fixed Cost   = ₹700/700 = ₹1
∴ Average Cost   = AVC +AFC
                                  = 2+1 = ₹3

Now P = C (1+m)
       3 (1+0.25)
       3 (1.25)
     = ₹3.75

2] A firm produces 5000 units of commodity X at the total fixed cost of ₹2,00,000& total variable cost of ₹3,00,000. Find the price which the firm would charge to its customers if it wants to make profit margin of 15% on cost. The firm uses cost plus pricing method.

Output of the firm = 5000 units
            TFC = ₹200000
           TVC = ₹300000

∴ Average Fixed Cost (AFC) = $\dfrac{TFC}{Q} = \dfrac{200000}{5,000}$

                       = ₹40
∴ Average Variable Cost (AVC) = $\dfrac{TVC}{Q} = \dfrac{300000}{5,000}$

                       = ₹60
Average Total Cost = AFC + AVC
                 = ₹40 + ₹60
                 = ₹100
∴ Net profit margin is 15% of total cost
∴ $\dfrac{15}{100} \times 100 = 15$

∴ Price of Commodity = ₹100 + ₹15
                      = ₹115

3] If total cost of producing a commodity A is ₹5,00,000 and markup fixed by the firm is
₹1,00,000. Total Output to be sold is ₹6000 units. Calculate the price per unit.

Price = $\dfrac{\text{Total cost of production} + \text{markup}}{\text{Total quantity of output}}$

= $\dfrac{5,00,000 + 1,00,000}{6000}$

= $\dfrac{6,00,000}{6000}$ = ₹100

4] If the cost of product is ₹500 per unit and the market expects 10% profit on costs.
Calculate selling price

Selling Price = AC + markup

$$= 500 + \frac{10}{100} \times 500$$

$$= 500 + 50$$
$$= ₹550$$

5] ABC International expects to incur the following costs in its business in the upcoming year.

Total production cost = ₹250000
Total Sales and administration cost = ₹100000
Company wants to make profit of ₹200000
And ABC expects to sell 20000 units of its product.
On the basis of above information, calculate full cost price.

Full Cost Price = $\dfrac{\text{Production cost+Sales and Administrative Cost+Markup}}{\text{Number of units expected to sell}}$

$$= \frac{250000+100000+200000}{20000}$$

$$= \frac{550000}{20000}$$

Full Cost Price = ₹27.5 per unit

3.2 MARGINAL COST PRICING

According to marginal cost pricing method price is determined on the basis of the marginal cost of production. Marginal cost means cost of producing an extra unit of output. Here the price is charged on the basis of cost of additional unit of output which the firm produces. The price is determined in such a way that it must cover the marginal cost.

In the long run both average/ full cost pricing method and marginal cost pricing method will give same price under perfect competition. This is because under perfect competition in the long run P = AR = MR = $LAC = LMC$.This is shown in the following diagram.
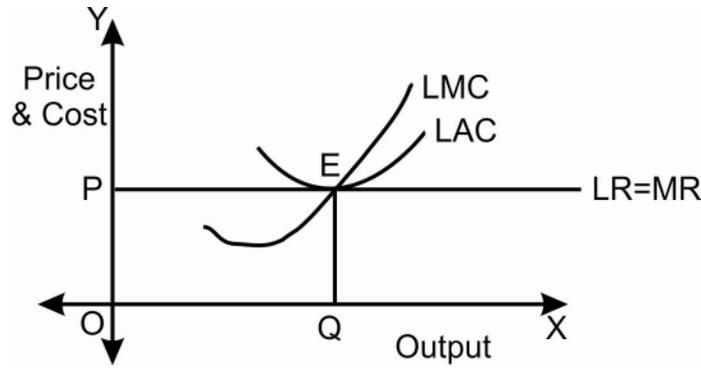
FIG 3.1

Above diagram shows that at profit maximizing condition i.e. MR=MC, Average/ Full Cost Price method and Marginal Cost Price Method gives same price i.e. OP.

But in case of monopoly, pricing with each of the method will give different result. This can be discussed with the help of following diagram.
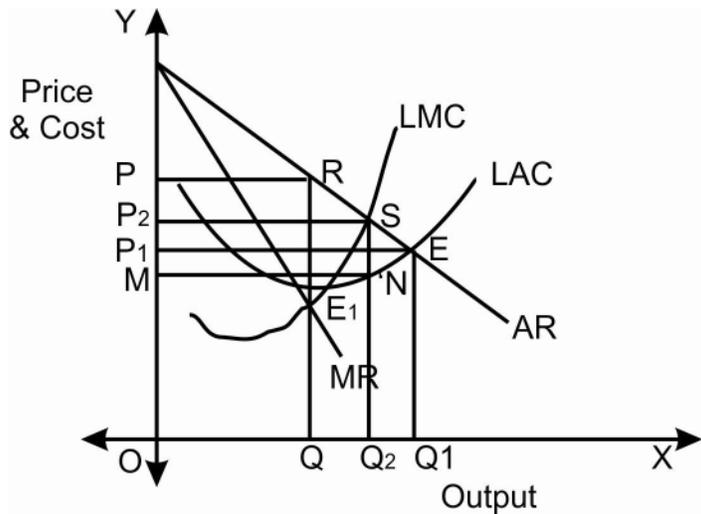
Fig 3.2

In the above diagram on the basis of profit maximizing condition i.e. MR=MC, equilibrium price is OP & equilibrium quantity is OQ.

On the basis of Average / Full Cost Pricing Method equilibrium price is OP_1 and quantity is OQ_1. This price is considered to be fair for both consumers & producers.

On the basis of Marginal Cost Pricing Method (P = MC) price is OP_2 and quantity is OQ_2.

Here TR = OQ_2SP_2 and TC = OQ_2NM
∴ Profit = $MNSP_2$.

If price charged by using Marginal Cost Method (i.e. OP_2) is greater than the price charged by using full cost pricing rule (i.e. OP_1) firm will make profit (i.e. excess profit).

But if price charged by using Marginal Cost Pricing Method is less than price charged by using average cost pricing method, firm will make loss.

Advantages
1] This method helps in solving short run problems therefore it is more effective than full cost pricing method.
2] Firms will be able to increase sales as prices tend to be competitive.

Disadvantages

1] It is very difficult to calculate MR and MC accurately for every additional unit of output produced.

2] This method is not advantageous in the long run.

3] During recession, firms using marginal cost pricing encourage severe competition. The firm may lower prices to increase the sales. Due to this other firms also reduce their prices and hence no firm would be earning sufficient to cover the fixed cost.

Check your Progress :

1) Suppose the firm has capacity to produce 2000 units. It uses 50% of its capacity and is considered as the standard output. The total variable cost incurred is ₹2000 and the overhead cost is ₹4,000. The mark up decided by the firm is 25%.

2) A firm produces 4000 units of commodity X at the total fixed cost of ₹12,00,000 & total variable cost of ₹4,00,000. Find the price which the firm would charge to its customers if it wants to make profit margin of 20% on cost. The firm uses cost plus pricing method.

3) What do you mean by full cost pricing?

4) What do you mean by Marginal cost pricing?

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3.3 MULTIPLE – PRODUCT PRICING

Most of the companies today produce more than one product and sell them in more than one markets. They produce variety of products instead of specializing in one product. They do this in order to make optimum utilization of their production capacities. The goods sold by them may be substitutes or complementary goods. An automobile firm like Maruti Suzuki produces wide range of cars. So each product will have an independent demand curve and hence a separate price.

Few more Examples:
- ➢ Samsung producing variety of products viz mobile phones, tablets, laptops etc.
- ➢ Cadbury producing variety of chocolates viz dairy milk, 5 star etc.

Pricing of variety of goods produced by a single firm is called multiple product pricing. It is also known as multi-product pricing or product line. In this type of pricing firms needs to be very vigilant about the repercussions of change in prices of one product on another.

Marginal revenue functions helps to explain the relationships between two products. These functions are:-
Suppose A & B are two products

$$MR_A = \frac{\Delta TR_A}{\Delta Q_A} + \frac{\Delta TR_B}{\Delta Q_A}$$

$$MR_B = \frac{\Delta TR_B}{\Delta Q_B} + \frac{\Delta TR_A}{\Delta Q_B}$$

Marginal revenue of a product A has two components i.e. change in total revenue of A product due to change in sale of A product and change in total revenue of B product due to change in sale of A product. Similarly we have equation for marginal product of B. Here also there are two components i.e. change in total revenue of B product due to change in sale of B product and change in total revenue of A product due to change in sale of B product.

If the second term on the right hand side is positive, commodities' are complementary and if second term is negative, goods are substitutes.

Multiple product pricing can be explained with the help of following diagram.
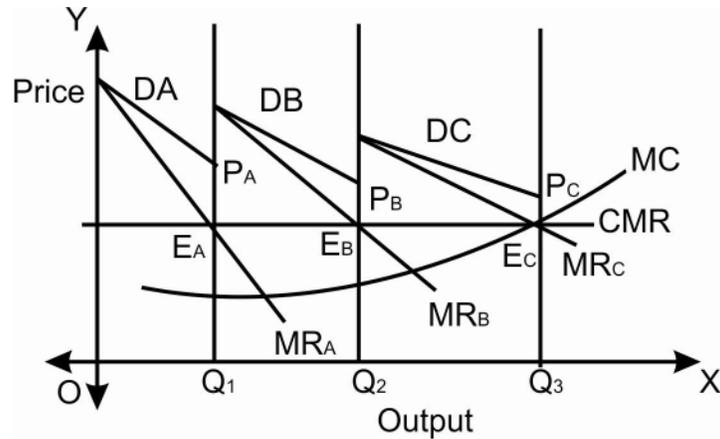
Fig 3.3

In the above diagram D_A, D_B & D_C are the demand curves of products A, B and C sold by the firm and MR_A, MR_B and MR_C are the corresponding marginal revenue curves.

The firm maximizes its profit when $MR_A = MR_B = MR_C = MC$ i.e. [Marginal Revenue of each product should be equal to each other and that should be equal to Marginal Cost]

This is shown by points E_A, E_B, & E_C where the equal marginal revenue or combined marginal revenue (CMR) curve is equal to marginal cost.

Therefore output of product A is OQ_1 and price is P_AQ_1, for product B output is Q_1Q_2 & price is P_BQ_2, for product C output is Q_2Q_3 and price is P_CQ_3.

This shows that as demand curve becomes more flatter (relatively elastic), price goes on declining.

Check your Progress :

1) What do you mean by Multiple product pricing?
2) Give few examples of firms using multiple product pricing.

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3.4 SUMMARY

In this unit we have seen three pricing methods i.e. Full cost pricing, Marginal cost pricing and multiple product pricing. According to Full cost pricing, price of a commodity is determined by taking into consideration Average Fixed Cost (AFC), Average Variable Cost (AVC) and Normal Profit Margin (NPM) or mark-up

percentage. Marginal cost pricing focus on marginal costs for determining price. Pricing of variety of goods produced by a single firm is called multiple product pricing. It is also known as multi-product pricing or product line. In this type of pricing firms needs to be very vigilant about the repercussions of change in prices of one product on another.

3.5 QUESTIONS

1) Discuss the concept of full cost pricing with advantages and disadvantages.
2) Explain marginal cost pricing method in detail.
3) Write short note on multiple product pricing.
4) Suppose the firm has capacity to produce 5000 units. It uses 80% of its capacity and is considered as the standard output. The total variable cost incurred is ₹16000 and the overhead cost is ₹8000. The mark up decided by the firm is 50%. Estimate the price per unit with the help of mark-up pricing.
5) A firm produces 100 units of commodity X at the total fixed cost of ₹2000 & total variable cost of ₹3000. Find the price which the firm would charge to its customers if it wants to make profit margin of 25% on cost. The firm uses cost plus pricing method.
6) If total cost of producing a commodity A is ₹5000 and mark-up fixed by the firm is ₹2000. Total Output to be sold is ₹700 units. Calculate the price per unit.
7) If the cost of product is ₹1500 per unit and the market expects 30% profit on costs. Calculate selling price.
8) XYZ International expects to incur the following costs in its business in the upcoming year.

Total production cost = ₹300000
Total Sales and administration cost = ₹200000
Company wants to make profit of ₹300000
And ABC expects to sell 4000 units of its product.
On the basis of above information, calculate full cost price.

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Unit - 3A

PRICE DISCRIMINATION

Unit Structure :

3A.0 Objectives
3A.1 Meaning of Price Discrimination
3A.2 Condition for Price Discrimination
3A.3 Equilibrium of price discriminating monopolist
3A.4 Dumping
3A.5 Transfer Pricing
3A.6 Summary
3A.7 Questions

3A.0 OBJECTIVES

1) To study the concept of Discriminating pricing / Price Discrimination.
2) To understand Condition for Price Discrimination.
3) To understand equilibrium of price discriminating monopolist.
4) To study the concept of international Price Discrimination / Dumping.
5) To study the concept of transfer pricing.

3A.1 MEANING OF PRICE DISCRIMINATION

Price discrimination refers to the charging of different prices by the monopolist for the same product.

Few Definitions:
"Price discrimination exists when the same product is sold at different prices to different buyers." –Koutsoyiannis

"Price discrimination refers to the sale of technically similar products at prices which are not proportional to their marginal cost." -Stigler

"Price discrimination is the act of selling the same article produced under single control at a different price to the different buyers." -Mrs. Joan Robinson

"Price discrimination refers strictly to the practice by a seller of charging different prices from different buyers for the same good." -J.S. Bain

Price discrimination refers to the act of selling the same article, produced under single control at different prices to different buyers.

Price discrimination generally takes place in case of monopoly. Following are the types of price discrimination.

1] Personal price discrimination- In this type different prices are charged to different consumers for the same product or service. Example: Doctors, Lawyers, Tuition Teachers etc. Charges different prices for different individuals. It is similar to first degree price discrimination.

2] Group Price Discrimination – Here entire population or area is divided into different groups and different prices are charged for different groups of people.

Example: Railways charges lower ticket to children and senior citizens and more for others. Industrial areas are charged more electricity charges as compared to residential areas. This is same as second degree price discrimination.

3] Market Price Discrimination – This means charging different prices for the same product in different markets.

3A.2 CONDITION FOR PRICE DISCRIMINATION

1] Non-Transferability of goods – A monopolist can charge different prices for the same good provided that the consumers are not in a position to transfer the goods from one to other. This could happened only if consumers either do not meet each other or in case they meet, will not be able to exchange the goods.

2] Geographical Distance – If markets are situated at sufficiently long distances then the transfer of goods may not be economical.
Example: IF we consider Mumbai and Kolhapur market and price difference is of ₹50 per unit, the transfer of goods from one buyer to other between the markets is not at all economical.

3] Political Hurdles – If political boundaries prevent the movement of people from one market to other market, a monopolist who operates in both markets can change different prices for the same commodity.

4] Lack of awareness – When the consumers are ignorant of the price difference, they will not mind paying higher prices than what the others are paying.

5] Insignificant price difference – When the price difference is very small, the consumers would not bother about negligible price difference. Therefore it is possible for the monopolist to have price discrimination.

6] Link between Price and Quality– When consumers, due to irrationality or any other reason consider higher price as an indicator of better quality, then it is possible for the monopolist to change higher price for such consumers.

7] Location – Goods sold in sophisticated or rich localities or sold in departmental stores may be charged higher prices than the same goods sold in poor localities.

8] Tariff Barriers – If home market is protected through tariffs, a monopolist may charge a higher price in the protected home market and lower price in competitive world market.

9] Government Sanctions – Government due to welfare social or political reasons may change different prices for the same goods & services.

10] If monopolist can bring about some product differentiation like changing packaging sale, promoting after sales services etc. then price discrimination is possible.

11] Differences in Elasticity – If elasticity of demand is different in different markets, it is possible for the monopolist to have price discrimination.

Check your progress :

1) What do you mean by price discrimination?
2) What are the types of price discrimination?
3) Discuss any two conditions for price discrimination.

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3A.3 EQUILIBRIUM OF PRICE DISCRIMINATING MONOPOLIST

For explaining equilibrium of price discriminating monopolist we make following assumptions:-

1] Monopolist operates in two different markets, i.e. market A & market B

2] Two markets differ in elasticities.

3] Production is undertaken at one place and it is at equal distance between the two markets so that there is no scope for price differences on the basis of transport cost.

Equilibrium of a price discriminating monopolist can be discussed with the help of following diagram.
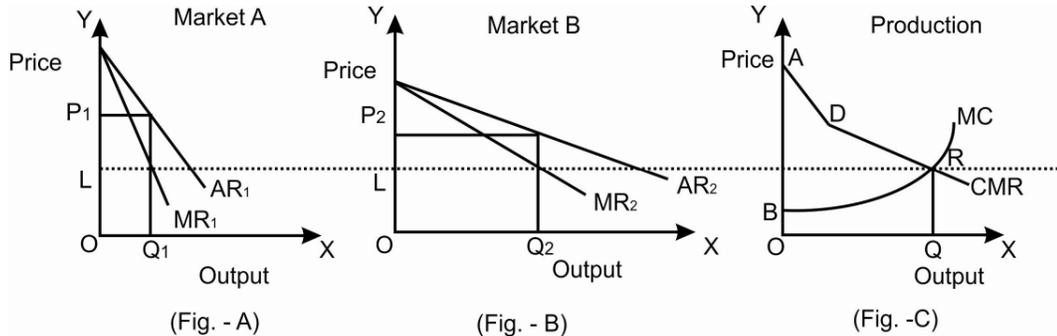
Fig 3A.1

Above diagram shows that in (Figure-A) & (Figure-B), there are two markets- Market A & Market B. Market A is relatively inelastic and Market B is relatively elastic. As Market A is relatively inelastic, AR & MR, of Market A are steeper and as Market B is relatively elastic, AR_2 & MR_2 of market B are flatter.

[AR & MR are the Average & Marginal revenue Curves of the two markets.] (Figure-C) explains the production.

CMR is the Combined Marginal Revenue Curve in (Figure-C) which is derived from horizontal summation of MR_1 and MR_2.

In figure-C Marginal Cost Curve (MC) intersects the combined marginal revenue curve at point R. Therefore total output is OQ. This output is distributed between market A & B in such a way that $MR_1 = MR_2 = MC$. In order to show this equality we have drawn horizontal line RL from point R in (Figure-C) to Y axis of (Figure-A).

Accordingly OQ_1 output is sold in market A at price OP_1 and OQ_2 output is sold in market B at price OP_2.

[Price in relatively inelastic market is greater than price in relatively elastic market.]

∴ Profit of the monopolist = TR – TC

OQRDA – OQRB

= BRDA

Therefore Price Discrimination monopolist will be in equilibrium when:-

1] Different markets differ in price elasticities enabling him to charge different price.

2] Total output is distributed in all the markets in such a way that marginal revenue in all the markets is equal.

3] Marginal Revenue in all markets which are equal must also be equal to marginal cost at equilibrium output.

3A.4 DUMPING

The practice of discriminatory monopoly pricing in the area of foreign trade is described as dumping. It implies different prices in the domestic and foreign markets.

Dumping refers to the situation in which producer enjoys a monopoly power in the domestic market, charges a high price to the domestic buyers and sell the same commodity at low competitive price in the world market or foreign markets. This type of dumping which results in international price discrimination is called persistent Dumping.

The rationale behind dumping is that it enables the exporter's to compete in the it enables exporters to compete in the foreign market and capture the market by selling at a low price, even sometimes below cost and make up the deficiency in sales revenue by charging high prices to the domestic buyers.

The success of international price discrimination depends on following conditions.

1] The producer must possess a degree of monopoly power at least in the home market.

2] The markets should be widely separated.

3] It should not be possible for the buyers to re-sell the goods from a cheaper market to the costly market.

4] Elasticity of demand should be different in different markets.

A situation of dumping can be discussed with the help of following diagram.
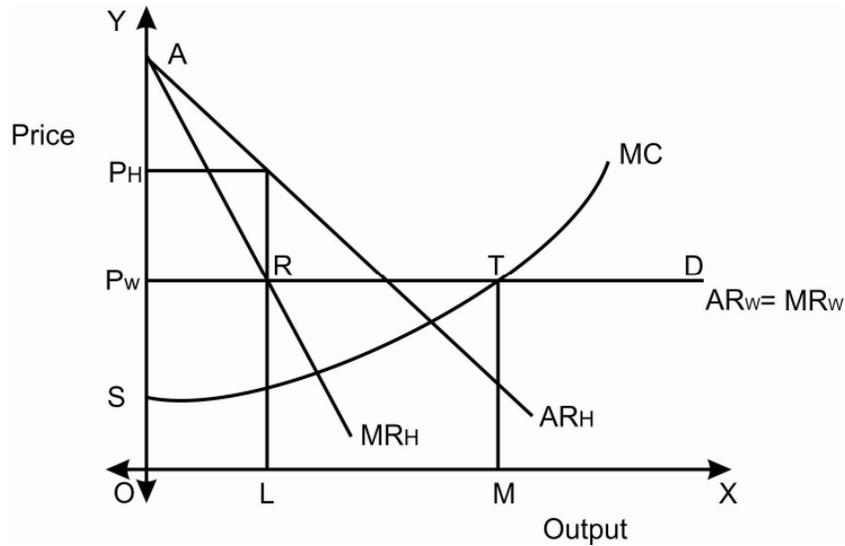
Fig 3A.2

In the above diagram AR_H and MR_H are the average and marginal revenue curves of the home market. As the seller is monopolist in the home market, they are downward sloping.

$AR_W = MR_W$ is the average and marginal revenue curve of the world market. It is perfectly elastic i.e. parallel to X-axis.

ARTD is the combined marginal revenue curve of the home market and of the world market. Equilibrium output is determined at the point where combined marginal revenue curve equals the marginal cost curve. In the above diagram equilibrium point is T and equilibrium output is OM.

This total output is distributed between two markets in such a way that marginal revenue of two markets are equal and that will be equal to marginal cost i.e. ($MR_H = MR_W = MC$)

Accordingly OL output is sold in the home market at price OP_H and LM output is sold in the world market at price OP_W.

∴ Total output OM = OL + LM.

Price charged in the domestic market (OP_H) is greater than price charged in the world market i.e. (OP_W).

∴ Total profit of price discriminating monopolist is given by $TR - TC$
∴ TR = OMTRA & TC = OMTS
∴ Profit = Area STRA

This is the maximum profit earned by two markets.

3A.5 TRANSFER PRICING

Transfer prices are internal prices at which intermediate goods from upstream divisions are sold to downstream divisions. [Upstream divisions are those which are producing intermediate product & downstream divisions are those that are producing finished product.

In the present day industrial system, vertical integration is common. [A firm is considered to be vertically integrated when it contains several divisions, with some divisions producing parts and components which other divisions use to produce the finished product.]

In such a company it is not easy for top management to be familiar with all stages of production process. This leaves scope for the emergence of bureaucratic style of functioning.

In a vertically integrated firm it is not easy to determine the amount of profit that should be credited to a division producing intermediate good in such a way that firm's total profit is maximized. For this management has to determine appropriate transfer price of intermediate goal.

In our case of determining transfer price we assume that there are only two stages of production.

1] In the first stage cloth is produced as an intermediate product and

2] In the second stage cloth is used for manufacturing shirts.

We discuss transfer pricing under 2 conditions

1] An External Market Exists for Cloth.

This means that cloth producing divisions can sell cloth to outside firm and divisions requiring cloth to make shirts can borrow from external sources.

As external market is perfectly competitive, there will be a market determined price at which cloth manufacturing division will sell its product to cloth using division. This can be explained with the help of following diagram
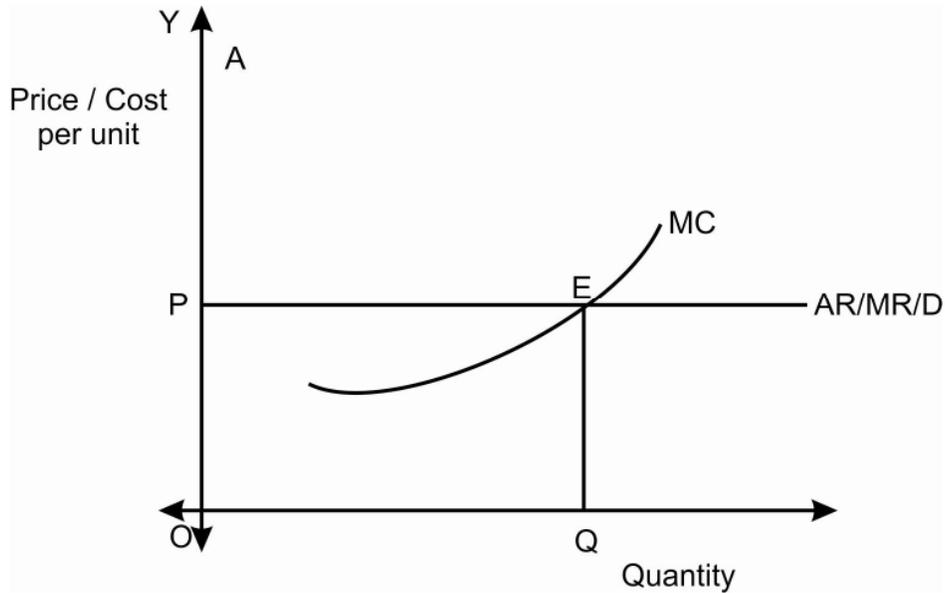
Fig 3A.3

Here cloth manufacturing division faces horizontal demand curve. For maximizing profit cloth manufacturing division will expand their output up to the point where (MR=MC) or (P=MC).

Accordingly OP is the market determined price of cloth.

If cloth manufacturing unit tries to set a price in excess of market price, shift making division purchase cloth from outside suppliers. Similarly if shift making unit refuses to pay a market determined price, the cloth producing division will sell their cloth to other buyers in open market.

Where an external market exists, the output of intermediate good producing division may not necessarily be equal to input demand of final good producing unit. If there is excess supply of cloth, it can be sold to other users. And if supply of cloth is insufficient, shift making division can buy cloth from other markets.

2] No External Market

When external market do not exist, cloth can be bought and sold only between two divisions of the firm. Here conflict may develop regarding the price to be charged for the cloth by its cloth manufacturing division. Here cloth manufacturing unit wants to set a high price but shirt making unit will benefit from lower price. Therefore management has to determine such a price for cloth that maximizes the overall profit of the firm. Following diagram explains the determination of price for intermediate and finance product.
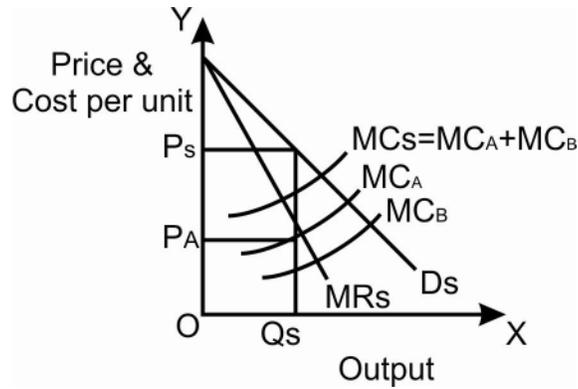
Fig 3A.4

In the diagram D_S and MR_S are the demand (average) & marginal revenue curves for shirt.

The marginal cost of producing clot to make shirt is MC_A and the marginal cost of transforming cloth into shirt is MC_B.

$\therefore$ Marginal cost of each additional shirt is $MC_A + MC_B = MC_S$.

For a firm combining cloth manufacturing and shift making division, profit maximizing out is at a point where $MR_S = MC_S$. Thus output per period is Q_S. The transfer price determined for cloth must be such that it compels the managers of shirt making unit to produce OQ_S quantity of shirts.

Top management of the integrated firm would solve this problem by advising the cloth division to change a price that is equal to the marginal cost of producing cloth.

For shirt making division profit maximizing quantity is OQ_S& price is OP_S and for cloth unit price is OP_A at which cloth unit will supply the exact amount of cloth that is necessary for producing OQ_S amount of shirts.

Check your progress :

1) Define Dumping.
2) What do you mean by transfer pricing?

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3A.6 SUMMARY

Price discrimination refers to the charging of different prices by the monopolist for the same product. In this unit we have seen concept of price discrimination along with conditions of price discrimination such as Non-Transferability of goods, Geographical Distance, Political Hurdles, Lack of awareness, insignificant price difference, Link between Price and Quality, Location, Tariff Barriers, Government Sanctions and Differences in Elasticity. We have also seen equilibrium of price discriminating monopolist. Price Discrimination monopolist will be in equilibrium when:-

1] Different markets differ in price elasticities enabling him to charge different price.
2] Total output is distributed in all the markets in such a way that marginal revenue in all the markets is equal.
3] Marginal Revenue in all markets which are equal must also be equal to marginal cost at equilibrium output.

Unit also discusses concept of international price discrimination i.e. dumping and Transfer pricing. Dumping refers to the situation in which producer enjoys a monopoly power in the domestic market, charges a high price to the domestic buyers and sell the same commodity at low competitive price in the world market or foreign markets. Transfer prices are internal prices at which intermediate goods from upstream divisions are sold to downstream divisions.

3A.7 QUESTIONS

1) Explain the concept of Price Discrimination.
2) Discuss condition required for Price Discrimination.
3) Explain equilibrium of price discriminating monopolist.
4) Write short note on Dumping.
5) Write short note on transfer pricing.

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Unit - 4

CAPITAL BUDGETING

Unit Structure :

4.0 OBJECTIVES

1) To study Meaning, importance, features and objectives of capital budgeting.
2) To comprehend steps involved in capital budgeting.

4.1 INTRODUCTION / MEANING OF CAPITAL BUDGETING

Capital budgeting or investment appraisal is an official procedure used by firms for assessing and evaluating possible expenses or investments. It is a process of planning of expenditure which involves current expenditure on fixed/durable assets in return for estimated flow of benefits in the long run.

Investment appraisal is the procedure which involves planning for determining whether firm's long term investments such as heavy machinery, new plant, research and development projects are worth the funding or not.

Charles T. Horn green defines Capital budgeting as a long term planning for making and financing proposed capital outlays.

Peterson defines capital budgeting as the process of planning capital projects, raising funds and efficiently allocating resources to capital projects.

Thus capital budgeting is the decision of the firms which leads to most efficient long term investment in the production process with the positive expectations regarding future flow of returns. A sound capital budget is the one which is not only done at the right time but is also of right quality and quantity. Success or failure of firms is based on soundness of capital budgeting.

4.2 OBJECTIVES OF CAPITAL BUDGETING

1) To identify whether the replacement of any of the existing fixed assets gives more profit than earlier.

2) To identify the cost-effective and profit oriented capital expenditure.

3) To decide and execute correct method of investment appraisal.

4) To evaluate the merits and demerits of each prospective projects to decide the best one.

5) To elect most suitable project for the firm.

6) To identify and make provisions for the volume of finance required for the capital expenditure.

4.3 FEATURES OF CAPITAL BUDGETING

1) Capital budgeting decisions influences rate and direction of growth.

2) Capital budgeting comprises of the investment in present for getting benefits in the future.

3) Usually, the forthcoming benefits arising out of investments are spread over several years.

4) The investments made by firm in present will determine its financial condition in future.

5) Here each investment includes huge volume of funds.

6) Investment decisions taken here are irreversible.

7) It helps to avoid and reduce unnecessary expenditures.

8) It helps to replace current old equipment by modern and more efficient equipment.

9) There is a high degree of risk involved in capital budgeting.

4.4 IMPORTANCE OF CAPITAL BUDGETING

1) Helps to determine the future of the firm:

It helps firms to take long term investment decisions. Benefits arising out of investments are spread over several years. As a result capital budgeting decision has its effect over a long time span and certainly it affects the firm's future growth and development. A wrong decision taken in present can prove terrible for the health of the firm in future. So the capital budgeting helps to determine the future of the firm.

2) Involvement of large amount of funds:

Capital budgeting decisions involve significant amount of investment. Therefore there is a need for judicious and accurate decisions, as an inappropriate decision would not only result in heavy losses but also affects the growth of the firm.

3) Decisions are Irreversible:

Capital budgeting decisions are irreversible because such decisions cannot be taken back without any substantial loss. These decisions involve bulky investments such as heavy machinery, new plant, buying land, construction of building, research and development projects so on so forth. And it is difficult to find a market for such second hand or used assets. Therefore capital budgeting decisions are irreversible.

4. Covers Risk and uncertainty:

There is a high degree of risk and uncertainty involved in capital budgeting decision. Investment done in present will give returns in future. The future is indefinite and full of risks. Longer the period of project, more may be the risk and uncertainty involved in it. Apt and sound capital budgeting will help to cover these risks and uncertainties.

5. Helps to estimate and forecast future cash flows:

Capital budgeting helps firm to select a best project and estimate its future cash flows, which in turn helps to determine whether a project should be accepted or rejected.

6. Helps to monitor and Control of expenditures:

A good project can become bad one if expenditures aren't judiciously controlled or monitored. A sound capital budgeting helps to monitor and control of expenditures.

7. Helps to maximise shareholder's worth

Capital budgeting protects the interests of the shareholders because it avoids over-investment and under-investment in fixed

assets. By selecting the most rewarding projects, the management enables the maximization of shareholder's worth.

8. Long term Effect on Profitability:
Profitability of firm depends upon the extent of Capital expenditures. If the expenditures are incurred after making capital budget accurately, then profitability of the firm will be high.

9. National Significance:
The selection of any project through capital budgeting will ultimately results in the creation of more employment opportunities, increase in national income, economic growth and development.

4.5 STEPS INVOLVED IN CAPITAL BUDGETING

Capital budgeting is a procedure in which multiple steps are involved. Firms use Capital budgeting to determine worth of a project or investment. The capital budgeting process involves five steps.

Step 1. Identification of various Investment Proposals:
The first step in capital budgeting is to identify various investment proposals. Identifications of investment proposals will give firm an idea about options available and then it will be easy for a firm to select the best possible investment proposals. The proposal regarding potential investment opportunities may come from workers of any department, management or from any officer of the firm.

Step2. Screening, Evaluation and selection of the Proposals:
After identification of prospective investment proposal it is very important to screen and evaluate these proposals on the basis of certain parameters such as practicality, feasibility, risk and uncertainty involved and most important profitability. There are many methods by which this screening and evaluation can be done such as payback period method, net present value method, internal rate of return method etc. After this entire exercise it becomes imperative for firm to select best suited investment proposal.

Step3. Preparation of Capital Expenditure Budget:
After selection of investment project, preparation of capital expenditure budget is must. The estimated amount of expenditure to be incurred on fixed assets during the given period is specified by capital expenditure budget.

Step4. Implementing and monitoring of the Proposal:
After selection of investment proposal and preparation of budget it is imperative to implement the project. While executing the project,

it is better to allocate roles and responsibilities to staff for completing the project within the given time and cost structure so as to avoid unnecessary delays and losses. Investor should monitor both quality and quantity associated with production process. Along with this close monitoring with regard to development of market for the product and repayment of dividends to stakeholders is also important.

Step5. Evaluation of the proposal:

Evaluation of the performance is the last stage in the process of capital budgeting. The evaluation can be done by comparison of projected and actual expenditures, and also by comparing the anticipated and actual return from the investment.

Check you progress :

1) Define Capital Budgeting.
2) Why Capital Budgeting is important?
3) List out important steps involved in Capital Budgeting.

4.6 Advantages and Disadvantages of Capital Budgeting

Advantages of Capital Budgeting:
1) Capital budgeting helps firm to understand and manage risk and uncertainty associated with investment decisions.
2) It helps firm to select best possible and cost effective investment proposal for maximising profit.
3) It helps firm to make long-term investment decisions.
4) It helps to avoid and reduce unnecessary expenditures and offers adequate control over entire outlay.
5) It helps firm to take an informed decision about an investment project taking into consideration merits and demerits of each project.
6) It helps firm to curb over investing and under-investing.
7) All methods of capital budgeting aims at maximising shareholders worth.

Disadvantages of Capital Budgeting:
1) Capital budgeting decisions are of long-term in nature.
2) Almost all Capital budgeting decisions are irreversible in nature.

3) Capital budgeting comprises of the investment in present for getting benefits in the future. Future is always uncertain. Therefore there is a possibility that calculations of the firm may go wrong.
4) Risk and the discounting factor remains subjective therefore there is a possibility that they may affect actual profit.

Check you progress :
1) List out advantages of Capital Budgeting.
2) List out disadvantages of Capital Budgeting.

4.7 SUMMARY

Capital budgeting or investment appraisal is an official procedure used by firm for assessing and evaluating possible expenses or investments. It is a process of planning of expenditure which involves current expenditure on fixed/durable assets in return for estimated flow of benefits in the long run. In this unit we have seen meaning, objectives, features and importance of capital budgeting. Identification of various Investment Proposals, Screening, Evaluation and selection of the Proposals, Preparation of Capital Expenditure Budget, Implementing and monitoring of the Proposal and Evaluation of the proposal are important steps involved in capital budgeting. Unit also focuses on some advantages and disadvantages of capital budgeting.

4.8 QUESTIONS

1) Discuss meaning and importance of capital budgeting.

2) What are the objectives of capital budgeting?
3) Elucidate features of capital budgeting.
4) Explain advantages and disadvantages of capital budgeting.
5) What are the steps involved in capital budgeting?

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Unit - 4A

TECHNIQUES OF INVESTMENT APPRAISAL

Unit Structure:

4A.0   Objectives
4A.1   Payback Period Method
4A.2   Net Present Value (NPV) Method
4A.3   Internal rate of return (IRR) method
4A.4   Summary
4A.5   Questions

4A.0 OBJECTIVES

1) To study and understand the payback period method of investment appraisal.
2) To study and understand the net present value method of investment appraisal.
3) To study and understand the internal rate of return method of investment appraisal.

4A.1 PAYBACK PERIOD METHOD

It is one of the simplest method of investment appraisal. It helps to calculate period within which initial investment or entire cost of project would be completely recovered. It is also known as pay-off or pay out method. It gives total number of years in which the total investment in particular capital project pays back itself. As per this method there will be no profit till the payback period is over.
Selection criteria: According to payback period criteria, project with lowest payback period should be selected.

Following methods are used to calculate Payback period.
Type I

If the firm is generating constant cash flows every year, then following formula will be used.

Payback Period $= \dfrac{Initial\ Investment}{Net\ annual\ Cash\ inflows}$

Example 1

　　　Calculate Payback period for the following data and find most suitable project.

Projects	Initial Investment (In Rupees)	Net annual Cash Inflows
A	30000	5000
B	30000	6000
C	30000	2000
D	30000	3000

Solution:

Projects	Initial Investment	Net annual Cash Inflows	Payback Period $$\text{Payback Period} = \frac{Initial\ Investment}{Net\ annual\ Cash\ inflows}$$	Ranks
A	30000	5000	$\frac{30000}{5000}$ = 6 years	2
B	**30000**	**6000**	$\frac{30000}{6000}$ = **5 years**	**1**
C	30000	2000	$\frac{30000}{2000}$ = 15 years	4
D	30000	3000	$\frac{30000}{3000}$ = 10 years	3

On the basis of payback period project B should be selected.

Type II

If firm is generating uneven or different cash flows in different years, then we have to calculate cumulative cash flows. The year in which cumulative cash flow is equal to initial investment, that year will be considered as payback period.

Example 1

　　　Suppose an initial investment in a project is **Rs. 50000** and following are the annual cash flows. Calculate payback period.

Year	Annual Cash flows
First	10000
Second	15000
Third	25000
Forth	40000
Fifth	60000

Solution:

Year	Annual Cash flows	Cumulative cash flows
First	10000	10000
Second	15000	25000
Third	25000	**50000**
Forth	40000	90000
Fifth	60000	150000

As initial investment is recovered in third year, payback period is 3 years.

Example 2

Suppose there are two projects A and B, with an initial investment of **Rs. 100000** each. Cash flows of both the projects are given below. Calculate payback period and find most suitable project.

Year	Annual Cash flows For Project A	Annual Cash flows For Project B
First	20000	40000
Second	30000	60000
Third	50000	70000
Forth	70000	90000
Fifth	90000	95000

Solution:
For project A

Year	Annual Cash flows	Cumulative cash flows
First	20000	20000
Second	30000	50000
Third	50000	**100000**
Forth	70000	170000
Fifth	90000	260000

For project B

Year	Annual Cash flows	Cumulative cash flows
First	40000	40000
Second	60000	**100000**
Third	70000	170000
Forth	90000	260000
Fifth	95000	355000

For project A, initial investment is recovered in third year. Therefore payback period is 3 years. For project B, initial investment is recovered in second year. Therefore payback period is 2 years. On the basis of payback period criteria, project B should be selected.

Type III

After calculating cumulative cash flows, if we are not getting cumulative cash flows exactly equal to initial investment, then we use following formula to calculate payback period.

Payback period = E + $\dfrac{B}{C}$

Where,
E = Preceding year of final recovery
B = Balance amount to be recovered
C = Cash flow during the year of final recovery

Example 1
Suppose an initial investment in a project is **Rs. 20000** and annual cash flows are as follows. Calculate payback period.

Year	Annual Cash flows
First	4000
Second	6000
Third	9000
Forth	10000
Fifth	14000

Solution:
Step 1:

Year	Annual Cash flows	Cumulative cash flows
First	4000	4000
Second	6000	10000
Third	9000	19000
Forth	10000	29000
Fifth	14000	43000

Step 2:
It can be seen from the above table that out of initial investment of Rs. 20000, Rs. 19000 are recovered in third year and Rs. 29000 are recovered in the fourth year. Therefore payback period lies between third and fourth year. The balance amount still to be recovered is Rs. 1000. (i.e. 20000 – 19000 = 1000)

Step 3:

Payback period = $E + \dfrac{B}{C}$

Where,
E = Preceding year of final recovery = 3 years.
B = Balance amount to be recovered = Rs. 1000
C = Cash flow during the year of final recovery = 10000

Therefore, Payback period = $3 + \dfrac{1000}{10000}$ = 3 + 0.1 = **3.1 years**.

Merits of Payback period Method
1) This method is simple to calculate and easy to understand.
2) This method is more realistic because psychology of any investor is that he/she would like to get back initial investment as soon as possible.
3) This method is relatively safe because it avoids risk in long run.
4) This method help us to rank various projects and select best out of them.
5) This method gives importance to the speedy recovery of initial investment.

Demerits of Payback Period Method
1) It stresses only on the recovery of initial investment and completely ignores the annual cash inflow after the payback period
2) This method oversee the interest i.e. costs of capital which is an important part of making sound investment decisions.
3) This method ignores time value of money.

Check your progress :

1) Calculate Payback period for the following data and find most suitable project.

Projects	Initial Investment (In Rupees)	Net annual Cash Inflows
A	20000	5000
B	20000	4000
C	20000	2000
D	20000	10000

2) Suppose an initial investment in a project is Rs. 25000 and following are the annual cash flows. Calculate payback period.

Year	Annual Cash flows
First	4000
Second	8000
Third	13000
Forth	20000
Fifth	30000

3) Suppose there are two projects A and B, with an initial investment of Rs. 20000 each. Cash flows of both the projects are given below. Calculate payback period and find most suitable project.

Year	Annual Cash flows For Project A	Annual Cash flows For Project B
First	4000	3000
Second	5000	4000
Third	11000	6000
Forth	15000	7000
Fifth	18000	10000

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4A.2 NET PRESENT VALUE (NPV) METHOD

Investment in project generates series of income (cash inflows) over a number of years. It is also known as discounted cash flow technique. NPV method considers the time value of money. To find out whether investment is worthwhile or not, the present value of this series of income (cash inflows) is calculated at a given rate of discount. This gives us Gross Present Value (GPV). If we deduct initial cost (investment) of project from GPV we get Net Present Value i.e. NPV.

Investment should be made if present value of the expected future cash inflows from project is larger than the cost of the investment. In simple terms if NPV > 0 then accept the project and if NPV < 0, then reject the project. In case of more than one project, project with higher NPV should be preferred by the firm.

NPV = GPV – Initial Cost.
If R_1 , R_2 , R_3 , ……. R_n are yields of assets after first, second, third, ………n^{th} year and r is the rate of discount then,

$$NPV = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \ldots\ldots + \frac{R_n}{(1+r)^n} - Initial\ Cost$$

Example1
If an initial investment is Rs. 20000 in a project. The project generates annual cash inflows of Rs. 6000, Rs. 10000 and Rs. 15000 for 3 years respectively. If rate of discount is 12 % p.a. then calculate NPV and find out whether project should be accepted or rejected.

Solution:
$$NPV = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \ldots\ldots + \frac{R_n}{(1+r)^n} - Initial\ Cost$$

$$NPV = \frac{6000}{(1+0.12)} + \frac{10000}{(1+0.12)^2} + \frac{15000}{(1+0.12)^3} - 20000$$

$$NPV = \frac{6000}{(1.12)} + \frac{10000}{(1.12)^2} + \frac{15000}{(1.12)^3} - 20000$$

$$NPV = \frac{6000}{1.12} + \frac{10000}{1.2544} + \frac{15000}{1.4049} - 20000$$

$$NPV = 5357.14 + 7971.94 + 10676.92 - 20000$$

$$NPV = 24006 - 20000$$

NPV = 4006
As NPV is positive, project should be selected.

Example2
If an initial investment is Rs. 30000 in a project. The project generates annual cash inflows of Rs. 10000, Rs. 12000 and Rs.

15000 for 3 years respectively. If rate of discount is 12 % p.a. then calculate NPV and find out whether project should be accepted or rejected.

Solution:

$$NPV = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} + \ldots\ldots + \frac{R_n}{(1+r)^n} - Initial\ Cost$$

$$NPV = \frac{10000}{(1+0.12)} + \frac{12000}{(1+0.12)^2} + \frac{15000}{(1+0.12)^3} - 30000$$

$$NPV = \frac{10000}{(1.12)} + \frac{12000}{(1.12)^2} + \frac{15000}{(1.12)^3} - 30000$$

$$NPV = \frac{10000}{1.12} + \frac{12000}{1.2544} + \frac{15000}{1.4049} - 30000$$

$$NPV = 8928.57 + 9566.33 + 10676.92 - 30000$$

$$NPV = 29171.82 - 30000$$

NPV = -828.18

As NPV is negative, project should be rejected.

Merits of NPV Method
1) This method takes into account the time value of money.
2) This method takes into account entire series of cash inflows that are generated.
3) This method is simple to understand, here we simply accept or reject the project on the basis of NPV.
4) This method help us to take correct decision if we are looking for maximum profits.

Demerits of NPV method
1) This method involves good amount of calculations and it is little complicated method.
2) If we want to use this method, knowledge of discount rate is must. If we are not aware of discounting rate then we cannot use this method.
3) The use of this method needs forecasting of future cash inflows and the discount rate. Thus correctness of Net Present Value depends on accurate estimation future cash inflows and the discount rate. This may not be possible in reality.

Check your Progress :

1) If an initial investment is Rs. 60000 in a project. The project generates annual cash inflows of Rs. 10000, Rs. 12000 and Rs. 15000 for 3 years respectively. If rate of discount is 15 % p.a. then calculate NPV and find out whether project should be accepted or rejected.
2) If an initial investment is Rs. 25000 in a project. The project generates annual cash inflows of Rs. 8000, Rs. 9000, Rs. 10000 and Rs. 11000 for 4 years respectively. If rate of

discount is 10 % p.a. then calculate NPV and find out whether project should be accepted or rejected.

4A.3 INTERNAL RATE OF RETURN (IRR) METHOD

Internal rate of return method like NPV also considers time value of money by discounting annual cash inflows. This method is also known as time adjusted rate of return method. In this method we find out that rate of return which will equate the present value of future cash inflows to the present cost of the project. It is generally the rate of return that project earns. It is the discount rate (r) which equates aggregate present value of the net cash inflows with aggregate present value of cash outflows of a project. In simple terms it is the rate which makes NPV of a project equals to zero. In case of multiple projects, project with higher IRR should be selected.

Following formula is used for calculating IRR.

$$I = \frac{R}{1+r}$$

Where,
I = Initial Investment
R = Cash flows
r = Rate of return

Example 1
If a sum of Rs. 800 is invested in a project, it will earn Rs. 1000 at the end of one year. Calculate IRR.

$$I = \frac{R}{1+r}$$

Where,
I = Initial Investment = Rs. 800
R = Cash inflows = Rs 1000
r = Rate of return = ?

$$800 = \frac{1000}{1+r}$$

800 (1+ r) =1000
800 + 800 r = 1000
800 r = 1000 – 800
800 r = 200

$r = \dfrac{200}{800}$

r = 0.25

or

r = 25 %

Example 2

If a sum of Rs. 20000 is invested in a project, it will earn Rs. 120000 at the end of one year. Calculate IRR.

$I = \dfrac{R}{1+r}$

Where,

I = Initial Investment = Rs. 20000

R = Cash inflows = Rs 120000

r = Rate of return = ?

$20000 = \dfrac{120000}{1+r}$

20000 (1+ r) =120000

20000 + 20000 r = 120000

20000 r = 120000 − 20000

20000 r = 100000

$r = \dfrac{100000}{20000}$

r = 5

or

r = 5 %

Merits of IRR Method

1) Like NPV, this method also takes into account the time value of money.
2) This method provides meaningful consideration to the entrepreneurs in their decision making process.
3) This method is more realistic as it deals with the entire range of annual cash inflows earned during lifetime of the project.

Demerits of IRR method

1) This method is difficult to understand and tedious to calculate.
2) It does not consider the size of the project while comparing projects. Here cash inflows are compared with the volume of capital expenditure. So it is unsuitable method for ranking the projects.

Check your Progress :

1) If a sum of Rs. 2000 is invested in a project, it will earn Rs. 1500 at the end of one year. Calculate IRR.
2) If a sum of Rs. 5000 is invested in a project, it will earn Rs. 2500 at the end of one year. Calculate IRR.

3) If a sum of Rs. 20000 is invested in a project, it will earn Rs. 200000 at the end of one year. Calculate IRR.

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4A.4 SUMMARY

Capital budgeting or investment appraisal is an official procedure used by firm for assessing and evaluating possible expenses or investments. It is a process of planning of expenditure which involves current expenditure on fixed/durable assets in return for estimated flow of benefits in the long run. In this unit we have discussed three important methods of investment appraisal with multiple examples viz. Pay Back period method, net present value method and internal rate of return method. Payback Period Method is one of the simplest method of investment appraisal. It helps to calculate period within which initial investment or entire cost of project would be completely recovered. According to payback period criteria, project with lowest payback period should be selected. NPV method considers the time value of money. To find out whether investment is worthwhile or not, the present value of this series of income (cash inflows) is calculated at a given rate of discount. This gives us Gross Present Value (GPV). If we deduct initial cost (investment) of project from GPV we get Net Present Value i.e. NPV. Investment should be made if present value of the expected future cash inflows from project is larger than the cost of the investment. In simple terms if NPV > 0 then accept the project and if NPV < 0, then reject the project. In case of more than one project, project with higher NPV should be preferred by the firm. Internal rate of return method like NPV also considers time value of money by discounting annual cash inflows. This method is also known as time adjusted rate of return method. In this method we find out that rate of return which will equate the present value of future cash inflows to the present cost of the project. It is generally the rate of return that project earns. It is the discount rate (r) which equates aggregate present value of the net cash inflows with aggregate present value of cash outflows of a project. In simple terms it is the rate which makes NPV of a project equals to zero. In case of multiple projects, project with higher IRR should be selected.

4A.5 QUESTIONS

1) Discuss in detail payback period method of investment appraisal.

2) What are the merits and demerits of payback period method?

3) Discuss in detail net present value method of investment appraisal.

4) What are the merits and demerits of net present value method?

5) Discuss in detail internal rate of return method of investment appraisal.

6) What are the merits and demerits of internal rate of return method?

7) Calculate Payback period for the following data and find most suitable project.

Projects	Initial Investment (In Rupees)	Net annual Cash Inflows
A	10000	5000
B	10000	4000
C	10000	2000
D	10000	3000

8) Suppose an initial investment in a project is Rs. 5000 and following are the annual cash flows. Calculate payback period.

Year	Annual Cash flows
First	1000
Second	1500
Third	2500
Forth	4000
Fifth	6000

9) Suppose there are two projects A and B, with an initial investment of Rs. 50000 each. Cash flows of both the projects are given below. Calculate payback period and find most suitable project.

Year	Annual Cash flows For Project A	Annual Cash flows For Project B
First	20000	10000
Second	30000	20000
Third	50000	30000
Forth	70000	50000
Fifth	90000	60000

10) Suppose an initial investment in a project is Rs. 30000 and annual cash flows are as follows. Calculate payback period.

Year	Annual Cash flows
First	6000
Second	9000
Third	13000
Forth	18000
Fifth	25000

11) If an initial investment is Rs. 50000 in a project. The project generates annual cash inflows of Rs. 15000, Rs. 20000 and Rs. 25000 for 3 years respectively. If rate of discount is 10 % p.a. then calculate NPV and find out whether project should be accepted or rejected.

12) If an initial investment is Rs. 22000 in a project. The project generates annual cash inflows of Rs. 7000, Rs. 9000, Rs. 12000 and Rs. 15000 for 4 years respectively. If rate of discount is 12 % p.a. then calculate NPV and find out whether project should be accepted or rejected.

13) If a sum of Rs. 1000 is invested in a project, it will earn Rs. 1500 at the end of one year. Calculate IRR.

14) If a sum of Rs. 3000 is invested in a project, it will earn Rs. 3500 at the end of one year. Calculate IRR.

15) If a sum of Rs. 20000 is invested in a project, it will earn Rs. 100000 at the end of one year. Calculate IRR.

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