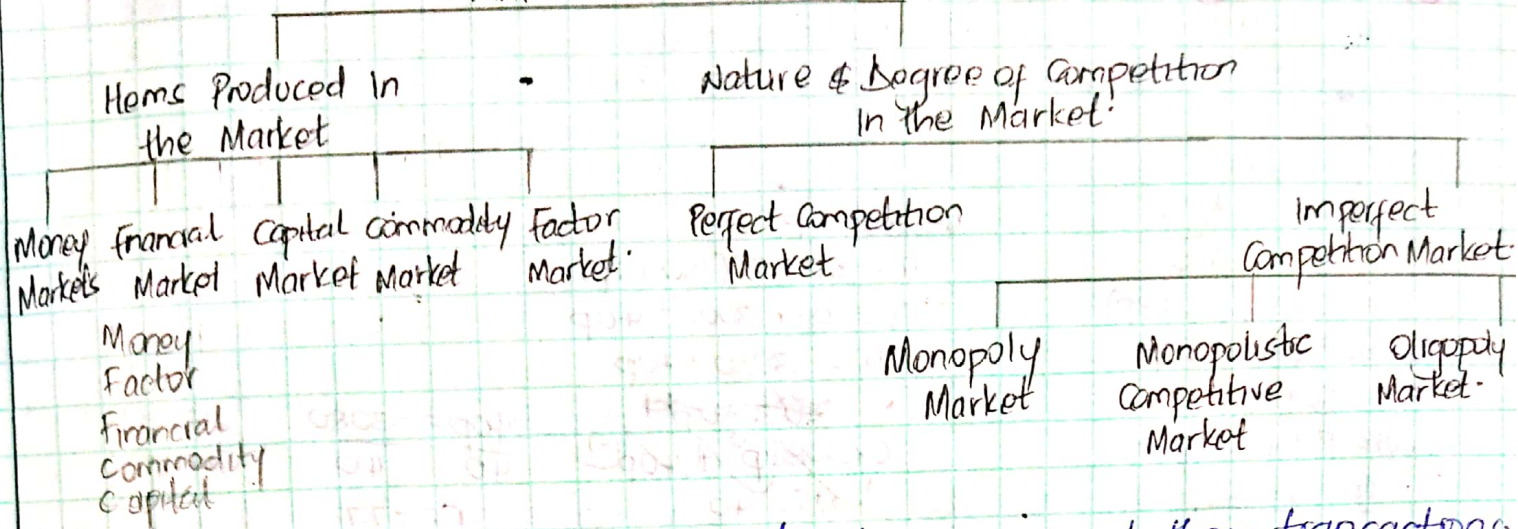


MARKET STRUCTURES

MARKET



- Markets are means by which buyers & sellers carry out their transactions.
- They may be physical places or arrangements by which buyers & sellers communicate their intentions.
- The word market could also be used to refer to the extent of sale for a given product.

1. **Average Revenue (AR)**
 - This is the total Revenue per unit of the commodity sold. It is obtained by dividing the TR with the units sold. i.e.

$$AR = \frac{TR}{Q}$$

Under perfect competition, the market price is constant at all levels of output & \therefore average revenue is equal to the price.

$$AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P \quad \text{AR} = P = \Delta D$$

Because of this, the AR curve will be the same as the demand curve.

2. **Marginal Revenue (MR)**
 This is a change in the TR resulting from the sale of an extra unit of output.

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

Dec 2017 20

$$Q + 10P = 20$$

Q level of output
 P = unit price.

i) AR function

$$AR = \frac{TR}{Q}$$

$$\frac{Q + 10P}{P}$$

ii) TR function

$$P = Q$$

$$P = Q$$

i) Make P the subject

ii) $TR = P \times Q$

iii) Solve

$$\frac{10P}{10} = \frac{20 - Q}{10}$$

$$P = 2 - 0.1Q$$

$$TR = (2 - 0.1Q) \times Q$$

$$TR = 2Q - 0.1Q^2$$

$$AR = \frac{TR}{Q} = \frac{2Q - 0.1Q^2}{Q} = 2 - 0.1Q$$

$$20 - 10Q$$

$$Q - 0.1Q^2$$

$$2Q - 0.1Q^2$$

Dec 2013 GC(1)

$$Q = 150 + 2P$$

$$TC = 50 + 20Q$$

Q = quantity in kg
 TC = Total cost
 P = Price

MR function.

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

$$TC = 50 + 20(150 + 2P)$$

$$TC = 50 + 3000 + 40P$$

$$Q = 150 + 2P$$

(Make P the subject)

$$\frac{2P}{2} = \frac{Q - 150}{2}$$

$$P = 0.5Q - 75$$

$$TR = P \times Q$$

$$TR = (0.5Q - 75)Q$$

$$TR = 0.5Q^2 - 75Q$$

$$MR = Q - 75$$

$$Q = 150 + 2P$$

$$TC = 50 + 20(150 + 2P)$$

$$TC = 50 + 3000 + 40P$$

$$TC = 3050 + 40P$$

$$0.5 \times 3050 = 40P$$

$$MR = 40$$

$$Q = 150 + 2P$$

$$Q = 150 + 2(-77)$$

$$Q = -4$$

$$TC = 50 + 20Q$$

$$TC = 50 + 20(-4)$$

$$TC = 50 + 3000 + 40P$$

$$TC = 40P + 3050$$

$$40P = -3050$$

$$\frac{40P}{40} = \frac{-3050}{40}$$

$$P = -77$$

$$Q = 150 + 2P$$

$$Q = 150 + 2(-77)$$

$$Q = 150 + (-154)$$

$$Q = -4$$

1. PERFECT COMPETITION MARKETS

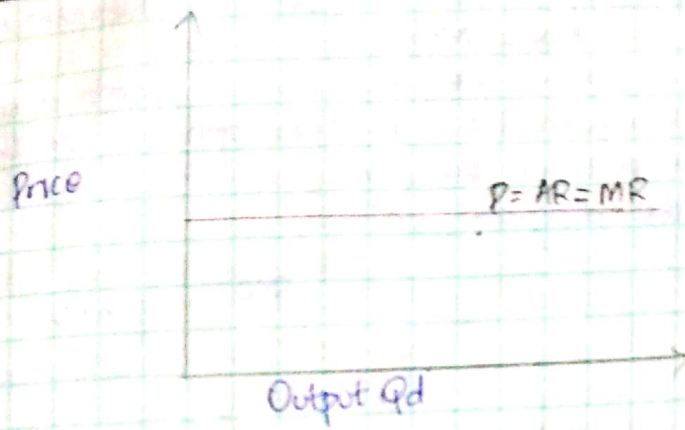
The model of perfect competition is based on the following assumptions (features).

1. Large no. of buyers & sellers.
 - The market includes a large no. of buyers & sellers so that each individual firm, however large, supplies only part of the total quantity offered in the market.
 - The buyers are also numerous so that no monopolistic power can affect the working of the market.

2. Product Homogeneity.

- The industry is defined as a group of firms producing homogenous products.
- This means that both the technical characteristics as well as the services associated with the products sold are identical.
- There is no way in which a buyer can differentiate the products of different firms.

NB Assumption of large no.s of buyers & sellers & that of product homogeneity implies that the individual firm under perfect competition is price taker. The demand curve facing the individual firm under perfect competition is perfectly elastic indicating that the firm can sell any amount of a commodity at the prevailing market price.

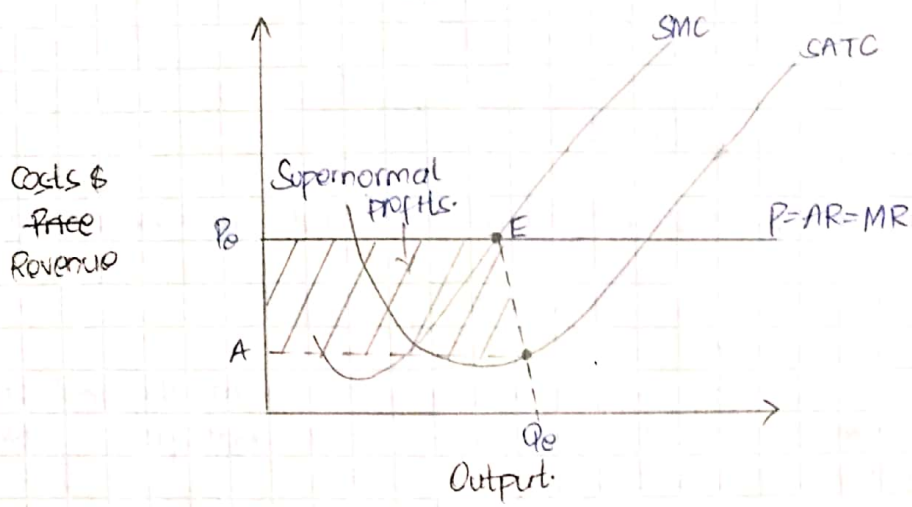


- The demand curve for the individual firm will also be its AR & MR curve.
4. Free entry & exit of firms.
 - There are no barriers to entry or exit of firms from the industry. Entry into & exit from the industry may take time but firms have the freedom of entry into & out of the industry.
 5. Profit maximisation.
 - The goal of the firm is to maximise profits both in the short run & in the long run.
 - No other goal is pursued.
 6. No Govt intervention.
 - There is no state intervention in the operation of this market i.e. no price controls, taxes, subsidies etc.
 7. Perfect mobility of factors of production.
 - FOP are free to move from one firm to another throughout the industry.
 - It is assumed that there is perfect competition in the factor markets.
 8. Perfect knowledge.
 - It is assumed that all sellers & buyers have complete knowledge of the conditions of the market.
 - This knowledge refers to only to the prevailing conditions in the private period but in all future periods as well.
 - Info is free & costless.

OPTIMAL LEVEL OF OUTPUT FOR THE FIRM

02/09/16

- The firm will maximise its profits (or will be in equilibrium) when the MR is equal to the MC $MR = MC$.
- Provided that the MR is above the shut down point. The level of output at this point is referred to as the optimal or the profit maximisation level of output for the firm.
- To illustrate this consider the diagram below;



- The SMC (Short run Marginal Cost) cuts the SATC from below at the minimum point.
- The firm is in equilibrium at the output level defined by the intersection of the MC & MR curve. i.e. at point E.
- To the left of point E profits have not yet reached the max. level because each additional unit of output to the left of Q_e brings to the firm a revenue which is greater than its MC.
- To the right of Q_e each additional unit of output costs more than the revenue obtained from its sales. so that a loss is made & the total profits are reduced.
- In summary a) if $MC < MR$ total profits have not yet reached (been maximised). & it pays the firm to expand its output
 b) if $MC > MR$, total profit is being reduced & it pays the firm to reduce the production.
 c) if $MC = MR$, the short-run profits are maximised.

Dec 2013 Qc(ii)

Profit maximising level of output.

$$MC = MR$$

$$MR = Q - 75$$

$$MC = Q - 75$$

$$80 + 20Q = 20$$

$MR = MC$
 $MR > MC$ Shut down point

$TC = 80 + 20Q$
 Make Q the subject

$$\frac{20Q}{20} = \frac{-80}{20}$$

$$Q = -4$$

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

$$MR = MC$$

$$Q - 75 = 80$$

$$Q = 80 + 75$$

$$Q = 155$$

95 units ✓

Dec 2005 7b (ii)

Assume this is a perfect competition market.

$$P = AR = MR$$

$$MR = MC$$

$$C = Q^3 - 12Q^2 + 60Q$$

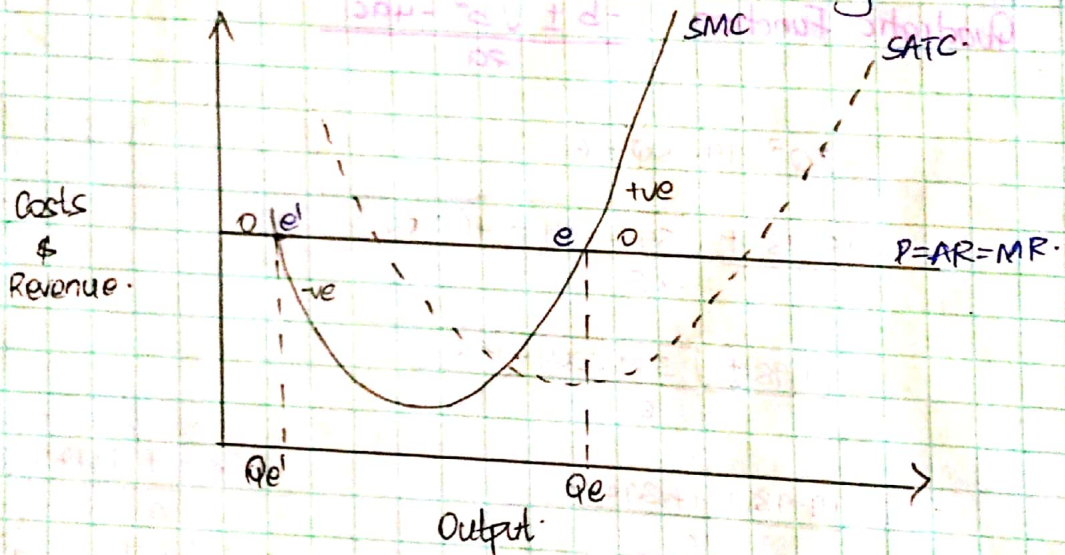
$$MC = 3Q^2 - 24Q + 60$$

$$P = MC$$

$$C = 3(60)^2 - 24(60) + 60 = 9,420$$

=

- Therefore the first & necessary condition for the equilibrium of the firm is at $MC = MR$
- However, this condition is not sufficient since it may be fulfilled & yet the firm may not be in equilibrium
- To illustrate the sufficient condition, consider the diagram below;



- We observe that the condition $MC = MR$ is satisfied at point e' yet the firm has not maximised its profits since the profits are maximised at Q_e which is greater than $Q_{e'}$ therefore the second condition for equilibrium requires that the MC be rising at the point of its intersection with the MR curve.
- This implies that the MC curve should cut the MR curve from below.
- In the diagram above, the firm maximizes its profits at point e where the two conditions for profit maximisation are satisfied i.e.
 - Necessary condition $MC = MR$
 - Sufficient condition i.e. the slope of MC is $>$ slope of MR at the point of intersection i.e. MC curve should cut the MR curve from below.

Jun 2013 3b

$$Q = 600 - 50P$$

$$C = Q^3 - 100Q^2 + 250Q$$

i) The equilibrium price.

$$MC = MR$$

$$MR = P = AR$$

Make P the subject

$$50P = 600 - Q$$

$$P = \frac{600 - Q}{50}$$

$$P = 12 - \frac{Q}{50}$$

$$MR \mid P = 12 - 0.02Q$$

$$MC = \frac{\Delta C}{\Delta \text{Output}}$$

$$C = Q^3 - 10Q^2 + 28Q$$

$$MC = 3Q^2 - 20Q + 28$$

$$\text{B } MC = MR$$

$$20Q - 0.02Q = 3Q^2 + 16.12 - 0.02Q = 3Q^2 - 20Q + 28$$

$$3Q^2 + 16 - 19.98Q$$

$$3Q^2 - 19.98Q + 16 = 0$$

$$12 + 28 = 0.02Q + 3Q^2 - 20Q$$

$$40 = -16.98Q + 3Q^2$$

$$3Q^2 - 19.98Q = -16$$

$$3Q^2 - 19.98Q + 16 = 0$$

$$\frac{40}{-16.98} = \frac{-16.98Q}{-16.98}$$

$$Q = -0.4245$$

$$\frac{12 - 28 = -16.98Q}{16.98} = \frac{-16.98Q}{16.98}$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2a. Quadratic Function $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$3Q^2 - 19.98Q + 16$$

$$\frac{19.98 \pm \sqrt{399.2004 - 4(3 \times 16)}}{2 \times 3}$$

$$\frac{19.98 \pm \sqrt{399.2004 - 192}}{6}$$

$$\frac{19.98 + 14.39445}{6}$$

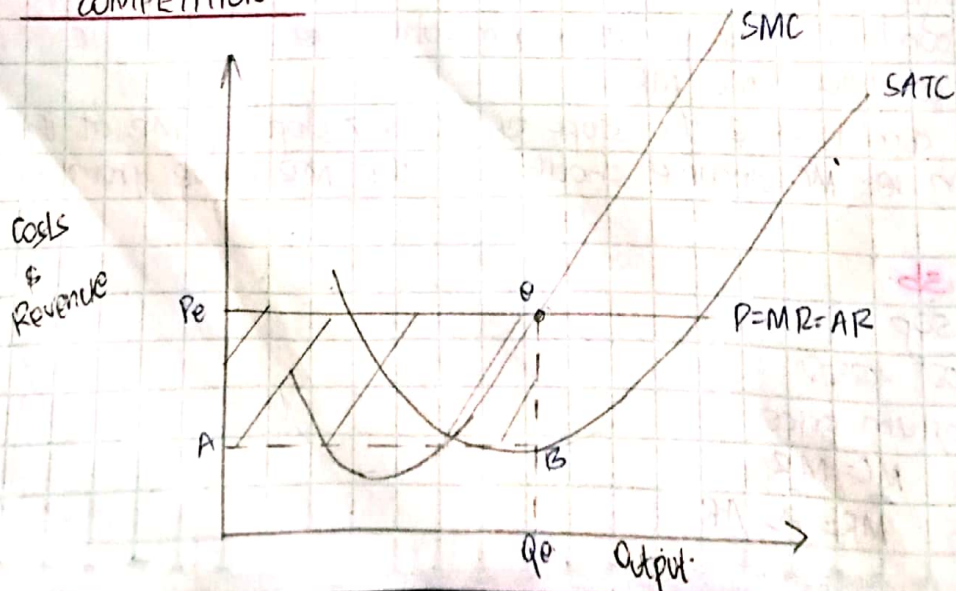
$$Q = 5.929 \checkmark$$

$$\frac{19.98 - 14.39445}{6} = 0.9309$$

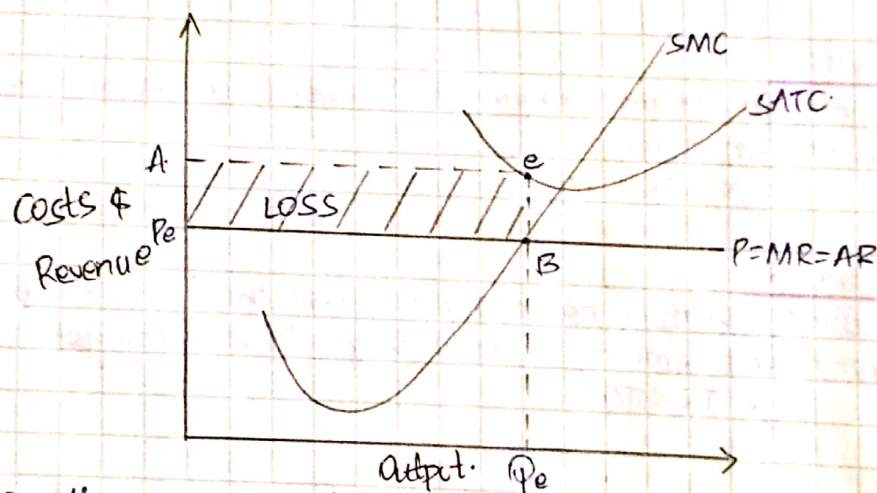
$$P = 12 - 0.02(5.929)$$

$$P = 11.89 \checkmark$$

SHORT RUN EQUILIBRIUM OF A FIRM UNDER PERFECT COMPETITION.

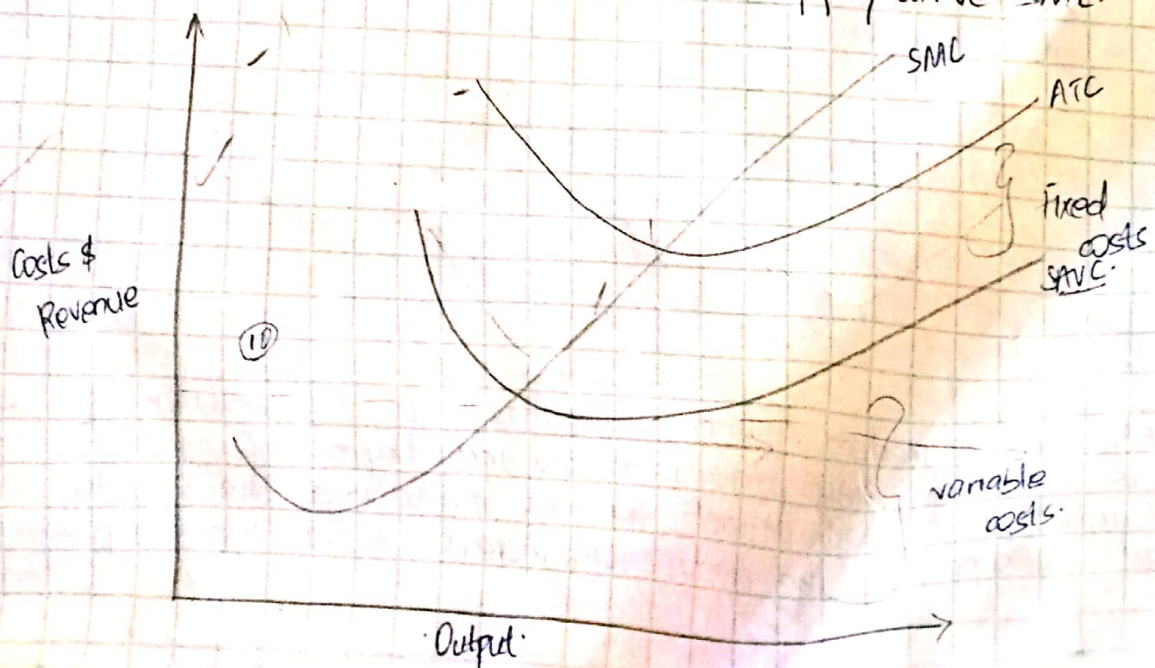


- A firm is in equilibrium when it maximizes its profits & cannot make bigger profits by changing the prices for its products.
- In the short run the firm will make a supernormal profits as illustrated above.
- A firm will produce an output level of Q_e where $MC=MR$. At this point, the firm will be making supernormal profits represented by the shaded area P_eABE .
- In the short run equilibrium the firm does not have to make supernormal profits whether the firm makes a profit/loss depends on the level of SATC at the short run equilibrium
- If ATC is below price at equilibrium, the firm will earn supernormal profits.
- If ATC is above price, at the short run equilibrium, the firm will make a loss.



- In the case where the firm is making a loss, it will continue to produce only if it covers its variable cost otherwise it will close down by discontinuing production so as to discontinue its losses.
- May 2016 7. b

To illustrate the firm's short run supply curve SMC.



- The point at which the firm covers its variable costs, it is referred to as the shut down point is point W.
- If the price falls below P_w , the firm does not cover its variable cost & it's better off if it shuts down.
- The firm's short supply curve will be that part of the MC curve that lies above the SAVC.
- It can be derived by the points of intersection of the successive MR curves & the short run MC curve.

Supernormal profits (Abnormal Profits) & Subnormal profits

1) Normal profits:

Refers to that surplus earnings, over & above what is necessary to keep the factors of production in their current employment.

$$\times TR > TC$$

2) Normal profits

Refers to minimum returns required to keep the factors of production in their current employment.

$$\times TR = TC$$

3) Subnormal profits:

They arise when what is necessary to keep the factors of production in their current employment is more than their earnings.

$$\times TR < TC$$

LONG RUN EQUILIBRIUM OF A FIRM UNDER PERFECT COMPETITION:

*

- Since there is freedom of entry of firms into the industry the surplus profits will attract new firms into the industry.
- The surplus profits will attract the new firms into the industry & as a result the supply of the product will increase & the market price will fall.

The long run equilibrium will occur when the demand curve is tangent to the ATC curve at its minimum.
 In this case, the firm is said to be making normal profits.
 \therefore the long run equilibrium condition for a firm under perfect competition is $P = AR = MR = LAMC = LATC$.
 Sep 2015 2a, May 2016 4b, May 2015 5a, Dec 2014 3c

Advantages of Perfect Competition Markets

1. No consumer exploitation.
2. Perfect competition achieves optimal allocation of resources since the output is produced at the minimum visible cost.
3. The consumer will pay the min possible price which just covers the marginal cost of the product.
4. The consumer is not exploited as the price of the good in the long run will be as long as possible.

Disadvantages of Perfect Competition Markets.

1. There is a great deal of duplication of production & distribution facilities among the firms & consequently wastage.
2. There is lack of innovation under perfect competition because of the assumption of free flow of info.
3. Perfect competitive markets, do not cater for the different tastes & preferences of the customers.

2. MONOPOLY MARKETS.

This refers to the market structure in which,

- a) There is a single seller.
- b) There are no close substitutes to the seller's products.
- c) There are barriers to entry, eg exclusive holding of patent rights.

Sources of Monopoly

1. Ownership of strategic raw materials or exclusive knowledge of a product's technique.
2. Patent right for a product or for production purposes.
3. A market franchise by a govt. agency i.e. a firm is granted exclusive privilege to produce a given good or a service in a particular area & in exchange for this, the firm allows the govt to regulate some aspect of its activities.
4. Natural monopoly - The size of the market may not allow existence of more than one plant of an optimal size. The technology may be such as to exhibit substantial economies of scale. which will require only one single plant if they are to be fully exploited.

5. Capital limitations - This implies that some investments require huge capital outlay which can only be raised by the govt or a few individuals

6. Monopolies can arise through business amalgamations or mergers & acquisitions

Equilibrium of the Monopolist:

X	Price	Quantity Demanded	TR	AR / P _{add}	MR. $\frac{\Delta TR}{\Delta Q}$
	60	1	60	60	50
	55	2	110	55	40
	50	3	150	50	30
	45	4	180	45	20
	40	5	200	40	10
	35	6	210	35	0
	30	7	210	30	-10
	25	8	200	25	-20
	20	9	180	20	-30
	15	10	150	15	-40
	10	11	110	10	-50

- Since there T

Since there is a single firm in the industry, the firm's demand curve is the same as the industry's demand curve.

This demand curve is downward sloping & it will be relatively price inelastic due to the absence of close substitutes in the market.

Under perfect competition, the firm is price taker so that its only decision is output determination.

The monopolist on the other hand is said to be a price maker & an output setter.

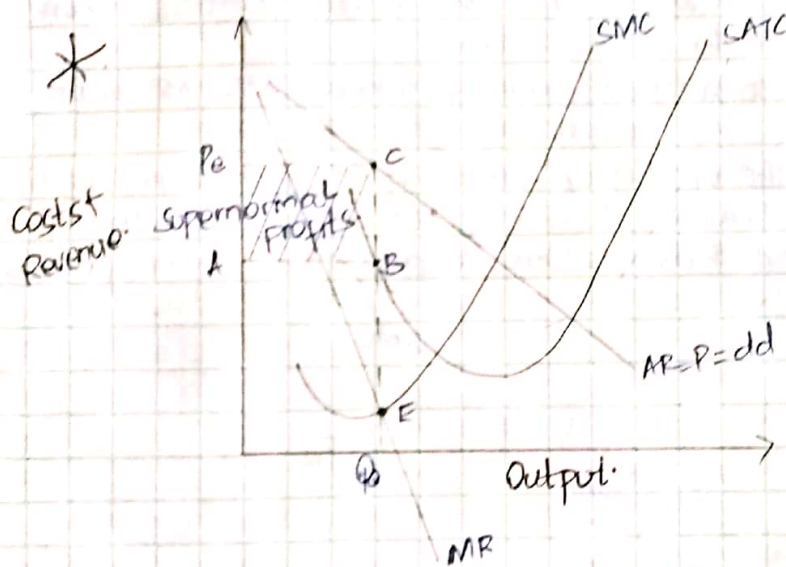
Since the monopolist faces a downward sloping demand curve, AR will not be the same as his MR at all levels of output.

When plotted on a graph, relating revenue to output, AR and MR will assume the shapes above.

It can be observed that the MR curve is below the AR curve at all levels of output.

The gradient of the MR curve is greater than that of the AR curve. For a straight line demand curve, the slope of the MR is twice that of the AR curve.

Short SHORT RUN EQUILIBRIUM OF A MONOPOLIST.



Nov 2015 36
May 2016 66

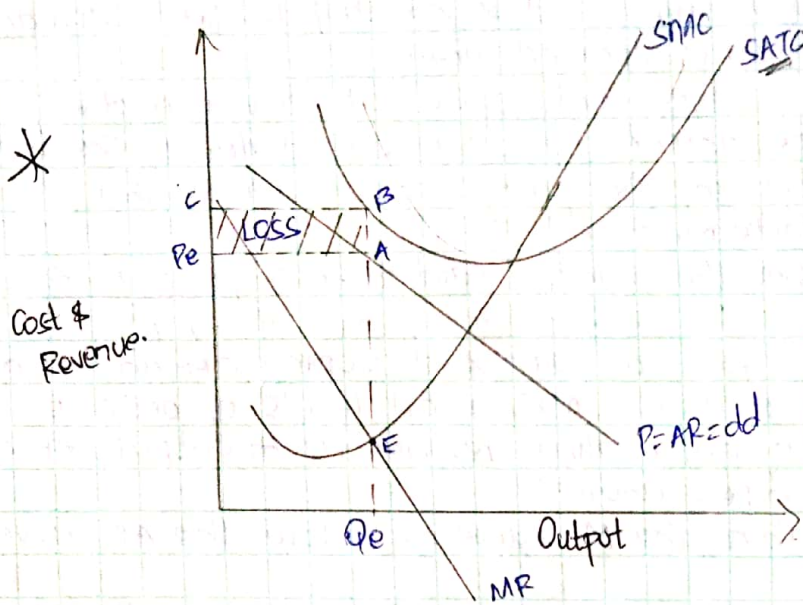
The monopolist will maximise his profits if the following two conditions are met;

- 1) $MC = MR$
- 2) The slope of MC = the slope of MR at the point of intersection.

This is illustrated above.

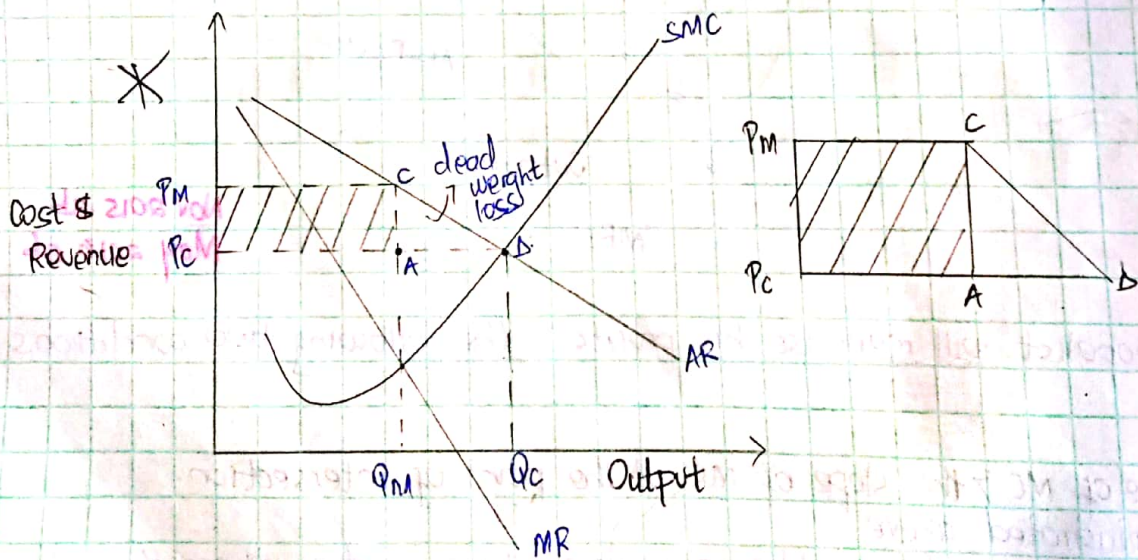
In the figure above, the equilibrium is defined by point E where the MC curve intersects the MR curve from below thus fulfilling both conditions for equilibrium.

The monopolist will be making supernormal profits represented by the shaded area $P_e ABC$.



COMPARISON BETWEEN A MONOPOLIST & A FIRM UNDER PERFECT COMPETITION.

- Under Consider the diagram below which illustrates the relationship between a monopolist firm & a firm under perfect competition.
- The monopolist produces where $MC=MR$ i.e. at point E where the output level is Q_m & the price is P_m .
- A firm under perfect competition produces where $MC=AR$ i.e. at point A where the output level is Q_c and the price is P_c .
- The monopolist has the option of producing a larger output of Q_c & charging a lower price of P_c . However, this may not be in his interest \therefore he reduces his output & charges his output at a higher price of P_m .



- \therefore there will be reduced consumer welfare represented by the area $P_m C \Delta B$.
- The shaded area $P_m C A P_c$ represents that part of the consumer's welfare which is converted into the monopolist's welfare.
- The remaining area $C A B$ represents a total loss in society's welfare as it does not go to the consumer nor to the monopolist referred to as the dead weight.

Dec 2008 Qc.

$$\Delta A = q + SP = 850$$

$$C(q) = 300 - 10q + q^2$$

Required, quantity of item A that should be produced per week to maximise profits.

$$MC = MR$$

$$P = AR = dd / MR$$

$$MR = q^2 - 10q + 300$$

$$MR = 2q - 10$$

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

$$MC = 2q - 10$$

$$\Delta A = q + SP = 850$$

$$\frac{SP}{S} = \frac{850 - q}{S}$$

$$P = 17 - 0.2q$$

$$TR = P \times Q = (17 - 0.2q)q$$

$$MR = 17q - 0.2q^2$$

$$17 - 0.4q$$

$$MR = P \times Q$$

$$(17 - 0.2q)q$$

$$17q - 0.2q^2$$

$$2q - 10 = 17q - 0.2q^2$$

$$2q - 17q = 10 - 0.2q^2$$

$$17q - 0.2q^2 = 2q - 10$$

$$0.2q^2 - 17q + 2q - 10$$

$$0.2q^2 + 15q - 10$$

$$2 \cdot 2 \quad 17 - 0.4q = 2q - 10$$

$$17 + 10 = 2q + 0.2q$$

$$27 = 2.2q$$

$$\frac{27}{2.2} = \frac{2.2q}{2.2}$$

$$MC = MR$$

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

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

$$MC =$$

$$C(q) = 300 - 10q + q^2$$

$$MC = 2q^2 - 10$$

$$MR =$$

$$\Delta A = q + SP = 850$$

$$\frac{SP}{S} = \frac{850 - q}{S}$$

$$P = 170 - 0.2q$$

$$\frac{\Delta TR}{\Delta Q}$$

$$MC = MR$$

$$2q - 10 = -0.4q + 170$$

$$2q + 0.4q = 170 + 10$$

$$2.4q = 180$$

$$\frac{2.4q}{2.4} = \frac{180}{2.4}$$

$$q = 75 \text{ units. } \checkmark$$

$$TR = P \times Q$$

$$TR = (170 - 0.2q)q$$

$$TR = 170q - 0.2q^2$$

LOSS MINIMIZATION OF A MONOPOLIST.

June 2013 3b. May 2014 3c.

$$Q = Q - 90 + 2P = 0$$

$$AC = Q^2 - 8Q + 57 + \frac{2Q^{-1}}$$

$$2Q^{-1} = \frac{2}{Q}$$

$$45 - 0.5Q = 90 + 2P$$

Required level of output that will maximise profit.

$$MC = MR.$$

$$Q \neq MC = \frac{\Delta TC}{\Delta Q}$$

$$AC = \frac{TC}{Q}$$

$$Q - 90 + 2P = 0 = Q = 90 + 2P$$

$$\frac{2P}{2} = \frac{90 - Q}{2}$$

$$P = \frac{45 - 0.5Q}{1}$$

$$TR = P \times Q$$

$$(45 - 0.5Q)Q$$

$$TR = 45Q - 0.5Q^2$$

$$MR = 45 - Q$$

$$TC = AC \times Q$$

$$TC = \left(Q^2 - 8Q + 57 + \frac{2}{Q} \right) Q$$

$$TC = \left(Q^3 - 8Q^2 + 57Q + 2 \right)$$

$$TC = Q^3 - 8Q^2 + 57Q + 2$$

$$MC = 3Q^2 - 16Q + 57$$

$$MC = MR$$

$$45 - Q = 3Q^2 - 16Q + 57$$

$$45 - 57 = 3Q^2 - 16Q + Q$$

$$3Q^2 - 16Q + Q + 57 - 45 = 0$$

$$3Q^2 - 15Q + 12 = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-15) \pm \sqrt{(-15)^2 - (4 \times 3 \times 12)}}{2 \times 3}$$

$$\frac{-15 - \sqrt{(-15)^2 - 4 \times 3 \times 12}}{2 \times 3}$$

$$\frac{225}{144}$$

$$181.9$$

$$\frac{15 + 9}{6} = \frac{24}{6}$$

$$\times \frac{24}{6} = 4$$

$$\frac{15 + \sqrt{225 - 144}}{6}$$

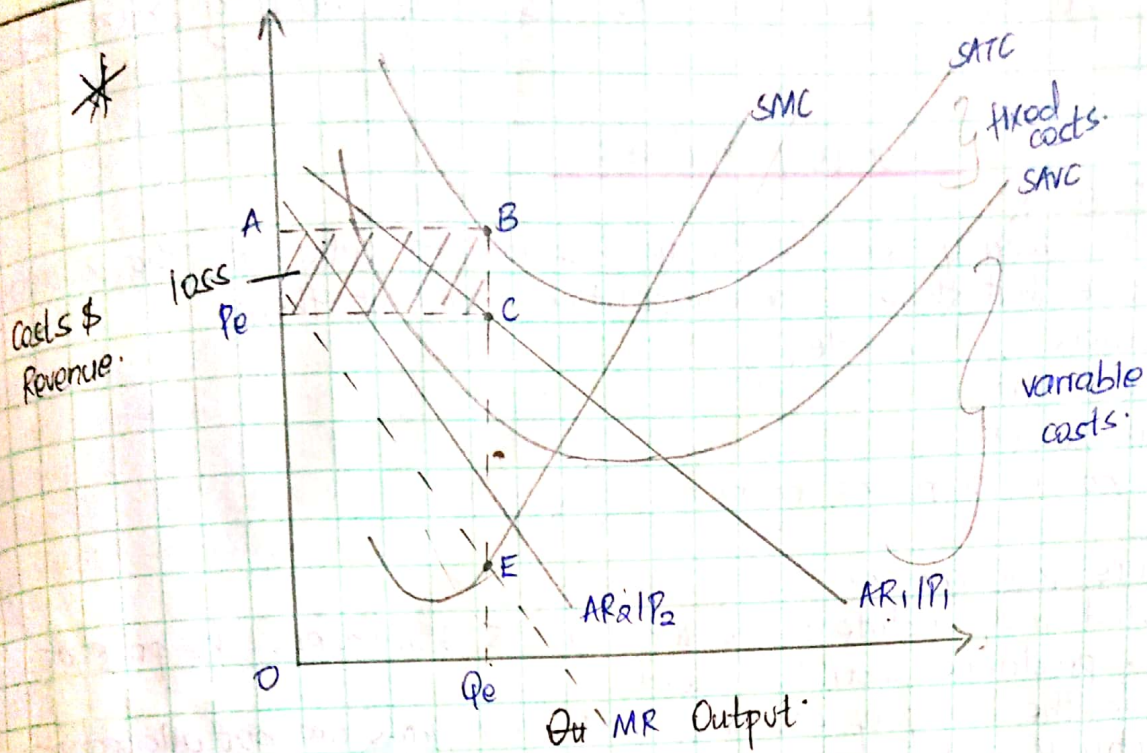
$$\frac{15 - \sqrt{225 - 144}}{6}$$

$$6$$

$$\frac{6}{6}$$

$$= 1$$

4 or 1.



$MC = MR$

$P_1 / AR_1 > AVC$ continue production.

$P_2 / AR_2 < AVC$ shut down production.

(T.N) 2 marks

- In the short run, the monopolist does not have to make supernormal profits.
- He can make losses. Whether he makes profits or losses depends on the position of the short run ATC curve.
- If the $AR < ATC$ at all levels of output, then the monopolist will make losses. He will \therefore minimize his losses by closing down the plant & stopping to produce if $AR < AVC$
- However if $AR > AVC$ but less than ATC he will continue operating in the short run by equating MC to MR. $ATC > AR > AVC$
- To illustrate this consider the diagram above.
- Suppose that the initial AR curve is AR_1 , the monopolist will make losses since $AR_1 < SATC$.
- However, he will minimize losses by producing where $MC = MR$ at the output level of Q_e .
- The total revenue is given by $P_e \times Q_e$ ($P \times Q$) & the total cost is given by ABQ_eO .
- The monopolist will be making a loss represented by the shaded area $P_e ABC$.
- The monopolist will however continue to produce in the short run since he covers his variable costs & part of the fixed cost.
- If the AR curve shifts downwards, from AR_1 to AR_2 , AR will be less than AVC ($AR < AVC$) & in this case the monopolist will minimize his losses by closing down the plant.
- In summary, the monopolist will minimize his losses in the short run by producing where $MC = MR$ if $AR > AVC$

- However if $AR < AVC$, he minimizes his losses by shutting down the plant.

Monopoly Practices:

1. Barriers to entry.

- Monopolists actually tend to create barriers to entry into the industry so as to ensure that there is no competition against them.

These barriers will include;

- a) Price undercutting.
- b) Individual boycotts.
- c) Exclusive holding of patent rights.

2. Resale price maintenance.

- A monopolist may dictate to the wholesalers & retailers the price at which his products should be sold.

- This is another way of ensuring that new firms are not allowed into the industry if such firms can sell their products at more competitive prices.

Question 5 (AT)

$$Q_{d1} = 5 - 2P_1 + P_2$$

$$Q_{s1} = -2 + 3P_1$$

$$Q_{d2} = 5 + P_1 - P_2$$

$$Q_{s2} = -2 + 2P_2$$

$$5 - 2P_1 + P_2 = -2 + 3P_1$$

$$5 + 2 - 2P_1 + 3P_1 = P_2$$

$$P_2 = -5 - 2 + 2P_1 + 3P_1$$

$$P_2 = -7 + 5P_1$$

$$5 + P_1 - P_2 = -2 + 2P_2$$

$$P_1 = -5 - 2 + P_2 + 2P_2$$

$$P_1 = -7 + 3P_2$$

$$P_2 = -7 + 5(-7 + 3P_2)$$

$$P_2 = -7 + -35 + 15P_2$$

$$P_2 = -7 - 35 + 15P_2$$

$$P_2 = -42 + 15P_2$$

$$P_2 = 15P_2 - 42$$

$$-14P_2 = -42$$

$$\frac{-14}{-14} = \frac{-42}{-14}$$

$$P_2 = 3 \checkmark$$

$$P_1 = -7 + 3(1.5)$$

$$P_1 = -7 + 4.5$$

$$P_1 = -2.5$$

$$P_2 = -7 + 3(3)$$

$$P_2 = -7 + 9$$

$$P_2 = 2 \checkmark$$

$$Q_{d1} = 5 - 2P_1 + P_2$$

$$Q_{d1} = 5 - 2(2) + 3$$

$$Q_{d1} = 5 - 4 + 3$$

$$Q_{d1} = 4 \checkmark$$

$$Q_{s1} = -2 + 3P_1$$

$$Q_{s1} = -2 + 3(2)$$

$$Q_{s1} = -2 + 6$$

$$Q_{s1} = 4 \checkmark$$

$$Q_{d2} = 5 + 2 - 3$$

$$Q_{d2} = 7 - 3$$

$$Q_{d2} = 4 \checkmark$$

$$Q_{s2} = -2 + 2(3)$$

$$Q_{s2} = -2 + 6$$

$$Q_{s2} = 4 \checkmark$$

3. Exclusive dealing & collective boycotts.

- The producers may agree to work only with recognized dealers on condition that the dealer does not stock the products of any other producer outside the group.
- Should the dealer break the agreement, all the other members agree to withhold supply from the offender.

4. Consumer exploitation:

- The most notorious practice for which monopolists are known for is that of exploiting the consumers by overcharging their products.

The two ways in which the monopolist can exploit the consumers are;

a) Profit maximisation - the price charged by the monopolist in order to maximise profits will be relatively higher than that of a firm under perfect competition which is also maximising profits.

b) Price discrimination - this will exist when the same product is sold at diff. prices to diff. buyers. Diff. prices will be charged to diff. buyers depending on;

- Tastes & preferences of the consumers
- Consumer's income.
- Availability of substitutes
- Diff. periods of time.

These factors give rise to demand curves with diff. elasticities in the various sectors of the market for the firm.

Price discrimination is easily implemented by the monopolist because he controls the whole supply of the commodity. There are 2 necessary conditions which must hold for the monopolist to discriminate prices;

- Monopolists must effectively separate the 2 markets from each other otherwise if they have not separated the two markets, there will be a possibility of the consumers in the low price market buying & selling the products to the consumers in a high price market.
- The price elasticities of demand in the 2 markets must be different so that profitability can be realised. At every price the demand in any market must be more elastic than the other with the low price market being more elastic than the high price market.

Question 5a CAT.

$$P_1 = \text{Sh } 110$$

$$P_2 = \text{Sh } 120$$

$$Q_1 = 20 \text{ units.}$$

$$Q_2 = 15 \text{ units.}$$

$$y = mx + c$$

$y = \text{price}$
 $m = \text{gradient}$
 $x = \text{quantity}$
 $c = \text{intercept}$

$$\text{Gradient} = \frac{\Delta y}{\Delta x} \therefore \frac{\Delta P}{\Delta Q} = \frac{P_2 - P_1}{Q_2 - Q_1}$$

$$= \frac{120 - 110}{15 - 20} = \frac{10}{-5} = -2$$

$$110 = -2(20) + c$$

$$110 = -40 + c$$

$$c = 150$$

$$P = -2Q + 150$$

ii) Price elasticity at sh 10.

$$\epsilon_d = \frac{\Delta P}{P} \cdot \frac{Q}{\Delta Q}$$

$$\epsilon_d = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

$$\frac{120 - 110}{15 - 20} \times$$

$$\frac{15 - 20}{120 - 110} \times \frac{120}{15}$$

$$-2 \times \frac{110}{20}$$

i) Make Q the subject:

$$\frac{2Q}{2} = \frac{150 - P}{2}$$

$$Q = 75 - 0.5P$$

$$-0.5 = \frac{10}{70}$$

$$= -0.071428$$

ii) Substitute price stated

$$\epsilon_d = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = 10$$

$$Q = 75 - 0.5P$$

iii) Differentiate

$$75 - 0.5P$$

$$= -0.5$$

- The reason for the monopolist applying price discrimination is to obtain an increase in his total revenue & consequently more profits.
- By selling the quantity defined by the equation of his MC & MR at diff. prices, the monopolist realises a higher total revenue than he would have received by charging a uniform price.
- Suppose that a monopolist has 2 markets, M_1 & M_2 , the profits in each market will be maximised by equating MC to the corresponding MR. In market 1, $MC = MR_1$, in market 2 $MC = MR_2$ where MR_1 & MR_2 are the

marginal revenues for market 1 & market 2 resp.
 The monopolist will \therefore maximise his profits by equating the common MC to the individual MR i.e. $MC = MR_1 = MR_2$

15/09/2016.

Types of Price Discrimination:

1) First degree (Perfect) (Primary)

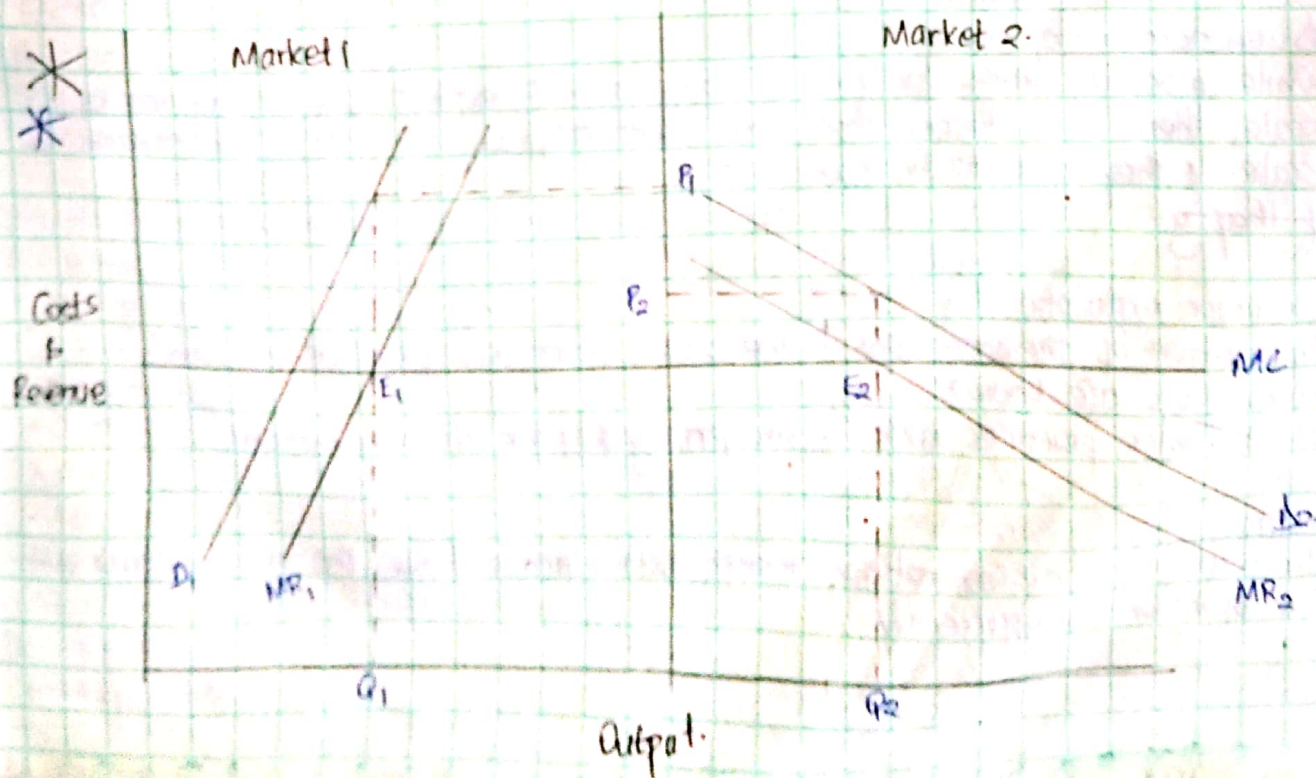
- It requires the monopoly seller of a good or service to know the absolute max price (reservation price) that every consumer is willing to pay.
- By knowing the reservation price, the seller is able to sell the good or service to each consumer at the maximum price he is willing to pay.
- So the profit is equal to the sum of the consumer surplus & the producer surplus. eg tenders, hawkers etc.

2) Second degree Price Discrimination.

- Price varies according to quantity demanded.
- Larger quantities are available at a lower unit price. This is widespread in sales to industrial customers where bulk buyers enjoy higher discounts.
- Since sellers are not able to differentiate btwn diff types of customers, the suppliers will provide incentives for the consumers to differentiate themselves according to preference which is done by quantity discount.
- This allows the supplier to set diff prices to the diff groups & capture a larger portion of the total market surplus.

3) Third degree Price Discrimination.

It means charging a diff price to diff consumer groups eg cinema goers can be classified to children & adults or splitting the market into peak & off peak periods by telephone companies or having a price for the urban market, sub-urban market & rural market.



25/09/07
 MR at
 than
 5 in foot
 109 MR
 MR

The monopolist will optimize & discriminate in pricing by equating $MC=MR_1$ in market 1 i.e. at point e_1 .

The monopolist will \therefore charge a price of P_1 in market 1 & produce an output of Q_1 in the same market.

In market 2, the monopolist will optimize by equating MC to MR_2 i.e., $MC=MR_2$. He will \therefore charge a price of P_2 in market 2 & produce an output of Q_2 .

Since the demand curve in market 1 is price inelastic, market 1 will pay the highest price of P_1 .

The demand curve in market 2 i.e. d_2 is price elastic \therefore market 2 will pay a lower price of P_2 .

ADVANTAGES OF A MONOPOLY MARKET.

May 2016 25

1. Economies of scale.

Most monopolies operate on large scale & \therefore they enjoy the advantages of a large size firm.

2. No wastage of resources.

Since there is no competition from other firms, monopolistic firms do not have to waste resources on product differentiation & advertising in an effort to capture customers from the other firms.

3. Price stability.

Since the monopolist is a price maker, prices under monopoly tend to be more stable than under perfect competition.

4. A monopoly is in a better financial position to carry out research & improve all its products than a firm in a competitive market.

DISADVANTAGES.

1. Diseconomies of scale.

While monopoly firms can grow to large size & exploit the economies of scale, there is a danger that they eventually suffer from diseconomies of scale. If they grow to be too large.

2. Consumer exploitation.

Exploitation of the consumers is the most notorious practice for which monopolists are known. This includes practices such as overpricing & price discrimination.

3. Inefficiency.

Since there is no competition, monopolistic firms have the risk to carry out the operations inefficiently.

4. Lack of motivation.

Monopoly firms though in a better financial position to invest in R&D & improve their products, they may not actually do so due to the absence of competition.

5. Lack of optimal allocation of resources.

Motivation.

For a price discriminating monopolist, the demand & marginal revenue functions are;

$$P_1 = 80 - 5Q_1$$

$$P_2 = 180 - 20Q_2$$

$$MR_1 = 80 - 10Q_1$$

$$MR_2 = 180 - 40Q_2 \text{ respectively.}$$

Q = Quantity demanded.

P = Price

MR = Marginal Revenue.

Required: Using the above info. calculate the profit maximising output in each of the submarkets & the corresponding prices when the industry's MC = 20.

Solution.

$$MC = MR_1 = MR_2$$

$$MC = 20 \therefore MC = MR_1$$

$$MC = 80 - 10Q_1$$

$$20 = 80 - 10Q_1$$

$$10Q_1 = 80 - 60$$

$$10Q_1 = 20$$

$$\frac{10}{10} = \frac{20}{10}$$

$$Q_1 = 2 \text{ units.}$$

The monopolist should produce Q_1 units in market 1

$$P_1 = 80 - 5Q_1$$

$$P_1 = 80 - (5 \times 2)$$

$$P_1 = 80 - 10$$

$$P_1 = \text{sh } 70$$

$$MC = 20 \therefore MC = MR_2$$

$$MC = 180 - 40Q_2$$

$$20 = 180 - 40Q_2$$

$$40Q_2 = 180 - 20$$

$$40Q_2 = 160$$

$$\frac{40}{40} = \frac{160}{40}$$

$$Q_2 = 4 \text{ units.}$$

The monopolist should produce 4 units in market 2.

$$P_2 = 180 - 20Q_2$$

$$P_2 = 180 - (20 \times 4)$$

$$P_2 = 180 - 80$$

$$P_2 = \text{sh } 100$$

Calculate the price elasticities of demand.

$$P_1 = 80 - 5Q_1$$

$$\frac{5Q_1}{5} = \frac{80 - P_1}{5}$$

$$Q_1 = 16 - 0.2P_1$$

$$\frac{\Delta Q \cdot P}{\Delta P \cdot Q}$$

$$-0.2 = \frac{\Delta Q}{\Delta P}$$

$$-0.2 \times \frac{50}{6}$$

$$-1.667$$

more price elastic

$$P_2 = 180 - 20Q_2$$

$$\frac{20Q_2}{20} = \frac{180 - P_2}{20}$$

$$Q_2 = 9 - 0.05P_2$$

$$\frac{\Delta Q \cdot P}{\Delta P \cdot Q}$$

$$-0.05 = \frac{\Delta Q}{\Delta P}$$

$$-0.05 \times \frac{180}{4}$$

$$= -1.875$$

less price elastic

Calculate the profits in the market -

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

$$TR_1 = P_1 \times Q$$

$$TR = (80 - 5Q_1)Q$$

$$TR_1 = 80Q - 5Q^2$$

$$TR_2 = P_2 \times Q$$

$$TR_2 = (180 - 20Q_2)Q$$

$$TR_2 = 180Q - 20Q^2$$

3. MONOPOLISTIC COMPETITIVE MARKETS.

16/09/2016.

- The model for monopolistic competition is based on the following assumptions; (features):
 - a) Large no. of buyers & sellers.
 - b) The products of the sellers are differentiated yet they are close substitutes for each other.
 - c) Freedom of entry & exit of firms into & out of the industry.
 - d) The goal of the firm is profit maximization both in the short & long run. Other goal is pursued.
 - e) The prices of the factors & technology is given.

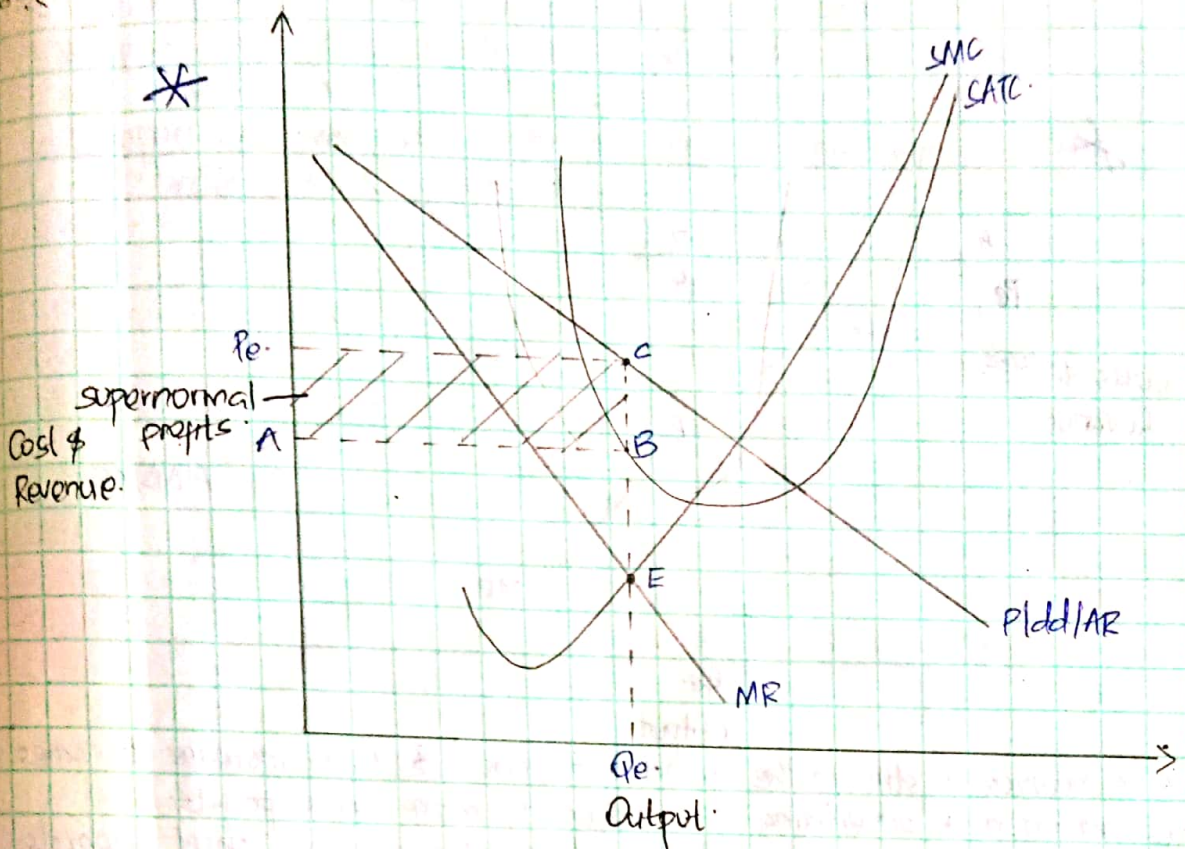
PRODUCT DIFFERENTIATION.

- This refers to the attempt by producers to distinguish their products from those produced by their competitors in the industry.
- This differentiation can either be real (ie where the inherent x'tics are different eg manufactured products) or fancied (ie where the products are basically the same & yet the consumers are persuaded through advertising & other selling activities that the products are diff).
- The aim of product differentiation, whatever the case, is to make the products unique in the minds of the consumer but ~~we~~ leave the products closely related if they are to be considered to be in the same product group.

Effects of Product Differentiation.

1. The producer has some discretion in the determination of prices. He is not a price taker but has some degree of monopoly power that he can exploit. However, he faces the keen competition of the close substitutes offered by the other firms: the discretion of the price is limited.
 - There are elements of monopoly as well as those of competition under this market structure hence the name monopolistic competition.
2. It provides a rationale for selling expenses eg advertising, salesmanship, sales promotion & so forth.
3. It creates brand loyalty & gives rise to a negatively sloping demand curve. The demand curve will be price elastic because of the availability substitutes.

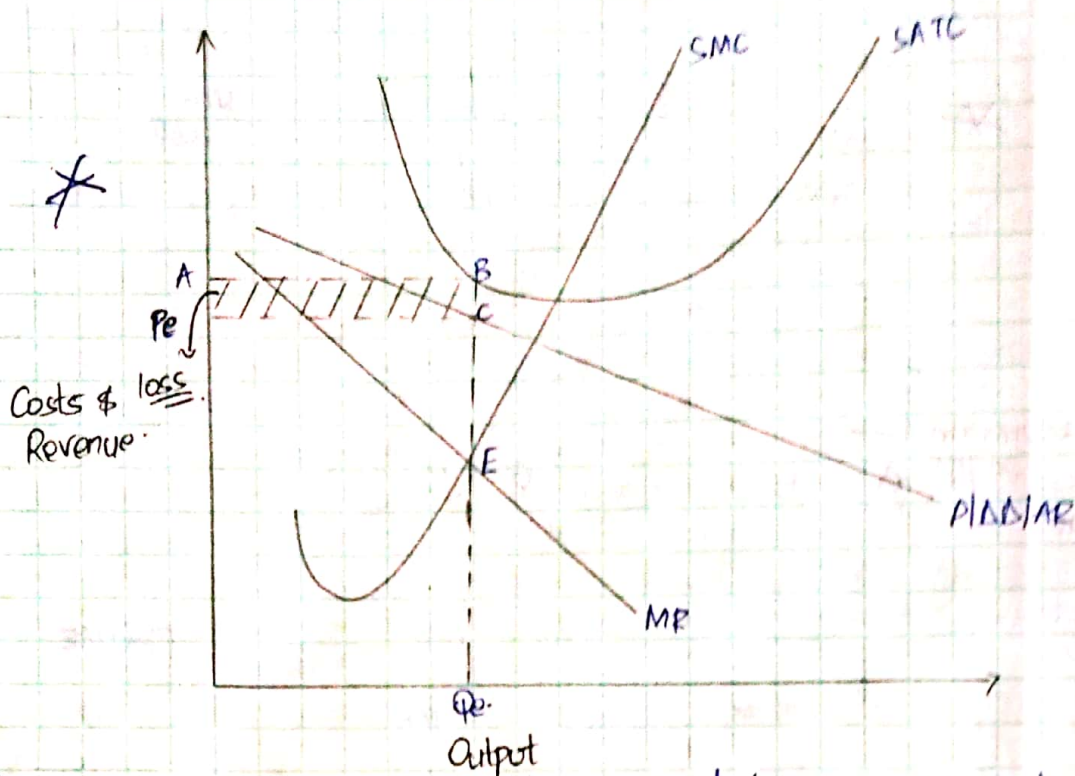
EQUILIBRIUM OF A MONOPOLISTIC COMPETITIVE MARKET. FIRM.



- Differentiation gives rise to a negatively sloping demand curve for the products of the individual firm.
- If the firm increases its price, it will lose some but not all its customers because of the brand loyalty.
- If it lowers its price, it will increase its sales by attracting some customers from the other firms.
- The downward sloping demand curve is however price elastic due to the availability of close substitutes in the market.

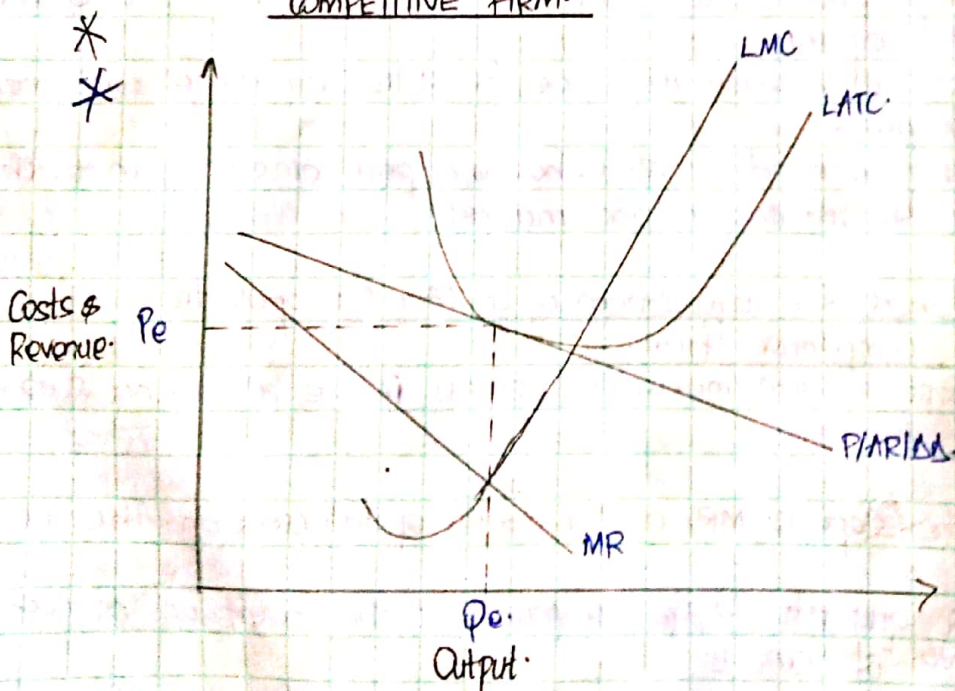
Short-Run Equilibrium of a Monopolistic Competitive Firm.

- A monopolistic competitive firm maximises profits if the following 2 conditions are met,
 1. $MC = MR$
 2. The slope of $MC >$ the slope of MR . at the point of intersection. This is illustrated above.
- The profit maximising quantity Q_e is found at the point of intersection of the MR & MC curve. at point E.
- The firm will be making supernormal profits represented by the shaded region $PeABC$.
- **NOT** A firm in the short run may be making a loss but still continue producing if at the point where $MC = MR$, $AR > AVC$. However if at the equilibrium point, $AR < AVC$ operations will stop but the firm will not quit the industry.



- This is because it still in the short run period & it can increase its sales through sales promotion & advertising & consequently make more profits.
- If such activities are successful, the demand curve will shift upwards.

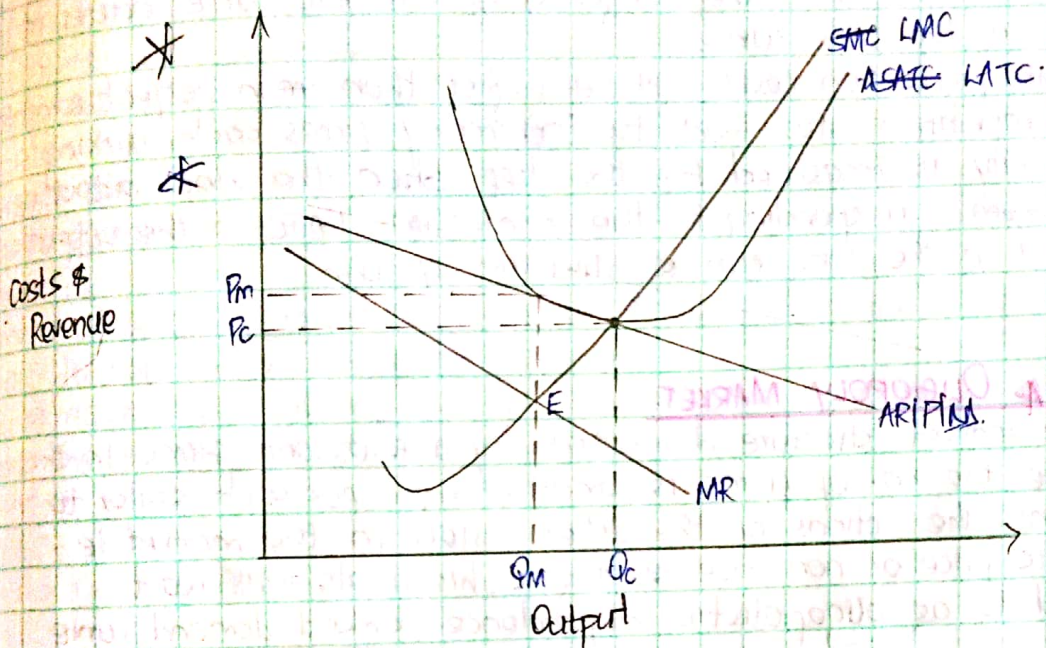
LONG RUN EQUILIBRIUM OF A MONOPOLISTIC COMPETITIVE FIRM.



- In the long run, supernormal profits will induce entry by other firms into the industry.
- As they introduce competing brands, the existing firms will lose their market share & their demand curves will shift downwards.
- This will continue until there are normal profits in the industry.

- In the long run, the demand curve (AR curve) will be tangent to the firm's ATC curve which corresponds to the equilibrium point E.
- The firm will be making normal or zero profits in the long run.

Comparison Between a Monopolistic Competitive & a firm Under Perfect Competition.



- The long run equilibrium of a MC market firm is defined by the point of tangency of the demand curve to the LMC curve.
- Under perfect competition, the long run equilibrium condition is given by $P = AR = MR = LMC = LAC$.

Q13a

$d = 15 - 0.5P$. Determine price elasticity at sh 12.

$$Q = 15 - 0.5P$$

$$\frac{dQ}{dP} = -0.5$$

$$Q = 15 - (0.5 \times 12)$$

$$Q = 9$$

$$-0.5 \times \frac{12}{9} = -0.67$$

Inelastic. ✗

Q13b

S.P = sh 500 per unit
 FC = sh 1.8 million
 V.C = sh 200 per unit.

Break even point $TC = TR$

$$TC = TR$$

$$1/8 \quad 1,800,000 + 200x = 500x$$

$$\frac{6,000}{1,800,000} = \frac{300x}{300}$$

$$= 6000 \text{ units.}$$

- As a consequence of the diff equilibrium conditions, prices will be higher & output lower under monopolistic competition (ie P_m & Q_m) as compared to a perfectly competitive market model (ie P_c & Q_c).
- The profits will be normal in the long run in both models.
- In monopolistic competition, there will be many firms in the industry each producing an output less than optimal ie at a cost higher than minimum.
- This is due to the fact that the tangency of the ATC curve occurs at the falling part of the LAC curve.
- Consequently, the production costs will be higher than in perfect competition.
- Monopolistic competition also leads to too many firms each working with excess capacity as measured by the diff. b/w the ideal output of Q_c & the minimum corresponding to the minimum LAC & the output actually attained in the long-run equilibrium of Q_m .

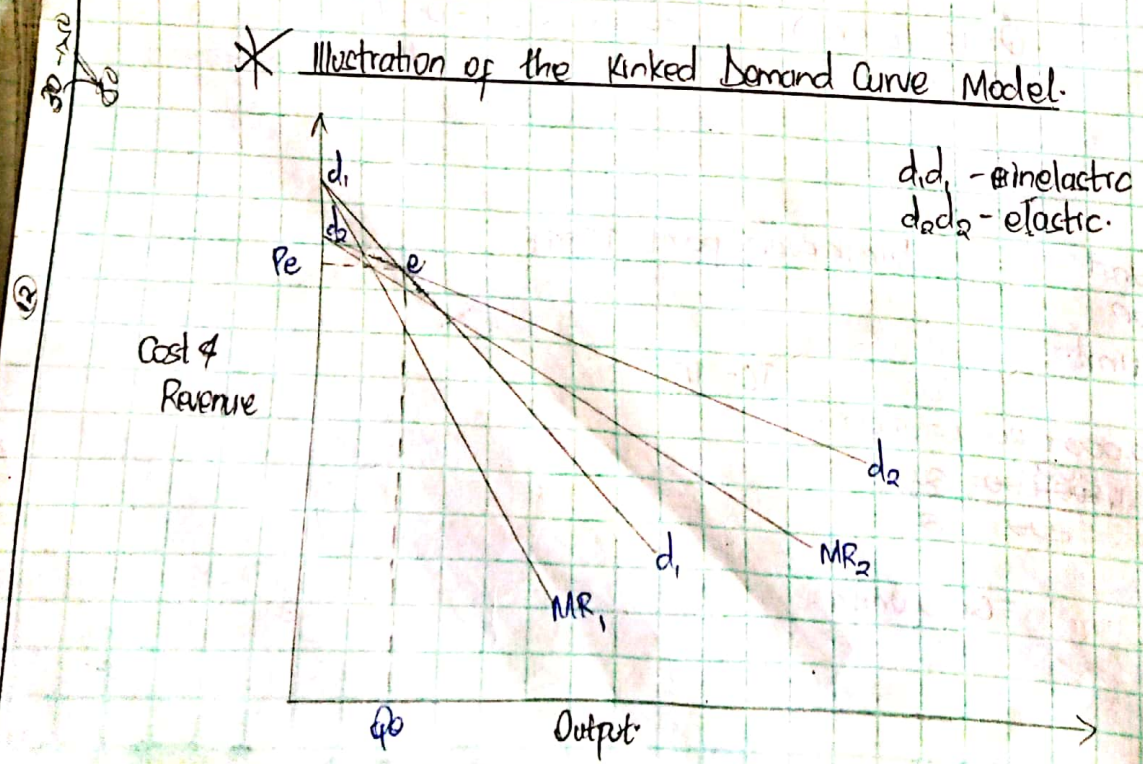
4 OLIGOPOLY MARKET.

- This refers to a market structure dominated by a few large firms. In this market structure, the no. of firms is small enough for each seller to take into account, the actions of the other sellers in the market ie if it changes its price or non price strategies, his rivals will react. This is referred to as oligopolistic dependence kinked demand curve model.

FEATURES.

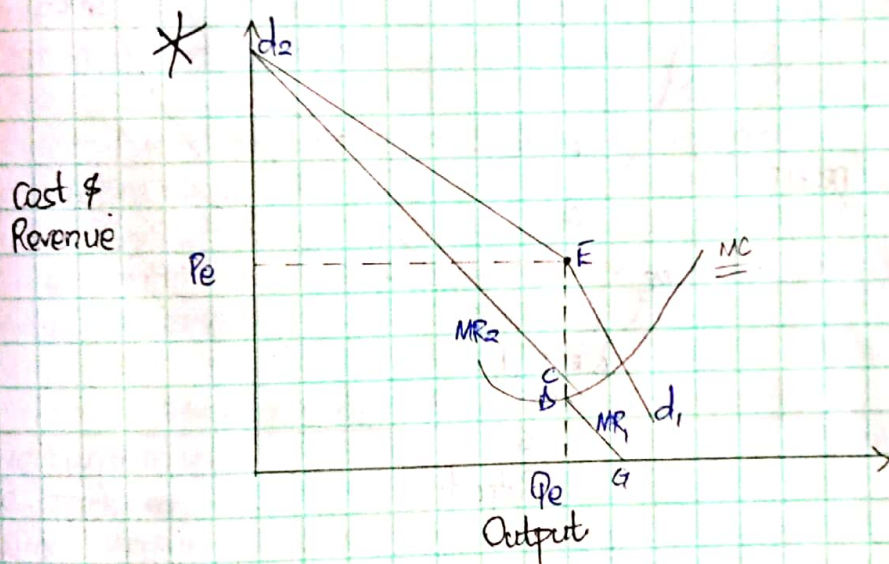
1. A few large dominant firms with many small ones.
2. A product either standardized or differentiated.
3. Power of dominant firms over price but fear of retaliation.
4. Technological & economic barriers to become a dominant firm.
5. Extensive use of non price competition because of the fear of price wars.

* Illustration of the Kinked Demand Curve Model.



tion.

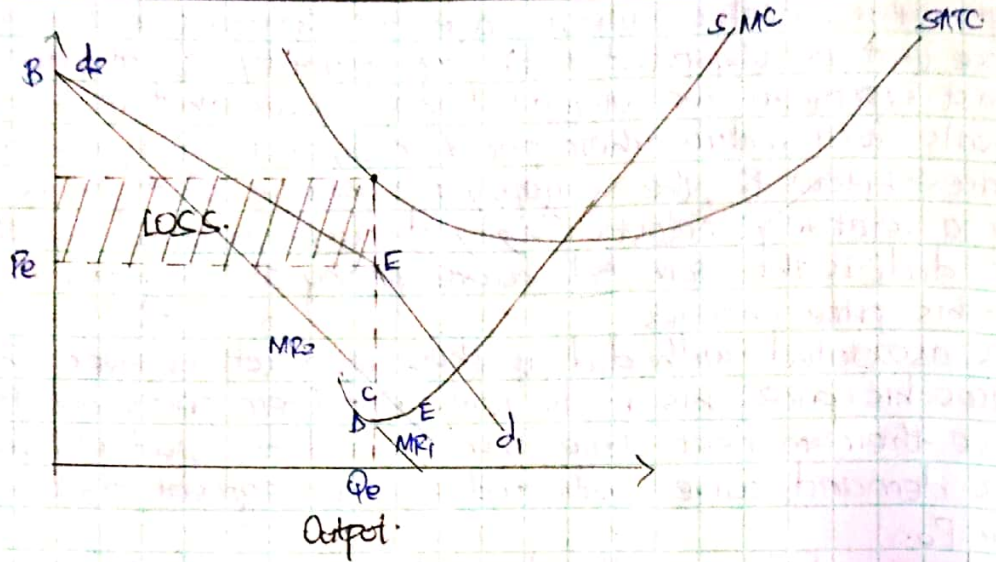
- To explain this model, consider a single firm operating in an oligopolistic market.
- Suppose that an oligopolist is setting quantity Q_e at price P_e , based on the past experience the oligopolist may believe that if he lowers his price his rivals will reduce their prices in order to retain their market share.
- For prices below P_e , the oligopolist believes that he is effectively facing a relatively inelastic demand curve indicated by the segment $d_1 d_2$. $d_1 d_2$ is the demand curve facing the oligopolist when rivals match his price changes.
- MR_1 is associated with $d_1 d_2$, if the oligopolist believes that if he increases his price, his rivals will keep their prices constant in order to increase their market share, then he will be effectively facing a relatively elastic demand curve indicated by the segment $d_2 e$. for prices above P_e .
- Demand curve $d_2 e d_1$ is \therefore the demand curve facing the oligopolist when his rivals do not match his price changes
- MR_2 is associated with $d_2 e d_1$ - To illustrate the effective demand curve facing the oligopolist, consider the diagram below



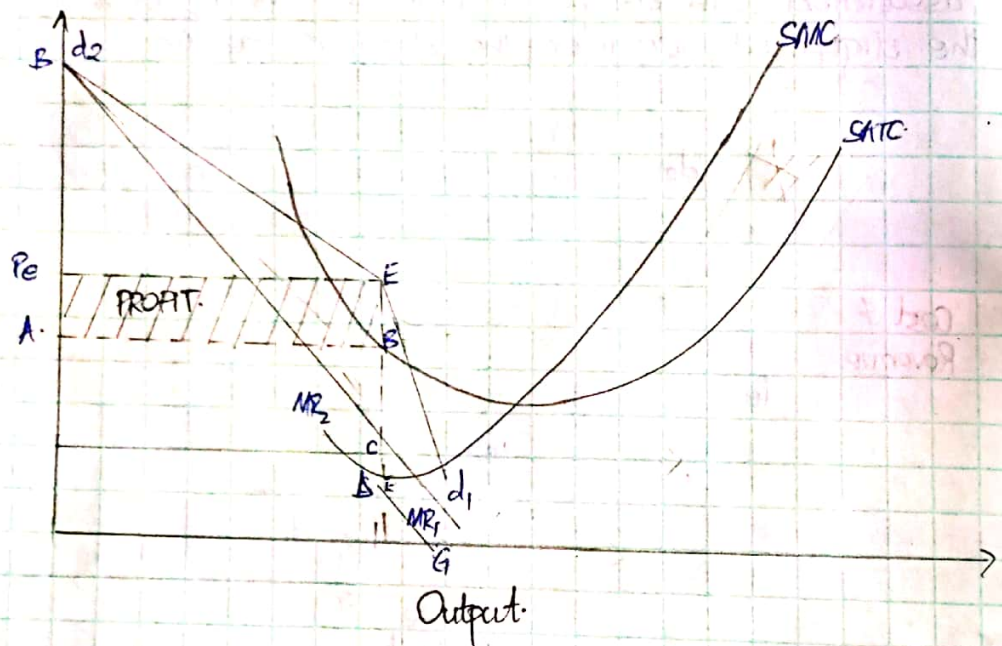
- The demand curve facing the oligopolist is reproduced in the diagram above by $d_2 e d_1$.
- Since it has a kink at point E it is referred to as oligopolist kinked demand curve.
- The effective MR curve is given by $BCAG$ with a discontinuity between c & B .
- Since the firm's profit maximising price is P_e & maximising quantity is Q_e it must be true that the ~~MR curve~~ MC curve cuts the MR curve somewhere below the discontinuity.
- It \therefore follows that large changes in the firm's MC are possible which will not induce the firm to change either its price or quantity.
- This theory therefore helps to explain the relative stability in prices under oligopoly, i.e. where the prices are sticking.

Nov 2016 26, Nov 2015 26

Costs & Revenue



Costs & Revenue



TYPES OF OLIGOPOLY.

OLIGOPOLY.

Perfect / Pure (Homogeneous)

Differentiated or Impure

Cooperation: Collusive Oligopoly

Lack of col-op Non-collusive Oligopoly.

Cartel

Price leadership

1. Pure / Perfect Oligopoly.

The firms produce homogeneous products i.e. all products are perfectly substitutable.

2. Imperfect / Differentiated / Impure Oligopoly.

The firms produce differentiated products i.e. there is no perfect uniformity in products.

3. Collusive Oligopoly.

There exists an agreement btwn few firms of an industry.

a) Cartel.

In this case, the firms jointly fix a price & output policy through an agreement i.e. all firms are running on the basis of the agreement.

b) Price Leadership.

One firm considered as the leader & it fixes prices & related things. All firms will follow the rules fixed by the leader.

4. Non-Collusive Oligopoly

There is no co-operation or agreement btwn the firms i.e. they operate independently.

Advantages of a Collusive Oligopoly.

1. It avoids uncertainty.
2. Price stability.
3. Revenue stability.
4. Avoids price wars.
5. Avoids cut throat competition.

Disadvantages of a Collusive Oligopoly.

1. Lack of productive efficiency.
2. Lack of allocative efficiency.
3. Consumer exploitation.
4. It is harmful to society.

Advantages of a Non-Collusive Oligopoly.

1. Productive efficiency.
2. Allocative efficiency.
3. No consumer exploitation.
4. Improved quality due to competition.

Disadvantages of a Non-Collusive Oligopoly.

1. Uncertainty in the market.
2. Price instability / fluctuation.
3. Revenue instability.
4. Increased price wars.
5. Cut throat competition.

10:30 → 12:00