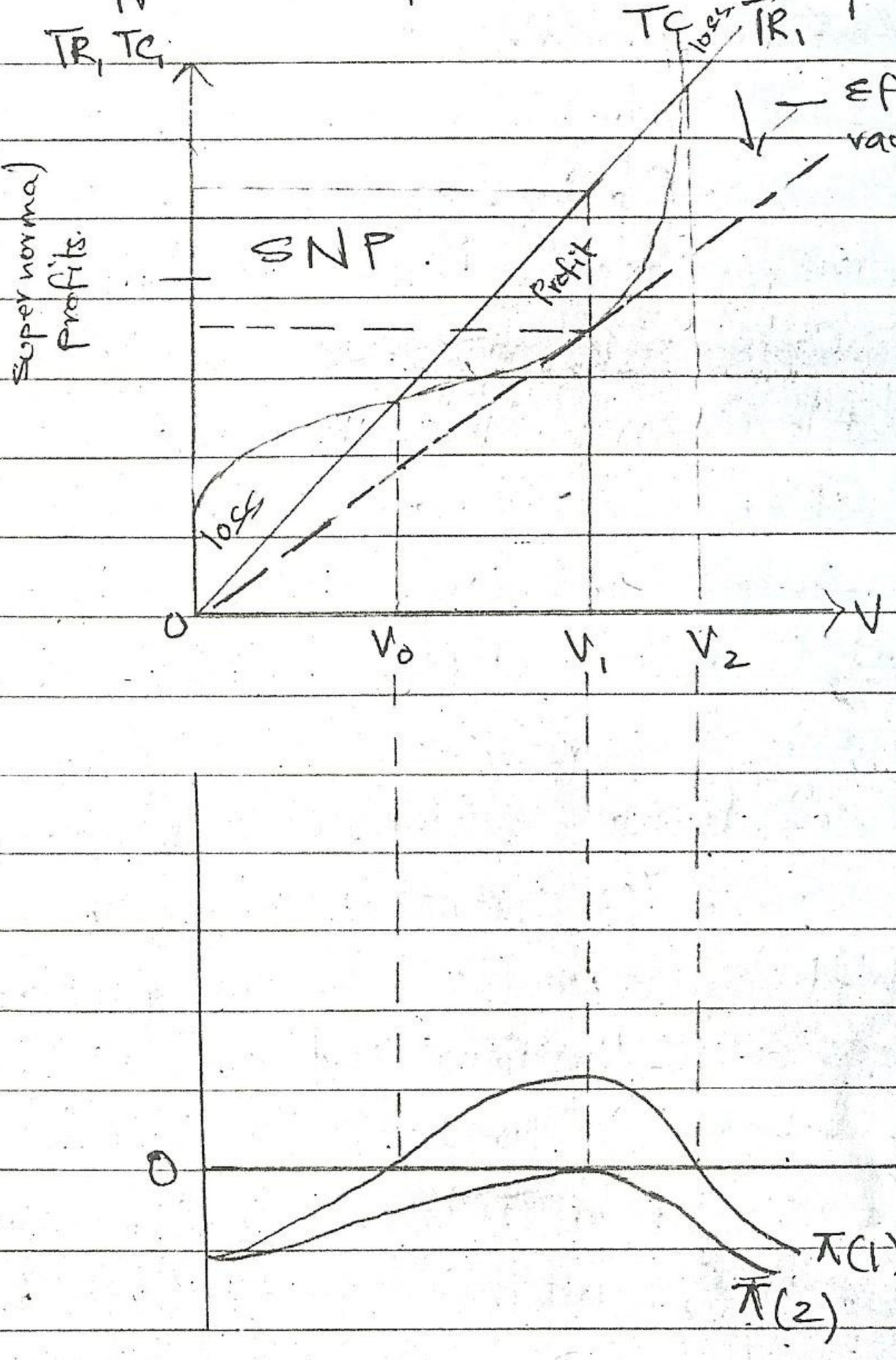
OALEVELNOTES.COM

The industry is initially in equilibrium at E_1 which is determined the intasection of D_1 & S_1. The equilibrium price is ~~P_1 &~~ P_1 which is passed on to a typical firm in the form of a perffectly elastic demand curve labelled $P_1 MR_1$. The firm is in equilibrium at C_1 where MC intersects MR_1 and ~~therefo~~ therefore it produces output level OV_1. Total revenue equals ~~R~~ rectangle $OP_1 C_1 V_1$. Point X on the AC curve corresponds to output level OV_1 which implies that Total cost equals $OYXV_1$. Since TC > TR it follows that there is a loss of $P_1 Y X C_1$. In the long run losses will trigger exit from the industry and as some firms will leave the industry supply ~~ss~~ curve will shift backwards causing price to rise. This process will continue until price has risen to a level where all losses are eliminated And remaining firms are breaking even. The final equilibrium will be at E_2 which is determined by the intasection ~~a~~ of $D_1 S_0$. The equilibrium price is P_2 MR_2 and a typical firm is in equilibrium at C_2 where MC cuts MR_2. The output level produced is OV_2 and since AC is tangent to C_2 it follows that $P = AC$ which means $TR = TC = OP_2 C_2 V_2$. Each firm now produces more ($OV_2 > OV_1$) However the industry supply has decreased from OQ_1 to OQ_0 b/c the no. of firms in the industry has decrease

www.studyguide.pk

OALEVELNOTES.COM

⇒ Total approach to profit maximization / loss minimization.

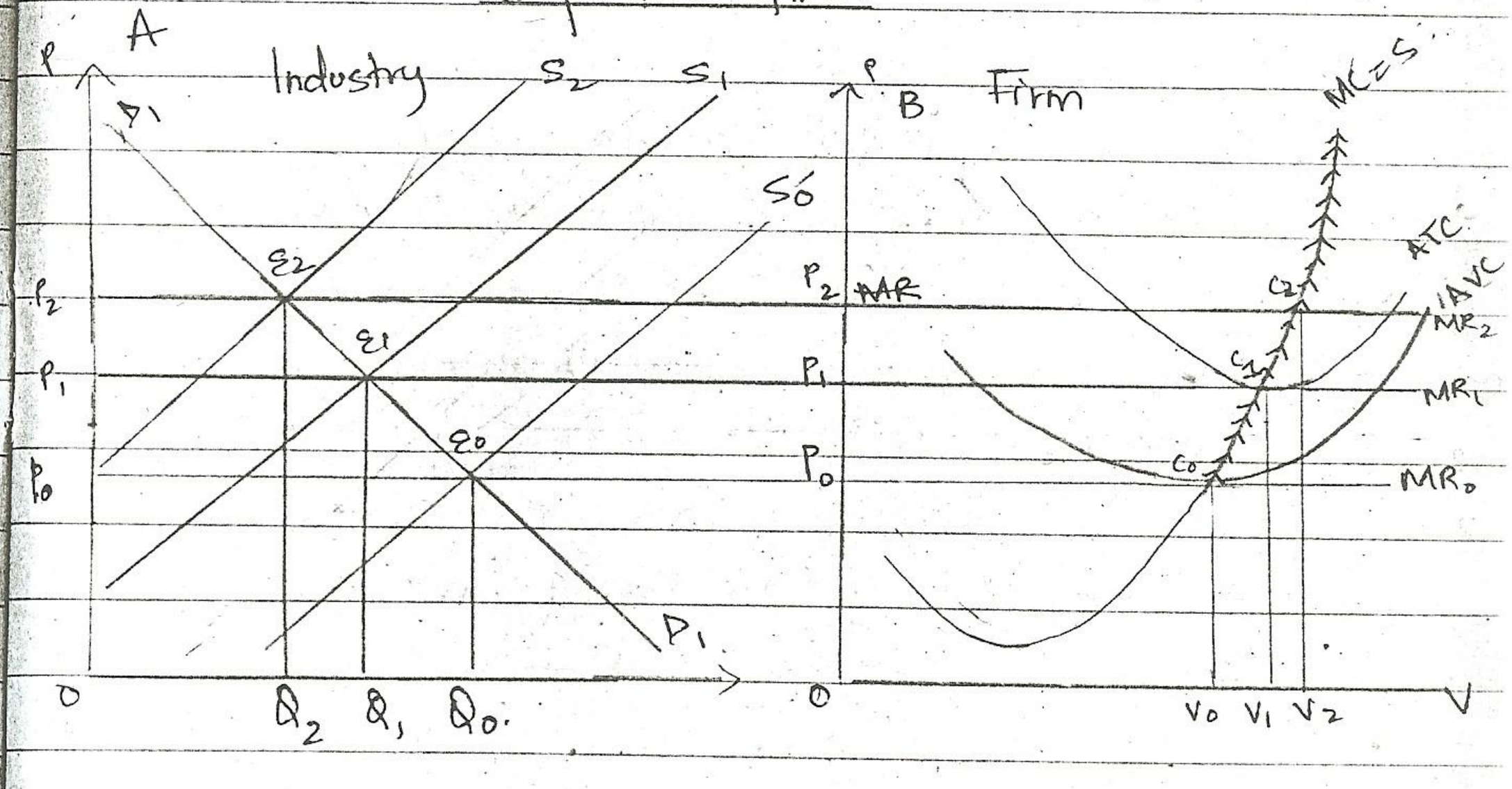


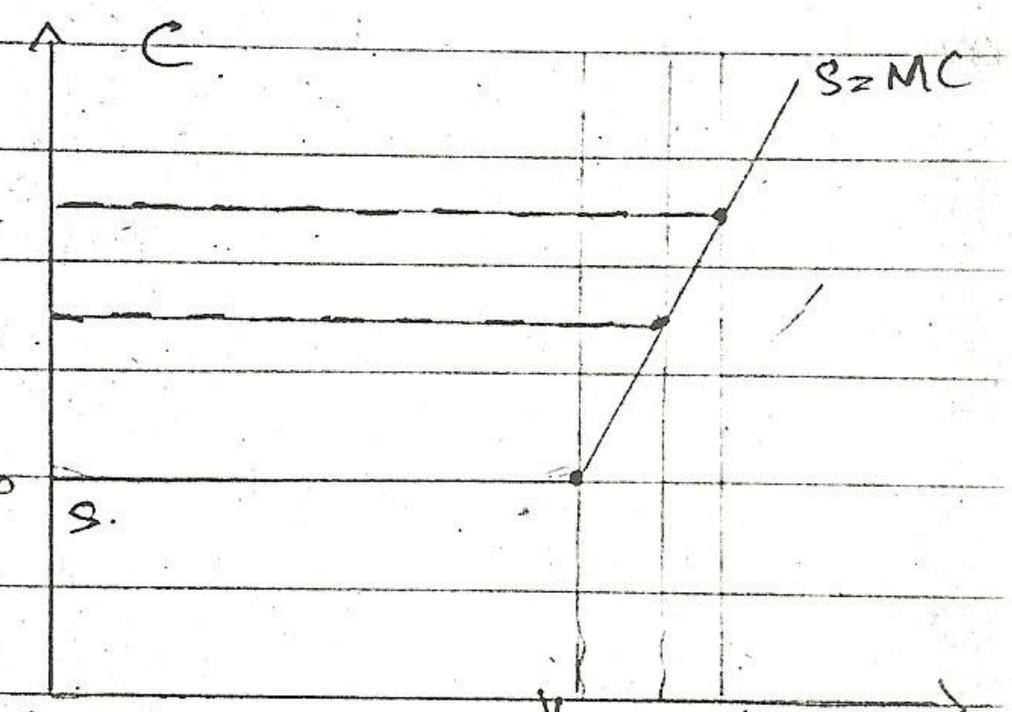
May 03
June 05

www.studyguide.pk

OALEVELNOTES.COM

⇒ Deriving the Short run supply curve of a perfectly competitive firm.





Panel A shows 3 equilibrium levels of a perfectly competitive industry which are ε_0, ε_1 and ε_2. These result in 3 different prices of P_0 P_1 and P_2 which are transferred to a typical firm shown in Panel B in the form of a perfectly elastic demand curve which are MR_0, MR_1 and MR_2. Firm will be in equilibrium at all those points where marginal cost intersects these MR functions. These points are C_0, C_1 and C_2 which correspond to output levels V_0, V_1 and V_2. At C_0, AVC is tangent which implies that ~~total~~ $TR = TVC = OP_0C_0V_0$. Therefore loss equals TFC. In other words P_0 is the minimum price that is acceptable to the firm and TFC is the maximum loss it can sustain. So if price ~~stops~~ drops ever

www.studyguide.pk

OALEVELNOTES.COM

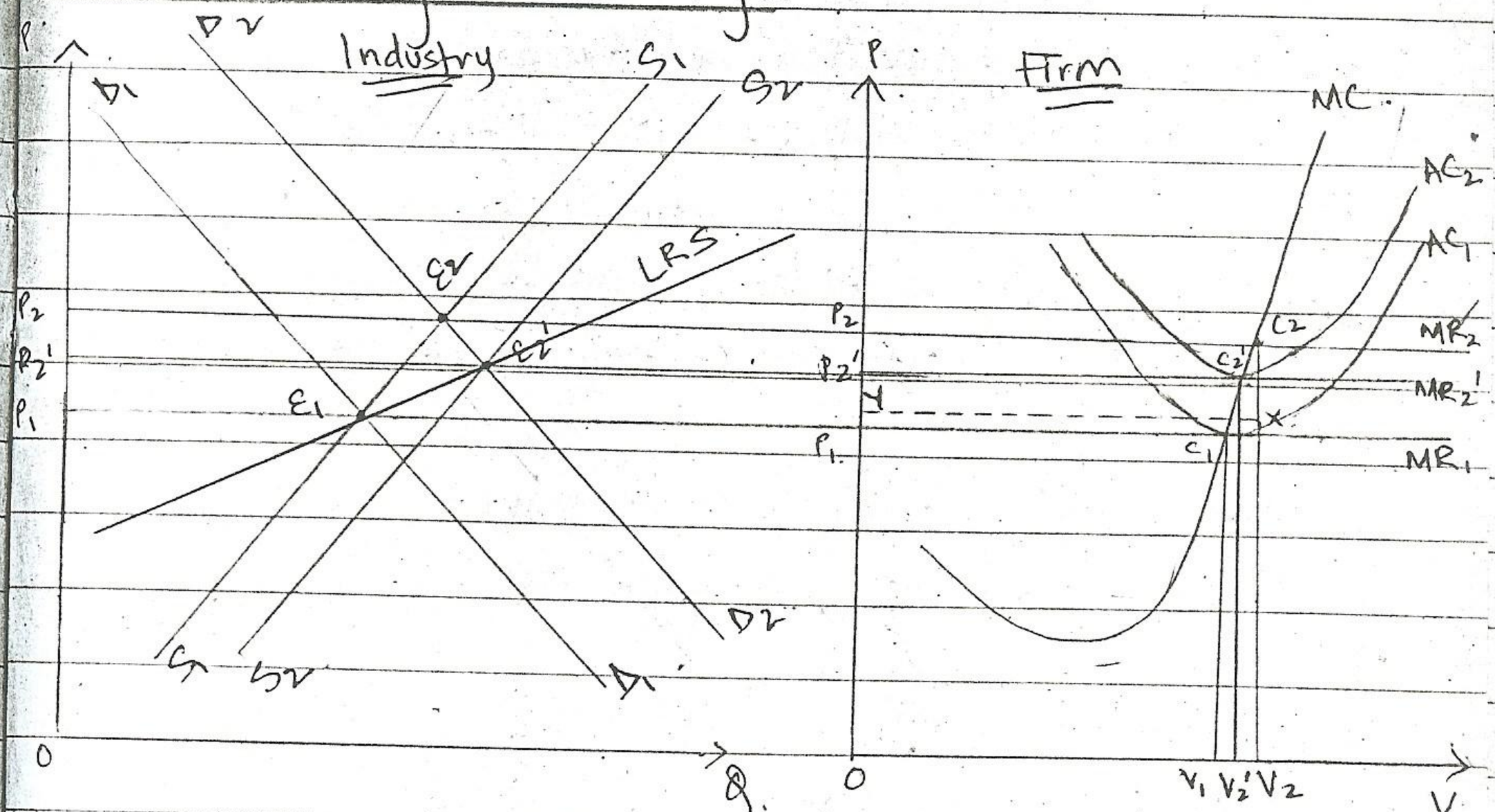
= A cent below P_0, the firm will instantly shut down and cease production all together. So we can say that C_0 is a shutdown point and P_0 is a shut down price. On the other hand as price rises above P_0, it gives firm the opportunity to minimize losses and breakeven b/w P_0 and P_1 and even make super normal profits b/w C_1 and C_2 (C_1 implies normal profit b/c $TR = TC = OP_1C_1V_1$). So we can see that all prices above P_0 firm will move along its MC curve and expand production. So we can conclude, "MC curve after it intersects AVC at its minimum becomes the Short Run Supply curve of pe a perfectly competitive firm". This section of MC curve is plotted in panel C where P_0V_0, P_1V_1 and P_2V_2 are coordinated to derive the supply curve. Furthermore, b/w P_0V_0 and V_0 supply curve becomes perfectly elastic suggesting that firm will shutdown if price fell below P_0.

www.studyguide.pk

OALEVELNOTES.COM

⇒ Long run Supply curve.

Case 1: Increasing Cost Industry.



The perfectly competitive industry is initially in equilibrium at E_1 where industry demand D_1 intersects industry supply S_1. The equilibrium price is P_1 which is given to the firm as P_1, MR_1 and firm is in equilibrium at C_1 where MC intersects MR_1. Since AC_1 is tangent to C_1, it follows that firm makes normal profit where $TR = TC = OP_1C_1V_1$. Now there is a permanent increase in demand from D_1 to D_2 which takes equilibrium to E_2. Equilibrium price is now P_2 MR_2 and firm is in equilibrium at C_2 producing output level ON_2. The point on the AC curve corresponding to V_2 is X which lies below price. Therefore firm is making super normal

www.studyguide.pk

OALEVELNOTES.COM

= profit equal to P_2C_2XY ($OP_2C_2V_2 - O4XV_2$). Presence of supernormal profits will attract new firms into the industry and as new firms enter not only the industry's supply will shift outwards but average cost facing each firm will also shift upwards. This is so because when more firms enter the industry the demand for industry's resources increases which leads to rise in factor prices and cost of production, due to external diseconomies of scale. The simultaneous shift in industry's supply and AC curve will continue until all supernormal profits are removed and firms revert to breakeven normal profits.

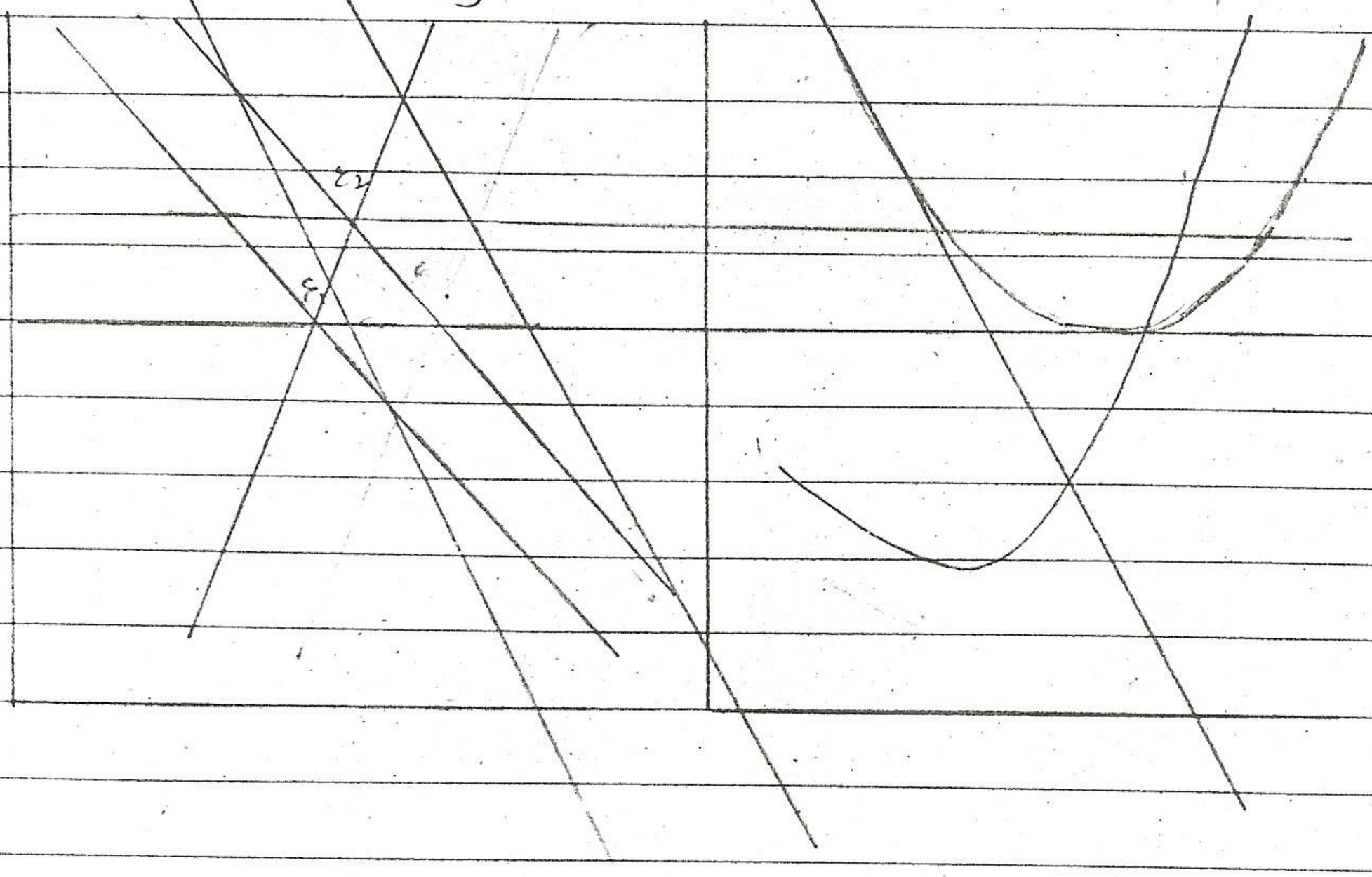
The final equilibrium will be E_2' which is determined by the intersection of D_2 and S_2, equiquilibrium price is P_2', MR_2' and a typical firm is in equilibrium at C_2' where MC cuts MR_2'. Notice that C_2' is the longrun breakeven b/c a new AC curve AC_2 is tangent to C_2' implying that $TR = TC = OP_2'C_2'V_2'$. On the industry panel we can connect the two longrun equilibrium points to derive the longrun supply curve of a competitive industry. This is done by connecting E_1 and E_2' while E_2 will be ignored due to supernormal profits which are not possible in the long run. The upper sloping LRS on the industry panel suggests that the industry will produce more in the long run only if price rises b/c its an increasing cost industry

www.studyguide.pk

OALEVELNOTES.COM

characterized by diseconomies of scale / Decreasing returns to scale.

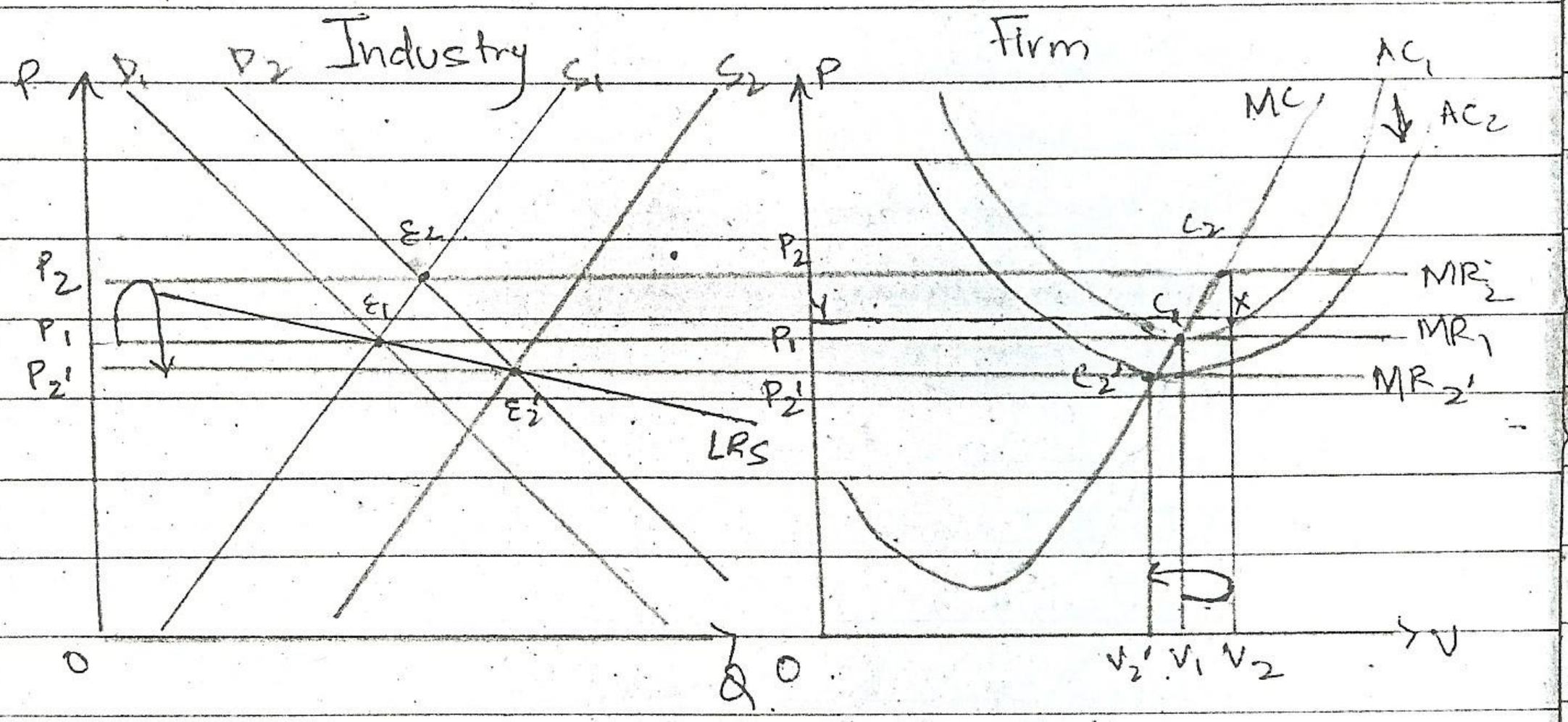
Case 2: Decreasing Cost Industry



www.studyguide.pk

OALEVELNOTES.COM

Case 2: Decreasing Cost Industry



The initial equilibrium is E_1 where price is P_1 MR_1 and a typical firm is in equilibrium at C_1 making normal profits as $TR = TC = OP_1C_1V_1$. Now industry demand rises permanently to D_2 taking price upto P_2 MR_2, a typical firm moves up its MC to C_2 where it makes supernormal profits equal to P_2C_2XY. Entry of new firms Presence of supernormal profits will trigger entry of new firms which not only shifts the supply rightwards but also avg cost downwards. This is so b/c supplies of resources/ factors of production realize economies of scale which are passed on to both new and old firms. The simultaneous shift in industry's supply and ~~AVC~~ AC will continue until all ~~firms~~ firms are breaking even i.e making normal profits. The final

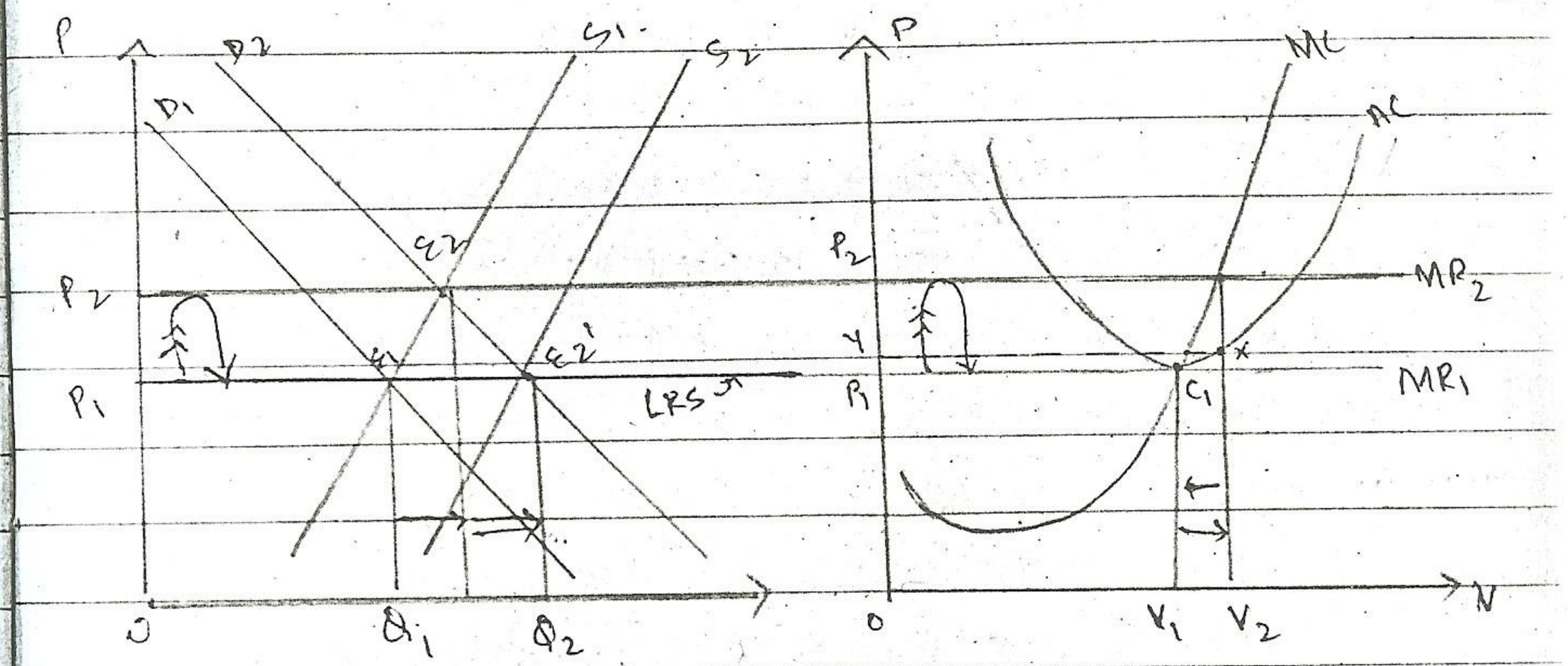
www.studyguide.pk

OALEVELNOTES.COM

29th Sun

equilibrium will be E_2' where price is P_2' MR_2' and a typical firm is in equilibrium at C_2'. Notice that C_2' is a longrun equilibrium b/c the new ~~ava~~ AC, AC_0 is tangent to it. On the industry panel we can connect E_1 and E_2' to derive the downward sloping longrun supply curve. The downward sloping curve suggests that in the longrun industry will supply more even at lower prices b/c its a decreasing cost industry characterized by economies of scale / increasing returns to scale.

$\Rightarrow$ Constant Cost.



www.studyguide.pk

OALEVELNOTES.COM

⟹ Monopolistic Competition

It is a market structure with the following setup of assumptions:

- There are large numbers of buyers and sellers in the market.
- Each firm produces a good which is a very close substitute to goods produced by its rival firms. In other words there is product differentiation under monopolistic competition but the degree of product differentiation is very low.
- There are no barriers to entry and exit, therefore, when industry makes supernormal profits then more firms will enter and when profits are subnormal, firms will exit.
- In the long run all monopolistically competitive firms make normal profits.

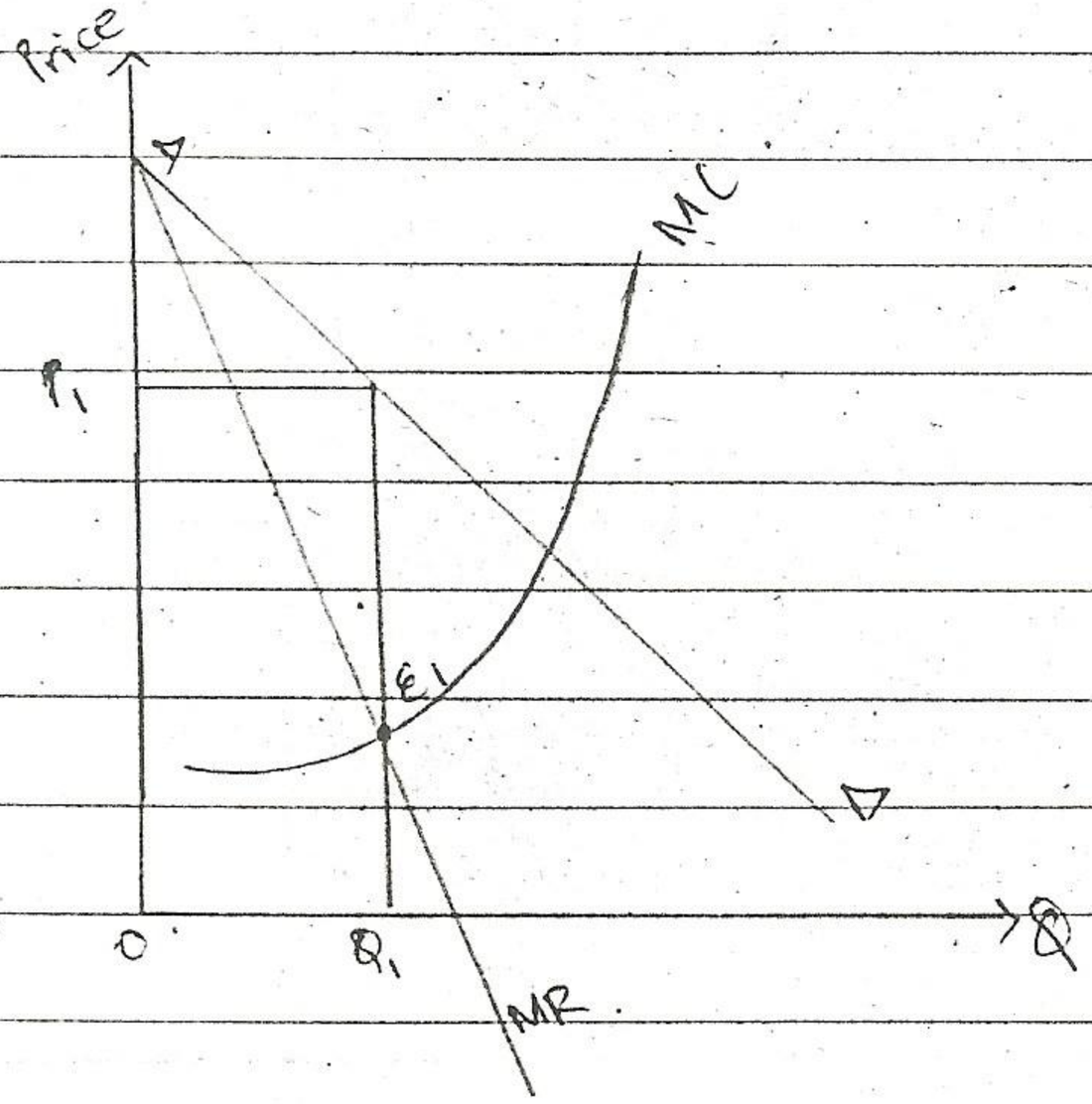
→ Profit maximisation under monopolistic competition:

A firm under monopolistic competition will maximise profits by equating marginal cost to marginal revenue. However, marginal revenue no longer coincides in price as demand curve is not perfectly elastic. In other words we are saying that firm under monopolistic competition becomes a price maker (to a small extent) which implies that every time it wants to sell more, it must reduce price which will make the firm loose revenue on the preceeding units which could have been sold at a higher price. Therefore, net marginal revenue becomes the difference b/w gain and revenue from additional

www.studyguide.pk

OALEVELNOTES.COM

~~revie~~ units sold and loss of revenue on preceeding units which could have been sold at a higher price.

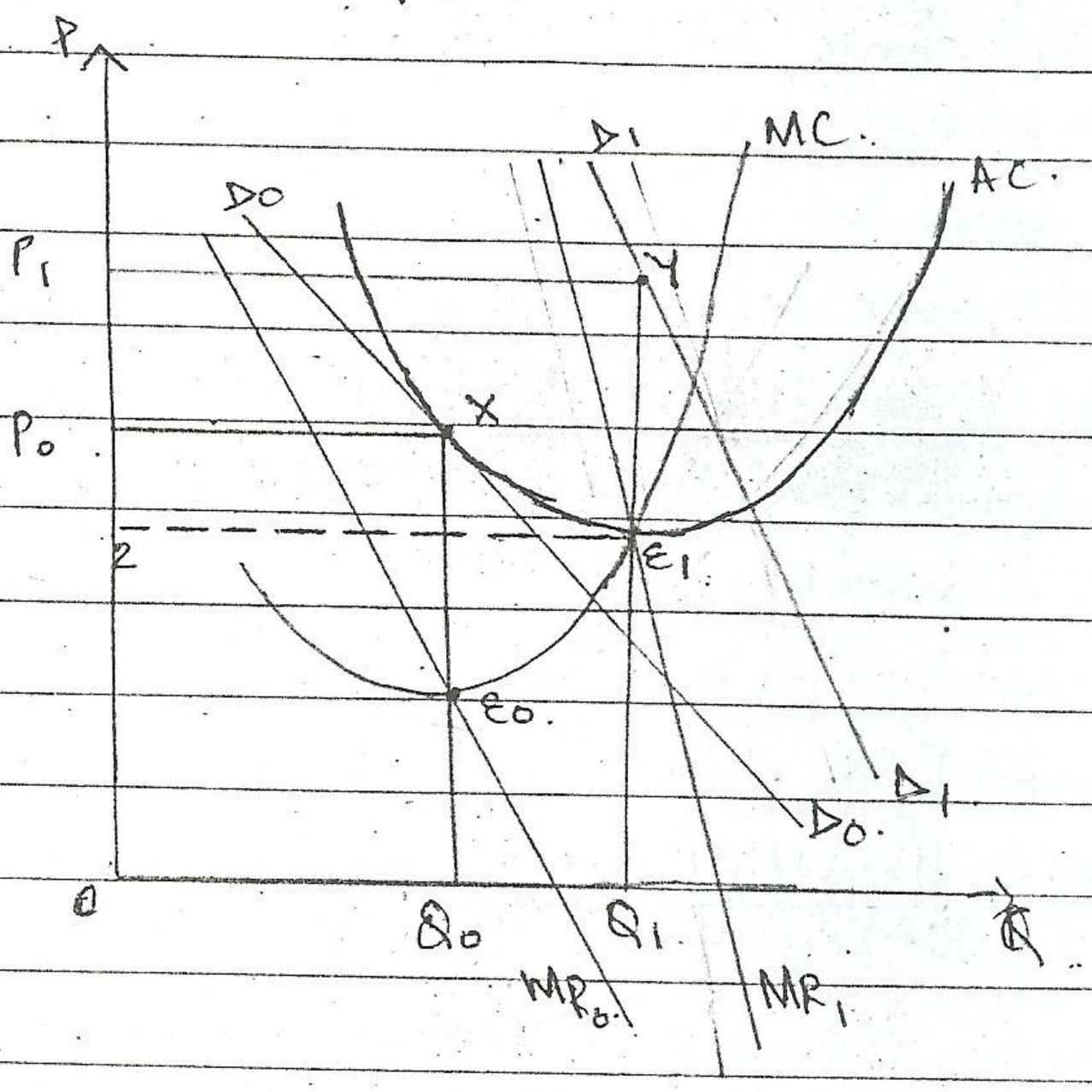


The diagram above shows that a monopostically competitive firm will maximise profits by equating MC to MR ~~and~~ at E_1. This results in equilibrium output of OQ_1 and equilibrium price of OP_1 (Price is always present in the demand curve which is why E_1 is extended upto the demand curve,).. Q_1 could be a profit maximising level or a loss minimising level depending on the position of AC curve. In the short run a firm can make super normal profits or subnormal profits but in the long run firm will always breakeven.

www.studyguide.pk

OALEVELNOTES.COM

→ Case 1 : From Super normal Profits to Breakeven/normal Profits.



The demand curve faced by the firm is D_1 with its corresponding MR curve, MR_1. firm is in equilibrium at E_1 where MC cuts MR_1 and this results in Equilibrium price of OP_1 and equilibrium output of OQ_1. Total Revenue generated by the firm is equal to $OP_1 Y Q_1$, while total cost equals $O2E_1Q_1$. (notice that point E_1 also lies on AC and corresponds to output level OQ_1. Since total revenue is greater than total cost, the difference b/w them becomes supernormal profit which is equal to $P_1 Y E_1 2$. Presence of supernormal profits will trigger entry of new firms. This will reduce the market share for existing firms causing their demand curves to not only shift inwards but also become

www.studyguide.pk

OALEVELNOTES.COM

relatively elastic due to increase in the number of substitutes. This process will continue until enough firms have entered to wipe out all supernormal profits. The final equilibrium will be E_0 for a typical firm where MC cuts MR_0, the equilibrium price is OP_0 and equilibrium output is OQ_0. We can also see that price OP_0 is exactly equal to AC of XQ_0 which implies that TR=TC= ~~OP_0Q_0X~~ $OP_0 \times Q_0$ (normal profits).

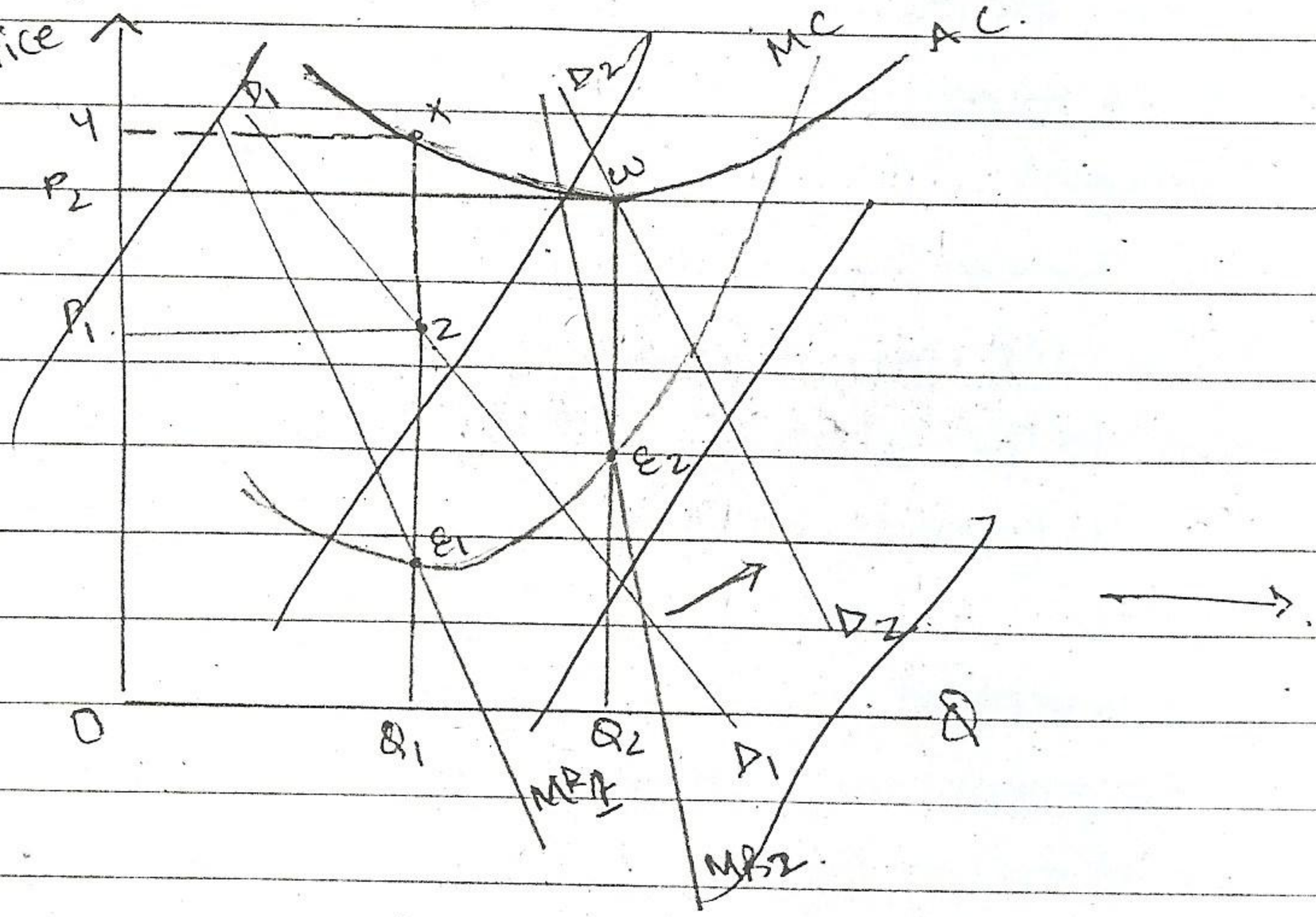
- Monopolistic Competition and Efficiency:

The long run adjustment has caused the firm to move from the minimum point on its AC curve E_1 to point X where there is excess capacity. Since this ~~or~~ outcome applies to most other firms in the industry it follows that ~~most other~~ monopolistic competition can become productively inefficient in the long run. In other words, instead of a few firms supplying the market by optimizing on capacity there are many firms present, each working below its capacity and wasting recources which results in inefficiency. However, the counter argument by those who favour monopolistic competition is that fall in price, increase in choice and variety and competitiveness in the market improves consumer welfare and that offsets the loss of productive efficiency. This argument is a normative one as welfare is not an observable phenomenon.

www.studyguide.pk

OALEVELNOTES.COM

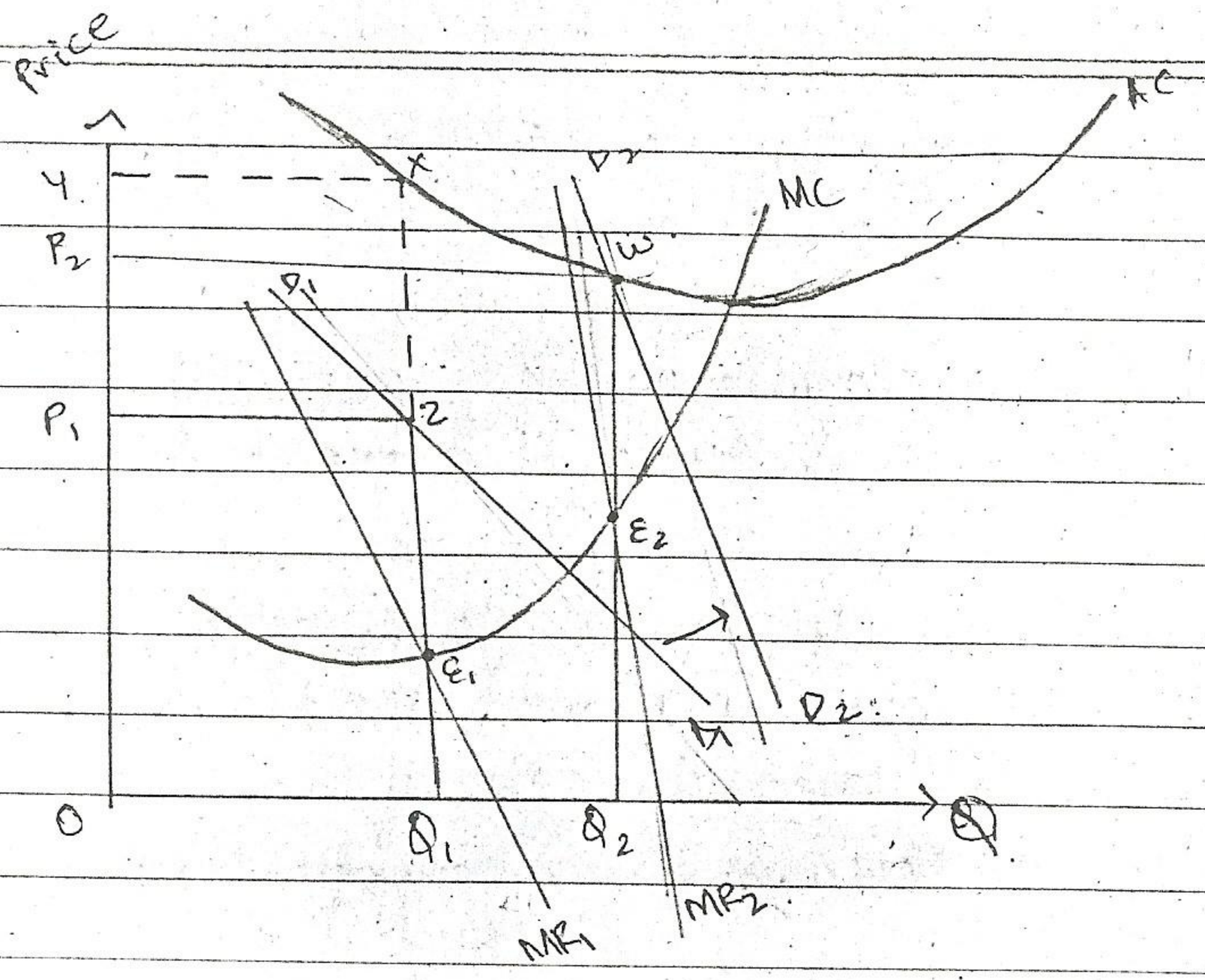
Case 28 From sub normal profits to Breakeven.



Short Run	Long Run
P_1 MR_1	Firms leave ∴ Demand shifts out and
$Eqb = E_1$	becomes more inelastic. Process goes
$Price = P_1$	on till all losses are gone. final
$Qnty = Q_1$	eqb will be E_2 where $MC = MR_2$ at
$TR = OP_1 Z Q_1$	$Price = P_2$, $Qnty = Q_2$
$TC = OY X Q_1$	$AC = OP_2 = WQ_2$
$Loss = Y X Z P_1$	∴ $TR = TC = OP_2 W Q_2$ (normal profits)

www.studyguide.pk

OALEVELNOTES.COM



www.studyguide.pk

OALEVELNOTES.COM

Oligopoly

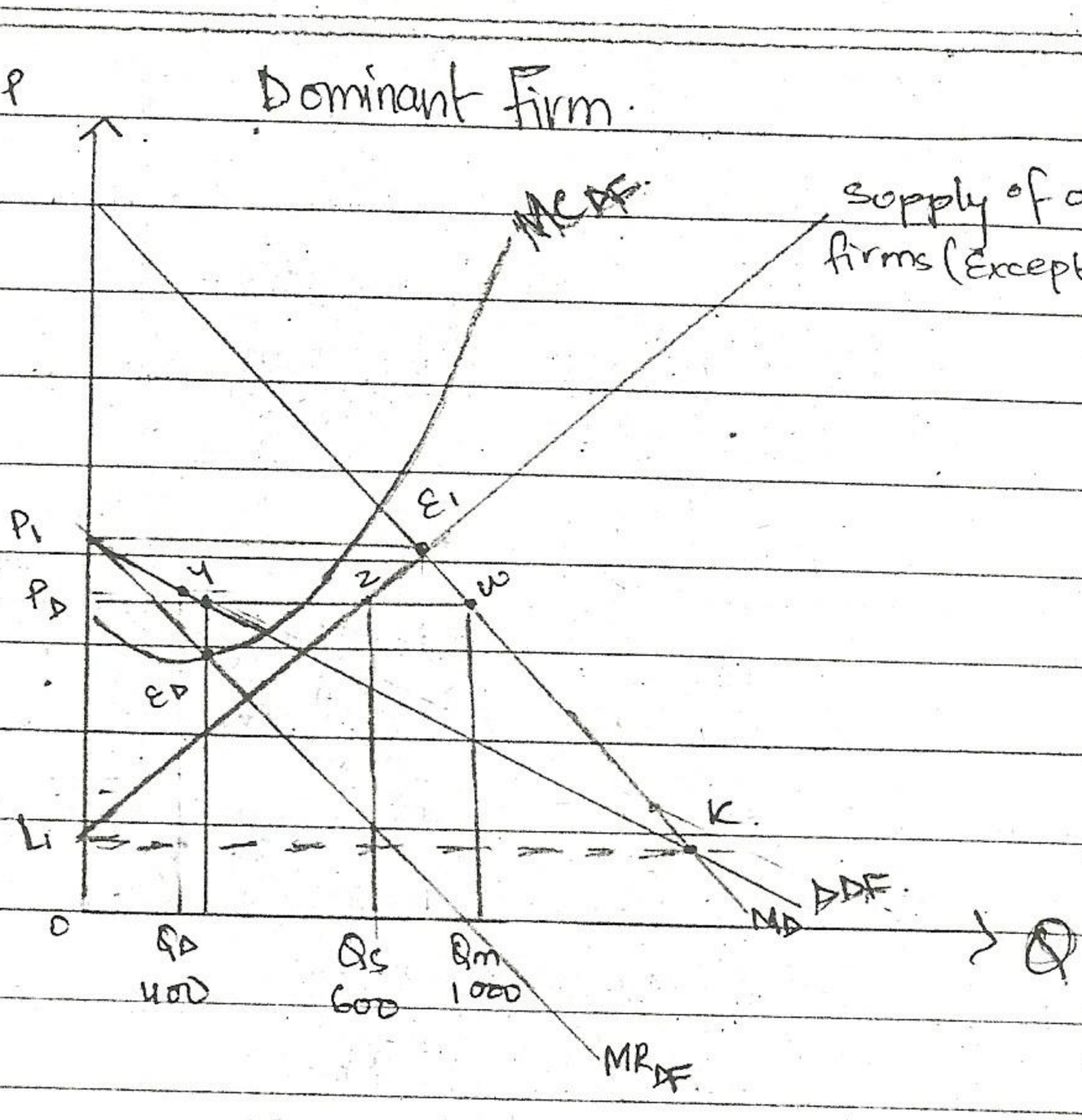
Oligopoly is a market structure where there are a few large firms dominating the market. These firms are interdependent in terms of different facits of business like output, advertising, research and development pricing policy etc. In other words if one firm changes any of these above mentioned variables, other firms in reaction are also likely to change them. A more narrow down version of oligopoly becomes duopoly when market is dominated by two big firms who are ~~ee~~ extremely ~~interp~~ interdependent. for eg coke and pepsi, apple and microsoft, Gillette and ~~sbi~~ schick, Different models of oligopoly have been put forward to show how equilibrium price and output are determined. ~~These~~ Some of these models are as follows;

1) Dominant firm oligopoly.
2) Collusive Oligopoly (Cartel)
3) Kinked Demand Curve Model.
4) Game Theory.

www.studyguide.pk

OALEVELNOTES.COM

(1)



The diagram above shows how price and output are determined under conditions of dominant firm oligopoly. MD is the market demand curve which is intersected at pt E_1 by supply of all other firms except the dominant firm. The equilibrium price P_1 would exist if there was no dominant firm. At the same time P_1 becomes a pt on the demand curve of the dominant firm where it sells 0 quantity b/c the entire market is captured by all other firms. Conversely Price of L_1 is the first pt on supply curve of all other firms suggesting that at this price all other firms will supply 0 to the market. This implies that at L_1, the entire market will be captured by the dominant firm. If we extend pt L_1 to the market demand curve, we get point k. which is the last point on the

www.studyguide.pk

OALEVELNOTES.COM

demand curve of the dominant firm where it captures the whole market. So we can derive the demand curve of the dominant firm by connecting points P, and k which gives us DDF along with the corresponding MRDF. The dominant firm will follow its own profit maximising rule of equating MR to MC which occurs at pt E_D where MC_{DF} intersects MR_{DF}. When we bring E_D down to the quantity axis we get Q_D which is the quantity produced by the dominant firm and taking E_D up to the demand curve gives us pt y which corresponds to the price P_D set by the dominant firm. The price P_D will also be extended to the supply curve of all other firms b/c they act like price takers. This gives us point z which corresponds to OQ_S, the quantity produced by all other firms. Horizontal summation of OQ_d and OQ_S gives us OQ_m which is the total market demand at the price P_D set by the dominant firm.

$$OQ_D + OQ_S = OQ_m$$

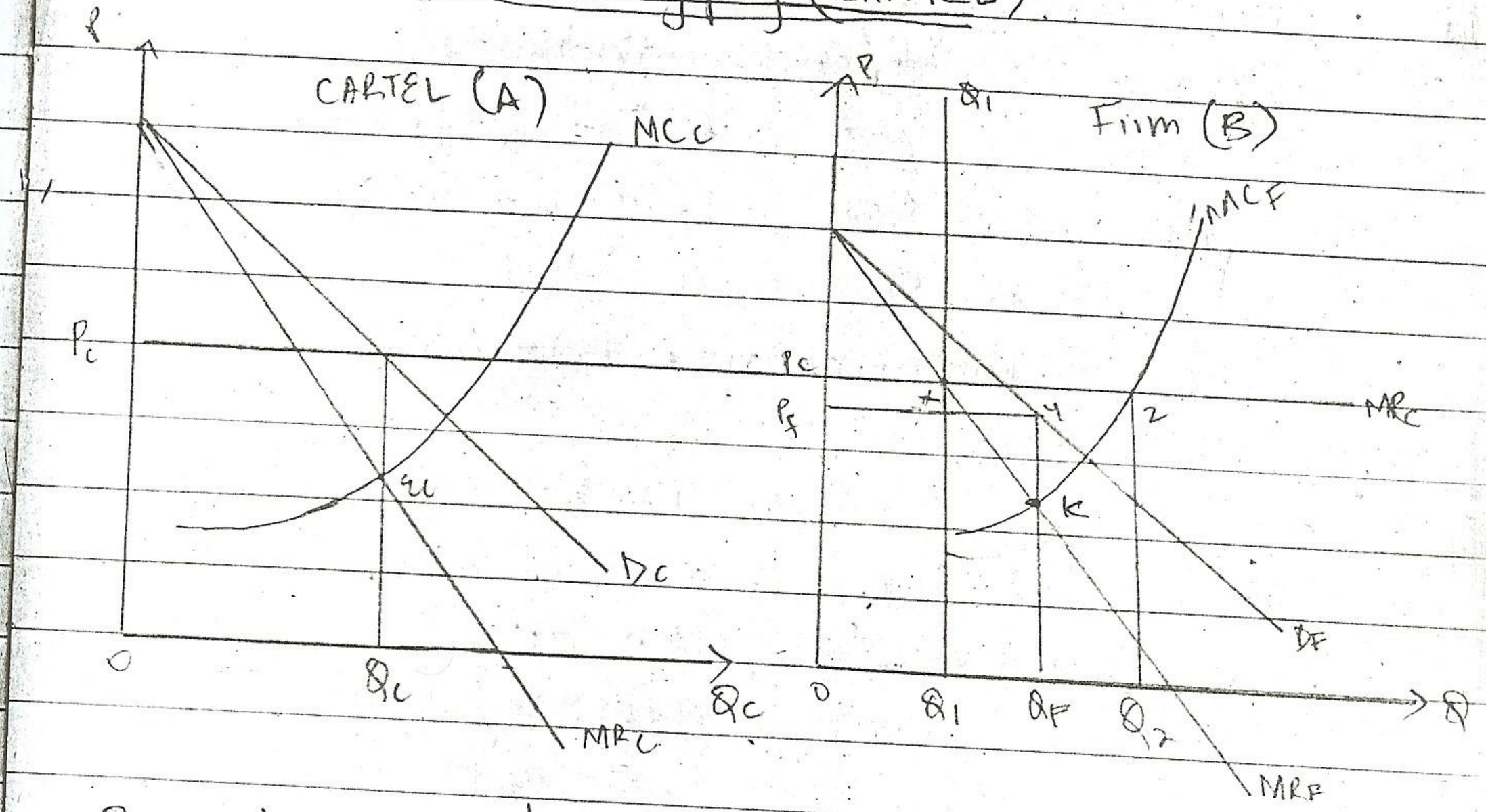
If dominant firm experiences a fall in cost of production and its marginal cost shifts to the right, then market price will fall which will cause contraction along the supply curve of all other firms but extension along the MD curve. As a result the market share of dominant firms will increase and so will the size of market. However, the market share of all other

www.studyguide.pk

OALEVELNOTES.COM

firms will decrease. The exact opposite will happen if Dominant firm experiences a rise in its ~~rate~~ cost which will shift MC upwards.

Collusive Oligopoly (CARTEL)



Panel A shows demand curve for Cartel D_c and the corresponding MR curve MR_c. Dc and MR_c have been derived by horizontal summation of ~~all the~~ demand curves of all those firms which are part of Cartel. Similarly, marginal cost of Cartel, MC_c, is derived by adding up ~~Mar~~ MC curves of all member firms. Cartel maximises profit at pt E_c where it MC intersects MR. Thus, Cartel output is OQ_c and Cartel price is OP_c. This price is transferred to a typical member firm shown in panel B. in the form of a perfectly elastic demand curve P_c, MR_c. This is so b/c each

www.studyguide.pk

OALEVELNOTES.COM

member firm will now act like a price taker. Furthermore, each member firm will be given an output Quota which is represented by a perfectly inelastic supply curve ~~Or~~ Q_1, Q_1 in panel B. So, a typical firm under Cartel agreement is required to produce OQ_1 and charge OP_C per unit. which results in Total Revenue of $OP_C \times Q_1$. Cartels are risky b/c they also provide an incentive to cheat and if one member firm cheats then others will follow suit and Cartel will eventually collapse. A typical firm can cheat in the following two ways:

(1) It can cheat on price & quantity by undercutting Cartel's price. For example firm in panel B can equate it MC MC_F to marginal revenue MR_F at point K which will lead to price of OP_F and quantity of OQ_F. This will result in Total Revenue of ~~$OP_F Q$~~ $OP_F \times OQ_F$ which should be greater than $OP_C \times O_1$. It must be noticed that the opportunity to generate extra revenue emerges only after cartel has been formed b/c that will make demand for an individual firm extremely elastic to downward changes in price. If the same opportunity existed before Cartel then firm wouldn't have joined Cartel in the first place. However, cheating on price can be very risky b/c consumers will carry evidence around that firm has undercut the Cartel set price of OP_C.

(2)

(1)

(2)

(3)

(4)

www.studyguide.pk

OALEVELNOTES.COM

② Alternatively, firm could act like a real price taker by equating its marginal cost MC_F to MR_C at point 2. this will further total revenue to ~~OP_E~~ $OP_C 2Q_2$ but at the same time, the volume by which firm cheats also increases from $QQ_F - OQ_1$ to $OQ_2 - OQ_1$. If Cartel comprises only a few large firms then such a change in quantity is likely to exert downward pressure on price and soon markets will show signs of surplus.

Cartels are very difficult to sustain b/c they require following conditions to be met:

① The product should be as standardized as possible b/c strong product differentiation can create brand loyalty which will give some firms a ~~concep~~ competitive edge over their rivals.

② Member firms should also have similar cost structures otherwise it will become difficult for them to agree on a common price.

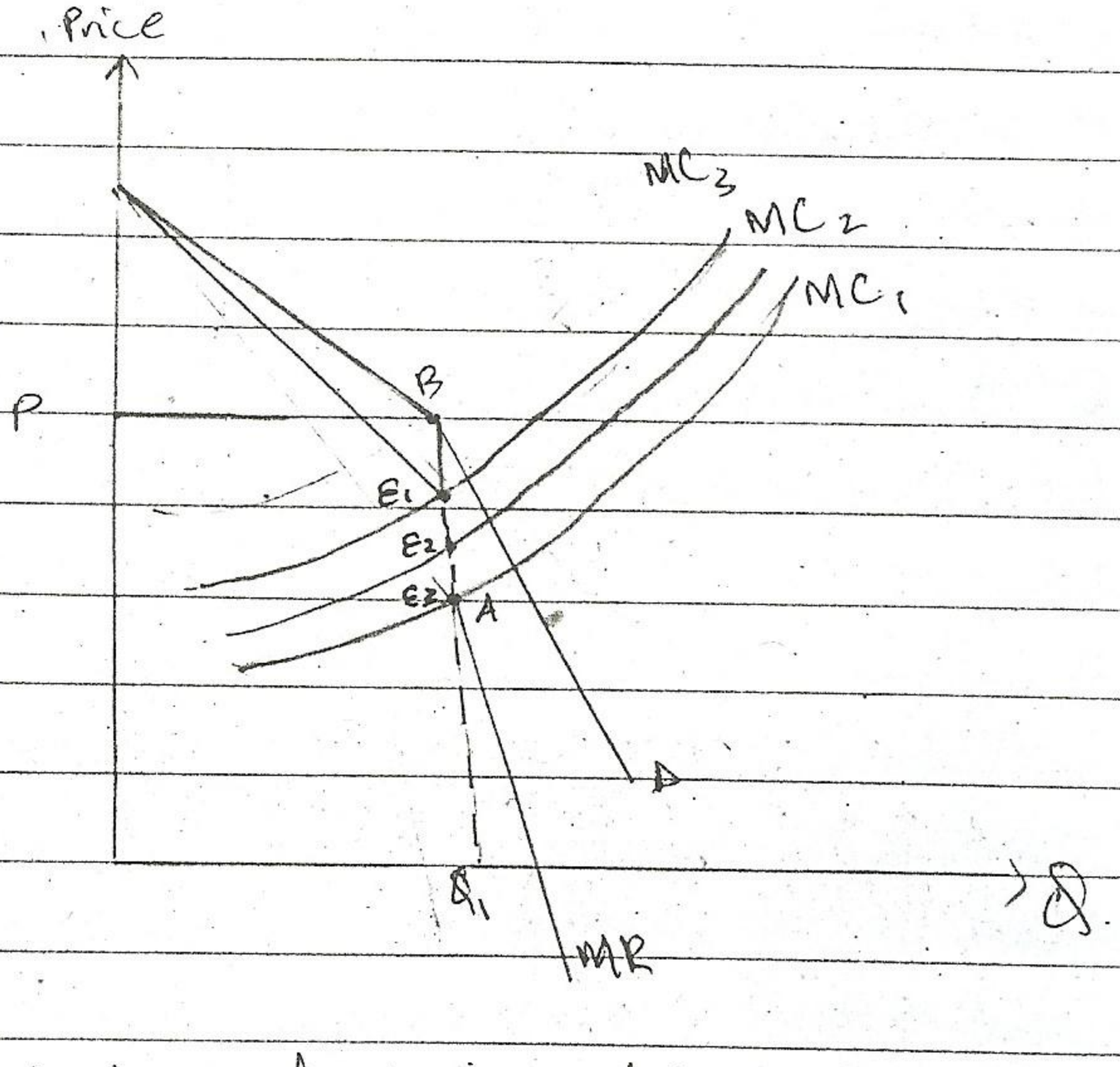
③ The quota output ~~all~~ alotted to each firm should be in proportion to the market share held by the firm b/f cartel was made. Any underallocation will increase the incentive to cheat.

④ All large firms under oligopoly must become members of cartel. If a large producer is left out then it will always threaten the existence of cartel by undercutting price.

www.studyguide.pk

OALEVELNOTES.COM

⇒ Kinked Demand Curve



- Kinked demand curve model is a non-collusive oligopoly where market is dominated by two large firms. These two firms are interdependent in terms of price, output, advertising and other aspects of business. According to the kinked demand curve model each firm makes the following two assumptions about the reaction of its rival :

1) If I decrease price, my rival will also decrease and there will be no significant increase in quantity sold. Therefore decrease in price will decrease total revenue implying that demand is inelastic for a downward change in price.
2) If I increase price my rival firm will not match the

www.studyguide.pk