

PERFECT COMPETITION

1. PERFECT COMPETITION AND ITS ASSUMPTIONS

"Perfect Competition is a market structure characterized by a complete absence of rivalry among the individual firms".
There are some key assumptions about Perfect Competition.

KEY ASSUMPTIONS

Perfect Competition is based on the following assumptions.

1. LARGE NUMBER OF BUYERS AND SELLERS

It is assumed that there are large number of buyers and sellers in the market, so that no single buyer or seller can affect demand or supply of the market. It means that individual buyers and sellers cannot influence the market price.

2. PRODUCT HOMOGENITY

The industry is defined as a group of firms producing homogeneous products. The buyers cannot differentiate among the products of different firms because there is no apparent difference in the commodities produced by different firms.
This assumption implies that in perfect competition, the individual firm is only price taker. Its demand curve is infinitely elastic.

3. FREE ENTRY AND EXIT OF FIRMS

It is assumed that there is no barrier for the firms to enter into the industry or to leave the industry.

4. PROFIT MAXIMIZATION

It is assumed that the objective of all the firms is profit maximization.

5. NO GOVERNMENT REGULATION

It is assumed that there is no government interference in the market. Subsidies, tariffs, rationing of production, all these interventions by the government are ruled out.
If the market situation fulfills these five conditions that would be called 'PURE COMPETITION'. For Perfect Competition, it is necessary that the following two assumptions are fulfilled.

6. PERFECT MOBILITY OF FACTORS OF PRODUCTION

It is assumed that all the factors of production are free to move from one firm to another. They are perfectly mobile. It means that there is a perfect competition in the market of factors of production.

7. PERFECT KNOWLEDGE ABOUT THE MARKET

It is also assumed that all the sellers and the buyers have complete knowledge of the conditions of the market.

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If these two additional conditions are fulfilled by the market situation, it is called Perfect Competition.

Price remains the same in perfect competition due to the above mentioned conditions. That is why Perfect Competition is also called **Law of One Price**.

2. EQUILIBRIUM OF FIRM UNDER PERFECT COMPETITION (OPTIMUM FIRM)

PLANT

A plant is a physical establishment - a factory, farm, mine, retail or whole sale store, warehouse- that performs one or more functions in the production and distribution of commodities.

FIRM

A firm is an economic unit which is independent to take decisions regarding the production and sale of commodities:

'A firm is business an organization that owns and operates the plants'.

INDUSTRY

An industry is the group of firms that produce the same or very similar products.

EQUILIBRIUM OF FIRM (OPTIMUM FIRM)

"Optimum firm is the one which operates its plant at its capacity level and produces the output that minimizes the per unit cost of production"

The firm that produces the output with minimum cost i.e., the optimal level of output, which can be obtained only by utilizing the plant at its full capacity level is called Optimum firm.

By producing the output with minimum per unit cost, the firm can achieve its target i.e., maximum profit. We know that profit is the difference of total revenues and total costs of the firm. The firm can be in equilibrium when it produces the output that maximizes the difference between total revenues and total costs.

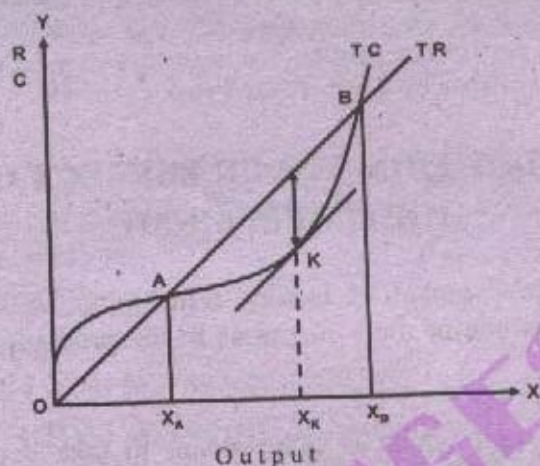
$$\Pi = TR - TC$$

- Normal profit is included in the cost items of the firm.
- Π is the profit above the normal rate of return on capital and remuneration for the risk bearing function of the entrepreneur.

We have two approaches to show the equilibrium of the firm:

1. TOTAL APPROACH

According to this approach, the firm will be in equilibrium when the difference between total revenue and total cost is maximum.



In this diagram TR curve which starts from the origin shows that price is constant at all levels of output. The firm is only price taker and can sell any amount of output at the going market price. TC curve is the total cost curve.

At points 'A' and 'B' TR and TC are equal to each other so profit is zero (Break even Points). The firm would not produce at X_A and X_D .

At point 'k' where tangent becomes parallel to TR curve, the profit is maximum. At the same point 'k', the vertical difference between total revenue and total cost curves is maximum. At this point the firm produces ' X_k ' output.

It means that the firm will be in equilibrium when it will produce ' X_k ' amount of output because this output maximizes the difference between total revenue and total cost.

DRAWBACKS

- It is difficult to find maximum difference between total revenue and total cost at the first glance.
- To find the price per unit of output is also difficult task.

2. MARGINAL APPROACH

This approach is called **Marginalistic Approach**. According to this approach, a firm will be in equilibrium when marginal cost would be equal to marginal revenue.

CONDITIONS

There are two conditions for the equilibrium of the firm under this approach:

A. NECESSARY CONDITION

Marginal cost must be equal to the marginal revenue of the firm.

$$MR = MC$$

B. SUFFICIENT CONDITION

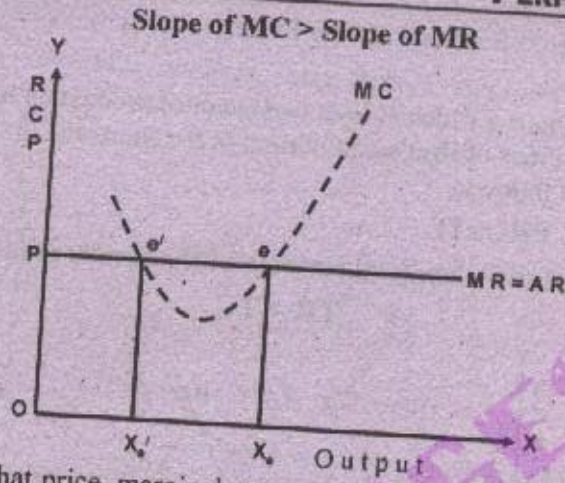
Marginal cost curve must intersect the marginal revenue curve from below i.e., at the point of intersection, the slope of marginal cost curve must be greater than the slope of marginal revenue curve.

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In this diagram we see that price, marginal revenue average revenue are equal, since in perfect competition the firm is price taker and it can sell any amount of output at given price. At point 'E' the MC curve intersects the MR curve from below. According to the conditions the firm will be in equilibrium at this point.

- To the right of point e, $MC > MR$, therefore the profit is being reduced.
- To the left of point e, $MC < MR$, therefore the maximum profit is not still reached.
- At point e', $MC = MR$, the slope MC curve is greater than that of MR curve. At this point the profit is maximum.
- At point e MC is also equal to MR. But this is not the point of equilibrium because MC still declines and remains below the MR.
- Normal profit, excess profit and loss of the firm depends on the level of average costs of the firm in the short-run.

3. EQUILIBRIUM OF THE FIRM UNDER PERFECT COMPETITION IN SHORT-RUN

PERFECT COMPETITION

"Perfect Competition is a market structure characterized by a complete absence of rivalry among the individual firms".

Perfect Competition is based on the following assumptions.

1. Large number of buyers and sellers
2. Product homogeneity
3. Free exit and entry of firms
4. Profit maximization
5. No government regulation
6. Perfect mobility of factors of production
7. Perfect knowledge about the market

These conditions are fulfilled by the market situation, it is called Perfect Competition. Price remains the same in perfect competition due to the above mentioned conditions. That is why

Perfect Competition is also called Law of One Price.

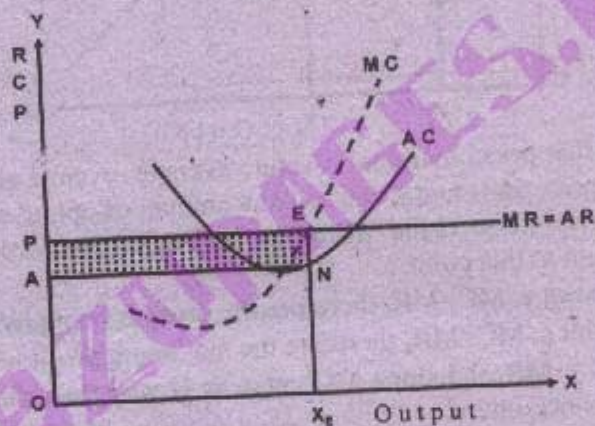
SHORT-RUN

“Short-run is the period during which at least one factor of production remains constant”.
There can be four possibilities of firm's equilibrium in the short-run under Perfect Competition.
These possibilities are as follows:

1. SUPER NORMAL PROFIT

Super Normal Profit means when total revenue of the firm is greater than total cost.

$TR > TC$



This diagram shows that;

- Equilibrium Point = E
- Equilibrium Output = OX_e
- Marginal Revenue = EX_e
- Marginal Cost = EX_e
- $EX_e = EX_e$
- $MR = MC$
- Average Cost = NX_e
- Total Cost = $OANX_e$
- Average Revenue = EX_e
- Total Revenue = $OPE X_e$
- $EX_e > NX_e$
- $AR > AC$
- $OPE X_e > OANX_e$
- $TR > TC$

$\Pi = TR - TC$

$\Pi = OPE X_e - OANX_e$

$\Pi = APEN$

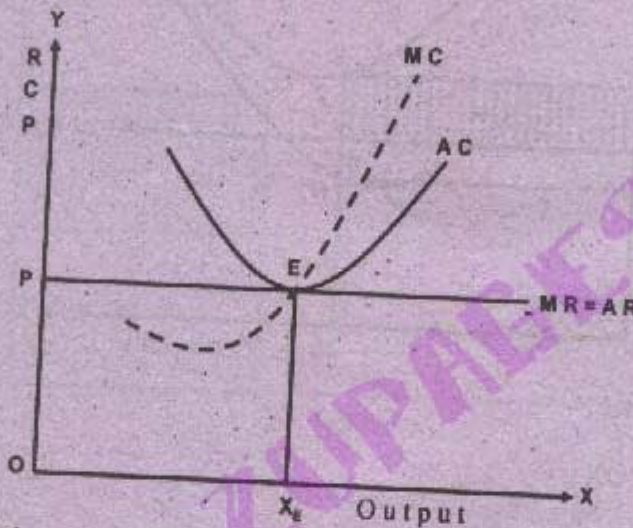
So this firm will enjoy Super-Normal profit equal to the area APEN, since its revenues are greater than its cost during the short-run.

In Mathematical Form
 $AR = MR = P > AC$

2. NORMAL PROFIT

Normal Profit means when total revenue of the firm is equal to total cost.

$$TR = TC$$



This diagram shows that

- Equilibrium Point = E
- Equilibrium Output = OX_E
- Marginal Revenue = EX_E
- Marginal Cost = EX_E
- $EX_E = EX_E$
- $MR = MC$
- Average Cost = EX_E
- Total Cost = $OPEX_E$
- Average Revenue = EX_E
- Total Revenue = $OPEX_E$
- $EX_E = EX_E$
- $AR = AC$
- $OPEX_E = OPEX_E$
- $TR = TC$

It is called **Break-even point**. This firm is earning Normal Profit in the short-run, since its total revenues are equal to its total costs.

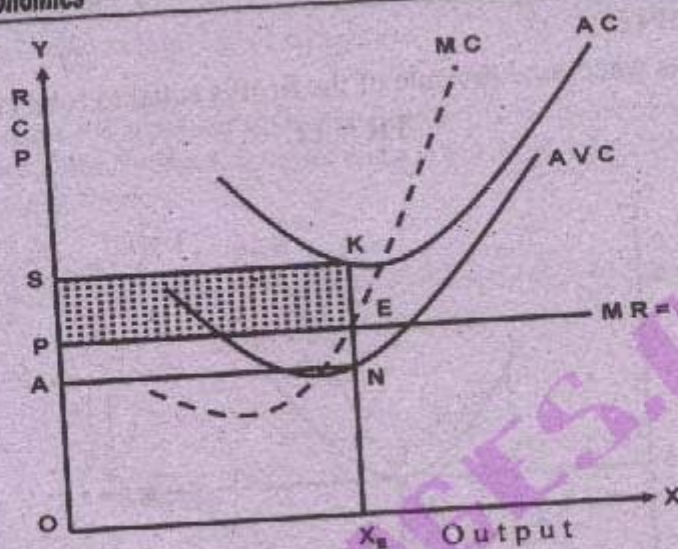
In Mathematical Form

$$AR = MR = P = AC$$

FIRST POSSIBILITY OF LOSS

Loss means when total revenue of the firm is less than total cost.

$$TR < TC$$



This diagram shows that
 Equilibrium Point = E
 Equilibrium Output = OX_E
 Marginal Revenue = EX_E
 Marginal Cost = EX_E

$EX_E = EX_E$
 $MR = MC$
 Average variable Cost = NX_E
 Total variable Cost = $OANX_E$
 Average Revenue = EX_E
 Total Revenue = $OPE X_E$
 Average Cost = KX_E
 Total Cost = $OSKX_E$
 Total Fixed Cost = $TC - TVC$
 Total Fixed Cost = $OSKX_E - OANX_E$
 Total Fixed Cost = $ASKN$

$EX_E < KX_E$
 $AR < AC$
 $OPE X_E < OSKX_E$
 $TR < TC$

$LOSS = TC - TR$
 $LOSS = OSKX_E - OPE X_E$
 $LOSS = PSKE$

This firm covers its variable costs fully but it covers fixed costs partially. Therefore the firm bears loss equal to the area PSKE which is a part of total fixed cost while the firm covers other part of total fixed cost which is APEN.

In Mathematical Form
 $AC > AR = MR = P > AVC$

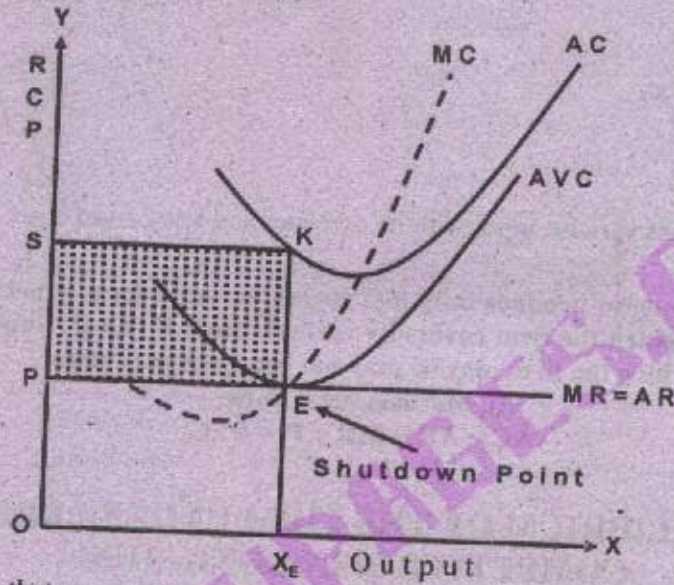
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4. SECOND POSSIBILITY OF LOSS



This diagram shows that

Equilibrium Point = E

Equilibrium Output = OX_E

Marginal Revenue = EX_E

Marginal Cost = EX_E

$EX_E = EX_E$

$MR = MC$

Average variable Cost = EX_E

Total variable Cost = $OPEX_E$

Average Revenue = EX_E

Total Revenue = $OPEX_E$

Average Cost = KX_E

Total Cost = $OSKX_E$

Total Fixed Cost = $TC - TVC$

Total Fixed Cost = $OSKX_E - OPEX_E$

Total Fixed Cost = $PSKE$

$EX_E < KX_E$

$AR < AC$

$OPEX_E < OSKX_E$

$TR < TC$

Therefore the firm
the firm covers the

$LOSS = TC - TR$

$LOSS = OSKX_E - OPEX_E$

$$\text{LOSS} = \text{PSKE}$$

$$\begin{aligned} \text{OPE } X_E &= \text{OPE } X_E \\ \text{TR} &= \text{TVC} \end{aligned}$$

$$\text{LOSS} = \text{PSKE} = \text{TFC}$$

This firm covers only its variable costs with its revenues and loses fixed costs fully equal to the area PSKE.

"The firm will continue to produce only if it covers variable costs, otherwise it will close down. The point at which the firm covers its variable costs is called 'Shut - Down Point'. This is the point at which the firm may or may not continue to produce."

In Mathematical Form

$$AC > AR = MR = P = AVC$$

4. EQUILIBRIUM OF THE FIRM UNDER PERFECT COMPETITION IN LONG-RUN

PERFECT COMPETITION

"Perfect Competition is a market structure characterized by a complete absence of rivalry among the individual firms".

Perfect Competition is based on the following assumptions.

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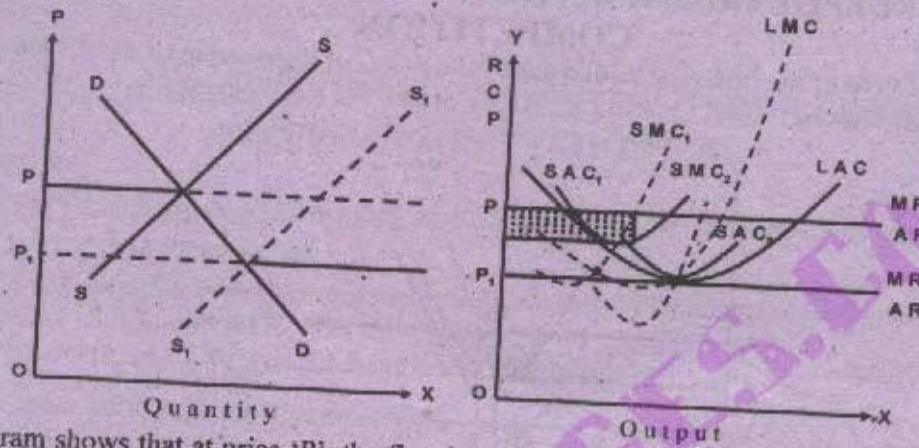
If these conditions are fulfilled by the market situation, it is called Perfect Competition. Price remains the same in perfect competition due to the above mentioned conditions. That is why Perfect Competition is also called **Law of One Price**.

LONG-RUN

"Long-Run is the period in which exit and entry into the industry take place until the situation arises that no firm outside the industry thinks about the industry".

In the long run all firms earn normal profit. If they earn super normal profit, the firms outside the industry will enter. This will lead to a fall in price and increase in costs due to increase in the price of factors. Ultimately the firms will earn normal profit. In case of loss in the long run, financially weak firms will leave the industry. Due to their departure, prices will rise and costs will fall and ultimately the remaining firms will earn normal profits. In the long run firms are in equilibrium when they have adjusted their plants so as to produce at

the minimum point of LAC curve.



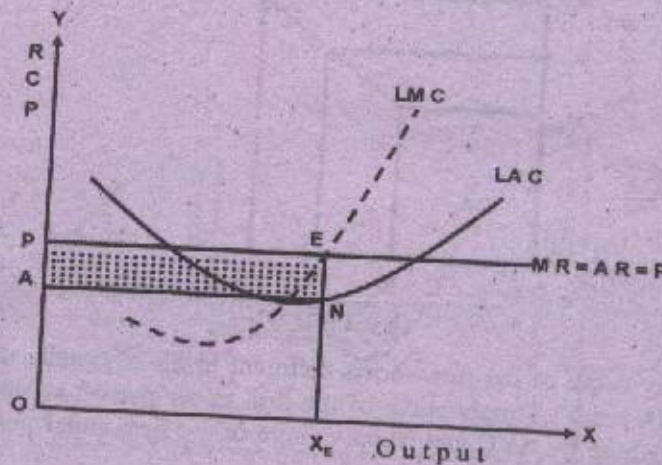
This diagram shows that at price 'P', the firm is enjoying super normal profit working with the plant whose cost is denoted by SAC₁. It will be incentive for the firm that it should expand the size along the LAC curve. At the same time new firms will also enter the industry to get their share from the super normal profit. Supply will increase and its curve will shift to the right. Given the demand curve of the market, price will fall to 'P₁'. At this price, the firm will earn normal profit because its total revenue and total cost are equal at this price. It means that at this level of price, firm will be in equilibrium. We can see that at equilibrium;

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

This implies that at the minimum point of LAC curve coincides the minimum point of SAC curve.

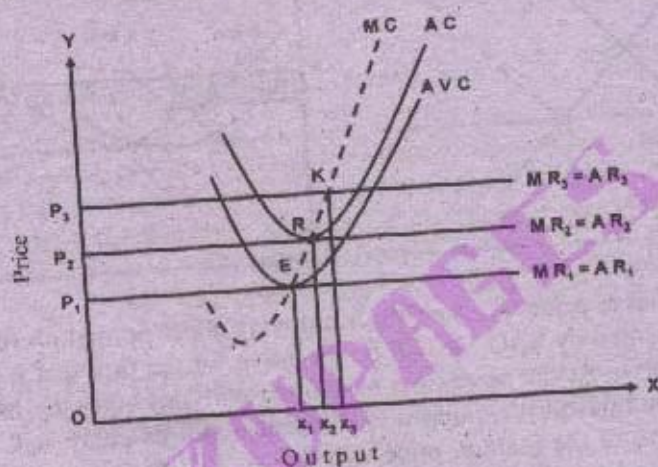
HETEROGENEOUS CASE

Generally, in the long run all firms earn normal profit but if the producer is honest, dedicated, hardworking, and efficient and have entrepreneurial abilities, the producer can earn super normal profit.

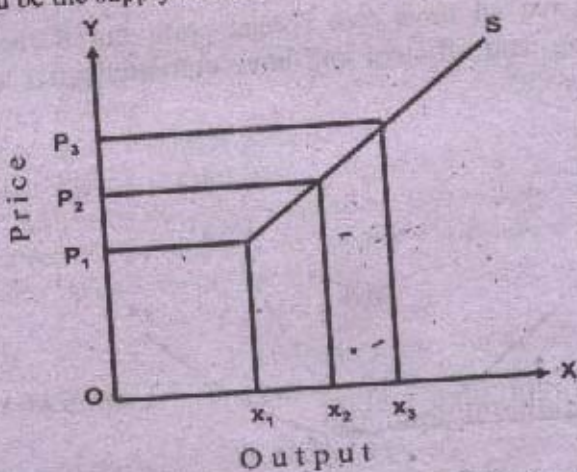


5. SUPPLY CURVE OF THE FIRM UNDER PERFECT COMPETITION

The Supply Curve of the firm may be derived by the points of intersection of its MC curve with successive MR curves.



In this diagram we can see that if the price increases gradually, MC curve intersects the new price curves at points which lie to the right of previous ones. This shows that quantity supplied increases as price rises. But if price falls below 'P₁' level, the firm will not supply any quantity because below 'P₁', the firm does not cover even its variable costs. Therefore MC curve above 'Shut-Down Point' would be the supply curve of the firm in the short-run.



In this diagram supply curve of the firm shows different levels of output at different prices. It starts from 'shut-down point'. Supply curve of the firm under perfect competition in short run starts from E to MC where $P = AVC$ and supply curve of the firm under perfect competition in long run starts from R to MC where $P = AC$. The supply curve of the industry is the summation of the supply curves of the individual firms.

Total quantity supplied in the market at each price is the sum of the quantities supplied by all the firms at that price.

6. EQUILIBRIUM OF THE INDUSTRY UNDER PERFECT COMPETITION IN SHORT-RUN

INDUSTRY

An industry is the group of firms that produce the same or very similar products.

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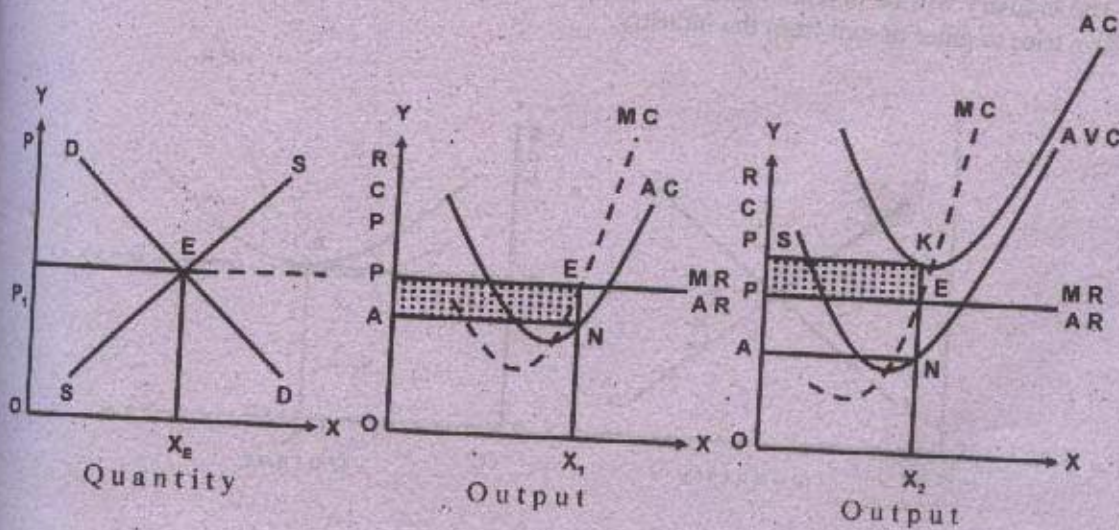
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SHORT-RUN

"Short-run is the period during which at least one factor of production remains constant".

EQUILIBRIUM OF THE INDUSTRY

Given the market demand and market supply, the industry will be in equilibrium at that price which clears the market i.e., the price at which demand and supply are equal.



This diagram shows that industry is in equilibrium at the price ' P_E ' at which quantity demanded and supplied are equal which are shown by the diagram as OQ . This is the market price in the short-run. At this price some firms may enjoy super normal profit and others may suffer loss.

7. EQUILIBRIUM OF THE INDUSTRY UNDER PERFECT COMPETITION IN LONG-RUN

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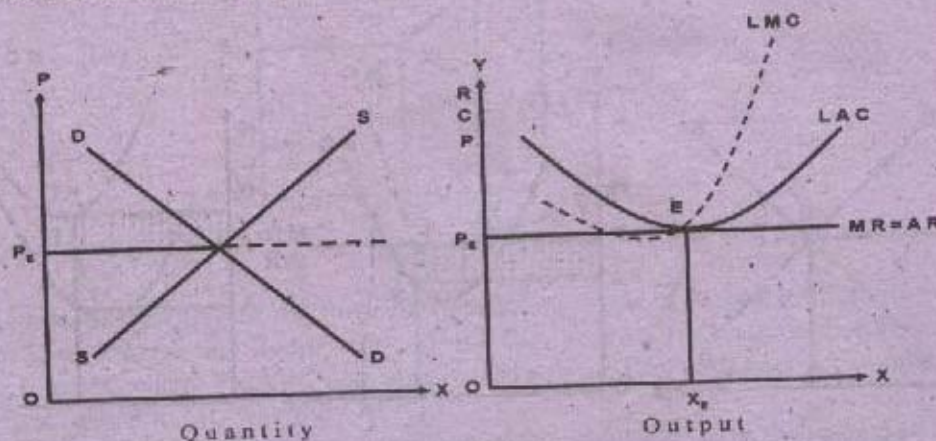
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LONG-RUN

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EQUILIBRIUM OF THE INDUSTRY

The industry will be in equilibrium when all the firms in the industry will be in equilibrium. No firm tries to enter or exit from the industry.



In this diagram we can see that firms produce at their minimum cost, earning just normal profits at the market price ' P_E '. The firm is in equilibrium at the level of output OX_E because $LMC = SMC = SAC = LAC = P = MR$ at this level.

At this price ' P_E ' the industry is in equilibrium because at this price profits are normal and there is no incentive for entry or exit. All costs are covered i.e.,

$$LAC = SAC = P$$

All the firms in the industry have the same minimum LAC. But it does not mean all the firms have the same size and the same efficiency. Different firms may have different sizes and may possess different efficiencies. These efficient firms may earn super normal profit. However this super normal profit is very small in the volume.

QUESTIONS FOR REVIEW

- Q No.1 What is Perfect Competition? What are its pre-requisites?
Discuss the key assumptions of Perfect Competition.
- Q No.2 Define "Optimum Firm" What is the Optimal Level of Production for a firm?
'A firm will produce that output which makes it's $MR=MC$ ' Explain.
"A firm in the long run is in equilibrium position when it has no incentive to increase or decrease the output" Discuss.
- Q No.3 How a firm can be in Equilibrium under Perfect Competition in the Short Run?
What is Perfect Competition? How price & output is determined under it in the Short Run?
- Q No.4 How a firm can be in Equilibrium under Perfect Competition in the Long Run?
Discuss Equilibrium of the firm under perfect competition in the Long Run.
- Q No.5 How can you derive the SUPPLY CURVE of a firm and Industry under Perfect Competition in the Short as well as in the Long Run? Also explain Industrial Equilibrium under Perfect Competition in the Short as well as in the Long Run.