VIVEKANANDA COLLEGE
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NAAC ACCREDITED 'A' GRADE

Topic: MONOPOLY

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Name of the Department: ECONOMICS

MONOPOLY

The word 'monopoly' actually originates from Greek word. That Greek word is 'monos polein' and its meaning is 'alone to sell'.

Monopoly is a market structure where there exists only a single seller and no other seller or producer is there in the market. A monopolist enjoys enormous power because there is no close substitutes of the commodity and there is barrier to entry. Some examples of monopoly are Indian Railways, CESC etc.

Features

(1) In a monopoly market there exists single seller and many buyers of the product.

(2) There is no close substitutes of the commodity.

(3) There is restriction of the entry of new firms.

(4) The monopolist has the power to set the price in the market. Here the producer or the seller is the price maker. On the other hand buyers are price taker.

(5) As there is only one seller, so there complete absence of competition.

(6) As there is a single producer or seller, so firm's output is equal to the industry supply.

(7) There arise economies of scale.

(8) The objective of the production is to maximise its profit.

A monopolist has sufficient control over the market price by restricting his supply, he can increase the price of his product. On the other hand if the monopolist desires to raise his sale he has to reduce the price of the product.

Consider the demand function,

$$P = f(q) \quad \ldots\ldots\ldots (1) \text{ where } f' = \frac{dP}{dq} < 0$$

Total Revenue of the monopolist $= R = P \cdot q$

where $P \rightarrow$ Price per unit

$q \rightarrow$ Output sold

$$\text{Average Revenue} = \frac{\text{Total Revenue}}{\text{No. of units sold}}$$

$$\text{Marginal Revenue} = \frac{d}{dq}\left[\text{Total Revenue}\right]$$

Slope of Marginal Revenue = 2 (Slope of Average Revenue)

Note

Marginal Revenue curve lies midway between vertical axes and Average Revenue Curve.

Relationship Between AR, MR and Elasticity (e)

We know, $TR = P.Q$

$$MR = \frac{d}{dQ}(TR)$$

$$= \frac{d}{dQ}(P.Q)$$

$$= P + Q\frac{dP}{dQ}$$

$$= P + \frac{1}{\frac{dQ}{dP}\cdot\frac{1}{Q}}$$

$$= P + \frac{1}{\frac{dQ}{dP}\cdot\frac{P}{Q}\cdot\frac{1}{P}}$$

$$= P + \frac{1}{\frac{dQ}{dP}\cdot\frac{P}{Q}}\cdot P$$

$$\therefore P - \frac{P}{-\left(\frac{dQ}{dP}\cdot\frac{P}{Q}\right)} \quad \cdots\cdots (1)$$

We know,

$$e = \frac{dQ}{dP}\cdot\frac{P}{Q}$$, Here e is expressed in negative quantity

$$\therefore |e| = -\left(\frac{dQ}{dP}\cdot\frac{P}{Q}\right) \quad \cdots\cdots (2)$$

from (1) & (2) we can write,

$$MR = P - \frac{P}{|e|}$$

$$= P\left[1 - \frac{1}{|e|}\right]$$

$$= AR\left[1 - \frac{1}{|e|}\right]$$

When, $|e| = 1$, $1 - \frac{1}{|e|} = 0 \Rightarrow MR = 0$

When $|e| > 1$, $1 - \frac{1}{|e|} > 0 \Rightarrow MR > 0$

When $|e| < 1$, $1 - \frac{1}{|e|} < 0 \Rightarrow MR < 0$

Equilibrium Under Monopoly

The aim of monopoly is to maximise his profit

Now, Profit (π) = TR − TC
$= R(q) - C(q)$

Maximisation of Profit requires two conditions:
First order condition requires, $\frac{d\pi}{dq} = 0$
Second order condition requires, $\frac{d^2\pi}{dq^2} < 0$.

Now, $\frac{d\pi}{dq} = 0$

or, $\frac{d}{dq}\left[R(q) - C(q)\right] = 0$

or, $\frac{d}{dq}\left[R(q)\right] - \frac{d}{dq}\left[C(q)\right] = 0$

or, $R'(q) - C'(q) = 0$

$\therefore$ MR − MC = 0

$\therefore$ MR = MC.

Also, $\frac{d^2\pi}{dq^2} < 0$

or $\frac{d}{dq}\left[R'(q) - C'(q)\right] < 0$

or $R''(q) - C''(q) < 0$

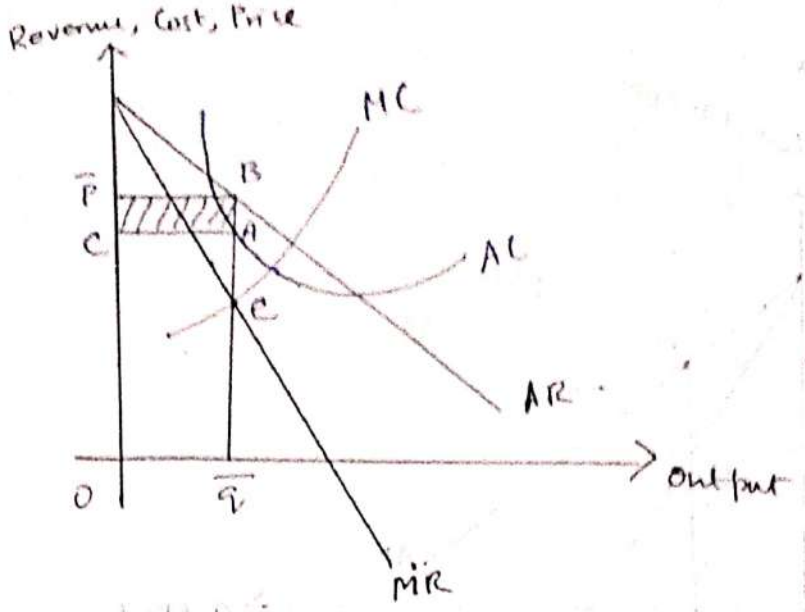
or, $R''(q) < C''(q)$

$\therefore$ Slope of MR < Slope of MC.

Second order condition is satisfied, if
Slope of MC > Slope of MR.
We have, slope of MR < 0
Second order condition is satisfied if slope of MC is zero or positive (i.e. MC is constant or rising). However even if positive slope of MC is negative i.e MC is falling the second order condition of profit maximisation of the monopolist may hold good.

Short Run Equilibrium Under Monopoly

Case I)



'e' is the equilibrium point where Profit maximising conditions are satisfied. For the equilibrium point $O\bar{q}$ is the equilibrium Output and $O\bar{P}$ is the equilibrium price.

$TR = (O\bar{P})(O\bar{q})$ = area of $\square O\bar{P}B\bar{q}$

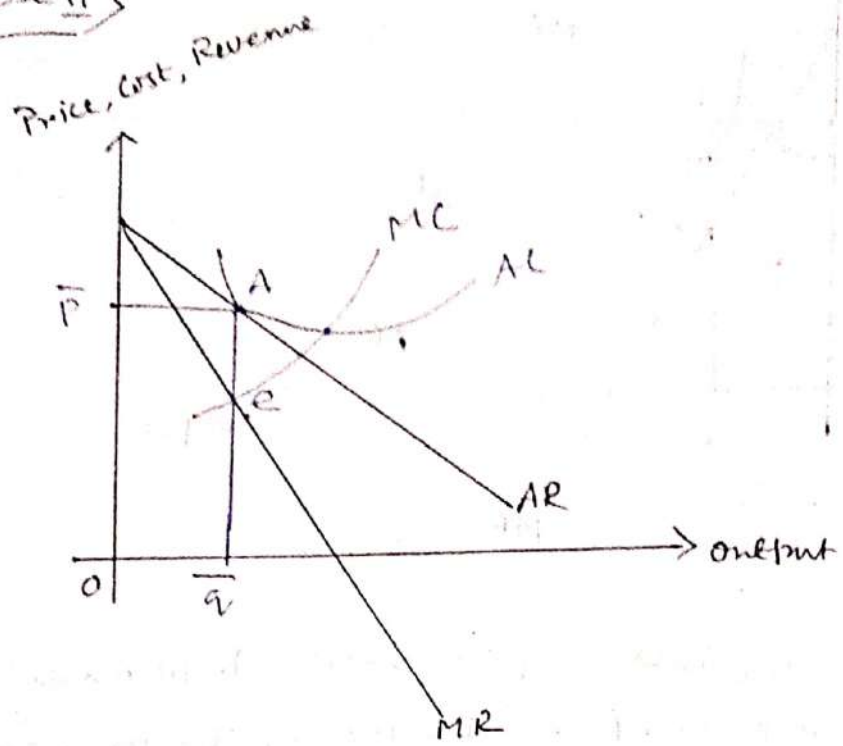
$TC = (A\bar{q})(O\bar{q})$ = area of $\square OCA\bar{q}$

Profit = TR − TC = area of $\square O\bar{P}B\bar{q}$ − area of $\square OCA\bar{q}$

= area of $\square C\bar{P}BA$.

In this case the monopolist earns super normal profit or pure profit.

Case II)



In the figure 'e' is the equilibrium point. At this point profit maximising conditions are satisfied. $O\bar{P}$ is the equilibrium Price and $O\bar{q}$ is the equilibrium quantity.

$TR = (O\bar{P})(O\bar{q})$

= area of $\square O\bar{P}A\bar{q}$

$TC = (A\bar{q})(O\bar{q})$

= area of $\square A\bar{q}O\bar{P}$

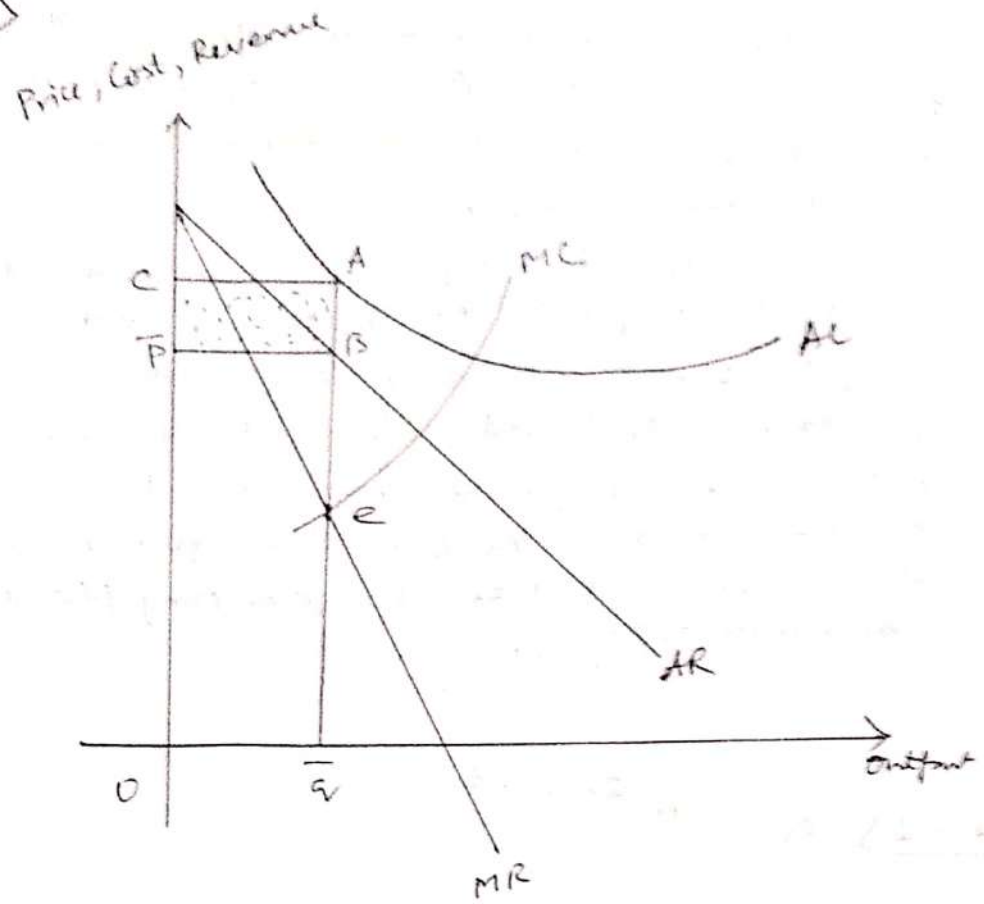
$\therefore$ Profit = π = TR − TC

= area of $\square O\bar{P}A\bar{q}$ − area of $\square A\bar{q}O\bar{P}$

= 0

Here the monopolist incurs normal profit.

Case III)



In the figure 'e' is the equilibrium point. At this point profit maximising conditions are satisfied. $O\bar{P}$ is the equilibrium price and $O\bar{q}$ is the equilibrium quantity.

$$TR = (O\bar{P})(O\bar{q})$$
$$= \text{area of } \square O\bar{P}B\bar{q}$$

$$TC = (A\bar{q})(O\bar{q})$$
$$= \text{area of } \square OCA\bar{q}$$
$$= -\text{area of } \square \bar{P}CAB$$

Here the firm incurs losses.

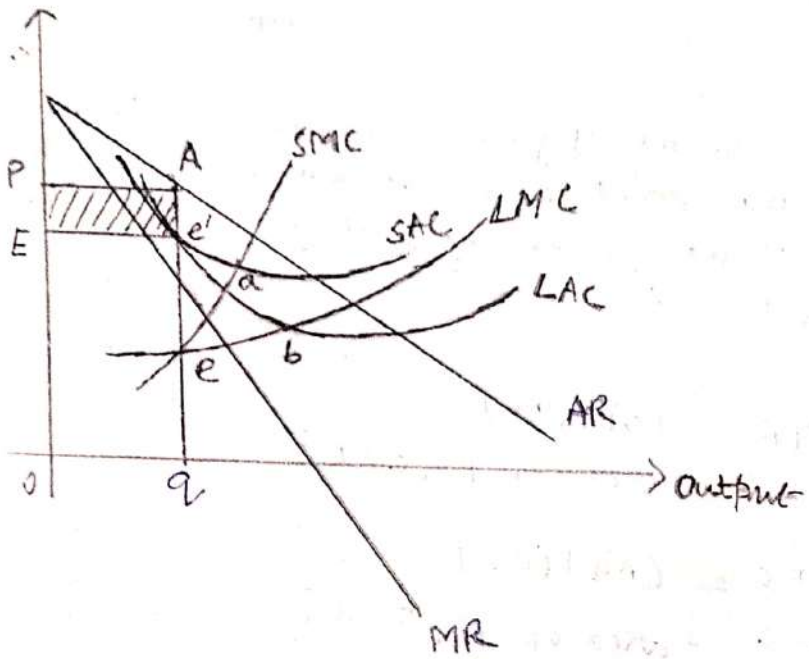
So we conclude that under short run a monopolist may face super normal profit, normal profit or loss.

Long Run Equilibrium under Monopoly

In case of monopoly there is only one firm and there is no possibility of entrance into the market even if the monopolist earns a pure profit in the short run.

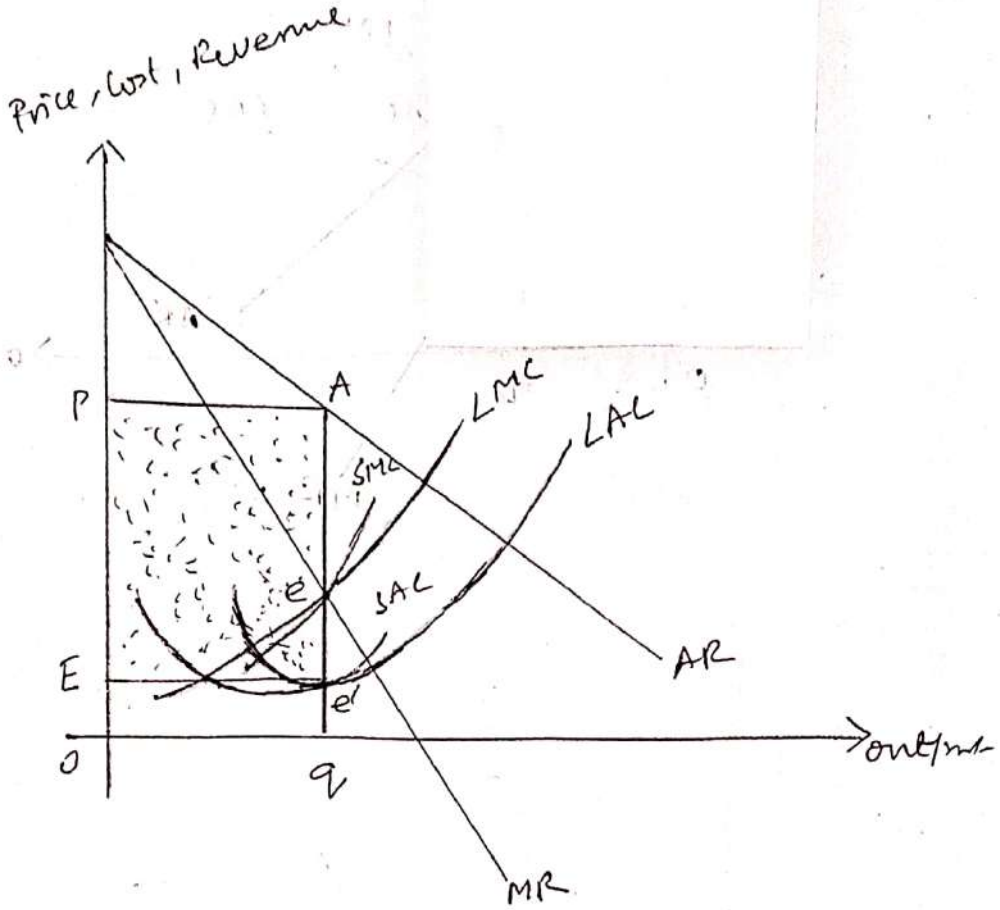
In the long run the monopolist has the time to expand his plant or use to use his existing plant at any level which will maximise his profit. With entry blocked, however, it is not necessary for the monopolist to reach an optimal scale. There is no guarantee that the monopolist uses his existing plant at optimum capacity.

Case I) price, Cost, Revenue



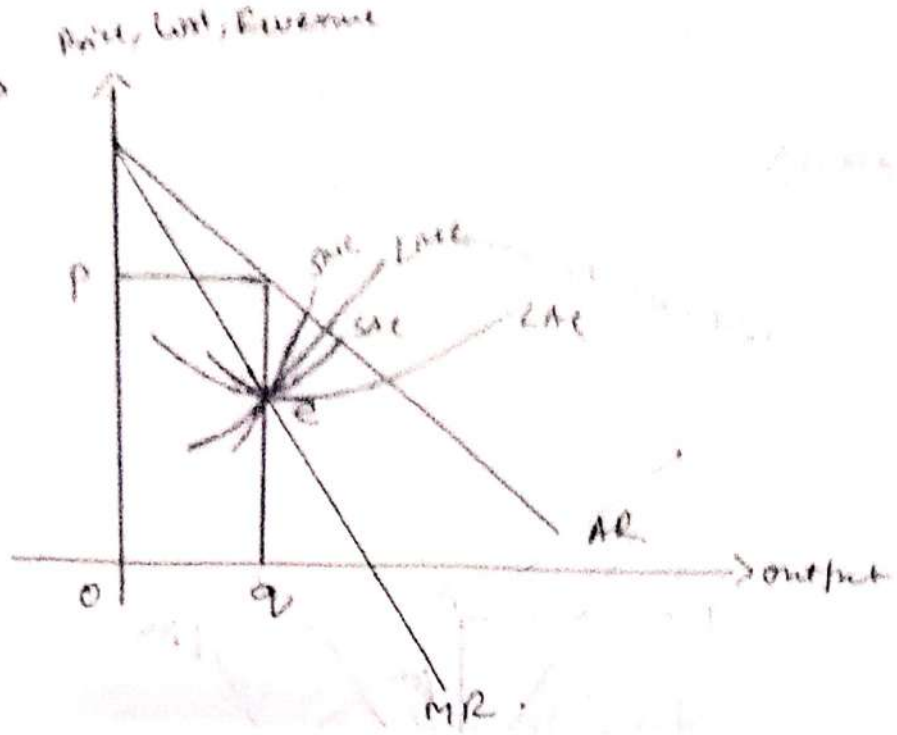
In this figure we depict the case in which the market size does not permit the monopolist to expand to the minimum point of LAC. Here the monopolist's plant is of ~~size~~ suboptimal size and under utilised. It is utilised at the e' level and there arises excess capacity.

Case II >



In this figure we depict the case where the size of the market is so large that the monopolist in order to maximise his output must build a plant larger than the optimal and overutilise it.

Case III >



In this figure we show the case in which the market size is just large enough to permit the monopolist to build the optimal plant and use it at full capacity.

It should be clear that which of the above situations will emerge in any particular case depends on the size of the market. There is no certainty that in the long run the monopolist will reach the optimal scale, as it is the case in a purely competitive market.