Q10. Will a profit-maximising firm in a competitive market produce a positive level of output in the short run if the market price is less than the minimum of AVC?
Ans: It is not possible for a firm to produce positive level of output in the short run if the price is less than the minimum of AVC. This is because as soon as the market price falls below the minimum of SAVC, which implies that the firm is not able to cover its fixed as well as variable costs, and thus it will stop production.
Let us understand this concept by taking an example:

At the point K, price charged by the firm is ON and output sold is Oq_1, and the firm generates TR.

$TR = P \times Q$

$= OP \times Oq_1$

= area (rectangle Oq_1LP)

And incurs the variable cost of TVC

TVC = SAVC$\times$Quantity of output

$= ON \times Oq_1$

= area (rectangle Oq_1KN)

Profit earned by the firm = TR – TC = TR – (TVC + TFC)

= TR – TVC – TFC

If the firm is not producing anything then at zero level of output, the firm's TR and TVC will be zero. However, the firm has to bear TFC. Thus at zero level of output, the profit earned by the firm is

Profit = Π_1 = TR – TVC – TFC

Π_1 = -TFC

Now if it produces Oq_1 level of output, then the profit earned will be

Π_2 = TR – TVC – TFC

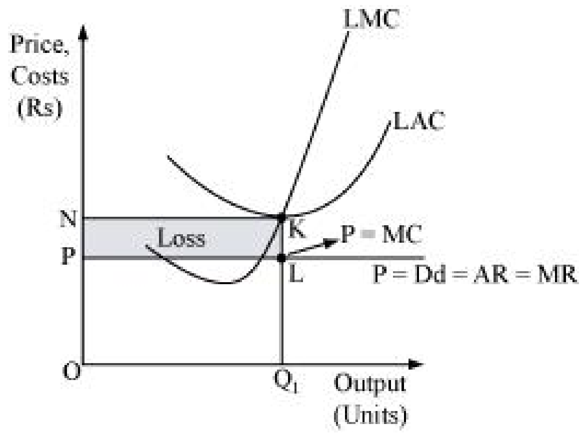
= area (rectangle Oq_1LP) – area (rectangle Oq_1KN) – TFC

Or, Π_2 = -area (rectangle PLKN) – TFC

This implies that Π_1 is greater than Π_2. The firm incurs more loss if it produces Oq_1 level of output than the loss associated with zero level of output. Thus the firm will stop production whenever P < SAVC and therefore at profit maximising level of output, the price must be greater than or equal to SAVC in the short run.

Q11. Will a profit-maximising firm in a competitive market produce a positive level of output in the long run if the market price is less than the minimum of AC? Give an explanation.

Ans: It is not possible for a firm to produce positive level of output in the long run if the market price falls short of the minimum of AC. This is because, in the long run there is free entry and exit of firms and all firms earn normal profit. Therefore, any firm making losses in long run will stop production.



At Oq_1 level of output,
Price charged by the firm = OP.

Revenue generated by the firm (TR) = $P \times Q$

= $OP \times Oq_1$

= area (rectangle Oq_1LP)

Cost of producing Oq_1 level of output (TC) =
LAC$\times$ Quantity of output

= $ON \times Oq_1$

TC = area (rectangle Oq_1KN)

Profit earned by the firm = TR – TC

= area (rectangle Oq_1LP) – area (rectangle Oq_1 KN)

= – area (rectangle NKLP)

Thus, the loss incurred by the firm is equal to the area of the rectangle NKLP.

In the long run, all firms earn zero economic profit, and if any firm earns loss or negative profit, then the firm will shut down its production. Thus, if the firm earns loss, i.e. if price is lesser than LAC at any level of output, it will not be the profit maximising output level of the firm.

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