

## MGT-PROBLEM SET - I

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① a) given :-

$$TC = 12 + 4q - 12q^2$$

$$\frac{\Delta t}{\Delta q} = 4 + 4q$$

$$MC = 4 + 4q$$

Profit maximization condition  $MR = MC$   
and perfect competition market

$$AR = MR$$

$$MR = 4 + 4q$$

$$AR = 4 + 4q$$

$$RP = 4 + 4q$$

$$\text{When } P = 16, 4q = 12$$

$$\boxed{q = 3}$$

b) Profit or loss =  $TR - TC$

$$\frac{d\pi}{dq} = P - 4 - 4q$$

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

$$16 = 4 + 4q$$

$$q = 3$$



$$\frac{d^2\pi}{dq^2} = -4 \text{ so, it is max at } 3$$

$$16 \times 3 = (12 + 4 \times 3 + 2 \times a)$$

$$= -54$$

$$\text{Loss} = -54$$

2) a) gives

$$Tc = 100 + a^2$$

$$\text{Profit } \pi = TR - Tc$$

$$\frac{d\pi}{dq} = \text{price} - 2q$$

If price = 60 to maximize profit

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

$$P = 2q$$

$$60 = 2q$$

$$q = 30$$

$$b) \text{ profit} = TR - Tc$$

$$= 60 \times 30 - 100 - 900$$

$$= 1800 - 1000$$

$$= 800$$

$$\text{Profit} = 800$$



$$4) a) \text{Producer surplus} = \text{area of triangle} \\ = \frac{1}{2} \times 3 \times 6$$

$$= 9$$

$$\therefore \text{producer surplus} = 9$$

$$b) \text{profit} = TR - TC$$

$$TC = TVC + FC$$

$$TVC = (AVC) \times q$$

$$= (3 + 3) \times 3$$

$$= 18$$

$$\therefore TVC = \$18$$

$$FC = \$3$$

$$TC = TVC + FC$$

$$= 18 + 3$$

$$= \$21$$

$$\text{Total Revenue} = \text{price} \times q$$

$$= 9 \times 3$$

$$= \$27$$

$$\text{Profit} = 27 - 21$$

$$= \$6$$

Firm is a company super normal profit

$$\text{profit} = \text{producer surplus} - \text{Fixed cost} \\ = 9 - 3 = \$6$$

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