Tut-11

Monopoly & monopolistic competition

1)

Soln

$TC = Q^2 + 12$

$P = 24 - Q$

$TR = P \times Q$

$= (24 - Q)\, Q$

$= 24Q - Q^2$

$MR = 24 - 2Q$

~~TC~~ $= MR$ (at equilibrium)

$$\frac{\partial(TC)}{\partial Q} = 2Q$$

$MC = 2Q$

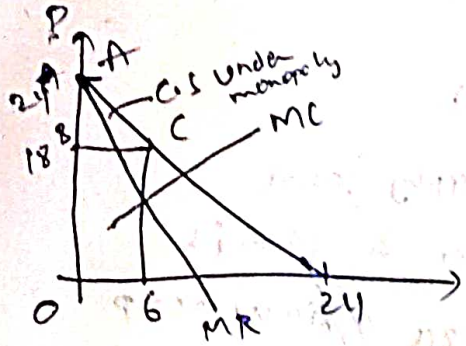
$MR = MC$

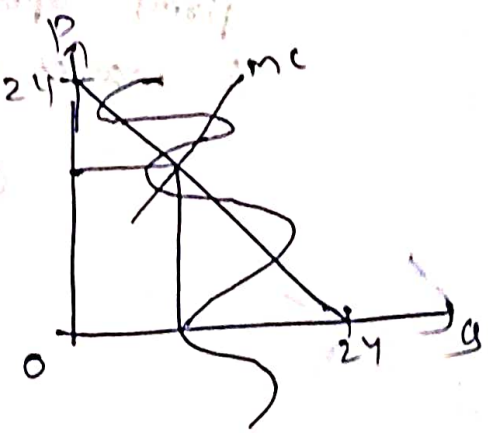
$24 - 2Q = 2Q$

$4Q = 24$

$Q = 6$

$P = 18$





$\Pi = TR - TC$

$= 108 - (36 + 12)$

$\Pi = 60$

(Profit)

Consumer surplus under monopoly

$$= \frac{(24 - 18) \times 6}{2}$$

$$= \frac{6 \times 6}{2}$$

$= 18$

2) Sol:

$Q = 100 - 2P$

$MC = 5 + 0.5Q$

$2P = 100 - Q$

$P = 50 - \frac{1}{2}Q$

$TR = 50Q - 0.5Q^2$

$MR = 50 - Q$

$MR = MC$

$50 - Q = 5 + 0.5Q$

$1.5Q = 45$

$$Q_m = \frac{450}{15} = 30$$

$P_m = 50 - \frac{1}{2}(30)$

$P_m = 35$

ideal price for $Q = 30$

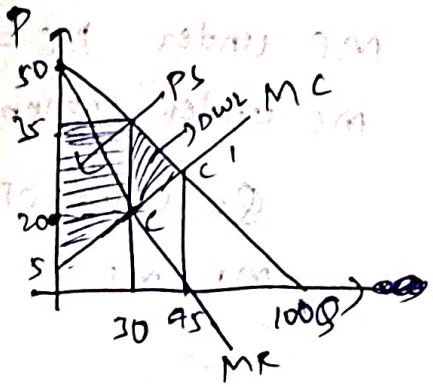
$P = 5 + 0.5(30)$

$P = 20$

$$DWL = \frac{(35-20) \times (45-30)}{2}$$

$$= \frac{15 \times 15}{2}$$

$DWL = 112.5$



$MC = P$

$5 + 0.5Q = 50 - \frac{1}{2}Q$

$Q_c = 45$

$P_{\text{oatmeal store}} = 5 + 0.5(45)$

$= 27.5$

3)
Sol

MC under PC = 10

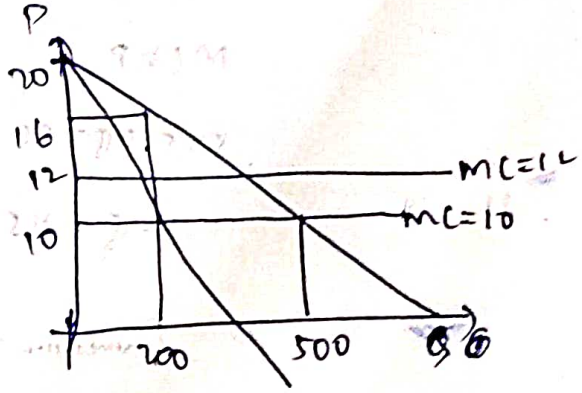
MC under monopoly = 12

$Q = 1000 - 50P$

$P = \frac{1000 - Q}{50}$

$P = 20 - \frac{1}{50}Q$

MR = MC



MC = P

$10 = 20 - \frac{1}{50}Q$

$\frac{1}{50}Q = 10$

$Q_c = 500$

$TR = 20Q - \frac{1}{50}Q^2$

$MR = 20 - \frac{2}{50}Q$

MC = MR

$12 = 20 - \frac{2}{50}Q$

$\frac{2}{50}Q = 8$

$Q_m = 200$

$P_m = 20 - \frac{1}{50} \times 200$

$P_m = 16$

C.S under PC

$\frac{500 \times 10}{2} = 2500$

C.S under monopoly

$\frac{(20-16) \times 200}{2} = 400$

Total loss of consumer surplus = 2500 − 400 = 2100

DWL = 2500 − 400 = 800

DWL = 1300

4) Soln

$LAC = P$

$Q^2 - 18Q + 100 = 36 - 2Q$

$Q = 8$

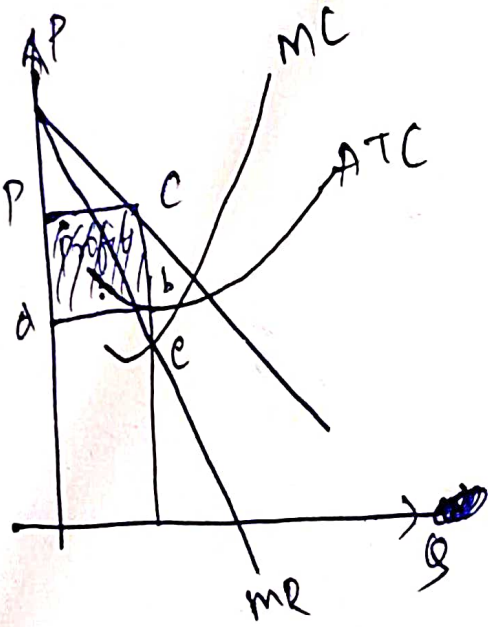
$P = 20$

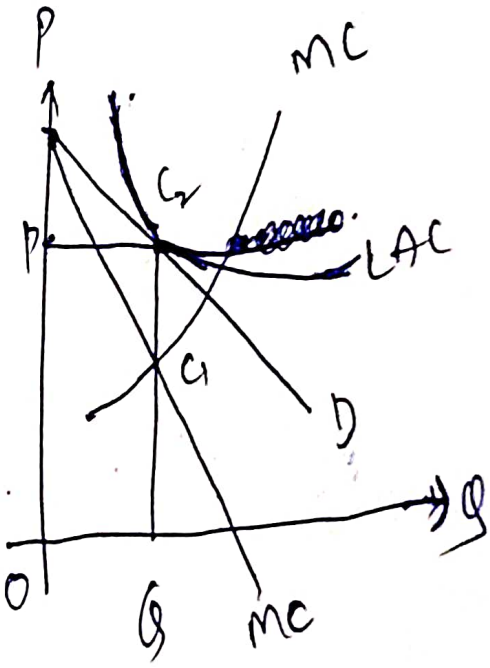
$\Pi = TR - TC$

$= (20 \times 8) - (LAC \times Q)$

$\Pi = 0$

Sol





In long Run firm will earn zero economic profit.