$\underline{Q_1}$ In ~~b~~ a perfectly competitive environment. Marginal Cost is the price.

$TC = 10 + 3q^2$.

$MC = \frac{d(TC)}{dq} = 6q = \text{price}.$

0

$\underline{Q_2}$ $P = 20 - Q$ $\qquad c = 2$.

In perfect competition the Marginal cost is the price

$\underline{\underline{P = 2}}$.

0

$Q = 20 - P = 20 - 2 = \underline{\underline{18}}$.

Under a cartel the goal is ~~tt~~ to maximize profit (total).

$$\max_{\substack{q_i \\ i=1,2}} \pi(q_1, q_2) = \left(20 - \sum_{i=1}^{2} q_i\right) \sum_{i=1}^{2} q_i - TC(q_1 + q_2)$$

$$\frac{d\pi}{dq_1} = \overset{10}{20} - 2(q_1 + q_2) - \cancel{2} = 0$$

$$q = q_1 + q_2$$

2

The total output produced will be $\underline{\underline{9}}$

The price will be $P = 20 - 9 = \underline{\underline{11}}$

Q3 Under Discriminating monopolist, the avoidance of arbitrage is obtained, when

$$p_1\left(1+\frac{1}{\varepsilon_1}\right) = p_2\left(1+\frac{1}{\varepsilon_2}\right)$$

$$p_1\left(1-\frac{1}{1.7}\right) = p_2\left(1-\frac{1}{3.4}\right)$$

$$\frac{p_1}{p_2} = \frac{2.4}{3.4} \times \frac{1-1/3.4}{1-1/1.7}$$

$$\frac{p_1-p_2}{p_2} = \frac{1/1.7 - 1/3.4}{1-1/1.7}$$

$$\frac{p_1-p_2}{p_2} = \frac{\frac{1}{3.4 \cdot 2}}{\frac{0.7}{1.7}} = \frac{0.5}{6.7}$$

$$x = \frac{5}{7} = 71.42\ \%$$

2

Q4 In renting, the monopolist's goal is to maximize profit

$TR = (50-Q)Q$ $\qquad P = 50 - Q$ - *

$MR = 50-2Q$ $\qquad MC = 5$

$\pi_{max} = TR - TC$ max

$$\frac{d\pi}{dQ} = 0 \Rightarrow \cancel{50-2Q}\ MR - MC = 0$$

$$= 50-2Q-5 = 0$$

$$\frac{45}{2} = Q$$

$P = \frac{55}{2}$

~~Revenue~~ ~~Profi~~ Revenue in period (1) $= \frac{55}{2} \times \frac{45}{2} = 618.75$ $\quad 1\frac{1}{2}$

Total revenue in 2 periods $= 618.75 \times 2$

1237.5

$\pi = ?$

Selling : In the second period the demand will be lowered by exactly the amount sold in the first period (say $\bar{q}_1$).

2nd Period :

$$q_2 = 50 - p_2 - \bar{q}_1 \quad -(1)$$

$$p_2 = 50 - \bar{q}_1 - q_2$$

$$TR = (50-\bar{q}_1-q_2)q_2$$

$$MR = 50-\bar{q}_1-2q_2.$$

For profit maximization $\quad MR = MC$

$$\frac{45-\bar{q}_1}{2} = q_2 \quad -(2)$$

For the marginal buyer in period 1, the utility will be same if he buys in period 1 or 2.

$$2(50-\bar{q}_1) - p_1 = (50-q_2) - p_2$$

$$100 - 2\bar{q}_1 - p_1 = \bar{q}_1 \quad \text{- from 1}$$

$$\frac{100-p_1}{3} = \bar{q}_1$$

$$\frac{100-p_1}{3} = 50 - p_1$$

$$100 - p_1 = 150 - 3p_1$$

$$2p_1 = 50$$

$$\boxed{p_1 = 25} \qquad \boxed{q_1 = 25} \quad \text{from *}$$

$$\cancel{q_1 = 75}$$

$$q_2 = \frac{45-\bar{q}_1}{2} = 10 \quad \text{- from 2}$$

$$\cancel{q_2 = \frac{45-\bar{a}_1}{2} = 10}$$

$$\boxed{q_2 = 10} \quad \text{- from 1}$$

$$p_2 =$$

$$\boxed{p_2 = 15}$$

Total Revenue $= p_1q_1 + p_2q_2$

$= 625 + 150$

$= 775$

Total Revenue if sells

0

Q5 $MC_{OPEC} = 5$, $MC_{NOPEC} = 10$

Let OPEC produce q_1

& Non OPEC " q_2

$$\pi_{OPEC} = \left(65 - \frac{q_1+q_2}{3}\right) q_1 - TC_{OPEC}$$

$$\frac{d\pi}{dq_1} = 0 \Rightarrow 65 - \left(\frac{2q_1+q_2}{3}\right) - 5 = 0$$

$$60 = \frac{2q_1+q_2}{3}$$

$$180 = 2q_1 + q_2$$

$$\pi_{Non\ OPEC} = \left(65 - \frac{q_1+q_2}{3}\right) q_2 - TC_{NOPEC}$$

$$\frac{d\pi}{dq_2} = 0 \quad 65 - \left(\frac{q_1+2q_2}{3}\right) - 10 = 0$$

$$55 \times 3 = q_1 + 2q_2$$

$$165 = q_1 + 2q_2$$

5

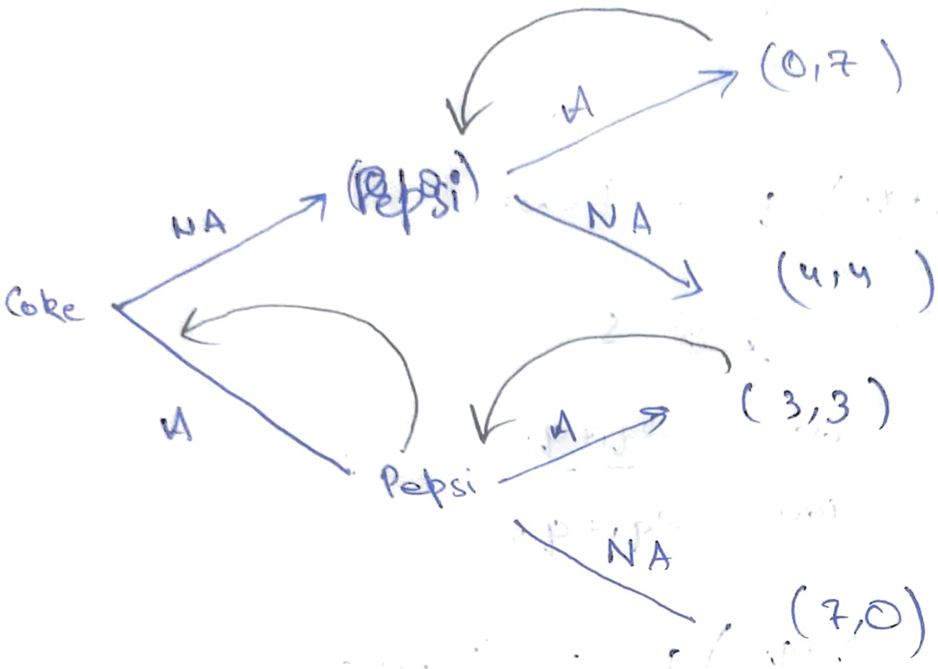
$$180 \times 2 - 165 = 3q_1$$

$$\boxed{\begin{array}{l} q_1 = \cancel{120}\ 65 \\ q_2 = 50 \end{array}}$$

$$\text{Price} = \left(65 - \frac{q_1+q_2}{3}\right)$$

$$= \left(65 - \frac{115}{3}\right) \Rightarrow \boxed{pe = 26.667}$$

Q6 Advertising : -1 Mkt size = 8



Coke \ Pepsi	A	NA
A	(3,3)	(7,0)
NA	(0,7)	(4,4)

~~whether coke choses to advertise or not, Pepsi will choose to advertise~~

If coke choses to advertize, pepsi will also chose to advertize, as it is better off [illegible] and vise versa

If coke decides to not advertize, pepsi will still choose to advertize, as it'll be better off. & vice versa

Hence the outcome will be where both choose to advertize & gain 3 billion each.

5