Week-3

4. Price Discrimination

- Monopoly / Market Power

$\frac{P - MC}{P} = \frac{1}{E_d}$ → $P > MC$ (markup)

For, PCM ⇒ $P = MC$

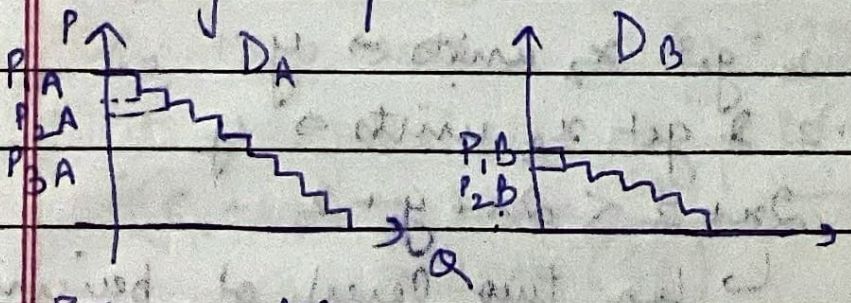
- Price discrimination →

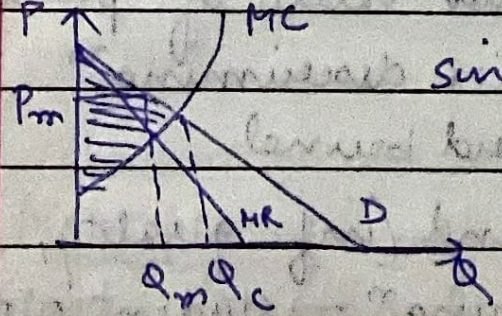
1st D → price per unit is diff. to diff. people & they vary units units

2nd D → price/unit is diff. for diff. units but diff. buyers buying the same amt. (units) pay the same price on per unit item.

3rd D → price/unit depends on the buyer. But per unit price doesn't Δ for a buyer (no matter how many units he takes).

- 1st degree price discrimination





since, $Q_c > Q_m$

$CS = 0$

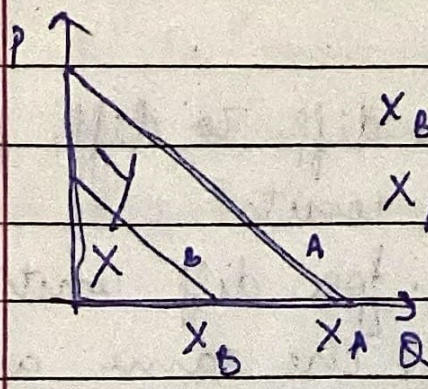
PS = entire area.

→ monopolist should be aware of indi. demand func^n.

- 2nd degree price discrimination → diff. units are sold at diff. per unit price.

10 → 5/unit, 11 → 100 → 4/unit ...

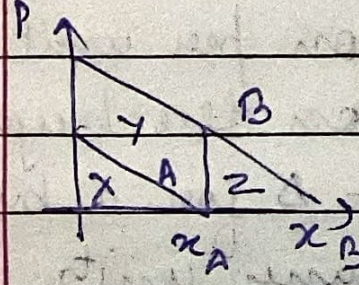
↳ bulk discounting



X_B at total price of X

X_A at total price of Y.

⇒ 2 diff. price quantity package.

- 

⇒ pay X (total) & get x_A units

⇒ pay X+Y+Z & get x_B units

⇒ 1st °. price discrimination

$CS_A = 0$, $CS_B = 0$, $PS_A = X$, $PS_B = X + Y + Z$

on quantity basis

⇒ pay x & get x_A units → y

pay x+z & get x_B units → y

⇒ $2x + z < 2x + y + z$

↳ for two level of pricing

- Hurdle model of price discrimination

on quality basis

Eg. Novels → Hard bound

↳ Soft bound (inf. quality, delay)

- 3rd ° price discrimination → student, old age discount

$$\max_{Q_1, Q_2} \underbrace{P_1Q_1 + P_2Q_2}_{TR} - \underbrace{C(Q_1 + Q_2)}_{TC}$$

$MR_1 = P_1\left(1 - \frac{1}{\varepsilon_1}\right)$, $MR_2 = P_2\left(1 - \frac{1}{\varepsilon_1}\right)$

$MR_1 = MR_2 = MC(Q_1 + Q_2)$

- if $\varepsilon_1 > \varepsilon_2 \Rightarrow P_1 < P_2$

Eg. $P_d = 140 - \frac{Q_d}{10}$, $P_w = 100 \Rightarrow \varepsilon = \infty$

Profit $= P_d Q_d + P_w Q_w - C(Q_d + Q_w)$

$MR_D = MR_W = MC(Q_d + Q_w)$

$Q_d = 200 \Rightarrow P_d = 120 > P_w = 100$

$\varepsilon < \varepsilon = \infty$

Hence, proved.

- Bundling

	S_X	S_Y
C_A	2200	1700
C_B	1300	2500

$S_X \to 2200 \to TR = 2200$

$\to 1300 \times 2 \to 2600$ ✓

$S_Y \to 1700 \times 2 \Rightarrow 3400$ ✓

$2500 \times 1 \to 2500$

$TS = 6000$

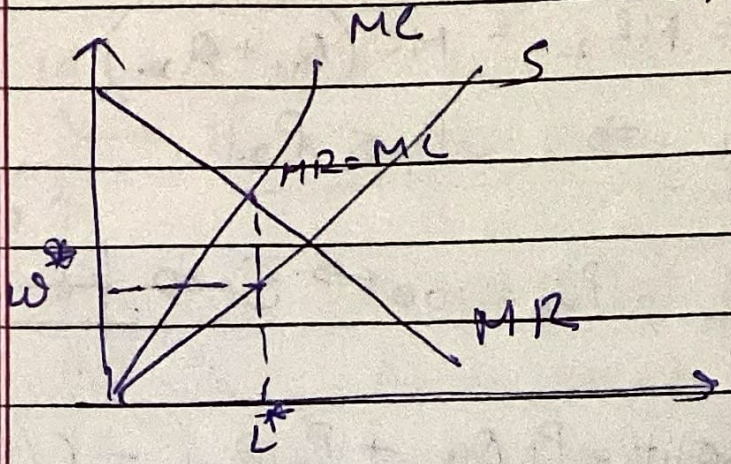
$(S_X + S_Y) \to 3800 (C_A) \longrightarrow 3800 \times 2 = 7600$ TR.

$\to 3900 (C_B)$

L2 Monopsony

- many sellers & 1 buyer, price maker in the input market & price taker in the output market

$P.f'(L) = w\left(1 + \frac{1}{\eta}\right)$ → price elasticity of supply



Eg. $w(L) = a + bL$, $MC = a + 2bL$

L3 Imperfect Comp.

- Market struc. → based on
  1. no. of firms
  2. Types of prod: role of substitutability
     (i) homogeneous prod. → identical on all aspects
     (ii) differentiated prod. → identical in core functioning but diff. in some other aspects.
- Oligopoly - there are a few firm selling
- Monopolistic comp → selling differentiated products

	Many Firms	Few firms	1 dominant firm	1 firm
Homo.	PCM	Oligopoly with homo. prod.	No	Monopoly
Diff. prod.	Monopolistic comp.	Oligopoly with diff. prod.	Fixed Rule	X

- 4CR – 4 firms with largest sales acc., (production output, employees, capacity
  → (0 – 100)
- HHI (Herfindahl Hirschman Index) – sum of the square of market sales % across all firm
  → (0 – 10000) $(\sum_{i=1}^{n}(S_i)^2$

L4 Game Theory

Eg. A game: Choose a no. btw. 0 & 100. You are the winner if your guess is closest to 2/3 of the avg. of all the nos. chosen. Find the eqz.

- Game Theory → Analysis of strategic interaction in which the outcome for each agent depends on not only her action but also the choices made by others.

- Study of rational behaviour in interactive or interdep. situa^{ns}. Knowing GT doesn't guarantee winning. Framework for thinking abt. strategic interac^{n}.
- Prisoner's dilemma ⇒ Game Matrix or Game Table

P_1 \ P_2	Confess	deny
Confess	(-5, -5)	(0, -20)
deny	(-20, 0)	(-1, -1)

- Rational player never choose dominated actions (actions which yield a lower payoff compared to other ac^{ns}, irres. of ac^{n} of others.
- Dominant Strategy
  i → a, b, c, d
  a dom. b
  a " c
  a " d
  } a dominates all ac^{n}. Hence, it is a dominant ac^{n}
- Rational player selects the dominant strategy
- Strictly dominant strategy → a always does better than all other strategy.
- Weakly dominant strategy → a always does atleast as good as all other strategies, sometimes better also.

	C	D
C	-5, -5	0, -20
D	-20, 0	-1, -1

(1) (2)

For player 1,
$-5 > -20$, $0 > -1$
C is dom. strategy

For player 2,
$-5 > -20$, $0 > -1$
C is dom. strategy

dominant strategy eq = (C, C)

- Good Strategy → attempt to see the situa" from pov of your rival. And also understand that he is toying to do the same thing.
- Nash Eq → A set of strategies, 1 for each player, along with the associated payoff for each player constitute the nash eq if no player can benefit by doing her strategy unilaterally.