8.10.25

ECO 101

Scarcity : Limitation of resources

Economics : Study of managing scarcity of resources and taking the decisions.

Micro : Particular (Brac, Nsu)

Macro : Generally, whole (University)

⇒ Scientist and Policy advisor

↓ Positive statements (Facts)

easier to proove right and wrong.

↓ Normative statement (Opinions)

Principle 1: People Face Tradeoffs

Principle 2:
The cost of something: opportunity cost
is what you give up
to get it

↳ কিছু পাইতে হলে কিছু বাদ দেওয়া

Principle 3: alters the decision making

People respond
to Incentive
(Marks, চাকরির আকার 5 points)
free things

Principle 4:

Principle 5: Market → Group of buyers and sellers
(classroom)

Principle 6: Government can sometimes improve market
Outcomes.

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Assumption and Models

1st Model: Circular Flow Diagram
(টাকা কিভাবে economy'র মধ্যে circulate করে)

⇒ actors
- Households
- Firms (companies)

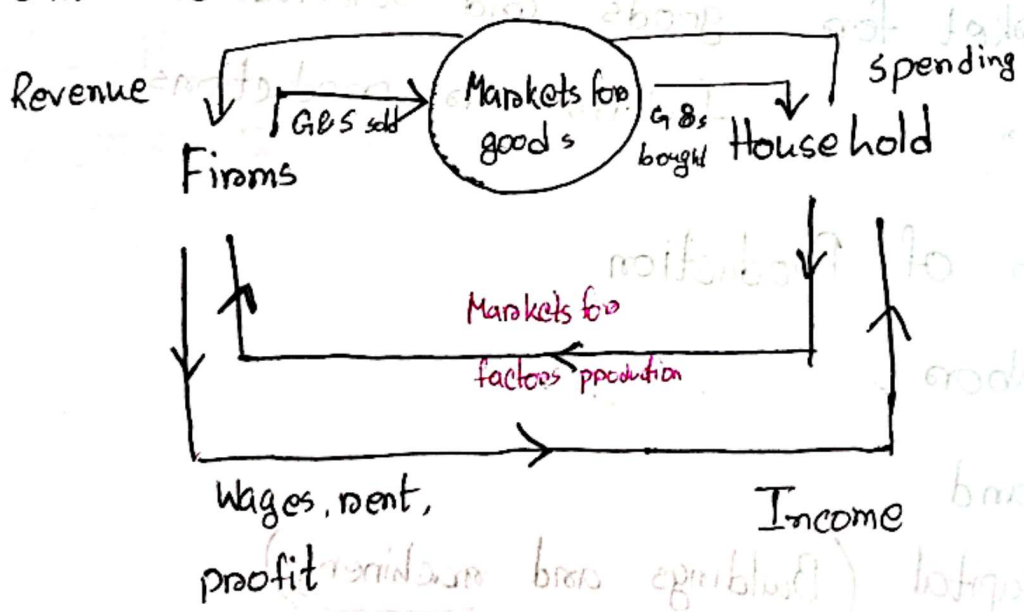
⇒ Markets (Group of buyers and sellers)
- Market for goods and services
- " " factors or productions

Factors of Production
- labor
- Land
- Capital (Buildings and machinery)
  ↳ Tools we need for the busines
  Funding

Households : Owns the factors of production
sell / rent for income
Buy and sell consume goods

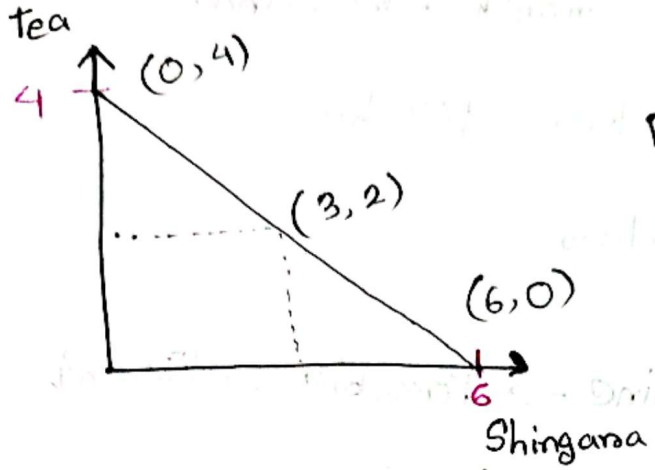
Firms : Buy / hire factors, use them to produce
Sell goods and services

Household Labor, land, capital advertise করে, Firms সুবিধামতো
যেই সুযোগ দেয়, In return Firms give wages, rent,
profit so that Household এর income হয়।



Green line for the money flow.

2nd Model : The Production Possibilities Frontier (PPF)



Budget = 60 → Resource

Products { Tea = 15
Shingarsa = 10

Combinations

Possible and efficient

1) (0,4)
2) (6,0)
3) (3,2)

efficient → No wastage of resources

Possible not efficient

1) (1,1)
2) (2,2)

- Inside the triangle, there is not any efficent point, but there is possible.

Outside the line, Impossible

Impossible

1) (3,3)

Economic Growth

⇒ Increase of resources

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50000 hrs per month - resource

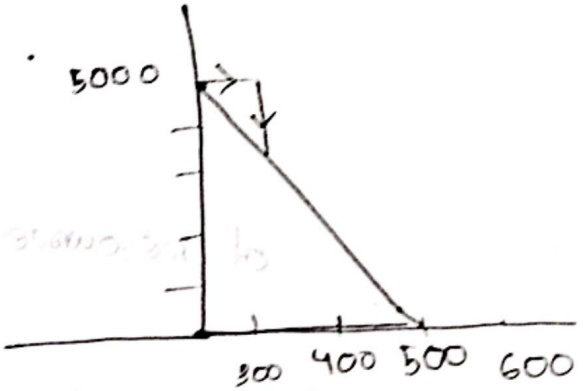
products - computers - 100 hrs

wheat - 10 hrs

Point on the line → Possible, efficient

* Slope

Opportunity Cost



Point D: (100, 4000)

-100 ↕ ↕ +1000

Point E: (0, 5000)

[E → D process Slide]

Opp cost D → E

$$\text{Opp. cost} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\text{new } y - \text{old } y}{\text{new } x - \text{old } x}$$

$$D \to E = \frac{5000 - 4000}{0 - 100}$$

$$= -10$$

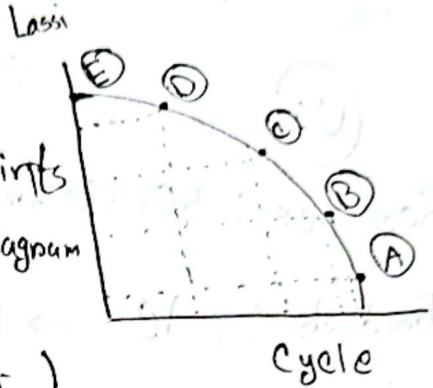
[losing 10 wheat per 1 comp]

[Opp. cost of 1 comp 10 wheat]

Shape of the PPF → Straight Line or curve

Curve হবে the m number keeps changing

→ can increase / decrease



* Why PPF is a Curve ? → 3 points

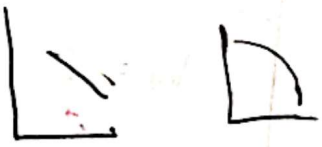
(i) Opp. cost changing throughout diagram

(ii) - compare (যেকোনো 2টা)

point A → we see (x, y)

point B → we see (x, y)

(iii) - comment (Opportunity cost keeps changing)



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ECO101 [Trade করলে countries end up with more products]

Interdependence

US

Resource : 50000 hrs → 25000hrs → 26000 hrs

Products : 1C → 100hrs
1W → 10hrs

Without trade

C: 250
W: 2500

With Trade

C: (50000 - 34000) = 16000hrs
(270) ↳ 160 110
W: 3400 (3400×10 = 34000)
2700 ↳ hrs

Japan

Resource : 30000hrs → 15000 hrs → 15000 hrs

Products: 1C → 125 hrs
1W → 25 hrs

Without Trade

C: ~~240~~ 120
W: ~~1200~~ 600
↳ Half divided

With Trade

C: 240 (240×125 = 30000)
(.130)
W = 0 (700
700

কত hrs খরচ,
বাকি,
কত production

Export – Import

Absolute Advantage — Produce maximum products
minimum resource

Resource : 1 day 24 hrs

I	O
D : 1	D : 10 (AA)
M : 20 (AA)	M : 2

Comparative Advantage → Lowest Opportunity Cost
Maximum Output

I

1D or 20M

1D = 20M

1M = 1/20 D = 0.05D (CA)

↳ To produce 1 marketing piece

0.05D or 1M

↳ have to compromise

Opp. cost

20 – 1D

1 – 1/20 D

= 0.05D

Bigger Team

O

10D or 2M

1D = 2/10 M = 0.2M (CA)

↳ কার Lowest Opp. cost

* 5D or 1M → 1 marketing piece বানাতে Time লাগে 5 টা app develop করতে পারবে

↳ Vice Versa

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US

Resource : 50000hrs

Products : 1C - 100hrs (AA)

1W - 10hrs (AA)

Japan

Resource : 30000

Products : 1C - 125 hrs

1W - 25 hrs

US:

100hrs

10W OR 1C

(CA) 1W 0.1C

Japan

125 hrs

5W OR 1C (CA)

1W 0.2C

After identifying AA, have to write the statement. (2)

*Japan / US has the absolute advantage.

1C — 125

1 — 1/125

1C — 125

Argentina

Resource : 10000hrs

Products : 1C = 2hrs

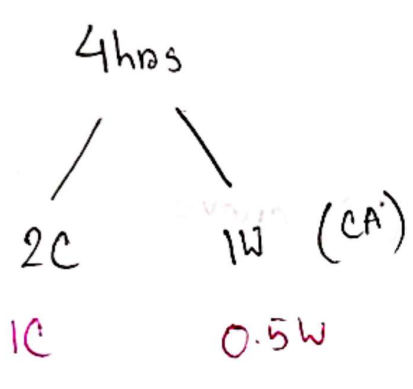
1W = 4hrs

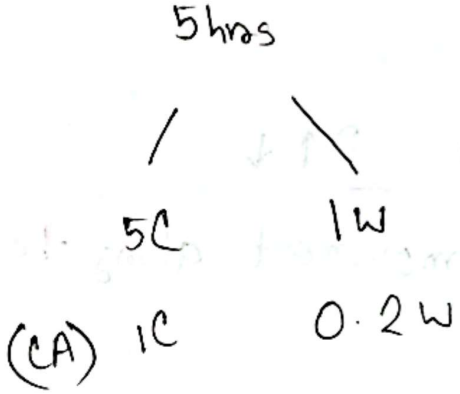
Brazil

Resource : 10000hrs

Products : 1C = 1hrs (AA)

1W = 5hrs



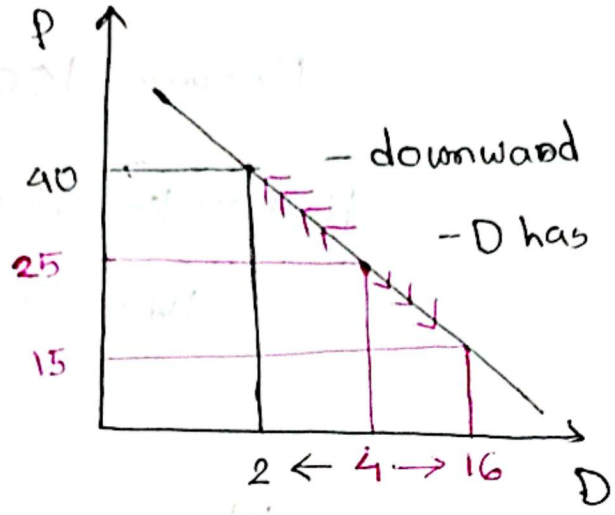


Demand and Supply

Quantity Demanded → কোনো একটা Product এর কতটুকু Price এর উপর depend করে demand.

Law of Demand → দাম বাড়লে চাহিদা কমে যায়.

D↑ = Shift Right
D↓ = Shift left



- downward Sloping
- D has inverse Relationship with P

When P ↑ ↓

↳ movement along the demand (D) curve

When Anything Else ↑↓

↳ Shifting of the D curve

Demand বাড়লে Price কমবে.

- When P decreases from 25 to 15
  → demand increases from 4 to 16
- When P increases from 25 to Tk 40
  ↳ Demand decreases from 4 to 2.

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Demand Curve Shifters

Price ছাড়া অন্য কিছু change হলে non price determinants of demand

- Number of buyers –
- Income –

- Normal Goods : Income ↑ → D↑ (Income বাড়ে demand বাড়ে, Income কমে demand কমে)
- Inferior Goods : Income ↓ → D↑ (Income কমলেই শুধু Demand বাড়ে)

Product A : Coke
Product B : Mojo

(P of B ↑ / D of B ↓ > D for A ↑)

Inverse Relation

Substitutes : P of Mojo ↑ / D of Mojo ↓ > D for Coke ↑

Product A : Tea
Product B : Sugar

(P of B ↑ / D of B ↓ > D for A ↓)

Complementary : P of sugar ↑ / D of sugar ↓ > D for tea ↓

Same Relation

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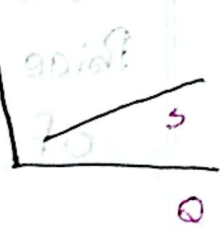
Price বাড়লে quantity of supply বাড়বে।



- When price ↑↓
  - ↳ Movements along supply curve

- When anything else ↑↓
  - ↳ Shift entire S curve.

Non-price determinant supplies:

Supply Curve Shifters:

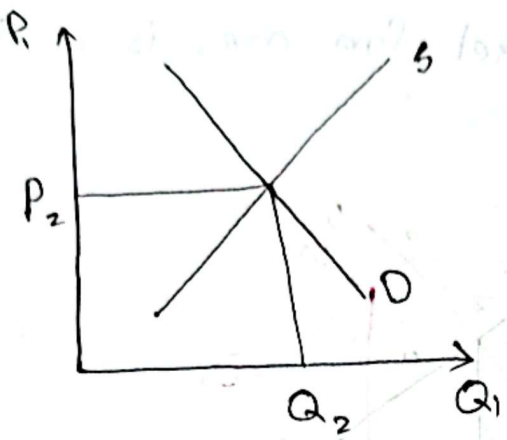
Input Prices — Production এর জন্য যে cost.
Land, Labor, capital (Milk, barrista)

Technology — determines how much import inputs are required

Number of Sellers — Nila Market

Expectations — Budget, ~~কুরবানি~~ Gorur → Sunid

Market Equilibrium Supply - Demand



→ The market for ..... is in Equilibrium

P = equilibrium Price:

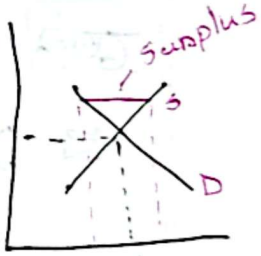
Q = " Quantity

Surplus – Supply is greater than demand

Production বেশি, Customer কম

$S > D$ = Surplus

$Q_S - Q_D$ = "

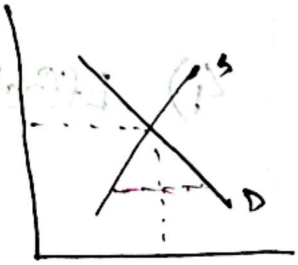


Shortage – Demand is greater than Supply.

$D > S$ = Shortage

$Q_D - Q_S$

Shortage হলে price বাড়বে



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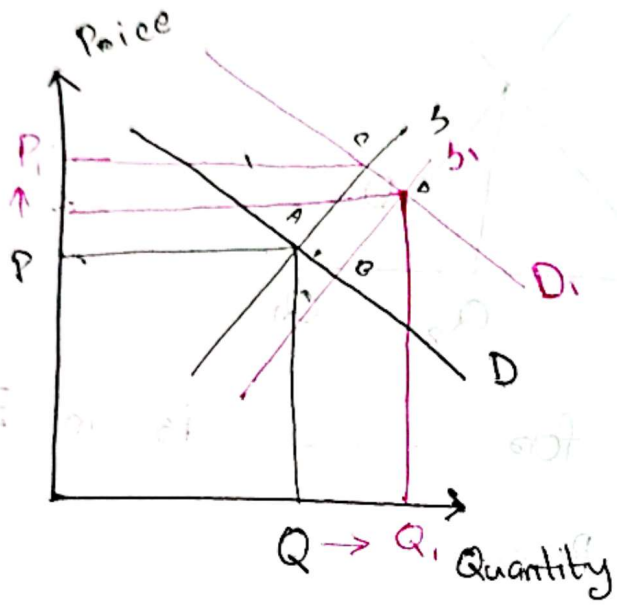
1) Initially, the market for cars is in EQUILIBRIUM.



2) DECREASE (aua kaita) in the price of fuel.

তেল এর price কমলে তেল এর Demand বাড়বে, তেল এর Demand বাড়লে গাড়ির Demand বাড়বে.

↳ D for Cars ↑

3) TECHNOLOGY in Car Production ↑

↳ S of Cars ↑

4) Effect of fuel Price reduction > Technology in car production

D↑ > S↑

5) Explain using D & S diagram, the effect of these 2 events on equilibrium P & Q. Ans: যেটা কম বেড়েছে সেটা আগে.

Elasticity

$$\% \Delta \text{ (Change)} = \frac{\text{new value} - \text{old value}}{\text{Old value}} \times 100\%$$

$$\% \Delta \text{ (Change)} = \frac{\text{new value} - \text{old value}}{\left[\frac{\text{new value} + \text{old value}}{2}\right]} \times 100\%$$

Mid point Method

1) Price Elasticity of Demand [PED] $= \frac{\% \Delta \text{ in QD}}{\% \Delta \text{ in P}}$

$$= \frac{\frac{\text{new QD} - \text{old QD}}{\left[\frac{\text{new QD} + \text{old QD}}{2}\right]} \times 100}{\frac{\text{new P} - \text{old P}}{\left[\frac{\text{new P} + \text{old P}}{2}\right]} \times 100} \quad \cancel{\times 100}$$

will always result in negative

Coke Price $25 QD = 4

new $15 QD = 10

$$P_{ED} = \frac{\frac{10-4}{\left[\frac{10+4}{2}\right]} \times 100}{\frac{15-25}{\left[\frac{15+25}{2}\right]} \times 100} = \frac{\frac{6}{7}}{-\frac{10}{20}} = -1.71$$

2) Price elasticity of Supply [PES] = $\frac{\% \Delta \text{ in } QS}{\% \Delta \text{ in } P}$

$$= \frac{\frac{\text{new } QS - \text{old } QS}{\left[\frac{\text{new } QS + \text{old } QS}{2}\right]} \times 100}{\frac{\text{new } P - \text{Old } P}{\left[\frac{\text{new } P + \text{old } P}{2}\right]} \times 100}$$

Coke Price \$25 : QS = 4

new \$15 QS - 2

$$P_{ES} = \frac{\frac{2-4}{\frac{2+4}{2}} \times 100}{\frac{15-25}{\frac{15+25}{2}} \times 100}$$

$$= \frac{\frac{-2}{3}}{\frac{-10}{20}} = 1.33$$

3) Income elasticity of Demand [YED] $= \frac{\% \Delta \text{in QD}}{\% \Delta \text{in I}}$

$$= \frac{\frac{\text{new QD} - \text{old QD}}{\left[\frac{\text{new QD} + \text{old QD}}{2}\right]} \times 100}{\frac{\text{new I} - \text{old I}}{\left[\frac{\text{new I} + \text{old I}}{2}\right]} \times 100}$$

$I = 5000 \quad QD = 4$

$I = 20000 \quad QD = 6$

$$YED = \frac{\frac{6 - 4}{\frac{6+4}{2}} \times 100}{\frac{20000 - 5000}{\frac{20000 + 5000}{2}} \times 100}$$

$$= \frac{\frac{2}{5} \times 100}{\frac{15000}{\frac{25000}{2}} \times 100}$$

$$= 0.33$$

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4) Cross Price Elasticity of Demand (XED) =

$$\frac{\% \Delta \text{ in } QD_A}{\% \Delta \text{ in } P_B} = \frac{\dfrac{\text{new } QD_A - \text{old } QD_A}{\left[\dfrac{\text{new } QD_A + \text{old } QD_A}{2}\right]} \times 100\%}{\dfrac{\text{new } P_B - \text{old } P_B}{\left[\dfrac{\text{new } P_B + \text{old } P_B}{2}\right]} \times 100\%}$$

দুইটা Product এর জন্য

1 Product এর Price

1 " " Demand

দেওয়া থাকবে।

Product A : Mojo → old QD – 10
new QD – 5

Product B : Coke → old price – $25
new price – $15

যেটার Price দেওয়া থাকবে ওটা B

$$XED = \frac{\dfrac{5-10}{\left[\dfrac{5+10}{2}\right]} \times 100\%}{\dfrac{15-25}{\left[\dfrac{15+25}{2}\right]} \times 100\%}$$

$$= 1.33$$

Interpretation

XED > 0 [Substitute] } 2 products
XED < 0 [Complementary] }

YED > 0 [Normal] } 1 product
YED < 0 [Inferior] }

|PED| > 1 [Elastic] PES > 1 * Imp

|PED| < 1 [Inelastic] PES < 1 * Imp

|PED| = 1 [Unit Elastic] PES = 1

|PED| = 0 [Perfectly Inelastic] PES = 0

|PED| = ∞ [Perfectly Elastic] PES = ∞

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|PED|>1

Necessity → elasticity কম [Inelastic] PES>1

Luxury → Elastic |PED|<1 PES<1

Inelastic Curve → Steep

Elastic " → flat

Perfectly inelastic demand

Price বাড়লেও demand same থাকবে. যেমন কারি কোম্পানি
People's elasticity is zero.

Revenue → not Profit, Earnings

P×Q

Elastic → Quantity বাড়বে

Inelastic → Price বাড়বে, as alternatives কম.

Elastic: Manufactured (Garments) PES>1.

Inelastic: Agricultural (কৃষিজাত) PES<1

↳ Production Time বেশি

Example :

(1)

$Q_{Dc} = 200 - 5P_c + 2M + 3P_m$ . . . (i)

$Q_{Sc} = 100 + 5P_c$ . . . (ii)

At Equillibrium $D = S$

$200 - 5P_c + 2M + 3P_m = 100 + 5P_c$

$\Rightarrow 200 - 5P_c + 2(80) + 3(20) = 100 + 5P_c$

$\Rightarrow 320 = 10P_c$

$\Rightarrow P_c = 32$, $Q_{Sc} = (100 + 5 \times 32)$

↳ যেকোনো Equation এ বসালেই হবে.

$\therefore Q = 260$

↳ Old quantity

↳ will be used for rest of the questions

XED / YED → Old Value

(2)

$$200 - 5P_c + 2M + 3P_m = 100 + 5P_c$$

$$\Rightarrow 200 - 5P_c + 2 \times 100 + 3 \times 20 = 100 + 5P_c$$

$$\Rightarrow 360 = 10P_c$$

$$P_c = 36$$

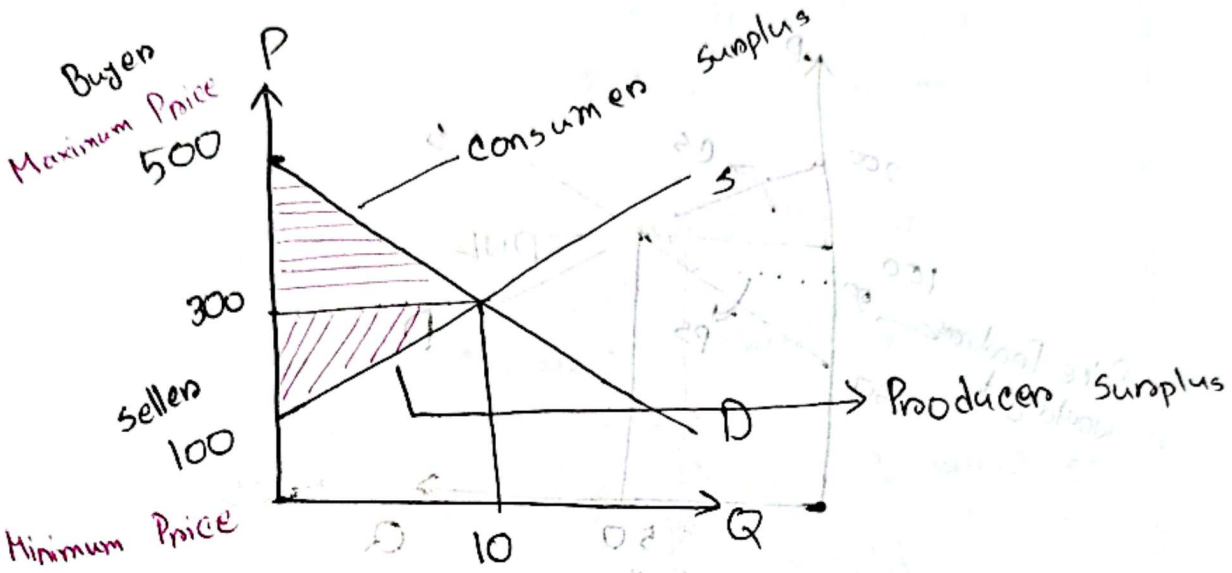
$$\therefore Q = 280$$

$$YED = \frac{\frac{280 - 260}{\left[\frac{280+260}{2}\right]} \times 100\%}{\frac{100-80}{\left[\frac{100+80}{2}\right]} \times 100\%}$$

$$= 0.33$$

Coke is a Normal Product

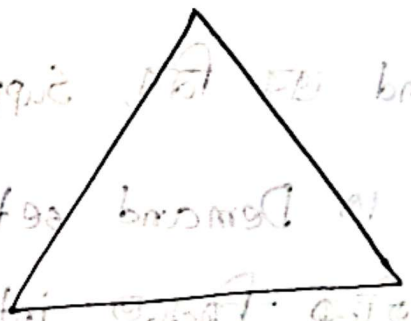
Well-fare and Efficiency



↳ 10 ถ้า Product Equilibrium ↳ sell

Consumer Surplus [Maximum Price − actual Price]

Producer Surplus [Actual Price − Minimum Price]



$$\text{Area} = \frac{1}{2} \times B \times H$$

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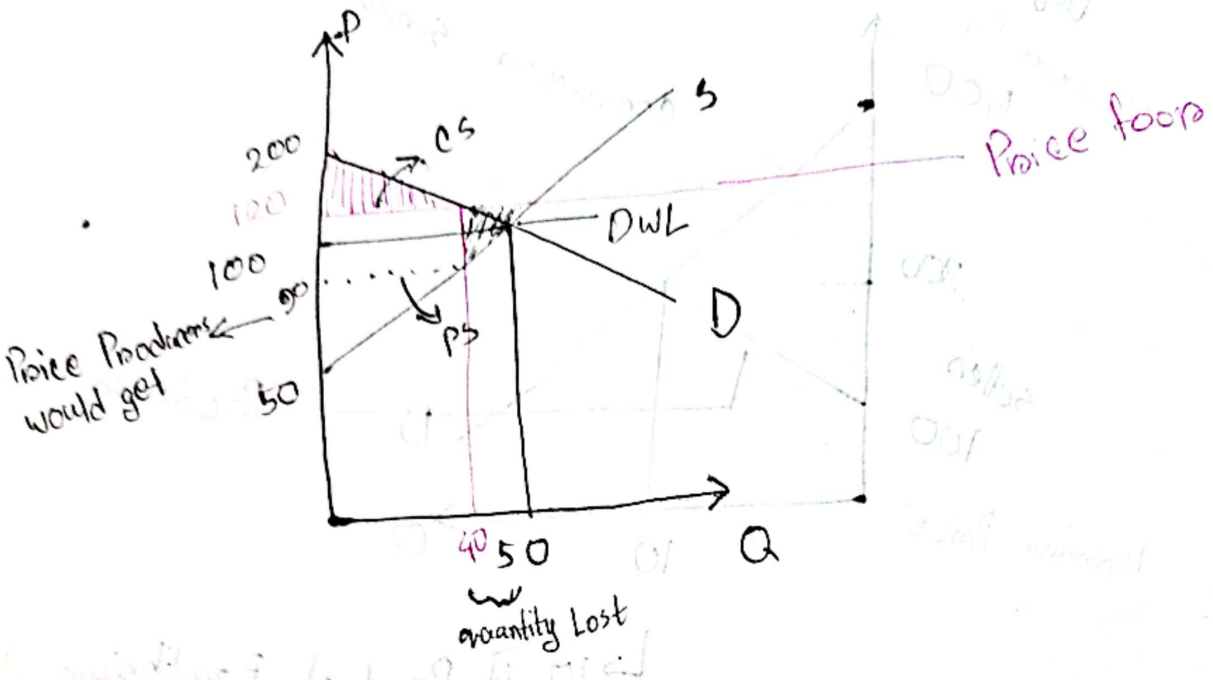


Step 1: Find equilibrium P & Q

2 : Draw D & S Diagram

3: Find max ~~of~~ & minimum price

↓ (Q=0 in D) ↓ (Q=0 in S)

4: Find initial CS and PS

5: Place Price Floor/Ceiling

Quantity Demand এর নিব, Supply এর না.

* Price floor ও Demand sets the quantity.

Consumer ~~কতটুকু কিনতে~~ interested.

Coffee Price 20 থেকে 50 হলে Supply বাড়লেও Consumer ~~কম~~ কিনবে.

6) Find new equilibrium Q → For Price floor
Put new P in demand
↳ For Price ceiling
Put new P in supply.

7) PF
The original price Producers would recieve
↳ Put new Q in S equation

PC
The original price consumers should have paid.
↳ Put new Q in D equation

8) Find new CS, PS and the DWL because of PF/PC.
↳ Deadweight Loss

$\Rightarrow CS = \frac{1}{2} \times 40 \times (200-120) = 1600$

$\Rightarrow PS = \frac{1}{2} \times 40 \times [(120-50) + (120-90)]$

$\Rightarrow DWL = \frac{1}{2} \times (120-90) \times (50-40)$

$11000 - 1000P = 500P$

$11000 + 1000 = 500P + 1000P$

$12000 = 1500$

$P = 8$

$Q = 3000$

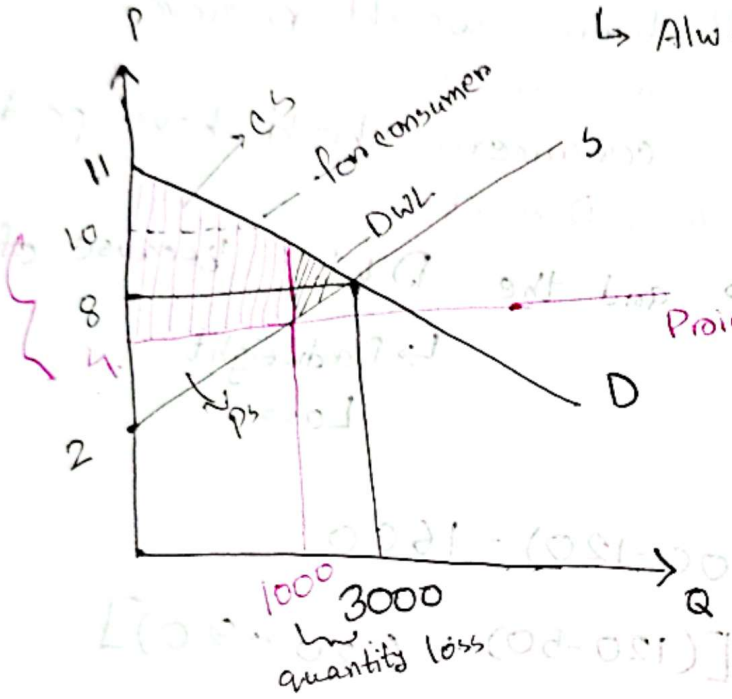
Price Ceiling

D: $QD = 11000 - 1000P$

S: $QS = 500P - 1000$

Price ceiling = 4

↳ Always be below equilibrium P



a) Equilibrium $P = 8$ & $Q = 3000$

b) $CS = \frac{1}{2} \times 3000 \times (11 - 8) = 4500$

$PS = \frac{1}{2} \times 3000 \times (8 - 2) = 9000$

c) For new equilibrium Q, place PC in S eqn

$QS = 500(4) - 1000$

$\therefore Q = 1000$

For price consumers should have paid, Put new Q in D eqn

$1000 = 11000 - 1000P$

$1000 = 11000 - 1000P \quad \therefore P = 10$

$CS = \frac{1}{2} \times 1000 \times [(11-4) + (10-4)] = 6500$

$PS = \frac{1}{2} \times 1000 \times \{4-2\} = 1000$

$DWL = \frac{1}{2} \times \underbrace{(3000-1000)}_{\text{quantity lost}} \times \underbrace{(10-4)}_{\text{price disapancy}} = 6000$

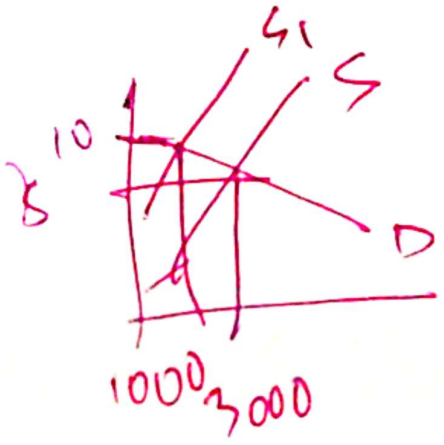
* Trade
* Practic → Trade (4)
* Elasticity → Sample Math

Income change হলে income এর elasticity

অথবা quantity change, যেটাই বের করতে হবে.

D & S – 2টা (1টা Diagram)

4টার মধ্যে 3টা



End Game begins...

10.12.25

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Tax

P-4

D: $P = 120 - 3Q$

S: $P = 30 + 2Q$

Govt places Tax = $15 on Producers [supply will be affected

$S: P = 30 + 2Q + 15$

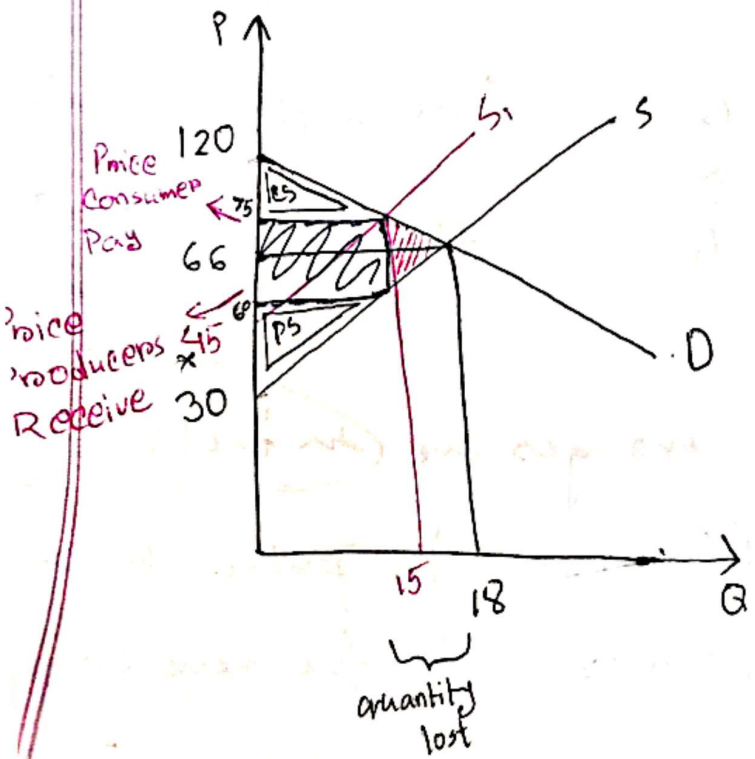
Equilibrium P and Q

$120 - 3Q = 30 + 2Q$

$\Rightarrow 90 - 5Q = 0$

$\Rightarrow Q = 18$ $

$P = 66$ $



Maximum Price,

$Q = 0$ in D eqn,

$P = 120 - 3(0)$

$\therefore P = 120$

Minimum Price,

$Q = 0$ in S eqn

$P = 30 + 2(0)$

$\therefore P = 30$

b) Initial CS and PS

$$CS = \frac{1}{2} \times 18 \times (120 - 66) = \$486$$

$$PS = \frac{1}{2} \times 18 \times (66 - 30) = \$324$$

Government will place a $15 Tax on Producers.

we will have a new Supply eqn.

$$S: P = 30 + 2Q + 15$$

(15 = Tax)

New S eqn, $S: P = 45 + 2Q$

↳ New minimum Price → $45 [new eqn का constant]

New equilibrium Q,

Old D = new S

$$120 - 3Q = 45 + 2Q$$

$$\Rightarrow 75 = 5Q$$

$$\Rightarrow Q = 15$$

c) Price producers receive, (P_P)

Put new Q in old S eq

S: $P = 30 + 2Q$

$\Rightarrow P = 30 + 2(15)$

$\therefore P_P = 60$

Price Consumers Pay, [P_C]

Put new Q in old D eqn

D: $P = 120 - 3Q$

$\Rightarrow P = 120 - 3(15)$

$\therefore P_C = \$75$

d) Find New CS, PS, DWL and tax receive.

new CS: $\frac{1}{2} \times 15 \times [120 - 75]$

↳ new Q ↘ max P ↘ P_C

$= \$337.5$

new PS: $\frac{1}{2} \times 15 \times [60 - 30] = \$225$

↘ ↘ ↘

New Q P_P min P

Tax revenue

Tax amount × new Q

$\Rightarrow$ 15×15

$= \$225$

DWL

old Q → 18, new Q → 15, P_c → 75, P_p → 60

$\frac{1}{2} \times [18 - 15] \times [75 - 60]$

$= \$22.5$

8.12.25

ECO101

Output and Costs

Production function – Input and output

Total Product (TP) = Total output at every level of workers

$$\text{Average Product (AP)} = \frac{\text{Total Product}}{\text{number of workers}}$$

$$= \frac{1500}{2} = 750$$

For 2 workers 1500 wheat

$$\text{Marginal Product (MP)} = \frac{\Delta \text{in TP}}{\Delta \text{in no. of workers}}$$

$$= \frac{\text{new TP} - \text{old TP}}{\text{new no. of workers} - \text{old no. of workers}}$$

$$= \frac{\text{new output} - \text{old output}}{\text{new input} - \text{old input}}$$

10.12.25

ECO101

Profit = Total Revenue − Total Cost

↓ Price × Quantity

↓ Fixed Cost + Variable Cost

***

$$\text{Marginal Cost} = \frac{\Delta TC}{\Delta Out} = \frac{\text{New TC} - \text{Old TC}}{\text{New Output} - \text{Old Output}}$$

$$= \left[\frac{(\text{new FC} + \text{new VC}) - (\text{Old FC} + \text{Old VC})}{\text{new output} - \text{Old output}} \right]$$

Marginal Product ⟶ divided by input

Marginal Cost ⟶ divided by output

Increasing Demand → Cost বাড়ে

Deminishing → Cost কমে

Constant → Cost same

Average Fixed Cost (AFC) = $\frac{FC}{Output(Q)}$

- O Q to O AFC n/a
- Will always Fall as Q raises

Average Variable Cost (AVC) = $\frac{VC}{Output(Q)}$

Average Total Cost (ATC) = $\frac{TC}{Output(Q)}$ OR AFC+AVC

15.12.25

ECO101

Marginal cost যেই point এ ATC কে hit করে it is the lowest and atc সেই point থেকে বাড়তে থাকে.

Efficient is the output level where we should stop producing

ATC = AFC + AVC

Before efficient scale

AFC impact ↑ AVC impact ↓

AFC > AVC

ATC > MC

Keep Producing

Efficient Scale

After efficient scale

AFC impact ↓ AVC impact ↑

AFC < AVC

ATC < MC

Reduce Production

* Marginal cost and ATC এখানে মিলে সেটাই Efficint scale.

Short Run : Fixed Cost

Long Run : Variable Cost

LRATC → Scale বদলা থাকলেই Long Run

Economies of Scale : ATC↓ Q↑

Constant Returns to Scale : ATC and Q stays the same

Diseconomies of Scale : ATC↑ Q↓

Last

17.12.25

ECO101

Profit

Perfect Comp : Many buyers and sellers

Example : Same product or service

CNGs, Rickshaws Freely enter or exit the market.

'Price Taker' — have to accept the price, no personal influence.

[Uber ও rider & passenger কার জন্য যে Price ঠিক করা হয়]

Total Revenue (TR) = Price × Quantity

Average Revenue (AR) = $\frac{TR}{Q} = \frac{P \times Q}{Q} = P$

Marginal Revenue (MR) = $\frac{\Delta TR}{\Delta Q} = \frac{\text{new } TR - \text{old } TR}{\text{new } Q - \text{old } Q}$

↓

Extra 1 Product sell

ও extra কত Profit

$P = AR = MR$ → Only for Perfect Comp

for all markets

$P = MR$

Profit Maximizing Output : MR = MC

↓

যে output এ সর্বোচ্চ মোট Profit (for all markets)

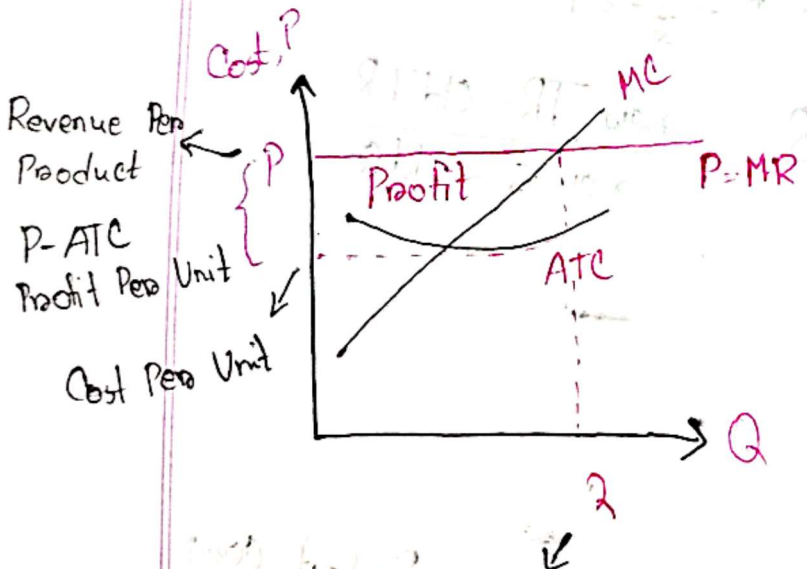
↳ প্রতি Product বৈশ্বিক খরচ

↳ প্রতি Product sell করে যে Profit

MR > MC → More Production

MR < MC → Reduce Production

Perfect Competition Profit Maximizing Output (Qpc): $\boxed{P = MC = MR}$



Profit - Maximization Quantity

ATC যদি P = MR এর বিচ. Profit

22.12.25

ECO101

ATC Price এর বেশি Profit

" " " কমের Loss

Profit per unit,

P - ATC

Total Profit = (P - ATC) × Q

24.12.25

Shut - down → Temporary বন্ধ, may come back. → noVC, may have FC

Exit → ~~Temporary~~ Permanent.

Shut down P<AVC

Sunk Cost → Whatever is gone, gone forever. ♡ (Cost)

After paying sem fee, we can't get it back

Exit P<ATC

New Firm's Decision to Enter Market

P > ATC

	Firm 1	Firm 2	Firm 3	Firm 4
Profit/Loss?	P	L	L	L
		AVC = 8	AVC = 12	AVC = 15
Shut down? (Short Run)	—	P > AVC ∴ No	P < AVC ∴ YES	P < AVC ∴ YES
		ATC = 9		ATC = 11
Exit? (Long Run)	—	—	P > ATC ∴ NO	P < ATC ∴ YES
				ATC = 8.5
New Firm (enter)	—	—	—	Firm 5 → P > ATC ∴ YES

Firm 1 → Profit, তাই nothing is needed.

Firm 2 → Loss হলেও shutdown হবে না.

Firm 3 → shutdown করলেও ATC এর থেকে বেশি বলে Exit করবে না.

Firm 4 → ATC থেকে কম বলে Exit.

New Entry → P > ATC হলে enter.

New Firm's Decision to Enter Market

P > ATC

	Firm 1	Firm 2	Firm 3	Firm 4
Profit/Loss?	P	L	L	L
		AVC = 8	AVC = 12	AVC = 15
Shut down? (Short Run)	—	P > AVC ∴ No	P < AVC ∴ YES	P < AVC ∴ YES
		ATC = 9		ATC = 11
Exit? (Long Run)	—	—	P > ATC ∴ NO	P < ATC ∴ YES
New Firm (enter)	—	—	—	Firm 5 → P > ATC (ATC = 8.5) ∴ YES

Firm 1 → Profit, তাই nothing is needed.

Firm 2 → Loss হলেও shutdown হবে না.

Firm 3 → shutdown করলেও ATC এর থেকে বেশি বলে Exit করবে না.

Firm 4 → ATC থেকে বেশি বলে Exit.

New Entry → P > ATC হলে enter.

Zero-Profit Condition

In the Long-Run, Firms will earn Zero economic Profit.

which is $P = ATC$.

Exercise

$P = 50$

$TC = \underbrace{600}_{FC} + 5Q + Q^2$

$MC = 10 + 2Q$

$\boxed{P = MC}$

$50 = 10 + 2Q$

$\therefore Q = 20$

$FC = \text{constant} = 600$

$VC = 5Q + Q^2 = \text{Variable}$

29.12.2

ECO101

Monopoly → Price Maker

Perfect Comp → Price Taker

Other firms cannot enter the market.

$P \neq MR$

Profit main, Quantity না

Price can change at anytime.

$$AR = \frac{TR}{Q} = \frac{P \times Q}{Q} = P$$

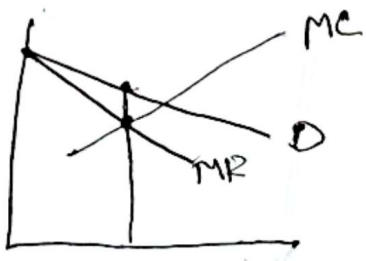
$$MR = \frac{\Delta TR}{\Delta Q} = \frac{\text{New TR} - \text{old TR}}{\text{New Q} - \text{old Q}}$$

MR and MC যে point এ meet করবে → Quantity.

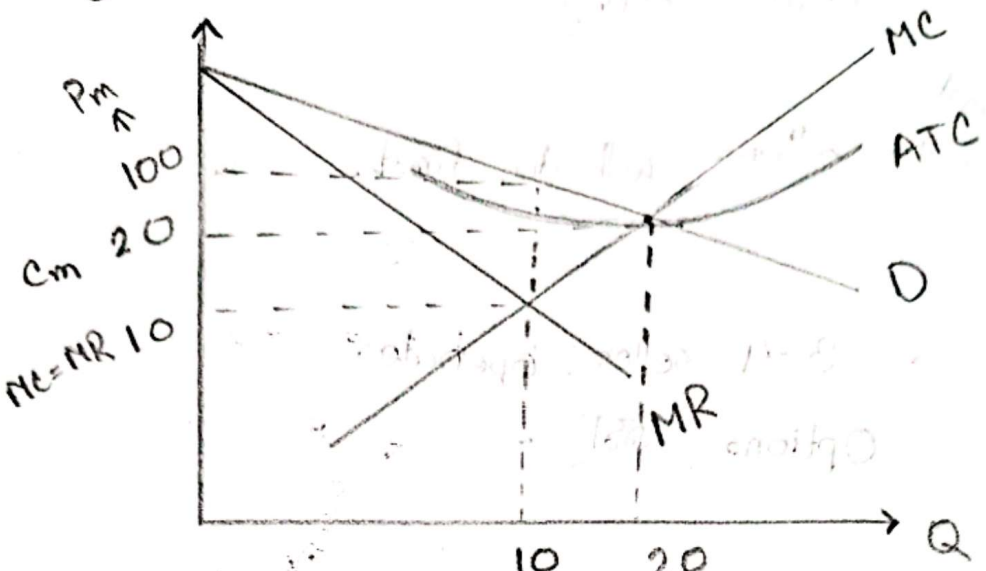
Quantity থেকে উপরে Demand এ meet করবে → Price

Monopoly → Profit হবে always

2. ATC কে যেখানে meet করবে. Monopoly Cost Plus Cm



Costs and Revenue



10k → Monopoly Quantity Q_m Qc

100k → Monopoly P. P_M

20k → Monopoly C, Cm (ATC)

Profit Monopoly = (P-ATC) × Q

= (100-20) × 10

= 800K

Perfect Comp ে D and MC সমান meet করে Cost and Price

Zero-Profit Condition (P=ATC)

Profit perfect comp = (P-ATC) × Q

= (20 - 20) × 20

= 0

∴ Perfect Comp Profit is zero due to zero profit condition where P = ATC.

$$DWL = \frac{1}{2} \times [20-10] \times [100-10]$$

↓ Qc ↓ Qm ↓ P_m $MC = MR_m$

7.01.26

Game Theory

Considering what the others will do first.

Oligopoly → 3-4 seller operates

Options

C = GO / STOP M = GO / STOP

C = GO → M GO / M STOP

STOP → M GO / M STOP

M = GO → C GO / C STOP

Worst option
Nash equilibrium

STOP → C GO / C STOP

best option
socially optimal outcome

i) if both goes, each gets -3
ii) if one stops, one goes
payoffs

↳ stop - 0
goes - 3
} pay offs

iii) if both stops, each gets 0
payoffs

→ One of the companies will have rows.

→ The first company will have the payoffs first.

যে company question এ mention করা থাকবে, it will be placed on rows. বাকিটা column.

C \ M	GO	STOP
GO	-3, -3 (A)	3, 0 (B)
STOP	0, 3 (C)	0, 0 (D)

pay-off matrix 4
Dominant 3
Worst / Nash 2
Socially Optimal 1

Dominant Strategy (3)

যে যেই side এ তার opposite (row, column)

C: M GO → STOP [m যখন GO তখন c এর best STOP]
STOPS → GO [m " STOP " " " " GO]

∴ No Dominant Strategy

দুইটাই STOP or GO থাকলে Dominant Strategy.

M : C GO → STOP (if the can goes)
STOP → GO

∴ NO Dominant Strategy.

→ which never happens

Socially Optimal Outcome

↳ best outcome

0,0

NASH Equilibrium → Always happens

↳ worst outcome.