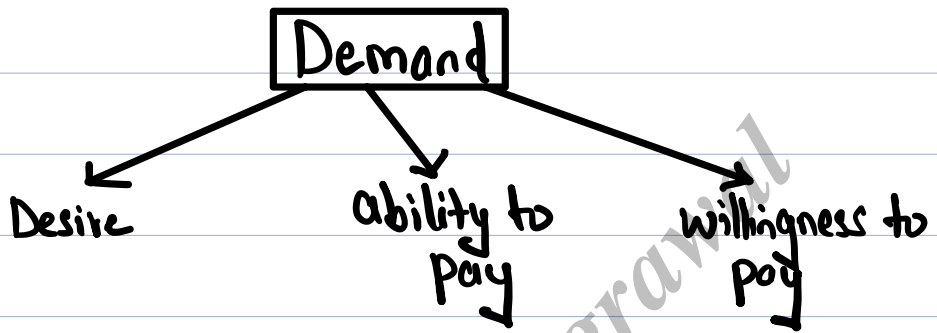
Theory of Demand & Supply

Unit 1 : Law of Demand and Elasticity of Demand



To constitute effective demand all the above 3 essentials should be present

e.g. A beggar sitting beside the temple wants to buy Sports car worth ₹ 1 crores.
Here, beggar cannot create demand for sports car in market because –

Desire ✓ Ability to pay ✗ Willingness to pay ✗

- The qty. demanded is always expressed at a given price.

- Qty. demanded is a flow concept.

e.g. demand for apples will be 500 dozens per day if price of apples is ₹100/dozen.

per day → time period (flow concept)

Determinants of Demand

(i) Price of a commodity [P ↑, Qd ↓ / P ↓, Qd ↑]

demand for a commodity is inversely related to it's price provided other things remains constant (Ceteris paribus)

(ii) Price of related commodity

- Complementary Goods
  - goods that are bought or consumed together
- Substitutes / Competing goods
  - goods that can replaced other goods with ease

e.g. car & fuel, ink pen and ink bottles, tea and sugar

e.g. Coke or pepsi, ink pen or ball pen, Lays or Balaji wafers

- indirect relationship blw qty. demanded of a commodity and price of it's complementary

e.g. Ipad ($P\uparrow$) → Apple Pencil ($Q_d\downarrow$)

- direct relationship blw qty. demanded of a commodity and price of it's substitute

e.g. Coke ($P\uparrow$) → Pepsi ($Q_d\uparrow$)

iii) Disposable Income of the Consumer

$$\begin{pmatrix} I\uparrow, Q_d\uparrow \\ I\downarrow, Q_d\downarrow \end{pmatrix}$$

demand for a commodity is directly related to the disposable income level of the consumer.

Exceptions:

- Inferior goods ($I\uparrow, Q_d\downarrow$)

e.g. As income level increases demand for street food decreases (person can now afford to visit fancy restaurants)

- Necessity [I ↑, Qd (const.)]

  e.g. salt, water etc.

(iv) Other factors

Demographics →
- Size of population
- Age distribution of population
- Level of national income and it's distribution

a) Size of population

For normal goods –

(Population ↑, Qd ↑
Population ↓, Qd ↓)

Direct relationship btw size of population and qty. demanded.

b) Age distribution of population

Old age persons ↑ → Demand for hospitals, walking sticks, medical shops etc. ↑

Youth ↑ → Demand for electronic gadgets, shopping malls, food courts etc. ↑

Children ↑ → Demand for toys, Chocolates etc. ↑

c) Level of national income and it's distribution

$MPC_{poor} > MPC_{rich}$

e.g.

	Income	Expenditure
Poor	1000 ↑	900 ↑
Rich	1000 ↑	200 ↑

Majority of national income comes from small no. of households (like in India) ← Uneven distribution of national income → Q_d ↓

Even distribution of national income → Q_d ↑

d) Consumer-credit facility and interest rates

Consumer-credit facility easily available → Q_d ↑

Interest rate ↑ → Q_d ↓

Interest rate ↓ → Q_d ↑

e) Govt. policies and regulations

Govt. provide incentives/subsidies → Q_d ↑

[e.g → subsidies on installation of solar panel etc.]

Govt. introducing policy unfavourable for product → Q_d ↑

[e.g → ↑ in tax rates on cigarette etc.]

(V) Tastes and preferences of buyers

i) Demonstration effect (Dekha Dekhi kina)

- term coined by James Duesenberry

Mr. X — Iphone 13 already hai uske paas

Mr. Y (Mr. X's friend) — Purchased latest Iphone 14 pro max

Here, Mr. X also purchased the same Smartphone model which his friend bought even though he has Smartphone which he purchased just 5 months back

ii) **Bandwagon effect** (it quantifies the demonstration effect)

e.g. Mr. Raj purchased a smartphone and because of this 3 of his friends out of 10 also purchased the same Smartphone.

Here, Conversion rate $= \frac{3}{10} \times 100$

$= 30\%$.

iii) **Snob effect** (Sab me sabse alag dikhne ki iccha rkhna)

One plus will manufacture 100,000 units of one plus 10 ₹ 50,000/unit

But will manufacture 5000 units of MARVEL edition ₹ 55,000/unit

iv) Veblen effect (show off krna)

- named after the American economist Thorstein Veblen

e.g. rich person will buy more of prestige goods like luxury cars, precious stones, gold etc. because these goods have utility attached to it's value.

Law of Demand

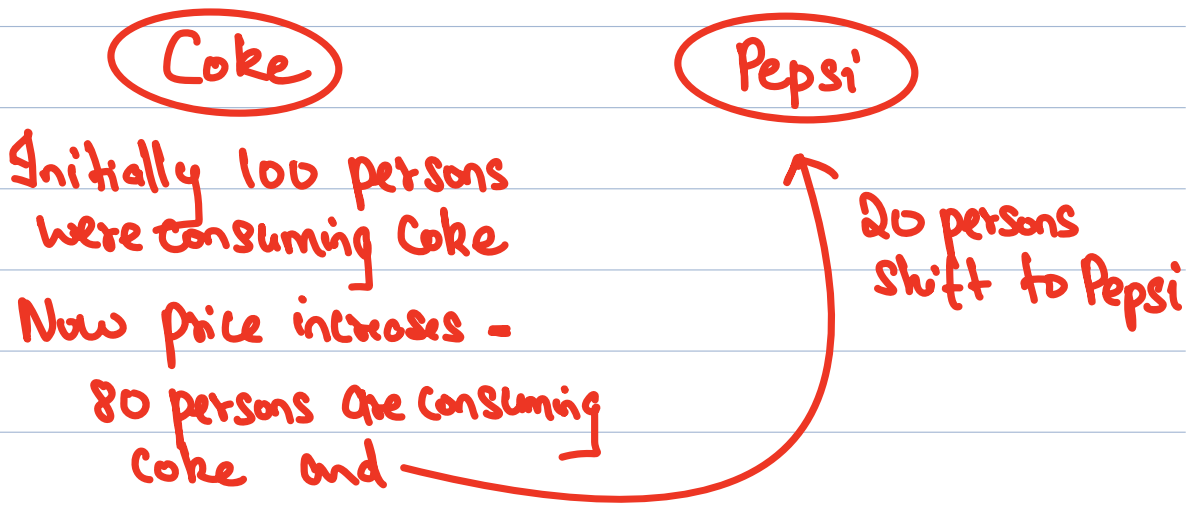
Prof. Alfred Marshall defined the law -
" The qty. demanded increases with a fall in price and diminishes with a rise in price."

It is a qualitative statement.

Rationale of the law of demand

(i) Price effect of a fall in price

(a) Substitution effect



(b) Income effect

Income / month → ₹ 40,000

monthly amt. allocated for Rice → ₹ 300

April month: Price of Rice / kg → ₹ 25 / kg

$$\text{Qty. demanded} = \frac{300}{25} = 12 \text{ kg}$$

May month: Price of Rice / kg → ₹ 30 / kg

$$\text{Qty. demanded} = \frac{300}{30} = 10 \text{ kg}$$

Because of increase in price of Rice, qty. demanded falls.

NOTE: At the time of inflation, purchasing power of money decreases.

Actual income → Const. (Nominal terms)

Real income → decreases (Real terms)

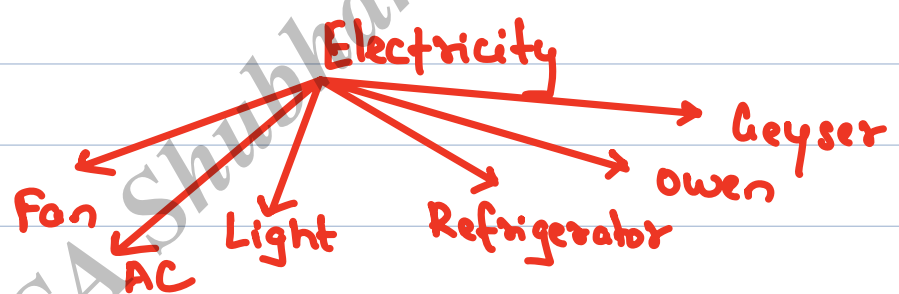
ii) Arrival of new Consumer

Earlier when price was high some people were not able to purchase that commodity. But now as price falls those people who were not able to purchase it earlier can now purchase it.

Price ↓ Qty. demanded ↑

iii) Different uses

e.g.



Electricity charges/unit → decreases

Consumption of electricity → increases

[Earlier we were using electricity for Fan, light, refrigerator only but now as charges/unit decreases we start using it for geyser, AC & owen also)

iv) Utility maximising behaviour of Consumers

No. of units	(TU) Total utility	(MU) Marginal utility
1	10 utils	10 utils
2	18 utils	8 utils
3	25 utils	7 utils
4	30 utils	5 utils

Consumption ↑, MU ↓

[Law of diminishing marginal utility]

No. of units	Price/unit	Amt. ready to pay	Consumer surplus	Total
1	10	12	2	2
2	10	11.75	1.75	3.75
3	10	11.25	1.25	5
4	10	10.75	0.75	5.75
5	10	10	0	5.75
6	10	9.75	-0.25	5.50

Consumer surplus = Amt. ready to pay − Amt. actually paid

A consumer is in equilibrium when marginal utility is equal to it's price [i.e. when total Consumer Surplus is maximum]

Exceptions to the law of Demand

(i) Demand for necessaries

e.g. Salt, water, cooking oil etc.

P(↑ ↓) Qd (const.)

(ii) Giffen Goods

Before price increase { Mon-Sat → Bread
Sunday → Meat

Price of bread ↑

Mon-Sat → Bread

Sunday → Bread

Price of bread ↑ Qd of bread ↑

NOTE: All Giffen goods are inferior goods but all inferior goods are not Giffen goods

Giffen goods → goods having direct relationship blw price and qty. demanded

(iii) Speculative Goods

e.g. Stock market

Reliance Industries Limited (RIL)

Stock price ↑ Demand for RIL Stocks ↑

Stock price ↓ Demand for RIL Stocks ↓

(iv) Future expectations about price

Mr. X
Price ↑ in future

Current ₹30/kg

Future ₹35/kg

Demand ↑ (pre-poned)

Mr. Y
price ↓ in future

Current ₹30/kg

Future ₹27/kg

Demand ↓ (post-poned)

(v) Incomplete information and irrational behaviour

Mr. X

no knowledge of price prevailing in market

₹25/kg (prevailing price)

But he purchased goods at price of ₹30/kg

(vi) Conspicuous Goods (Veblen effect)

Prestige goods like Diamond, Expensive cars, precious stones etc.

Price ↑ Demand ↑

(since here utility is attached to it's value)

(vii) Conspicuous necessities (have become necessaries bcoz of it's constant usage)

The demand for goods is affected by the demonstration effect of the consumption pattern of a social groups to which an individual belongs.

e.g. Refrigerator, two-wheeler, television, Smartphones etc.

Demand function

$$Q_x = f(P_x, P_r, M, \ldots)$$

where Q_x = Qty. demanded of commodity X } dependent variable

P_x = Price of commodity X

P_r = Price of related goods } independent variable

M = Income level

e.g. $Q_x = 100 - 2P_x$

Here, Q_x depends only on P_x (assuming other factors remains const.)

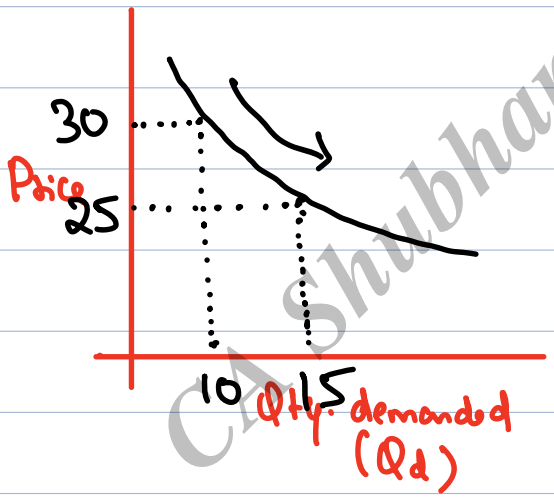
[slope is negative bcoz of inverse relationship blw price and qty. demanded]

Demand Schedule (Individual)

Commodity - Apple | **Individual → Raj**

Price / kg	Demand (in kgs)
150	0
120	3
100	5
90	6

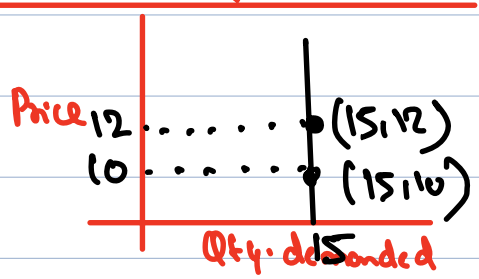
Demand Curve (Individual)



- downward sloping
- Slope of demand curve is negative.

NOTE: Demand curve can be linear (straight - line) or it can be curvilinear.

Demand curve for necessaries



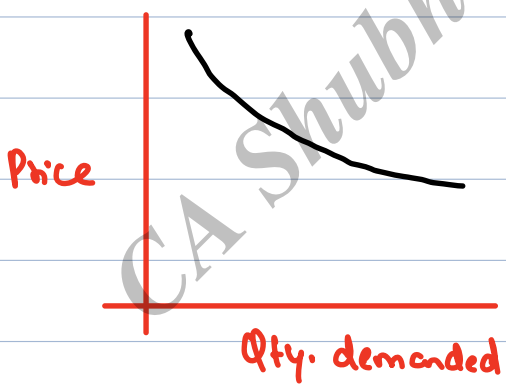
Slope = ∞

Market Demand Schedule

Commodity → Apple Market → consist of only two persons Raj & Simran

Price/kg	Raj (Demand)		Simran (Demand)		Mkt. Demand
150	0	+	0	=	0
120	3	+	4	=	7
100	5	+	6	=	11
90	6	+	7	=	13

Market Demand Curve



- market demand curve downward sloping
- Slope = -ve

NOTE : For preparing mkt. demand curve we will have to horizontally add all the individual demand curve.

Expansion & Contraction of Demand

Price of commodity → change
(other factors remains constant)

Price/kg	Qty. demanded (in kgs)
30	100
25	125

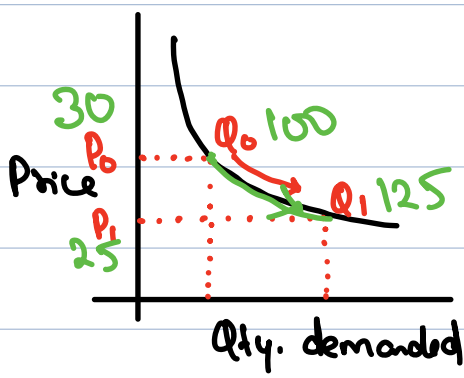
P ↓, Qd ↑

It is an example of Expansion of Demand

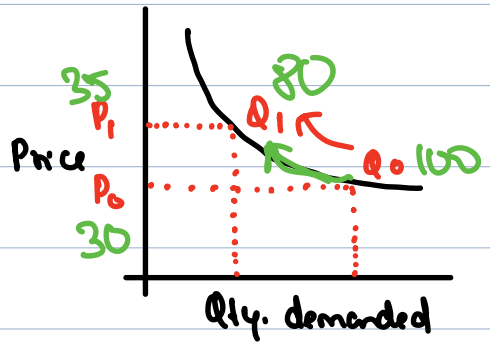
Price/kg	Qty. demanded (in kgs)
30	100
35	80

P ↑, Qd ↓

It is an example of contraction of demand.



Expansion of demand
↓
downward movement
along the demand curve



Contraction of demand
↓
Upward movement along the demand curve

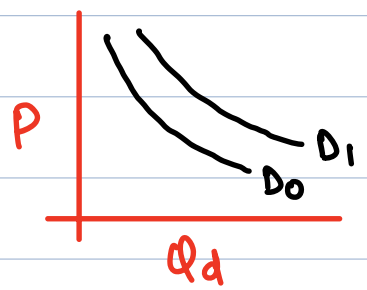
Increase & Decrease in Demand

Price of commodity → Const.
other factors → change

Increase in Demand → Demand curve will shift to the right.

Decrease in Demand → Demand curve will shift to the left.

e.g.

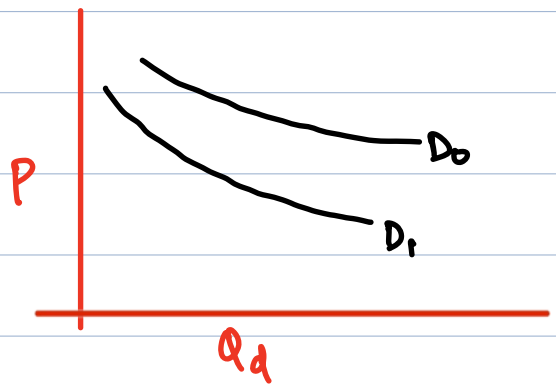


I ↑ , Q_d ↑

Here, demand curve will shift to the right bcoz of increase in income level

D_0 → demand curve before increase in income level
D_1 → demand curve after increase in income level

e.g



Commodity → Coke
Substitute → Pepsi

Pepsi (P↓), Coke (Q_d ↓)

demand curve of coke will shift to left bcoz of decrease in price of Pepsi.

D_0 → initial demand curve

D_1 → demand curve after decrease in price of substitute

Elasticity of demand (e_d)

$$\frac{\%\text{ change in qty. demanded}}{\%\text{ change in determinant}}$$

1) Price elasticity of demand

$$\frac{\%\text{ change in qty. demanded of commodity}}{\%\text{ change in price of commodity}}$$

e.g

	Price / bottle	Demand
Fanta	₹ 50	400
	₹ 60 (+20%)	360 (-10%)

$$e_d = \frac{-10\%}{20\%} = -0.5$$

Here, **-ve sign** denotes inverse relationship blw price and qty. demanded.

And **0.5** denotes % change in qty. demanded is 0.5 time the % change in price.

For normal goods,

price elasticity of demand = -ve

For necessaries,

price elasticity of demand is very close to zero.

For Giffen goods,

price elasticity of demand = +ve

Ignoring -ve sign of e_d -

- $e_d = 0 \Rightarrow$ perfectly inelastic (e.g. → salt, water etc.)
- $0 < e_d < 1 \Rightarrow$ inelastic (e.g. → essential goods)
- $e_d = 1 \Rightarrow$ unitary elastic

- $e_d > 1 \Rightarrow$ elastic (e.g. → electronic gadgets)
- $e_d = \infty \Rightarrow$ perfectly elastic (e.g. → goods whose mkt. is perfectly competitive)

Price elasticity of demand = $\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

where ΔQ = change in qty. demanded
ΔP = change in price
P = initial price
Q = initial qty. demanded

2) Cross price elasticity of demand

$$\frac{\text{\% change in qty. demanded of commodity}}{\text{\% change in price of related commodity}}$$

NOTE: Cross price elasticity of demand of complementary goods is negative and that for substitutes is positive.

NOTE: Cross price elasticity of demand of uncorrelated goods is zero (0).

e.g.

Ink Pen (P)	50	60 (+20%)
Ink bottles (Qd)	100	70 (-30%)

Cross price elasticity of demand for ink bottles

$$= \frac{-30\%}{+20\%}$$

$$= -1.5$$

$$\text{Cross price elasticity of demand} = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

where ΔQ_x = Change in qty. demanded of 'x'

ΔP_y = Change in price of related commodity 'y'

P_y = initial price of related commodity 'y'

Q_x = initial qty. demanded of 'x'

3) **Income elasticity of demand**

$$\frac{\%\text{ change in qty. demanded of commodity}}{\%\text{ change in income level of consumer}}$$

Type of Goods	Income elasticity of demand
i) Normal Goods	+ve
ii) Inferior Goods	-ve
iii) Luxuries	highly +ve (>1)
iv) normal essential goods	low (<1)
v) necessaries	close to zero

Income elasticity of demand

$$= \frac{\Delta Q}{\Delta I} \times \frac{I}{Q}$$

where ΔQ = change in qty. demanded

ΔI = change in income level

I = initial income level

Q = initial qty. demanded

Arc elasticity

- Price elasticity of demand = $\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

  here P = avg. price
  Q = avg. qty.

- Cross price elasticity of demand = $\frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$

  here P_y = avg. price of commodity Y
  Q_x = avg. qty. demanded of commodity X

- Income elasticity of demand = $\frac{\Delta Q}{\Delta I} \times \frac{I}{Q}$

  here I = avg. income level
  Q = avg. qty. demanded

Promotional elasticity of demand (Advt. expenditure)

$$= \frac{\%\text{ change in qty. demanded}}{\%\text{ change in advt. expenditure}}$$

$$= \frac{\Delta Q}{\Delta A} \times \frac{A}{Q}$$

here ΔQ = change in qty. demanded

ΔA = change in advt. expenditure

A = initial advt. expenditure

Q = initial qty. demanded

Promotional elasticity of demand

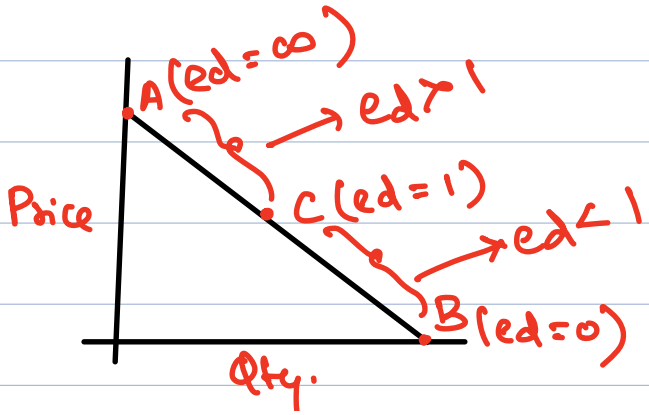
(Arc Elasticity method)

$$= \frac{\Delta Q}{\Delta A} \times \frac{A}{Q}$$

here A = avg. advt. expenditure

Q = avg. qty. demanded

Measurement of elasticity on a linear demand Curve



Ed at any point

$$= \frac{\text{lower segment}}{\text{upper segment}}$$

Point elasticity

- Used when % change in price is infinitesimally small (very very small)
- Price elasticity of demand = $-\frac{dq}{dp} \times \frac{p}{q}$

e.g.

$q = 80 - 3p$

Find price elasticity of demand at $p = 15$.

$$\frac{dq}{dp} = \frac{d}{dp}(80 - 3p) = -3$$

At $p = 15$,

$$q = 80 - 3(15) = 35$$

$$e_d = -\frac{dq}{dp} \times \frac{p}{q}$$

$$= -(-3) \times \frac{15}{35}$$

$$= 1.285$$

Total outlay method for calculating price elasticity

e_d → inelastic

P ↓ Total outlay ↓
P ↑ Total outlay ↑

direct relation

e_d → elastic

P ↓ Total outlay ↑
P ↑ Total outlay ↓

inverse relation

e_d → unitary elastic

P (↑↓) Total outlay (remains same)

[The above summary applies in case of Total Revenue also]

Total Revenue

Total Revenue = Price/unit × No. of units sold

Price effect (No. of units sold = const.)

P ↑ TR ↑
P ↓ TR ↓

Qty. effect (Price = const.)

No. of units Sold ↑ TR ↑

No. of units Sold ↓ TR ↓

Important points

1) more the no. of substitutes, greater will be the price elasticity of demand

2) more the no. of substitutes, lower will be the cross price elasticity of demand.

3) more the no. of uses of commodity, greater will be the price elasticity of demand

4) If the product has major portion in household's budget then the price elasticity of demand for that product is greater.

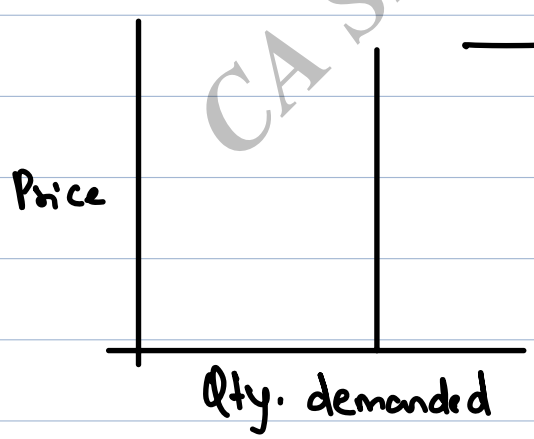
5) • perfect substitutes → Cross-price elasticity b/w them is infinite.

- close substitutes → cross-price elasticity will be positive and large.

- not close substitutes → cross-price elasticity will be positive and small.

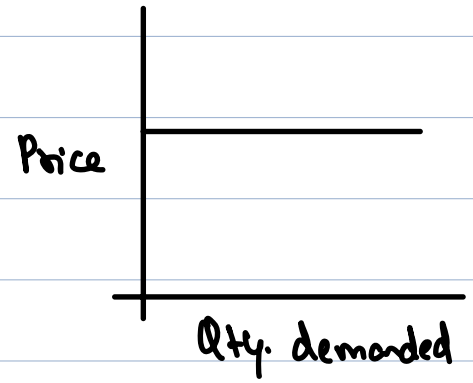
6) habitual consumer of a commodity then demand for the commodity will be inelastic.

7) Demand for cheap, complementary items to be used together with a costlier product generally have an inelastic demand.

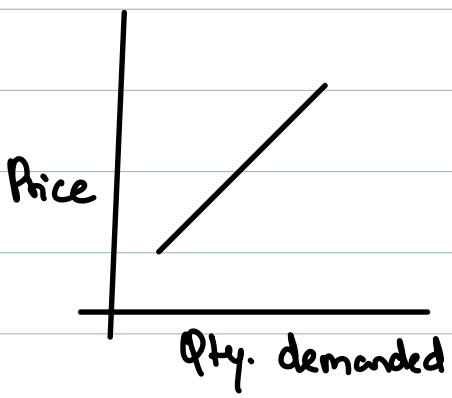
8) 

→ Demand curve for necessaries

- $e_d = 0$ (perfectly inelastic)
- slope = ∞

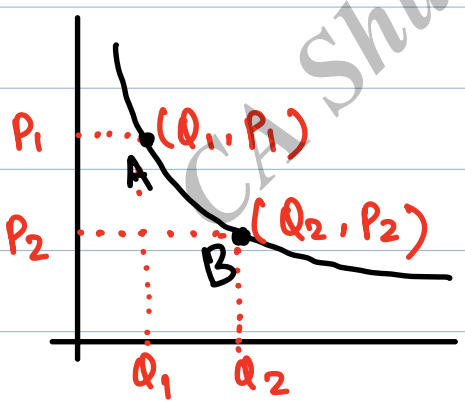


- $e_d = \infty$ (perfectly elastic)
- Slope = 0



→ Demand curve for Giffen goods

- upward sloping
- slope = +ve



- $P_1Q_1 = P_2Q_2 = \ldots$

  then $e_d = 1$ (unitary elastic)
- Shape of demand curve is rectangular hyperbola.

e.g. $e_d = 1$

	Price	Qty.	$50 \times ? = 1200$
			$? = 24$
Initial	30	40	1200
Final	50	?	1200

Unit 3 : Law of Supply & Elasticity of Supply

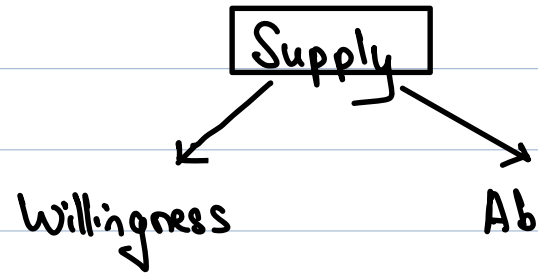
Meaning of Supply

Supply refers to quantity that supplier wishes to supply at a particular price over a period of time.

ex-ante → planned (Supply / Demand) ✓

ex-post → Actual ✗

Supply is a flow variable.



Price ↑ Supply ↑ [Direct relationship blw price and qty. supplied]
Price ↓ Supply ↓

Determinants of Supply

i) Price of the commodity $\begin{bmatrix} P\uparrow, Q_s\uparrow \\ P\downarrow, Q_s\downarrow \end{bmatrix}$

ii) Price of related goods

e.g. Farmer can cultivate both rice & wheat.

Wheat → shift to → Rice

Supply of wheat ↓ P ↑

iii) Price of factors of production

land, labour, capital } Price ↑ → cost ↑, supply ↓

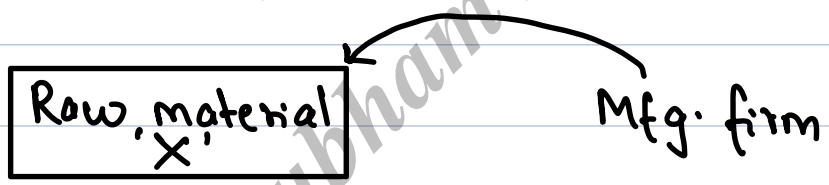
land, labour, capital } Price ↓ → cost ↓, supply ↑

Price of land ↑ then it will affect more on the production of pulses (like wheat) and less effect on the production of smartphones.

iv) State of technology

Technology ↑ → Supply ↑

v) Govt. policy



Tax rate 5%.

↳ Tax rate 8% → Cost of raw materials ↑
(Irrecoverable tax) Supply ↓

tax rate on raw materials ↑, Supply ↓
Subsidies ↑, Supply ↑

vi) No. of sellers [No. of sellers ↑, Supply ↑
no. of sellers ↓, Supply ↓]

vii) Nature of competition & Size of industry

e.g.

2 market structures

Monopoly & oligopoly

Supply will be more in oligopoly as there will be more no. of sellers in oligopoly mkt. structure as compared to monopoly mkt. structure.

viii) Expectations

Future	Present
Price ↑	Supply ↓
Price ↓	Supply ↑

ix) Other factors

e.g.

labour strikes ↑ , supply ↓

Communal riots ↑ , supply ↓

Infrastructional development ↑ , supply ↑

Law of Supply

If price of the commodity increases then qty. supplied of the commodity also increases and vice-versa.

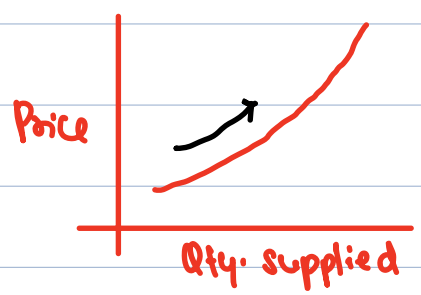
Price ↑	Supply ↑
Price ↓	Supply ↓

[i.e. direct relationship b/w price and qty. supplied]

Supply Schedule (Individual firm)

Price /kg	Qty. supplied (in kgs)
30	600
32	630
35	670
40	700

Supply Curve



- upward sloping
- slope of supply curve = +ve

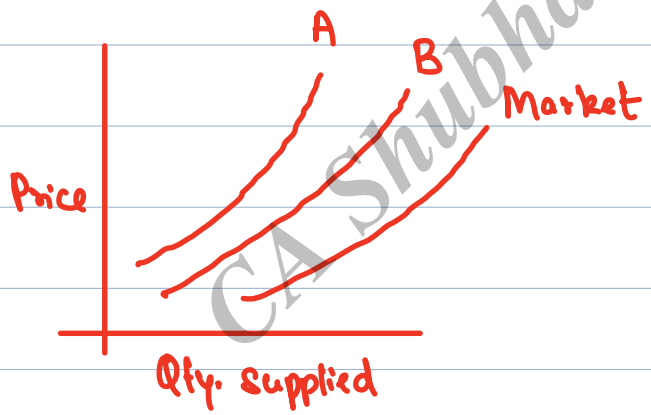
Supply curve can be linear or curvilinear.

Market Supply Schedule

Commodity → Wheat

Market → Individual firms A & B

Price / kg	Firm A Qty. supplied		Firm B Qty. supplied		Market Supply
30	600	+	700	=	1300
32	630	+	720	=	1350
35	670	+	750	=	1420
40	700	+	770	=	1470



Market supply curve

- Upward sloping
- Slope of curve = +ve

For preparing market supply curve we have to horizontally add all the individual firm's supply curve.

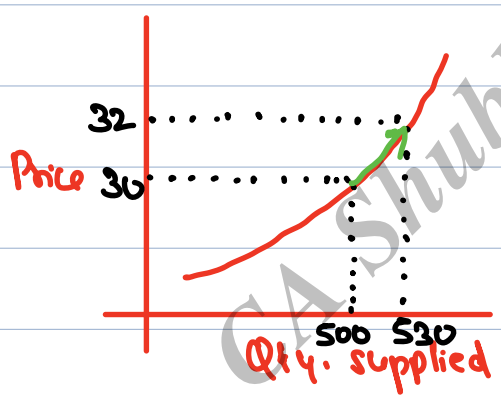
Expansion & Contraction of Supply

Price of commodity → Change
(other factors remains constant)

Price / kg ↓	Qty. supplied
30	500
32	530

P↑ . Qs ↑

It is an example of expansion of supply

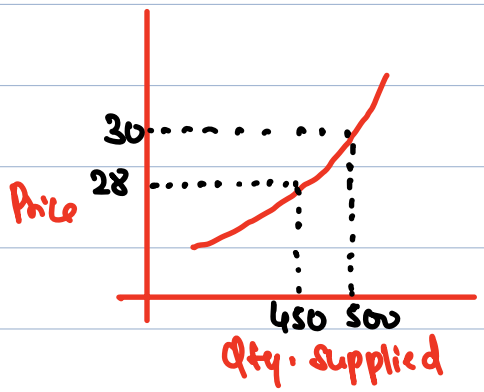


Expansion of supply – upward movement along the supply curve.

Price / kg ↓	Qty. supplied (in kgs)
30	500
28	450

P↓ . Qs ↓

It is an example of contraction of supply.



Contraction of supply -

Downward movement along the supply curve.

5:45 to 6:45

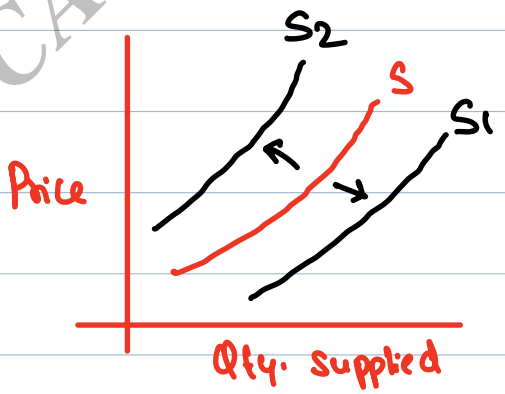
Increase & Decrease in Supply

Price of the commodity → const.

other factors → change

Increase in supply → Rightward shift (S_1)

Decrease in supply → Leftward shift (S_2)



Elasticity of Supply (Price elasticity of supply)

$$= \frac{\% \text{ change in qty. supplied of commodity}}{\% \text{ change in price of commodity}}$$

$$= \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

where ΔQ_s = change in qty. supplied

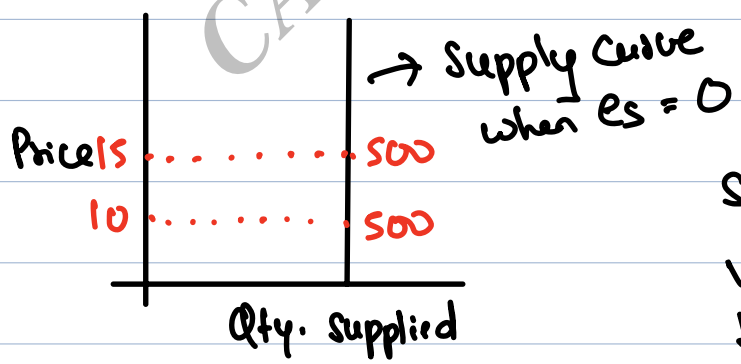
ΔP = change in price

P = initial price

Q_s = initial qty. supplied

- $e_s = 0$ (perfectly inelastic)

  Price ↑↓ , Q_s = const.



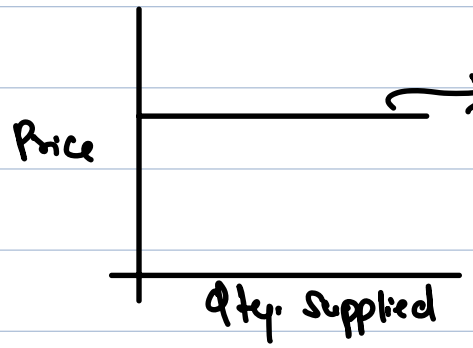
→ Supply curve when $e_s = 0$

Slope of supply curve = ∞

Vertical straight line parallel to Y-axis (Price axis)

- $e_s = \infty$ (perfectly elastic)

  Price → negligible change, Q_s → high change



→ When $e_s = \infty$

Slope = 0

horizontal straight line parallel to X-axis (Qty. supplied axis)

Arc elasticity

$$e_s = \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

where P = avg. price

Q_s = avg. qty. supplied

Relative price

e.g. Commodity A ₹ 20/kg

Commodity B ₹ 10/kg

Relative price of B as compared to A

10 : 20 = 1 : 2

Relative price of A as compared to B

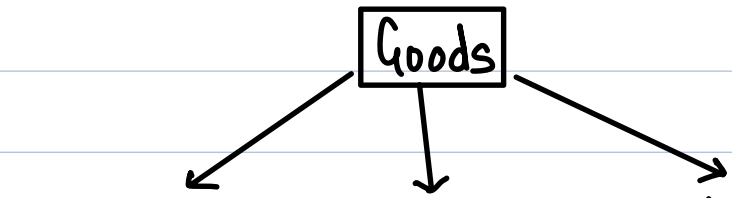
20 : 10 = 2 : 1

Important Points

- Time period ↑ → e_s ↑
- large no. of producers → e_s ↑
- raw materials and inputs → easily and cheaply available → supply will be elastic
- adequate stock available of RM, FG etc. → e_s ↑
- capital and labour can be easily switched → e_s ↑
- labour employed → scarce or requires longer training period → e_s ↓
- production process more complicated → e_s ↓
- Flatter supply curve is more elastic as compared to steeper curve.

Unit 2 : Theory of Consumer Behaviour

Human wants are unlimited but the resources available to satisfy these human wants are limited.



e.g. salt, water, clothing etc.

e.g. two wheelers, fan, cooler etc.

e.g. Car, Air-conditioner, diamond etc.

Comforts lies blw necessaries and luxuries.

Utility

- want satisfying power of a commodity
- utility can be measured as stated by Prof. Alfred Marshall and it's unit of measurement is utils.
- even harmful things like liquor, tobacco etc. may be said to have utility because people want them.
- Concept of utility is ethically neutral.

- utility is a subjective and relative entity and vary from person to person.

Marginal Utility [Marginal Utility Analysis propounded by Alfred Marshall]

Units	Total Utility (TU)	Marginal Utility (MU)
0	0	0
1	75	75
2	140	65
3	190	50
4	230	40
5	265	35
6	280	15
7	280	0
8	270	-10

Observations

- as we consume more and more of a commodity, total utility (TU) rises but at a diminishing rate.
- Marginal utility (MU) falls as additional units are consumed.

- TU starts falling after MU becomes zero.
- MU is either negative, zero or positive.
- TU is maximum when MU is zero.
- Slope of TU curve = MU at that point

Assumptions for MU Analysis

i) Utility is quantifiable and is measured in utils.

ii) Consumer is rational (i.e. he has all the available market information and his objective is to maximise his utility)

iii) Marginal utility of money is constant.

iv) Money is the measuring rod of utility.

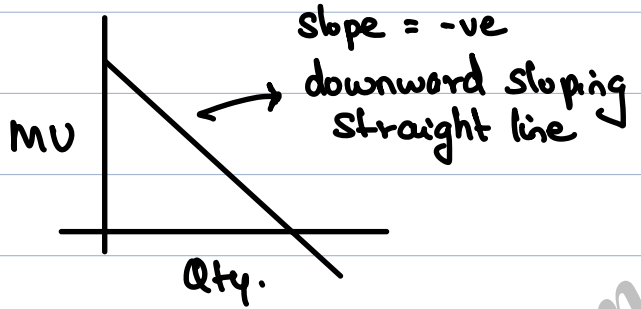
v) Goods are unrelated

vi) Continuous Consumption

viii) goods to be consumed should be homogenous or identical in nature.

viii) Standard units

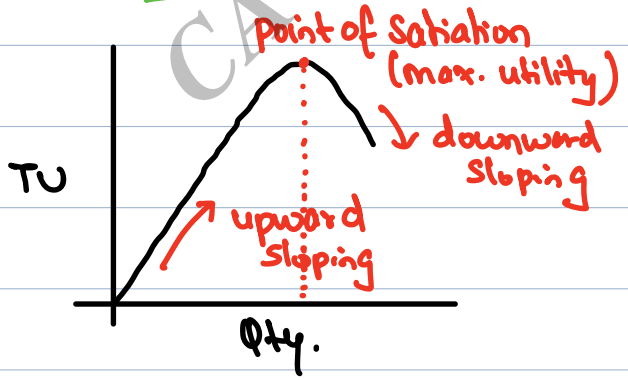
Marginal Utility Curve



Area under the marginal utility curve gives total utility

MU curve can be either straight line or curvilinear.

Total Utility Curve



At any point - Slope of TU curve = marginal utility

NOTE: For conspicuous goods, TU curve is upward sloping only.

Limitations of law of diminishing marginal utility

i) MU of money is ~~Constant~~
(infact MU of money is increasing)

ii) goods are ~~unrelated~~
(infact goods can be related)

iii) Prestige goods / Veblen goods do not follow law of DMU because here utility is attached to it's value. (Same thing applies for money, power, hobbies etc.)

Consumer Surplus

Consumer surplus = Amt. ready to pay − Amt. actually paid

No. of units	Price/unit	Amt. ready to pay	Consumer surplus	Total
1	10	12	2	2
2	10	11.75	1.75	3.75
3	10	11.25	1.25	5
4	10	10.75	0.75	5.75

5 ✓	10	10	0	5.75
6	10	9.75	-0.25	5.50

→ Total consumer surplus is maximised when marginal utility (amt. ready to pay for additional unit) is equal to price/unit.

→ decrease in consumer surplus → increase in revenue

increase in consumer surplus → decrease in revenue

(i.e. in direct relationship blw consumer surplus and revenue)

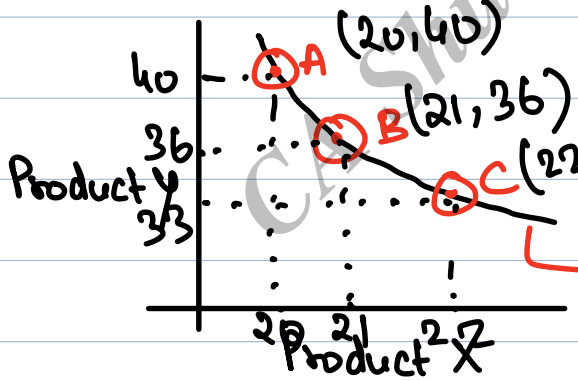
Ordinal Concept of Utility

Utility cannot be quantified but utility derived from consumption of different products can be compared.

e.g. Bitter gourd < Ice-cream

Indifference Curve [Indifference curve analysis propounded by Hicks & Allen]

locus of all the points having the same amount of utility.



at all points (A, B and C) same utility is derived.

→ Indifference Curve

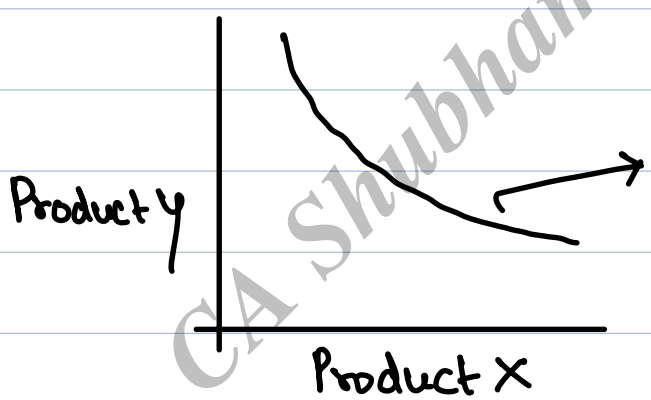
$U_A = U_B = U_C$

Product X		Product Y	
	20		
1	21	4	40
			36
1	22	3	33
1	23	2	31

$\frac{36-40}{21-20} = -4$

$\frac{33-36}{22-21} = -3$

Marginal rate of substitution of product Y over product X [for 1 unit increase in product X how much units of product Y you are ready to sacrifice]



Indifference Curve

Slope of IC = MRS of Y over X

MRS of Y over X = $\frac{\Delta Y}{\Delta X}$ or $\frac{MU_X}{MU_Y}$

NOTE: When we are moving upward or downward along the IC, utility remains constant.

Product X		Product Y		ARS of Y over X
	15	30		
2			5	5/2 = 2.5
	17	25		
3			5	5/3 = 1.67
	20	20		
2			1	1/2 = 0.5
	22	19		

NOTE: When we are moving downward along the IC then both MRS & ARS of Y over X decreases.

NOTE: IC is also called Iso-utility curve / Equal Utility Curve

Characteristics of IC

- IC is downward sloping.
- Both MRS & ARS of y over X falls as we move downward along the IC.
- IC curve is convex to the origin.
- Higher the IC, more will be the utility.
- Two IC's cannot intersect each other.
- Slope of IC = MRS of y over X

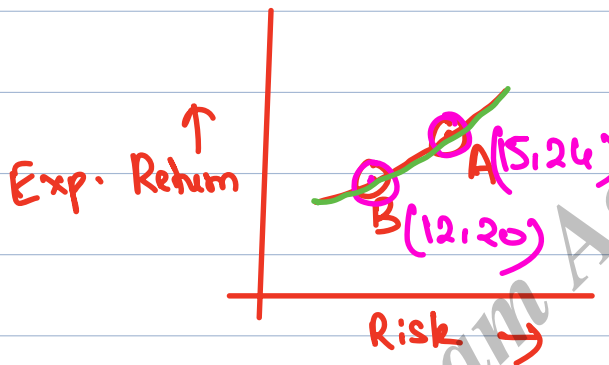
$$= \frac{\Delta y}{\Delta x} \text{ or } \frac{MU_x}{MU_y}$$

Exceptions to Indifference Curve

i)

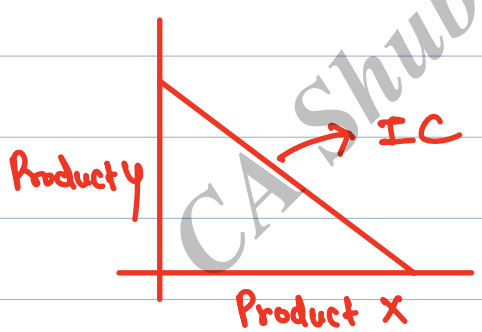
	Stock A	Stock B
Risk	15%	12%
Expected Return	24%	20%
Actual Return	18%	18%

(15, 24) (12, 20) 1000



IC is upward sloping in case of speculative goods.

ii)

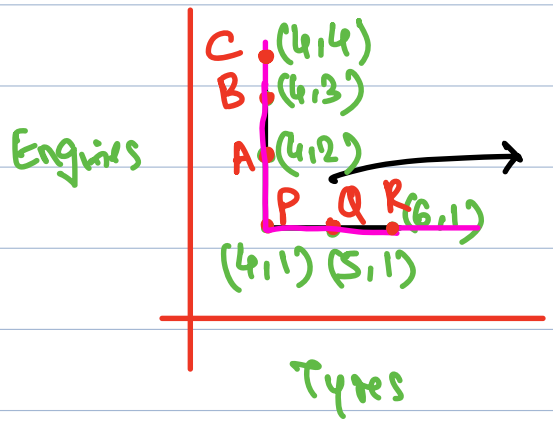


X & Y are perfect substitutes.
(IC is downward sloping straight line)

Product X		Product Y
20	27-30 = -3	30
21	21-20	27] 3
22	24-27 = -3	24] 3
23	22-24	21] 3

In case of perfect substitutes, MRS of Y over X is constant.

In case of perfect complementary goods, IC is L-shaped.



L-shaped IC for perfect complementary goods.

Budget line

	Product x	Product y
Price	P_x	P_y
Qty.	x	y

Money income level of consumer → M

$$M = x P_x + y P_y$$

$$y P_y = -x P_x + M$$

$$y = -\frac{x P_x + M}{P_y}$$

$$y = \left(-\frac{P_x}{P_y}\right)x + \frac{M}{P_y}$$

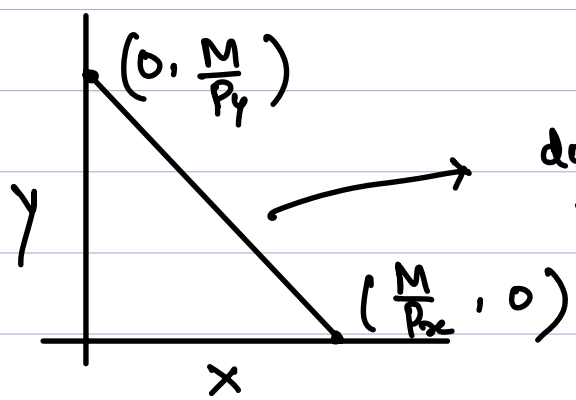
Comparing it with $y = mx + c$

$$\text{Slope} = -\frac{P_x}{P_y}$$ (slope of budget line is -ve)

$$y\text{-intercept} = \frac{M}{P_y}$$

If $y = 0$
then $M = xP_x$
$\therefore x = \frac{M}{P_x}$

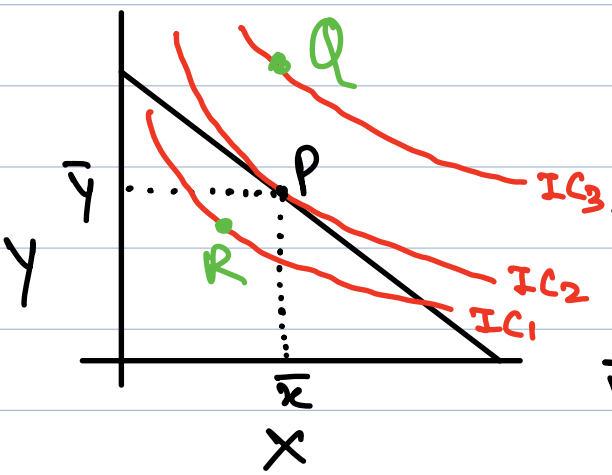
If $x = 0$
then $M = yP_y$
$\therefore y = \frac{M}{P_y}$



Slope = $-\frac{P_x}{P_y}$

downward sloping Straight line

Consumer equilibrium will occur at the point when the IC is tangent to the budget line.



P = point of equilibrium
$\bar{x}$ = equilibrium qty. of product X
$\bar{y}$ = equilibrium qty. of product Y

At point of equilibrium (point P) -
Slope of budget line = Slope of IC

$$\frac{P_x}{P_y} = \frac{MU_x}{MU_y}$$

$$\boxed{\frac{MU_x}{P_x} = \frac{MU_y}{P_y}}$$ → law of equi-marginal utility

Important Points

- Demand curve shift to the right and supply curve is unchanged then -
  eq. qty. & eq. price increases.

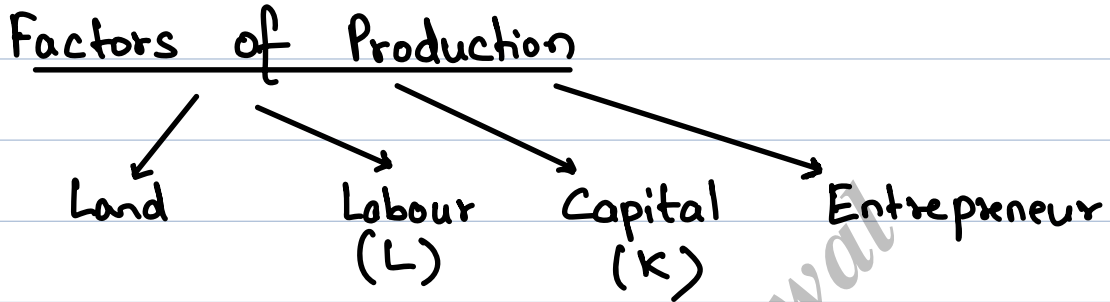
- Demand curve shift to the left and supply curve is unchanged then -
  eq. qty. & eq. price decreases.

- Supply curve shift to the right and demand curve is unchanged then -
  eq. qty. ↑ and eq. price ↓

- Supply curve shift to the left and demand curve is unchanged then -
  eq. qty. ↓ and eq. price ↑

Theory of Production & Cost

Unit 1 : Theory of Production



Short Run → Law of variable proportion
Long Run → Returns to scale

Long Run (Returns to Scale)

In long run all factors of production can be changed but condition here is that there should be same % change in all factors of production.

e.g

	L	K
Initial	1000	100 lakhs
Final	1100 (+10%)	110 lakhs (+10%)

Increasing Returns to Scale

% change in qty. produced > % change in factors of production

e.g.

	L	K	Qty.
Initial	100	100 lakhs	4000 units
Final	105	105 lakhs	4400 units

% change in factors of production (inputs) = 5%.

% change in qty. produced (output) = 10%.

Constant Returns to Scale

% change in qty. produced = % change in factors of production

e.g.

	L	K	Qty.
Initial	100	100 lakhs	4000 units
Final	105	105 lakhs	4200 units

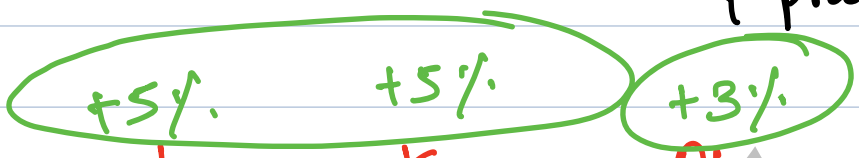
% change in inputs = 5%.

% change in output = 5%.

Decreasing Returns to Scale

% change in qty. produced < % change in factors of production

e.g.



	L	K	Qty.
Initial	100	100 lakhs	4000 units
Final	105	105 lakhs	4120 units

% change in inputs = 5%.

% change in output = 3%.

Cobb - Douglas Production function

$$\text{Qty. Produced } (Q) = f(L, K)$$

$$Q = C L^a K^b$$

Where Q = output

C = constant

L = labour employed

K = amt. of capital

e.g. $Q = 40 L^{0.3} K^{0.7}$

$L^{0.3}$ → if labour changes by 1%. then % change in qty. produced is 0.3%.

$K^{0.7}$ → if capital changes by 1%. then % change in qty. produced is 0.7%.

Total % change in qty. produced
= 0.3% + 0.7%
= 1%.

Thus, the above production function exhibits Constant returns to scale.

V.V Imp

Addition of Power i.e. a+b

= 1 ⇒ Constant returns to scale
> 1 ⇒ increasing returns to scale
< 1 ⇒ decreasing returns to scale

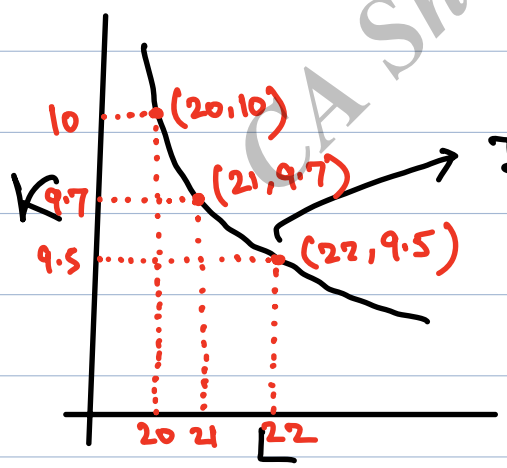
Isoquant

locus of all the points having same amt. of qty. produced (same level of output)

e.g. (x-axis) (y-axis)

L	K (in lakhs)	Q	MRTS (in lakhs)
20	10	500	$\frac{9.7-10}{21-20} = -0.3$
21	9.7	500	$\frac{9.5-9.7}{22-21} = -0.2$
22	9.5	500	$\frac{9.4-9.5}{23-22} = -0.1$
23	9.4	500	

MRTS = marginal rate of technical substitution



$\frac{9.7-10}{21-20} = (-)0.3$

$\frac{9.5-9.7}{22-21} = (-)0.2$

- downward sloping (∵ slope is -ve)
- Slope = MRTS of K over L

Characteristics of Isoquant

- Higher the isoquant, more will be the level of output.
- Convex to the origin
- Two isoquants cannot intersect each other.
- Slope = MRTS of K over L
  $= \frac{\Delta K}{\Delta L}$ or $\frac{MP_L}{MP_K}$
- As we move downward along the isoquant, Slope decreases

Iso-Cost line

L → w (wages) K → r (rate of interest)

$$C = Lw + Kr$$

10 (L) × 1000 (w) = 10,000

10,00,000 (K) × 10% (r) = 1,00,000

$$Kr = -Lw + C$$

$$K = \frac{-Lw + C}{r}$$

10,000 + 1,00,000

(C) 110,000

$$K = \left(\frac{-w}{r}\right)L + \frac{C}{r}$$

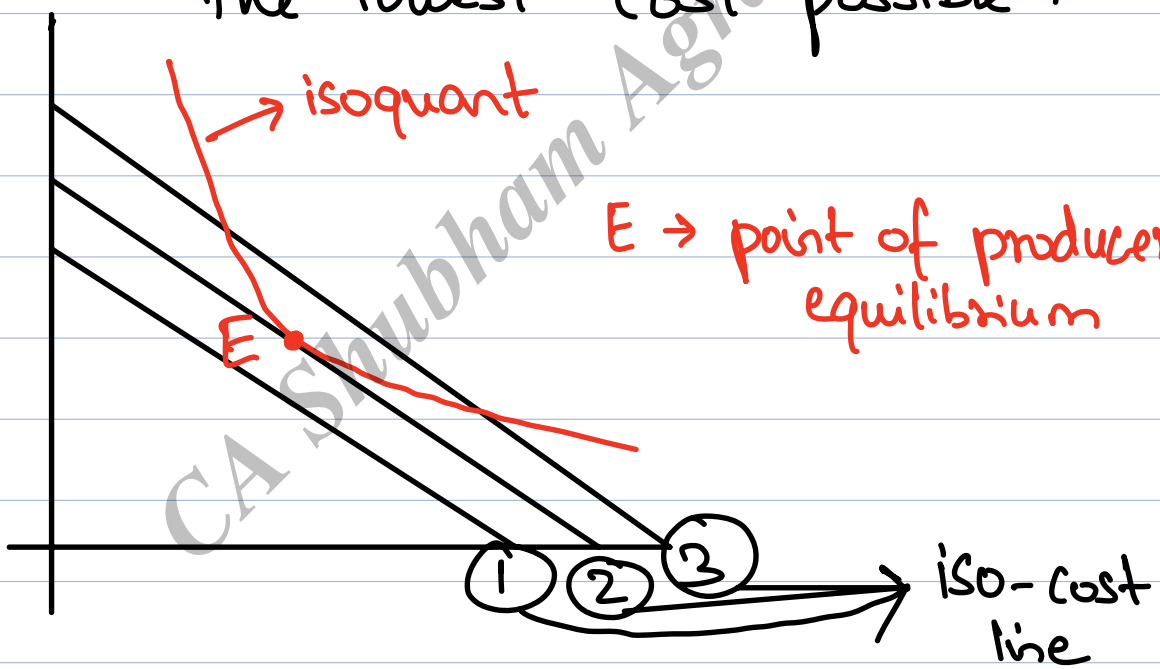
Comparing it with $y = mx + c$

Slope $= -\frac{w}{r}$ (-ve sign indicates downward sloping)

y-intercept $= \frac{C}{r}$

Producer equilibrium occurs at the point of tangency of isoquant and the lowest possible iso-cost line.

NOTE: Every producer/manufacturer wants qty. produced at the lowest cost possible.



At point E -

Slope of isoquant = Slope of iso-cost line

$$\frac{MP_L}{MP_K} = \frac{w}{r}$$

$$\frac{MP_L}{w} = \frac{MP_K}{r}$$

→ law of equi-marginal productivity

Marginal Product & Average Product

(assumed K is constant)

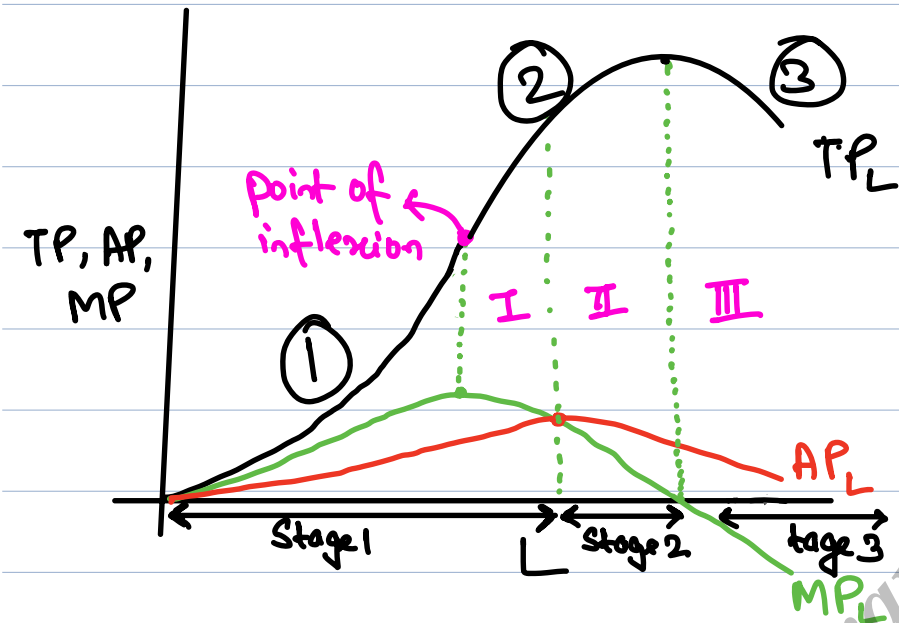
L	TP	MP_L	AP_L
0	0		
1	80	80	$80/1 = 80$
2	180	100	$180/2 = 90$
3	285	105	$285/3 = 95$
4	380	95	$380/4 = 95$
5	450	70	$450/5 = 90$
6	510	60	$510/6 = 85$
7	553	43	$553/7 = 79$
8	584	31	$584/8 = 73$
9	594	10	$594/9 = 66$
10	594	0	$594/10 = 59.4$
11	583	-11	$583/11 = 53$

$$(MP_L)_n = TP_n - TP_{n-1}$$

$$AP_L = \frac{TP}{L}$$

Assumptions for law of variable proportions

- At least one of the factor of production is kept fixed.
- State of technology is assumed to be given and unchanged.
- law does not apply to those scenarios where factors of production must be used in fixed proportions to produce output.
- only physical inputs and outputs are considered and not economic profitability in monetary terms.



V.V IMP

Observations

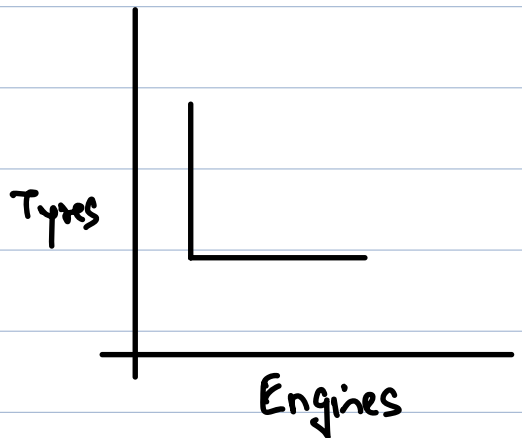
- AP_L and TP_L cannot be negative.
- MP_L can be either -ve, zero or +ve.
- Slope of TP_L = MP_L
- TP_L is maximum when $MP_L = 0$
- AP_L and MP_L meet at the point where AP_L is maximum.
- When AP_L is increasing, MP_L is on the

upper side of AP_L and when AP_L is decreasing, MP_L is on lower side of AP_L.

- When MP_L is increasing and +ve, TP_L increases at an increasing rate.
- When MP_L is decreasing but +ve, TP_L increases but at a diminishing rate.
- MP_L = -ve ⟶ TP_L starts falling

Stage 1 → Increasing Returns
Stage 2 → Decreasing Returns but not -ve
Stage 3 → Negative Returns

Exception to Isoquants



When raw materials are required in fixed proportion to manufacture finished product, shape of isoquant is L-shaped.

Unit 2 : Theory of Cost

Short run

Total Cost = Total Fixed Cost + Total Variable Cost

$$TC = TFC + TVC$$

Dividing both L.H.S & R.H.S by Q,

$$\frac{TC}{Q} = \frac{TFC + TVC}{Q}$$

$$\frac{TC}{Q} = \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$AC = AFC + AVC$$

$$AC = \frac{TC}{Q}$$

$$AFC = \frac{TFC}{Q}$$

$$AVC = \frac{TVC}{Q}$$

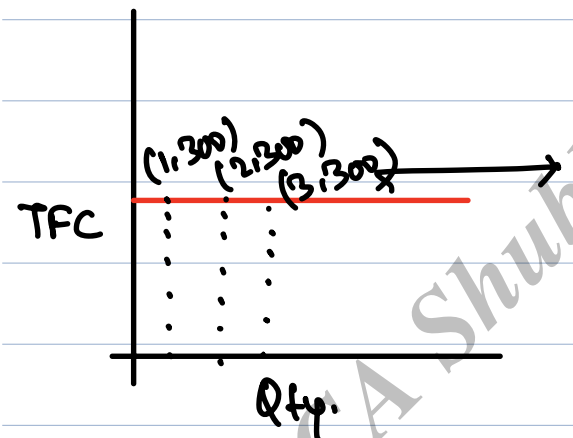
where –

AC = Average Total Cost

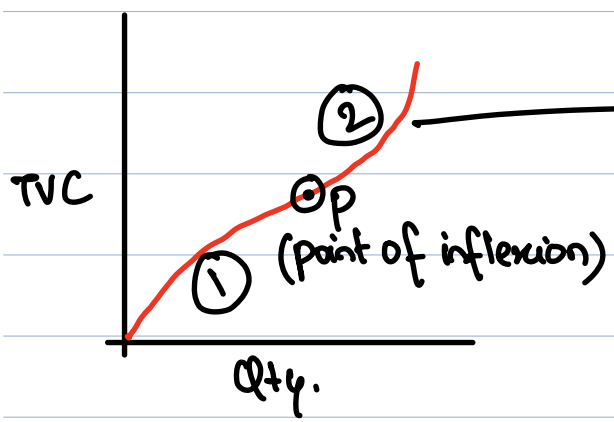
AFC = Average Fixed Cost

AVC = Average Variable Cost

Output level	TVC	TFC	TC	AVC	AFC	AC
0	0	300				
1	40	300				
2	75	300				
3	105	300				
4	145	300				
5	190	300				
6	240	300				



→ Total Fixed Cost curve
- horizontal straight line parallel to X-axis.
- slope = zero

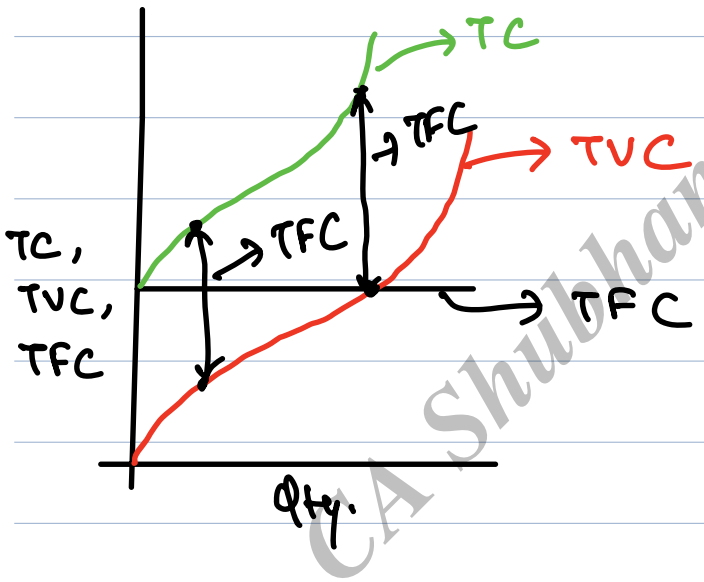


→ Total Variable Cost Curve (elongated S-shaped)

Explanation for elongated S-shaped

- In Stage ①, TP ↑ at an increasing rate and hence TVC ↑ but at decreasing rate.
  (inverse relationship b/w productivity and cost)

- In stage ②, TP ↑ at diminishing rate and hence TVC ↑ but at an increasing rate.



- Total Cost Curve is parallel to Total variable Cost Curve.
  (TC curve ∥ TVC curve)

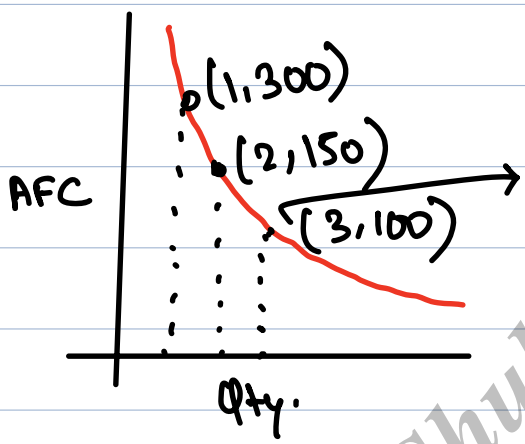
- Total Cost curve starts from the same point from where Total Fixed Cost Curve is starting.

- Slope of TC curve = Slope of TVC curve = Marginal Cost
  (Change in TC by production of additional unit of output)

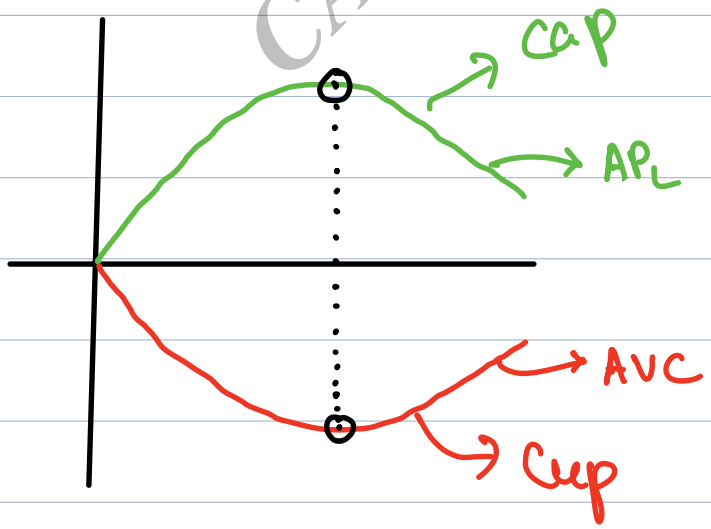
e.g

Output level	TC	MC
0	30	-
1	80	80-30 = 50
2	120	120-80 = 40
3	150	150-120 = 30

- Vertical difference b/w TC & TVC curves = TFC



Average Fixed Cost Curve
(Rectangular Hyperbola)



Cup & Cap

AVC attains minimum value when AP_L attains maximum value.

(bcoz of inverse relation b/w cost and productivity)

$$AP_L = \frac{Q}{L}$$

$$TVC = L \times w$$

$$= \frac{L \times w \times Q}{Q}$$

$$= \frac{w \times Q}{(Q/L)}$$

$$\boxed{TVC = \frac{w \times Q}{AP_L}}$$

$$TVC \propto \frac{1}{AP_L}$$

TVC is inversely proportional to AP_L

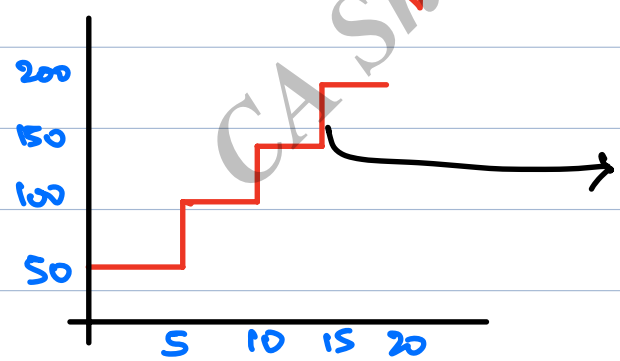
$$AVC = \frac{TVC}{Q}$$

$$= \frac{w \times Q}{\frac{AP_L}{Q}}$$

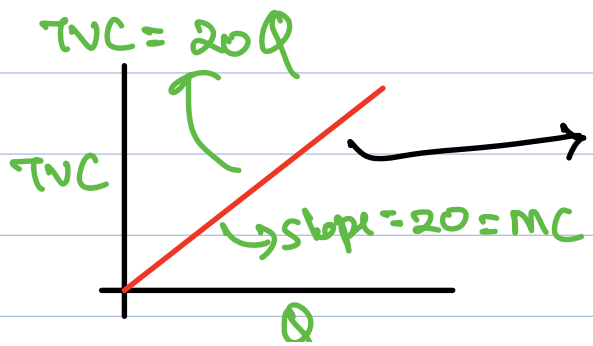
$$= \frac{w \times Q}{Q \times AP_L}$$

$$\boxed{AVC = \frac{w}{AP_L}}$$

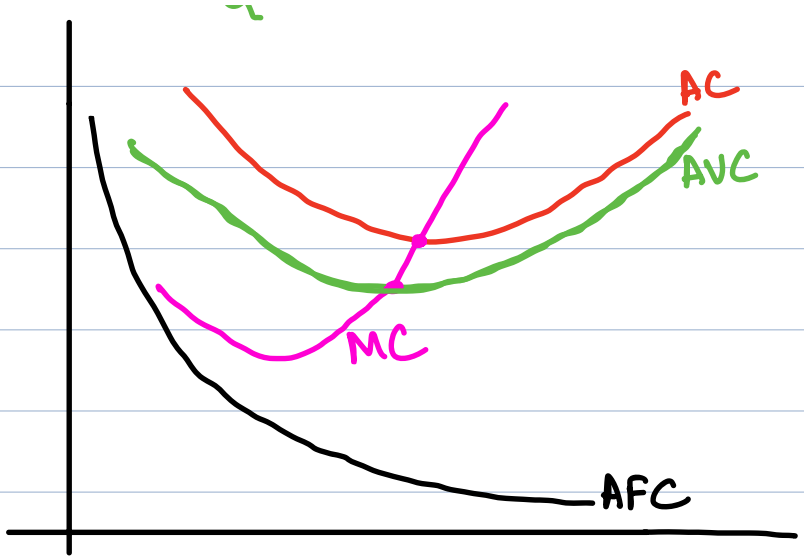
AVC is inversely proportional to AP_L.



→ Semi-variable cost curve (Step-shaped)



if relation blw variable cost and no. of units produced is linear.
Variable Cost curve is straight line passing through origin.



ATC = AVC + AFC

ATC - AVC = AFC

Observations

- AFC curve never intersects X-axis (i.e. it cannot be zero)
- AC and AVC curves never intersect each other. (i.e. at every point AC > AVC)
- Shape of AC & AVC curve ⇒ U-shaped
- MC curve passes through the minimum point of AC curve & AVC curve.
- gap b/w AC curve and AVC curve keeps on decreasing b/coz as output level increases,

AFC decreases.

(AC = AFC + AVC ⇒ AC - AVC = AFC and AFC decreases as output level increases)

- When AC & AVC is decreasing, MC curve lies below AC & AVC curves but when AC & AVC is increasing, MC curve lies above AC & AVC curves.

Long run

Economies of scale

As output level increases, cost/unit decreases

(Production level ↑, cost/unit ↓)

Diseconomies of scale

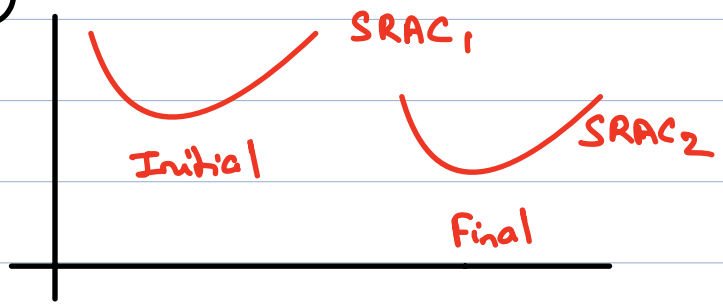
As output level increases, cost/unit increases.

(Production level ↑, cost/unit ↑)

e.g

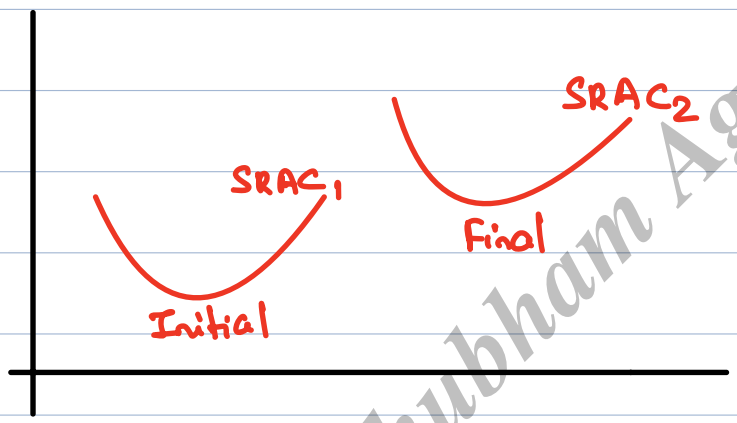
No. of workers	Total wages	Output level	Cost/unit
10 workers	100,000	10,000	₹10/unit
14 workers	140,000	12000	₹11.67/unit

(1)



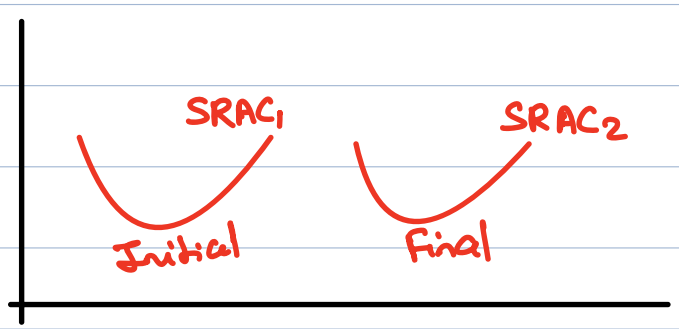
Output level ↑, Cost/unit ↓, Returns ↑
(Increasing Returns to Scale)

(2)



Output level ↑, Cost/unit ↑, Returns ↓
(Decreasing Returns to Scale)

(3)

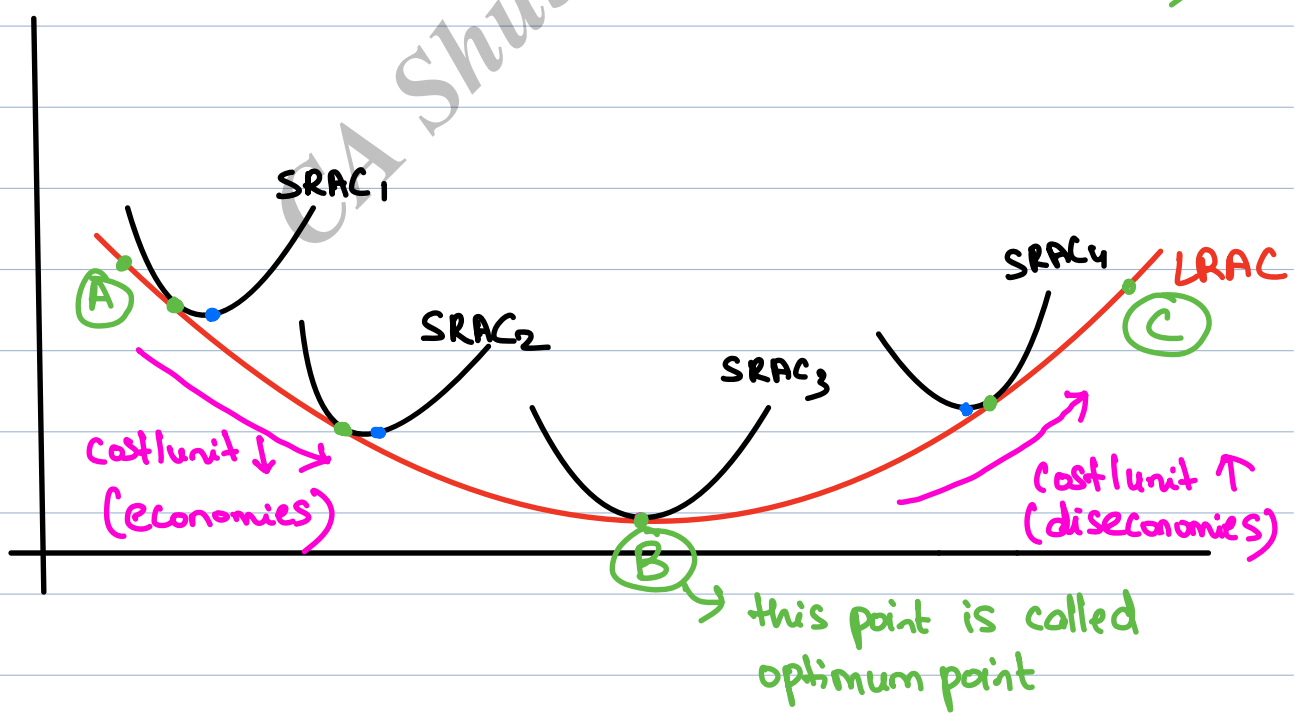


Output level ↑, Cost/unit (Const.), Returns (Const.)
(Constant Returns to Scale)

NOTE Raw material (RM) cost/unit ↓ (₹3) wages cost/unit ↑ (₹2)

- If economies > diseconomies then
  Cost/unit '↓' (decreases) [Increasing Returns to Scale]
- If RM cost/unit ↓ (₹3) economies = wages cost/unit ↑ (₹3) diseconomies then
  Cost/unit '=' (remains constant) [Constant Returns to Scale]
- If RM cost/unit ↓ (₹3) economies < wages cost/unit ↑ (₹4) diseconomies then
  Cost/unit '↑' (increases) [Decreasing Returns to Scale]

Long Run Average Cost Curve (Planning Curve)



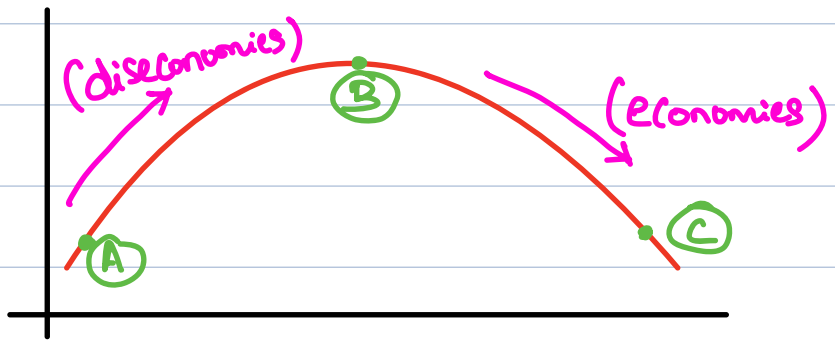
Shape of LRAC curve is **Flattened U-shaped** or **Smile-shaped**.

A to B → cost/unit ↓
(Increasing Returns to Scale)
→ under utilisation of resources

B to C → cost/unit ↑
(Decreasing Returns to Scale)
→ over utilisation of resources

At point B → cost/unit = minimum
(Constant Returns to Scale)
→ optimum utilisation of resources

In case of startups, LRAC curve is dome shaped in initial years.



Inverted Flattened U-shaped

or

Dome-shaped

A to B → cost/unit ↑

(decreasing returns to scale)

B to C → cost/unit ↓

(increasing returns to scale)

Price Determination in Different Markets

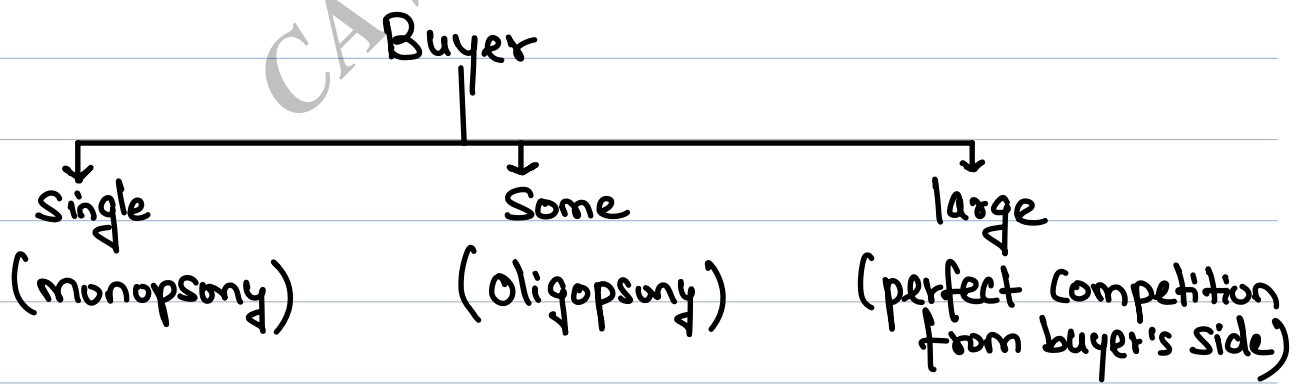
Unit 1 : Meaning and Types of Markets

Meaning / Definition of Market

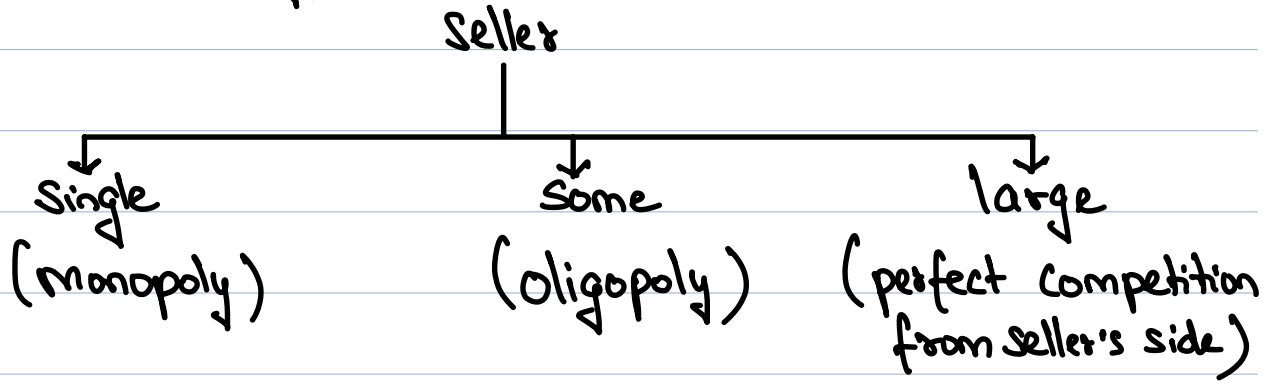
Market is a process or place where buyer and seller interact with each other in order to buy or sell goods / services at an appropriate price.

Elements of Market

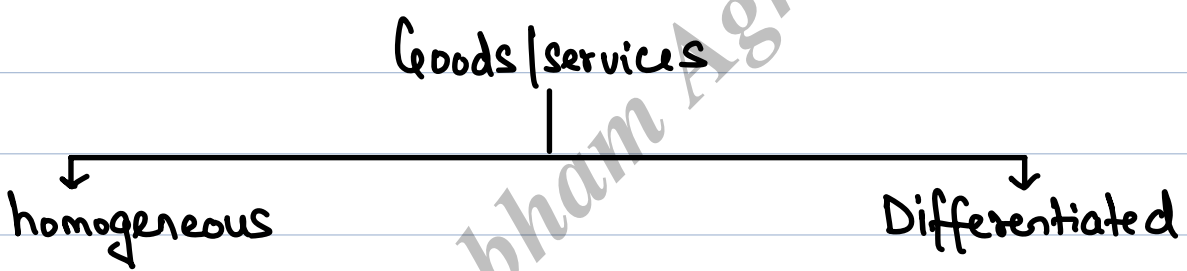
- Buyer (psony)



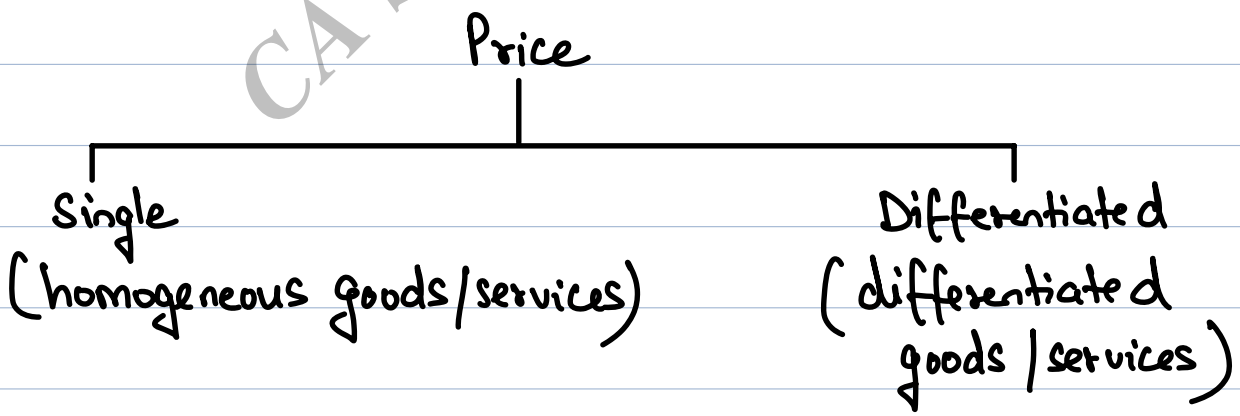
- **Seller (poly)**



- **Goods | services**



- **Price**



- Interaction (Bargaining for a price)

Concept of Total Revenue (TR), Average Revenue (AR) and Marginal Revenue (MR)

$\frac{y_2 - y_1}{x_2 - x_1}$

No. of units sold (Q)	TR	MR	AR
1	70	70	70/1 = 70
2	130	60	130/2 = 65
3	180	50	180/3 = 60
4	220	40	220/4 = 55
5	250	30	250/5 = 50

$MR_n = TR_n - TR_{n-1}$

$AR = \frac{TR}{\text{no. of units sold}} = \frac{TR}{Q}$

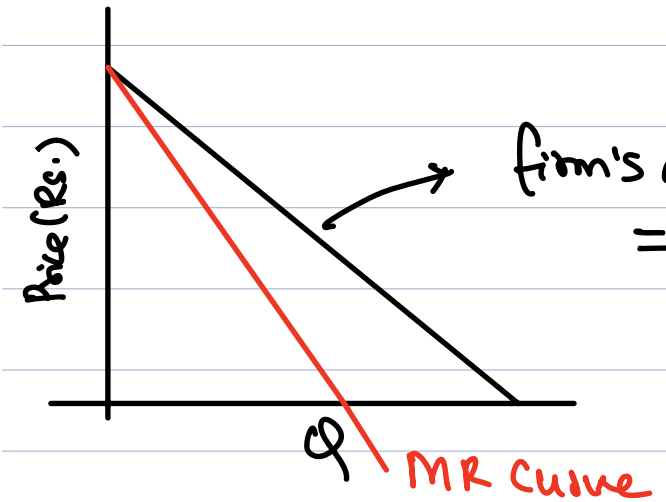
If price/unit is same then -

Total Revenue = Price/unit × No. of units sold

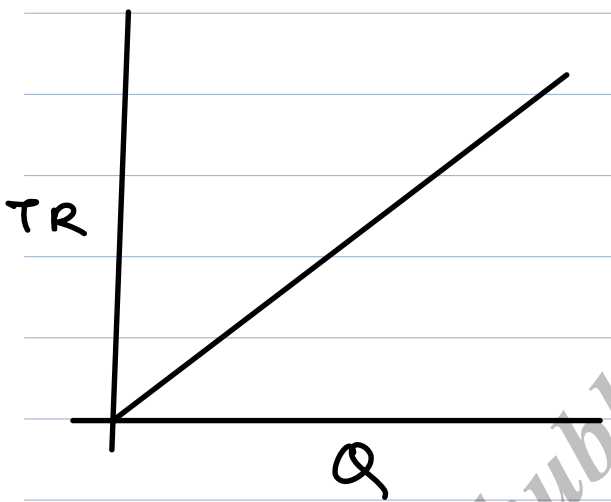
$TR = P \times Q$

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

∴ AR curve is also the firm's demand curve.

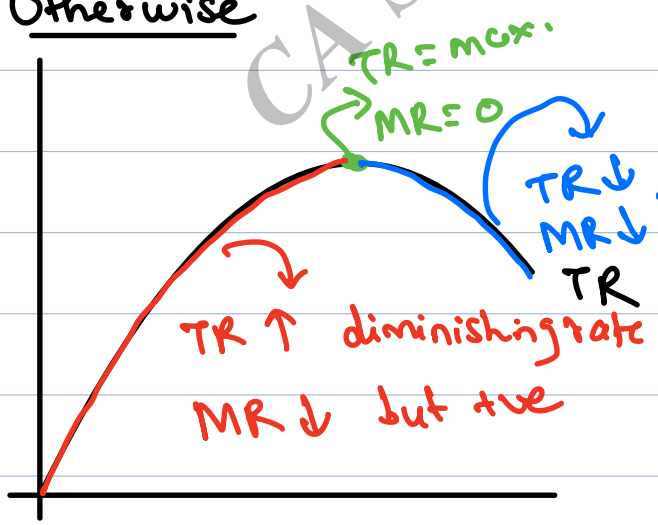


firm's demand curve
= AR curve



if price/unit is same then TR curve is upward sloping straight line passing through origin.

Otherwise



TR rises at a diminishing rate and then attains maximum value (when MR = 0) and after that TR starts falling as MR becomes -ve.

Slope of TR curve at any point
= MR at that point

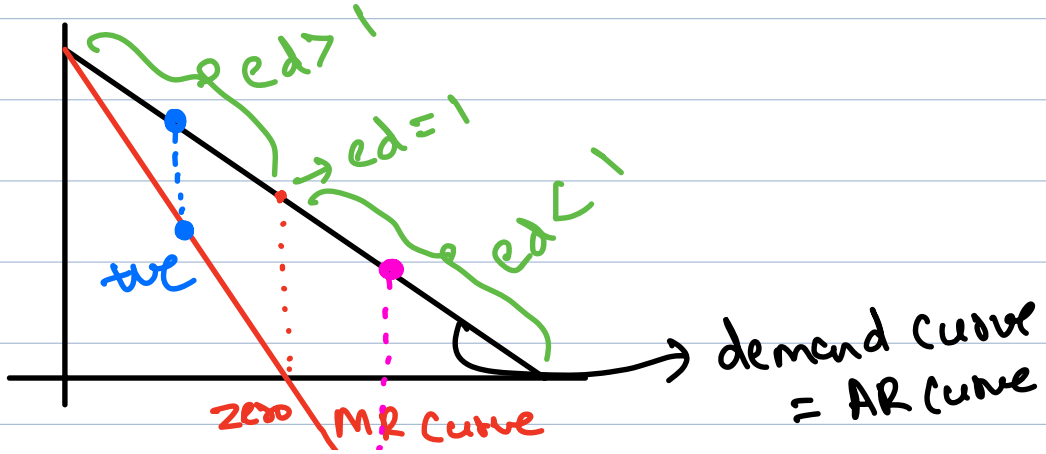
Relationship b/w AR, MR and Price elasticity of demand (e_d)

$$MR = P\left[1 - \frac{1}{e_d}\right] \qquad MR = P\left[\frac{e_d - 1}{e_d}\right]$$

OR

$$MR = AR\left[1 - \frac{1}{e_d}\right] \qquad MR = AR\left(\frac{e_d - 1}{e_d}\right)$$

- If $e_d > 1$, MR is +ve
- If $e_d = 1$, MR is zero
- If $e_d < 1$, MR is -ve



Behavioural principles

Principle 1 : A firm should not produce at all if it is unable to recover its total variable cost.

Principle 2 : The firm will be making maximum profits when it is producing no. of units at which MR = MC.

Unit 2 : Determination of Prices

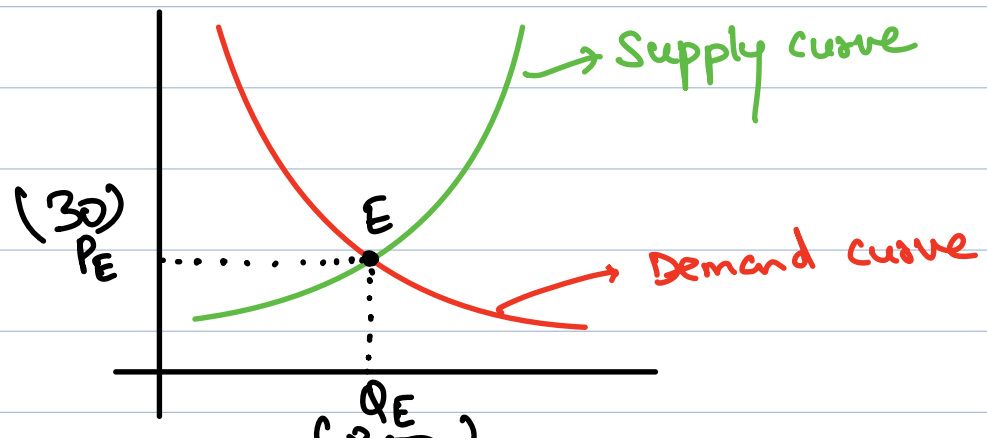
Equilibrium price or market clearing price is the price at which -

Qd of commodity = Qs of commodity

(i.e. at equilibrium price there is no unsold stock or no unsupplied demand)

e.g.

Price (₹)	Demand (in kgs)	Supply (in kgs)
25	1000	600
27	900	700
28	850	750
30	800	800
32	700	875
35	600	1000



(800)

Point E = point of intersection of Demand curve and Supply curve (equilibrium point)

P_E = equilibrium price

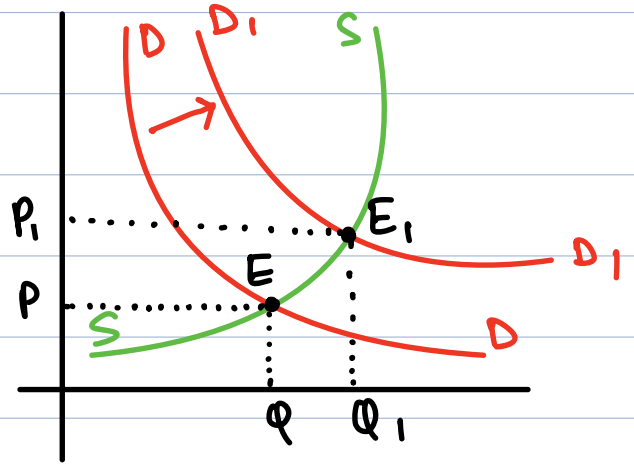
Q_E = equilibrium qty.

Changes in Demand & Supply

4 Cases

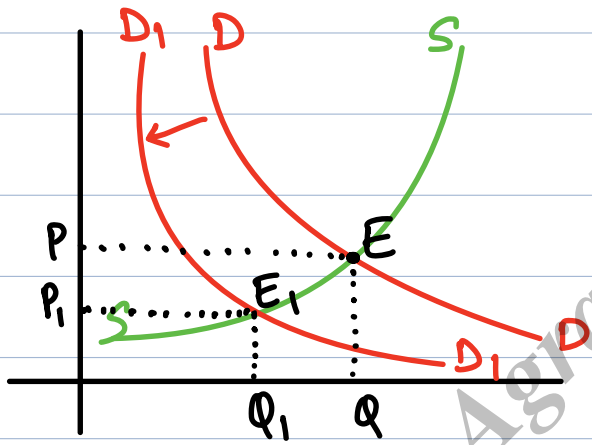
- increase in demand (rightward shift in DD)
- decrease in demand (leftward shift in DD)
- increase in supply (rightward shift in SS)
- decrease in supply (leftward shift in SS)

i) An increase in demand



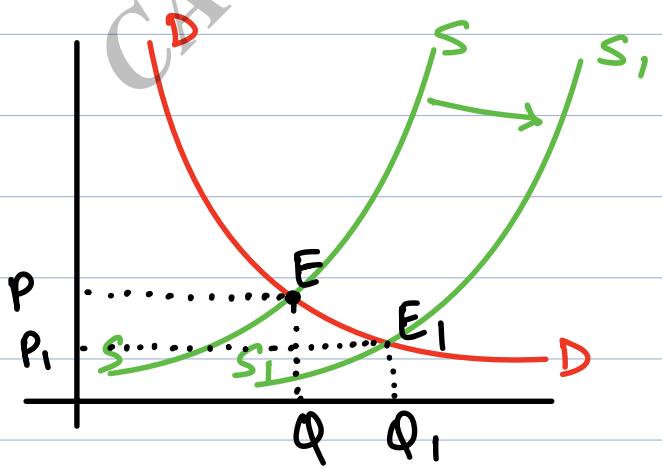
Both equilibrium price and equilibrium qty. increases with an increase in demand.

ii) Decrease in Demand



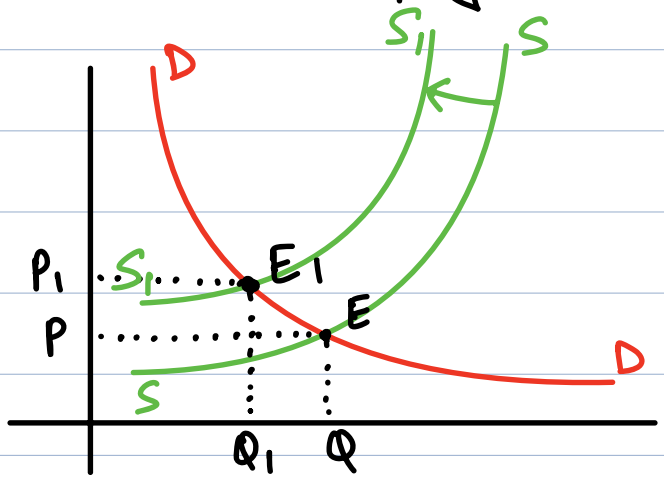
Both equilibrium price and equilibrium qty. decreases with a decrease in demand.

iii) Increase in Supply



Here, equilibrium price decreases and equilibrium qty. increases as a result of increase in supply.

iv) Decrease in Supply



Here, equilibrium price increases and equilibrium qty. decreases as a result of decrease in supply.

Simultaneous Changes in Demand and Supply

- When both demand and supply decrease, the equilibrium qty. decreases but nothing certain can be said about equilibrium price.

- When both demand and supply increase, the equilibrium qty. increases but nothing certain can be said about equilibrium price.

- When demand increases and supply decreases, the equilibrium price rises but nothing certain can be said about equilibrium qty.

- When demand decreases and supply increases, the equilibrium price falls but nothing certain can be said about equilibrium qty.

Perfect Competition (Ideal Market)

Features

- large no. of buyers
- large no. of sellers
- homogeneous goods
- single price
- full information is available
  (no advertisement expenditure is required)
- perfect mobility of factors of production
  (no transportation cost)
- no restriction on entry or exit in long run

These two features of perfect competition are not present in pure competion.
As compared to perfect competition, pure competition is more realistic.

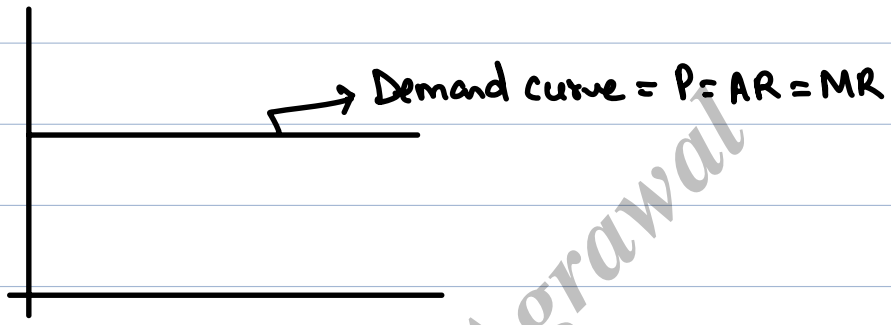
Short Run equilibrium of firm in perfect Competition

Conditions for equilibrium of a firm:

i) MR = MC

ii) MC curve should cut MR curve from below

Price elasticity of demand in perfect competition is infinite. Therefore, demand curve of firm is horizontal straight line parallel to X-axis in perfect competition and AR curve is same as demand curve.

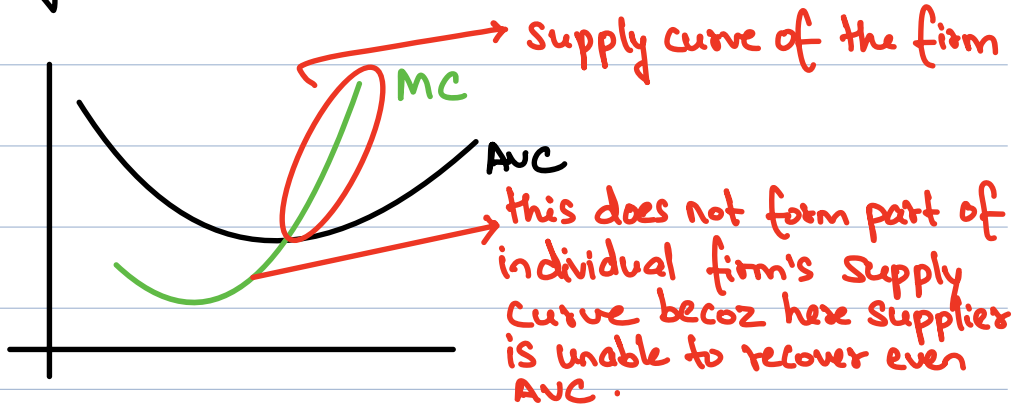


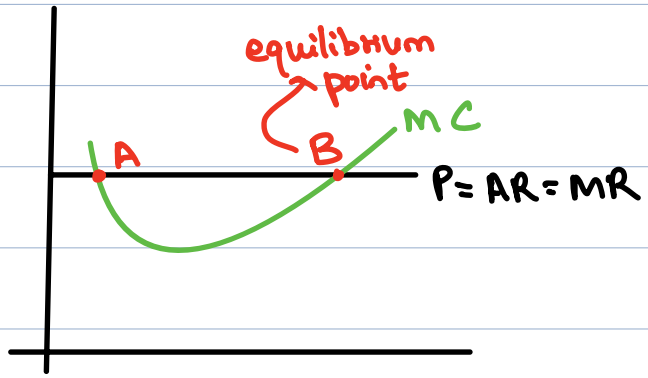
Also, in perfect competition -

$$MR = AR$$

(as price charged for individual units is same)

Supply curve of individual firm is that part of marginal cost curve which lies on and above the average variable cost curve.





Why any seller reduce price of goods ?

→ To increase sale of goods

But in perfect competition, individual seller will not charge price below equilibrium price as lower price will result in loss to seller bcoz in that case MR < MC and also he can sell any no. of units at equilibrium price.

Also, individual firm cannot charge price more than the equilibrium price as individual firm will not be able to sell any goods at higher price.

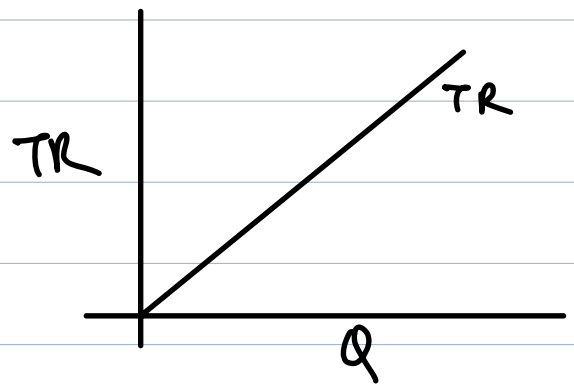
In perfect competition, individual firms are price takers and industry is price maker.

Price is endogenous variable for industry and exogenous variable for individual firms.

$TR = P \times Q$

$y = mx + c$

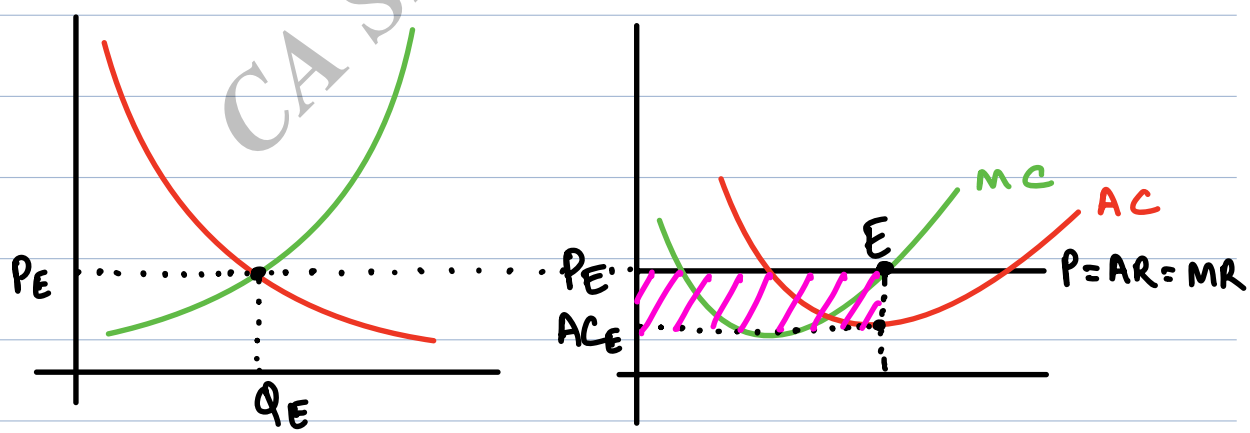
$\therefore$ m = slope = P and C = y-intercept = 0



Slope of TR curve = equilibrium price

Short Run

Case 1: Supernormal profit



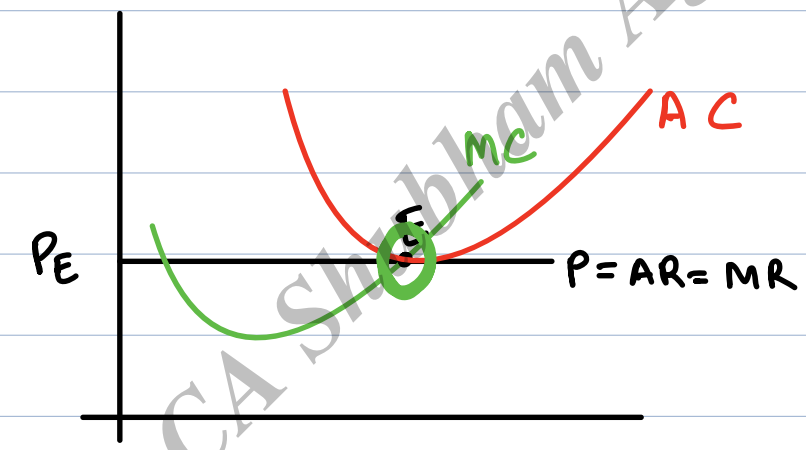
Supernormal profit = Area of rectangle (pink region)

At equilibrium point (point E) -

$P_E > AC_E$ (hence supernormal profits)

If individual firms present in the industry are earning supernormal profit in short run then it implies that on equilibrium point, average cost curve lies below the average revenue curve.

Case 2 : Normal profit

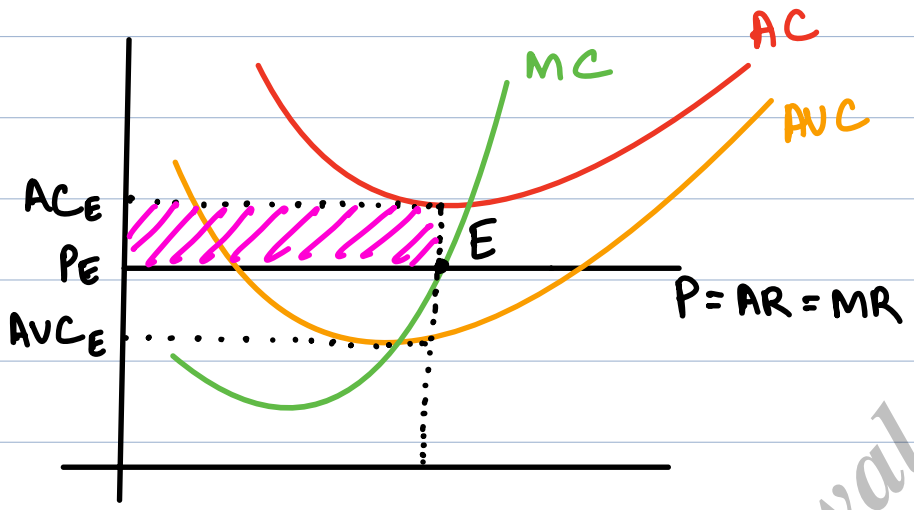


At equilibrium point (point E) -

$P = AR = MR = MC = AC$

If individual firm is earning normal profit in short run then it implies that at equilibrium point, demand curve (AR curve) is tangent to the AC curve.

Case 3: Loss



Loss = Area of rectangle (pink region)

At equilibrium point (point E) -

$P_E < AC_E$ and $P_E > AVC_E$

i.e. $AVC_E < P_E < AC_E$

If individual firm present in the industry is incurring loss in short run then it implies that, AC curve lies above the AR curve but AVC curve lies below the AR curve.

Long Run Equilibrium

- In long run, individual firms in perfect competition cannot earn supernormal profits.

Reasoning

Short Run → individual firms earn supernormal profit

↓

attract new firms to enter the industry (∵ no barriers present)

↓

Aggregate supply → increase

Aggregate demand → constant

↓

equilibrium price will fall and hence all the supernormal profit will get wiped out.

- In long run, individual firms in perfect competition cannot incur loss.

Reasoning

Short run → individual firms incurring losses

↓

existing firms will exit from the market

↓

Aggregate supply → decrease
Aggregate demand → Constant

↓

equilibrium price will rise till it gets equal to average cost.

Hence, in long run individual firms present in perfect competition can earn normal profits only.
In perfect competition, there is optimum utilisation of resources in long run.

Monopolistic Competition

Features

- large no. of buyers
- large no. of sellers
- Similar but not identical (product differentiation)
- aggressive advertisement (non-price competition)
- freedom of entry and exit in long run.

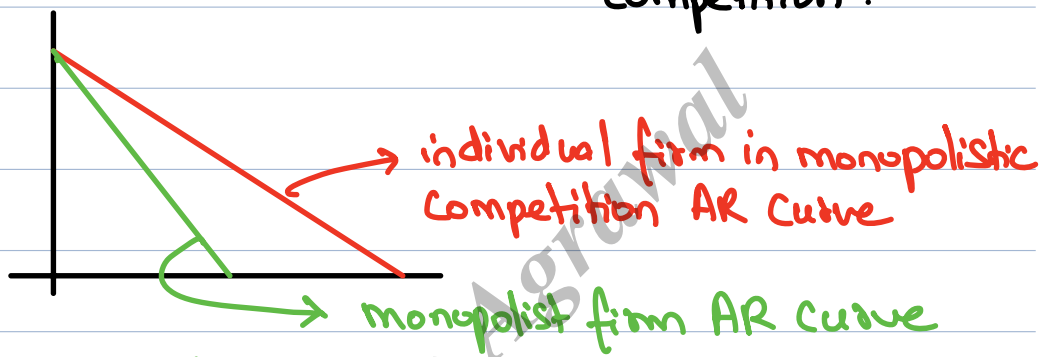
e.g. Soaps and detergents, packaged food items, clothing, restaurants, cosmetics etc.

Note: In order to increase sales in monopolistic competition, individual firms present in the industry will not indulge in price-war but will incur heavy expenditure on advertisement.

In monopolistic competition, close substitutes are available in market and hence cross price elasticity of demand is highly positive in monopolistic competition.

Also, price elasticity of demand of individual firms in monopolistic firm is greater than that of single firm present in monopoly.

∴ Slope of AR curve of monopolist firm > Slope of AR curve of individual firms in monopolistic competition.



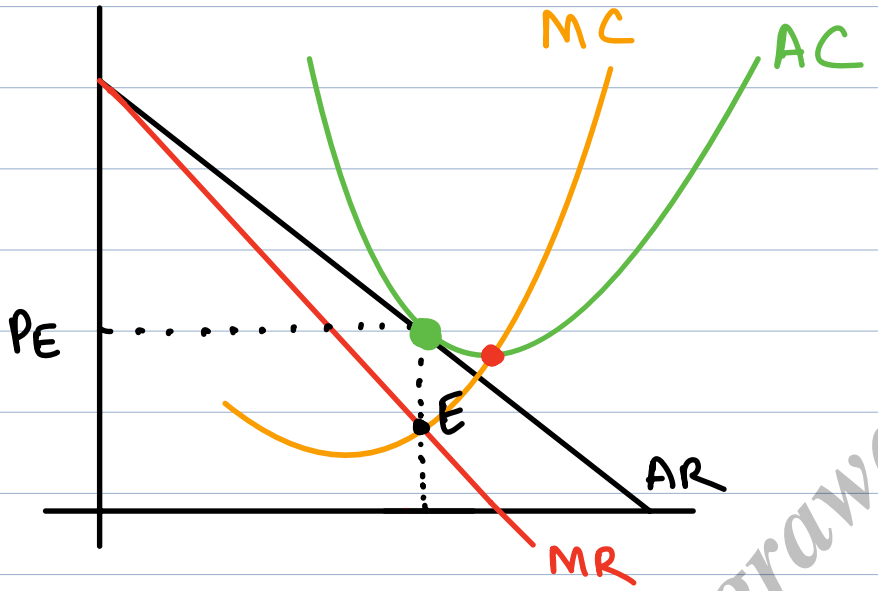
Short Run Equilibrium

In short run, individual firms present in monopolistic competition can earn supernormal profits or normal profits or it can incur loss also.

Long Run Equilibrium

In long run, individual firms present in monopolistic competition can earn normal profits only. But it is not operating at optimum point in long run because there is under

utilisation of resources.



At equilibrium point -

AR = AC

(∵ AR curve is tangent to AC curve)

Monopoly

Features

- Single seller
- large no. of buyers
- high degree of differentiation
- seller has large control over price
- entry barriers are there

- AR curve in monopoly market is downward sloping straight line.

- MR curve is also downward sloping straight line and

  Slope of MR curve = 2 x Slope of AR curve

- y-intercept of AR curve and MR curve is equal.
- MR curve is steeper as compared to AR curve.
- MR curve lies halfway b/w the AR curve and y-axis (i.e. MR curve cuts the X-axis into two equal parts)
- No substitutes available in monopoly market structure and hence demand is relatively inelastic (i.e. $ed < 1$).
  Also, cross-price ed = 0
- In monopoly market structure -
  demand curve of firm = demand curve of industry
- Entry barriers are there in monopoly market structure and hence it will be very difficult for new firms to enter in the market.
  (e.g. → license, patents etc.)

Short Run Equilibrium

In short run, monopolist (single seller) can earn supernormal profits or normal profits or it can even incur loss.

Long Run Equilibrium

Can monopolist firm (single seller) enjoy super-normal profit in long run?

Yes, monopolist firm can enjoy supernormal profits in long run.

Reasoning: Entry barriers are present in this market structure and therefore no new firms can enter in the market and hence single seller in monopoly market structure can continue to earn supernormal profits even in long run.

Price Discrimination

Charging different prices from different class of customers for same product.

Objectives of Price Discrimination

- to earn maximum profit
- to dispose off surplus stock
- to enjoy economies of scale
- to capture foreign markets and
- to secure equity through pricing.

First Degree Price Discrimination

Here, monopolist firm is charging maximum price such that Consumer Surplus is zero for each unit.

Second Degree Price Discrimination

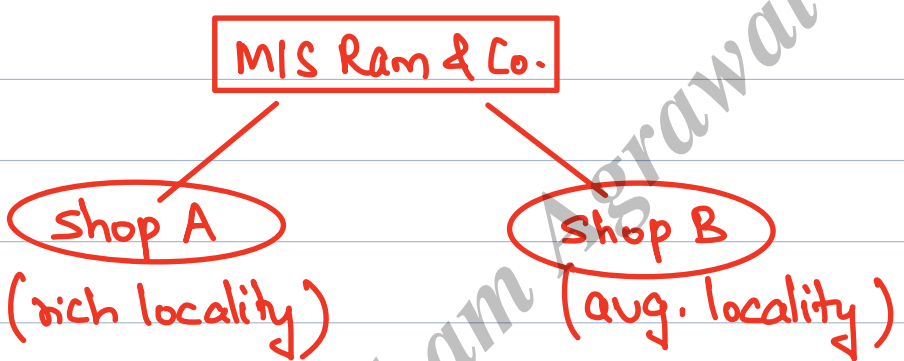
Here, monopolist firm is charging different price for different range of units.
Monopolist firm is not able to extract entire Consumer Surplus in second degree price discrimination.

Third Degree Price Discrimination

- on the basis of age
  (railways, amusement park etc.)

- on the basis of location
  (hospitals, land rates etc.)
- on the basis of gender
  (schools, colleges, bus etc.)
- on the basis of time
  (theatres, water parks etc.)

e.g



M/S Ram & Co. will charge higher price in rich locality as compared to avg. locality bcoz price elasticity of demand will be less in rich locality as compared to avg. locality.

Reasoning

Let ed (A) = 1.25 and ed (B) = 1.50
and in both shops MC = MR = 40.

$$MR = P\left[\frac{ed - 1}{ed}\right]$$

Shop A

$$40 = P\left[\frac{1.25 - 1}{1.25}\right]$$

$$P = 40 \times \frac{1.25}{0.25}$$

$$\boxed{P = 200}$$

Shop B

$$40 = P\left[\frac{1.50 - 1}{1.50}\right]$$

$$P = 40 \times \frac{1.50}{0.50}$$

$$\boxed{P = 120}$$

Price charged in A > Price charged in B

(200 - 120 = 80)

NOTE: The gap between the price charged in two different markets should be less than or equal to inter-firm operation cost.

Oligopoly

Features

- few no. of sellers
- large no. of buyers
- level of differentiation in product is high but less than that present in monopoly
- importance of advertising and selling costs
- Strategic interdependence
- Group behaviour

Eg telecommunication industry, Automobile industry, Airlines industry, power generation, aluminium industry etc.

Strategic Interdependence

Individual firms present in oligopoly market structure will closely observe the strategy of different competitors and make strategic decisions.

NOTE: In oligopoly market structure also,

firms present in the market will not indulge in price war but will incurr heavy cost on advertisement and promotional activities.

Types of oligopoly

Pure or Perfect oligopoly : Homogeneous goods

Open oligopoly : free entry or exit

Closed oligopoly : entry is restricted

Collusive oligopoly : common understanding or work in collusion with each other
(मिलके काम करना) eg OPEC

Competitive oligopoly : individual firms compete with each other and absence of common understanding

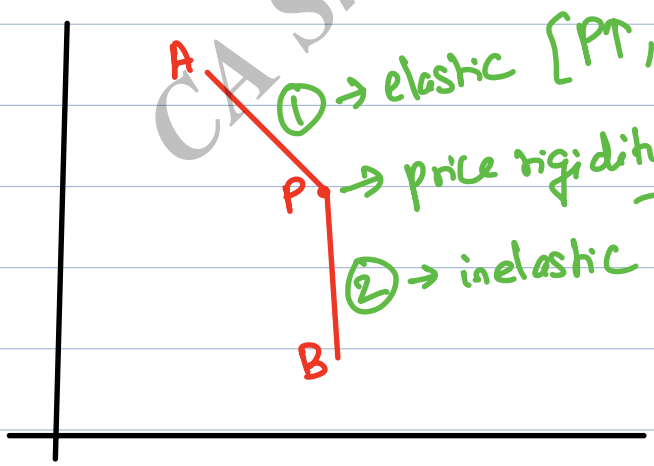
Partial oligopoly : market is dominated by one large firm and is considered as the price leader.

Full oligopoly : absence of leadership

Syndicated oligopoly : individual firms sells goods through centralised syndicate.
e.g. Pushpa movie

Organised oligopoly : Central association for fixing prices, quotas, output, etc.

Best
Kinked Demand Curve [Sweezy's Model]



① → elastic [P↑, Qd↓] ed > 1
→ price rigidity
② → inelastic [P↓, Qd↑] ed < 1

AP → flatter → slope ↓, ed ↑
PB → steeper → slope ↑, ed ↓

(1) → demand will be relatively elastic as % change in qty. demanded will be greater than % change in price.
This is because competitors will not increase price of their products and hence there will be large % fall in qty. demanded [as consumers will shift to products of our competitors] even with small % increase in price.

(2) → demand will be relatively inelastic as % change in qty. demanded will be less than % change in price.
This is because competitors will also decrease the price of their products and hence there will be only small % increase in qty. demanded.