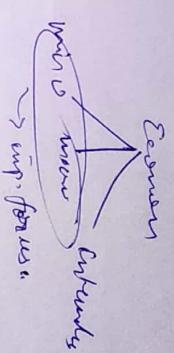


providing basic service that starts with the

Economics → A study of wealth, in general & spreading.

Alex. Smith → Father of economics.

New Econ. → Study about "produced will in economy".



Primary Sector → Agriculture (fishing, forest, mining, etc.)  
Secondary Sector → Industry

Tertiary Sector → Services  
In general, Income is denoted by ₹.

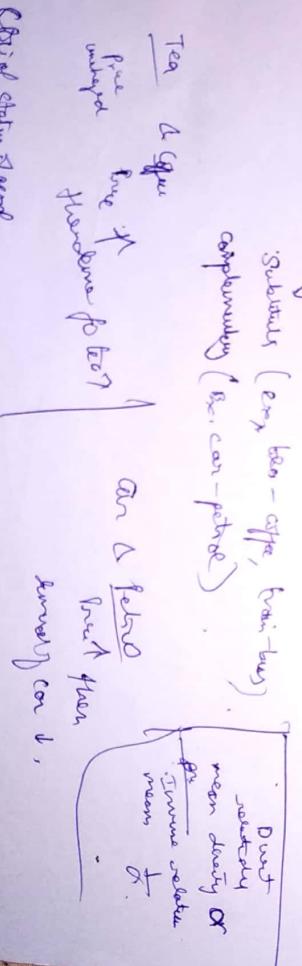
Substitution of Economic → Production, distribution, Consumption.

Demand → Desire + Will + Pay.

Demand depends on:-

- 1) Price of commodity -
- 2) Relative commodity.

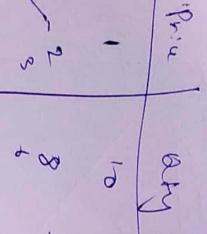
Substitutes (ex. tea - coffee, train - bus), complementary (ex. car - petrol).



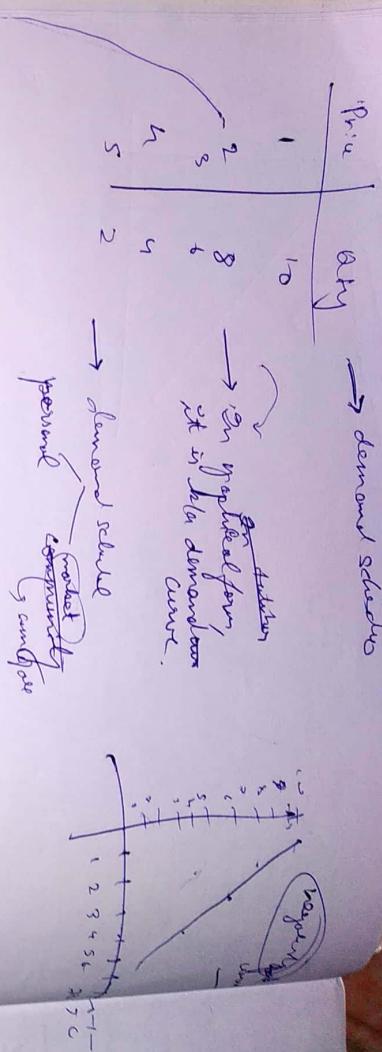
- 3) Social status of people,
- 4) Personal tastes & preferences
- 5) Expectations of price change in future.
- 6.) V → other factors

$$\text{Demand} = f(p_1, p_2, Y, t, t_m, P)$$

Price  $\rightarrow$  demand schedule



→ In graphical form  
it is like a demand curve.



What

Theory of consumer behaviour  
Demand  $\rightarrow$  theory of demand.

It is desire for something, willingness & ability  
to pay in order to purchase it.

②  $\rightarrow$  demand function shows the  
functional relationship b/w demand & its determinants.

③  $\rightarrow$  Price of commodity, price of related consumer  
expenditure, income, tastes & preferences, consumer's  
expectations about future price.

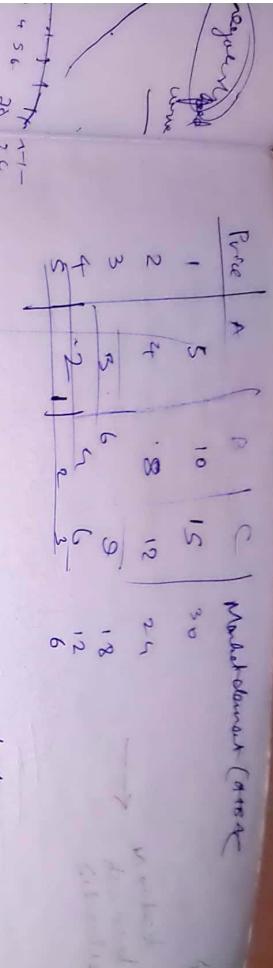
④ One factor:  $D.D. = f(P_1, P_m, Y, T, E_n, U)$

$\rightarrow$  Price:  $\uparrow$   $\rightarrow$  There is an inverse relationship b/w price & demand

$P \uparrow, Q \downarrow$ .

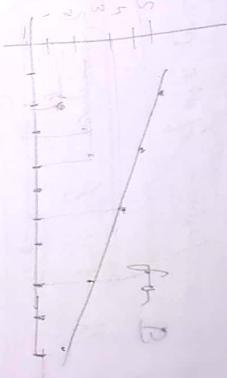
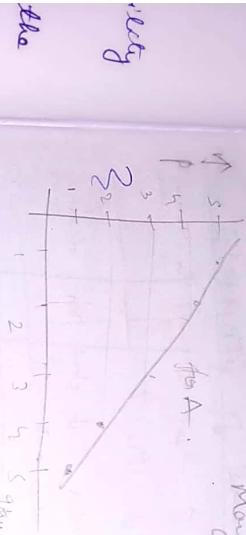
$\rightarrow$  Price relatives  $\rightarrow$  prices of other goods that can be substituted for one good  $\rightarrow$  offer, payment capacity of (dissatisfied) consumer ( $P_m$ )  $\rightarrow$  income

price of complementary goods ( $P_1$ )  $\rightarrow$  joint consumption  $\rightarrow$  (Willingness) relative



very prud. bought by a customer at a particular price.

Market Demand  
Curves.

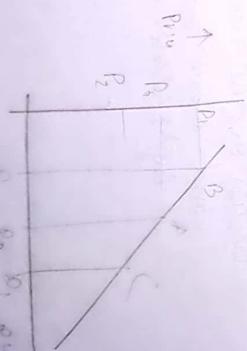


Main discussion for demand of a commodity is the price of the commodity.

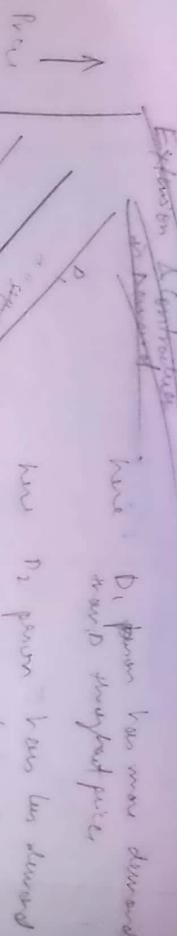
o P vs Q curve shows this relation.

1) Price ↓ →  
    Quantity ↑  
    Demand ↑  
2) Price ↑ →  
    Quantity ↓  
    Demand ↓

(Explanations)  
↑ Price  
↓ Demand  
↓ Price  
↑ Demand  
↑ Demand  
↓ Demand



as per ↑ from P to P<sub>1</sub>, demand  
decreases from Q to Q<sub>1</sub>. i.e.  
less demand & more supply. L very  
little increase in P & decrease in Q.



Law of Demand  
As price falls more is demanded  
As price rises less is demanded  
Price ↓ → Demand ↑  
Price ↑ → Demand ↓

- \* If the income of consumer ↑ then upward shift in demand curve is produced.

- \* If the price of the complementary item ↑ then ↓ shift in demand curve is produced.

- \* If the price of complementing item ↑ then ↑ shift in demand curve is produced.

### MARKET DEMAND SCHEDULE & MARKET CURVE

- Market demand schedule shows standard demand of commodity that the consumers are ready to purchase at different price level. It is the horizontal summation of individual demands in the market. It is shown below:

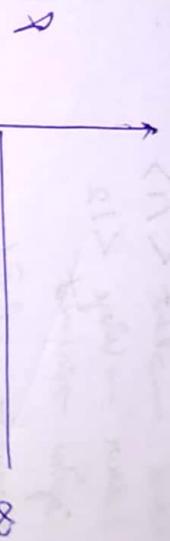
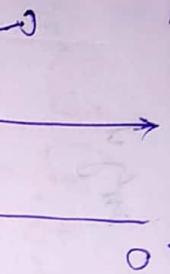
(physically stronger than previous part).

- Extension & contraction in demand (Change in price of commodity)
  - If the price of the commodity changes, it leads to extension & contraction in the demand curve. The movement along with the demand curve in upward path (A to C) is called extension in demand & if due to reduction in price of commodity A vice versa.

- Changes in factors other than price ( $P_1, Y, t, E \& U$ )
  - leads to a shift in demand curve. An upward shift shows an ↑ in demand and a downward shift shows a ↓ in demand.

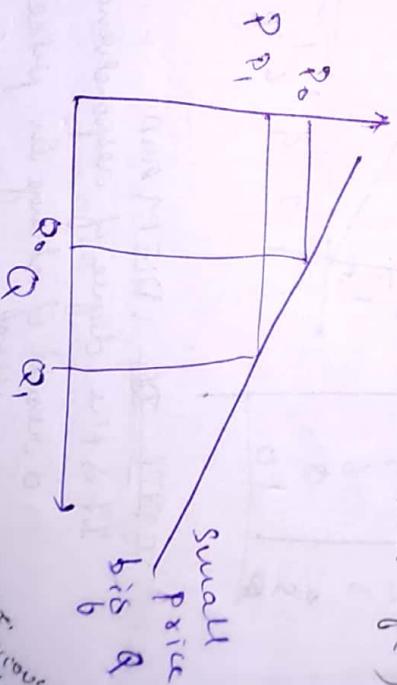
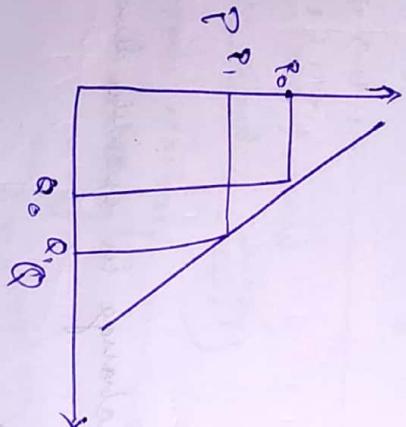
## Economics

### Price Elasticity of Demand



Perfectly inelastic  
(From Commodity)

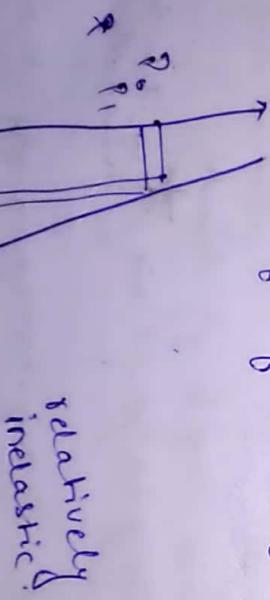
Perfectly elastic  
No such commodity  
real life



Unitary elastic (same proportionate change in Q by sugar change)

Relatively elastic.

$$ed = \frac{\% \text{ Increase in } Q}{\% \Delta \text{ Decrease in } P}$$



Relatively inelastic

## SUPPLY

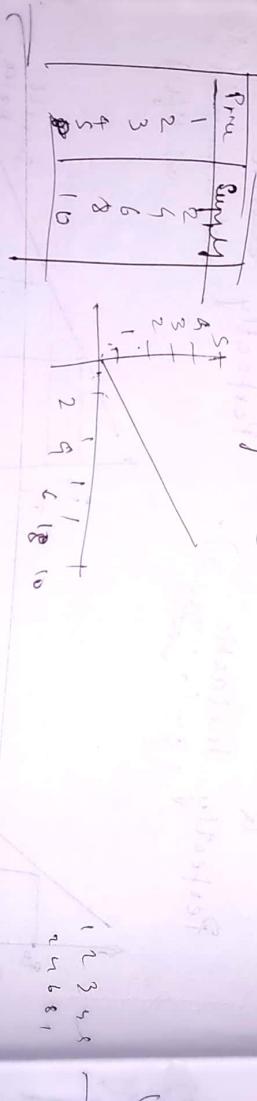
Supply → The amount of goods a producer is willing to sell at different prices.

Quantity demanded:  $D_d$   
 Quantity supplied:  $D_s = f(P, f_1 + f_2 + f_3 + \dots)$  other factors  
state up relationship

factors of production

- <1> Land → Rent <1/1>
- <2> Labour → Wages <1/2>
- <3> Capital → Interest
- <4> Organisation → Profits,

→ Supply schedule & supply curve



$$\frac{\Delta Q}{\Delta P} \propto f_i \uparrow \text{Supply U.}$$

Business

P ↑ Supply ↑

## ELASTICITY OF DEMAND

It is the degree of responsiveness in change in quantity demanded as a result of change in price.

$$ed = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

Degrees of elasticity -

perfectly elastic demand

small change in price make an a change in qty demanded.

Demand curve will be horizontal straight line (Explain in example)

perfectly inelastic demand.

Change in price does not make any change in qty demanded. Demand curve will be a vertical straight line & change in Q

Unitary elastic demand: % change in price makes original proportionality in quantity demanded - demand curve will be a rect. hyperbola / linear. Elasticity = 1.

→ Relatively elastic: % change in price makes more than proportional change in quantity demanded. Demand curve is flatter.

$$\text{Elasticity} = 2.1?$$

: % change in price will less than

$\epsilon < 1$

Elastic < 1, demand curve is steeper

Inelastic < 1, demand curve is flatter

$$Q_s = f(P_1, I_1, M_1, \dots, I_n, S, U)$$

↳ Price elasticity of supply is relatively unimportant



U → other factors (ex. price of related commodity, complementary commodity, govt. policies etc.)

Elasticity of demand

→ Price elasticity (absolute value)

→ Income elasticity (income)

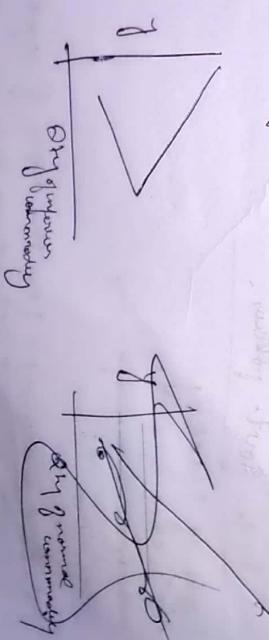
→ Cross elasticity

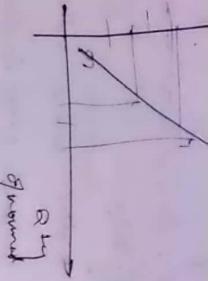
↳ based on prices of related/complementary goods.  
related/complementary goods.

① Normal commodity

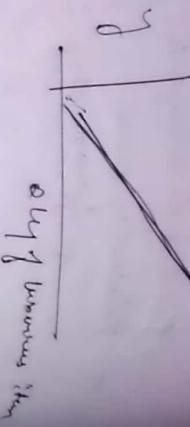
② Inferior commodity

③ Luxurious commodity





Supply curve



Demand curve

### Cross elasticity

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

### Notes:-

- Extension & contraction in supply results in extension/ contraction of supply
- A forward movement along the supply curve is (A)↑ in extension in supply & is due to ↑ in price of the commodity
- A backward

↑ in contraction in supply & is due to ↓ in price of commodity

- A change in any factor other than price leads to shifted supply curve. An upward shift shows ↑ in supply & downward shift shows ↓ in supply.

upward shift  
An reduction in prices of factor of production (Land, Capital, labour, orgnt)

An improvement in state of technology

An ↓ in price of related commodity (Ex Rice & Wheat)  
Govt. govt. policies.

### 3 types of elasticity

→ Income

→ Price (already discussed)

→ Cross

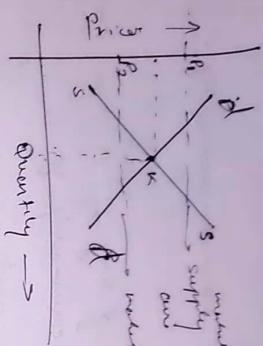
Income elasticity: It is the degree of responsiveness in change of quantity demanded as a result of % change in income of consumer

$$Id = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}} = \frac{\Delta Q}{Q} \times \frac{\Delta Y}{Y}$$

income

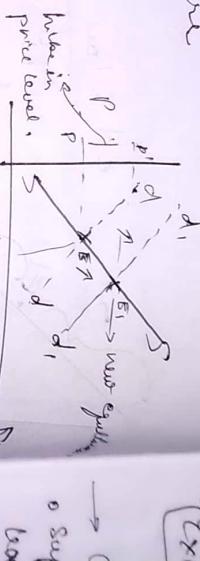


## MARKET EQUILIBRIUM



Suppose income of consumer  $\uparrow$ , then upward shift in demand curve,  
so equilibrium price will also increase  
o inflation o deflation

Suppose govt adopt for. policy  
to produce, then upward shift in production curve  
 $\rightarrow$  old equilibrium, new equilibrium.



Suppose income of consumer  $\uparrow$ , then upward shift in demand curve,  
so equilibrium price will also increase  
o inflation o deflation

Suppose govt adopt for. policy  
to produce, then upward shift in production curve  
 $\rightarrow$  old equilibrium, new equilibrium.



- Methods of measuring elasticity**
  - o Percentage method
  - o 
$$\frac{\Delta Q}{Q} \times \frac{\Delta P}{P}$$
  - o If new income  
new demand  
new price  
at any pt. &  
finds the same  
thing.  
then  
 $\frac{\Delta Q}{Q} = \frac{\Delta P}{P}$
- o Graphical method  
(Straight line/point method)
  - Here elasticity is measured at different prices on demand curve.
  - If can be calculated using following method. It will be  $(\text{Lower segment of demand curve}) \div (\text{Upper segment})$ .
  - Price elasticity will be different at different pts of demand curve, so measure pts of demand curve, for extending the elasticity we have to re-axis x-axis & y-axis.

→ Market Equilibrium

- o Equilibrium is the balancing pt. of 2 opposing forces.
- o Market equilibrium → a situation when market demand = market supply.
- o Price at which market is in equilibrium is equilibrium ~~rate~~
- o Any price other than equilibrium price is \_\_\_\_\_.
- o If the market price is higher than the equilibrium price,  
then there will be excess supply than demand. (P. Diagram).

June,  
1965.

Exercices demandés

higher demand their supply ( $P_2$  in graph).

(See notes on adjacent page)

→ Changes in Capitalism.

- Suppose, the income of consumers in market even leads to shifted up demand curve. Hence, this situation where demand is supply, lead to increase in price of commodity.

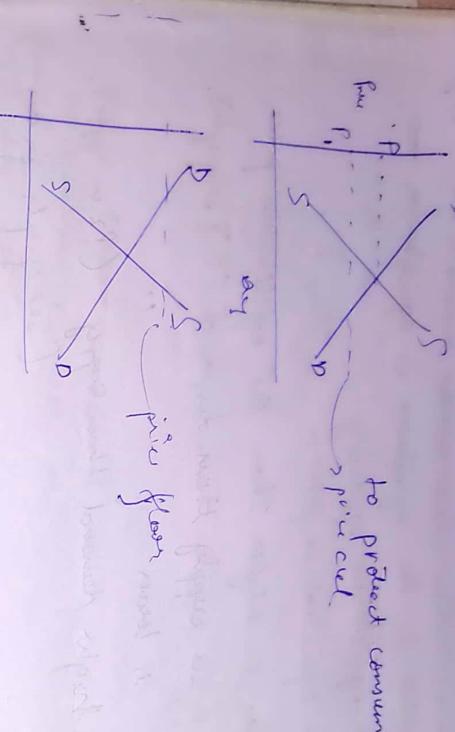
- o If govt. adopts a policy in favor of producers, it leads to shifting up supply curve, here there is no change in demand curve, hence it lead to ~~in~~ increase in price of commodity.

travel  
and  
met flock).  
was seen at  
end curve,  
by following  
in zigzag  
order (or  
a line).

Oregon D.  
a deer).

## EFFECT OF GOVT. INTERVENTION IN MARKETS

To protect consumers  
Price floor model



### Effect of govt. intervention into the market

#### Price ceiling

- o Fixing a price below equilibrium is called price ceiling.
- o It is max. price that can be imposed by the producer for their product.
- o Normally it is fixed by govt./some agency for protecting consumer.
- o It is necessary usually applied for necessary items ex wheat, sugar, salt, rice etc. because at higher market price a section of the people will not be able to afford.
- o Demand & Supply, no govt. how to supply through channels like ration shop, rationing.
- o Rationing is a technique in a method used by govt. to sell a min. quantity of product to the poor section at a cheaper price.

Ex

## ⇒ Price Floor

- It refers to the min. price of commodity fixed by the government to protect consumers.
- Normally above open. price.
- In certain seasons, the supply of certain comodities is higher, so the producers demand less price for govt products.

- Done usually to protect producers.  
An usual demand ↓ & supply ↑, no govt. collects goods at high prices & sells late through rationing etc.

## Mathematical Interpretation of $Q_d$ , $Q_s$ & price ( $p$ )

$Q_d = Q_s$  (at equ.)

$$Q_d = a - bp \quad | \quad Q_s = c + dp$$

- Both demand and supply can be stated in the following equations.

$$Q_d = a - bp \quad | \quad Q_s = c + dp$$

- here  $a$  &  $c$  are intercept coefficient of demand & supply  
→ also  $a$  is max price a consumer is willing to pay for a commodity (in economics known as reservation price).  
→ also  $c$  is min price that a producer is willing to sell at for a commodity  
→  $b$  is the coefficient that shows slope of demand & supply.

Ex.: Calculate equiv. price & quantity :

$$Q_d = 44 - 5p$$

$$Q_s = 2 + 8p$$

$$Q_d = Q_s$$

$$44 - 5p = 2 + 8p$$

$$\frac{42}{13} = \frac{12}{13} p$$

$$p = \frac{42}{13}$$

$$= 0.923$$

$$\text{Then } \frac{42}{13} = 3.23$$

→ Behaviour of producer

→ 4 factors of producer

- o Land
- o Labour → variable factor
- o Capital → fixed factor
- o Organisation

labor & capital

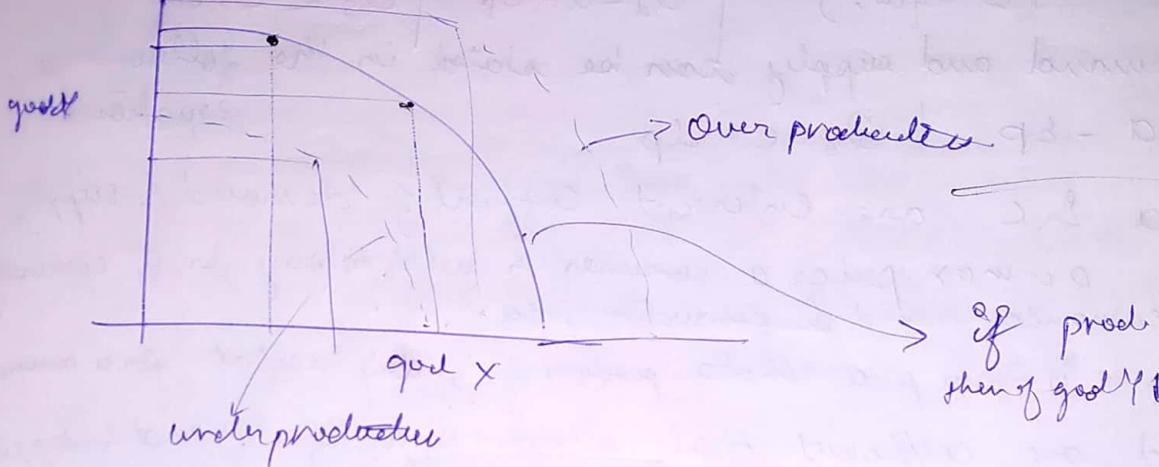
is long run, cost is variable.

→ Resources of a nation are limited, but our demands are infinite

So, how a country can produce using limited resources to satisfy infinite needs.

### Production Possibility Curve

(Assumption: only 2 products manufactured given from a resource).



If prod of good X  
then of good Y & vice-versa.

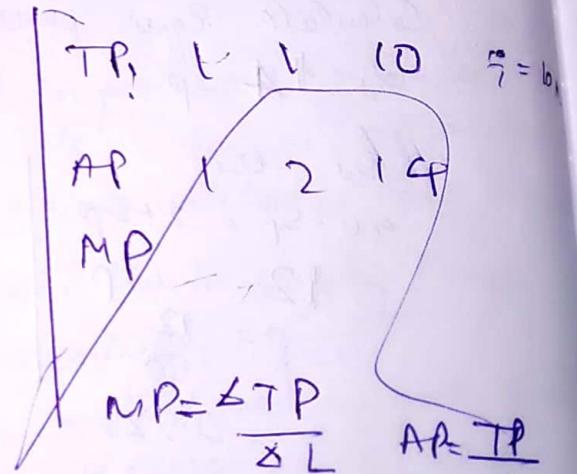
Law of variable proportion

→ In short run

Land is fixed factor

Labour is variable factor

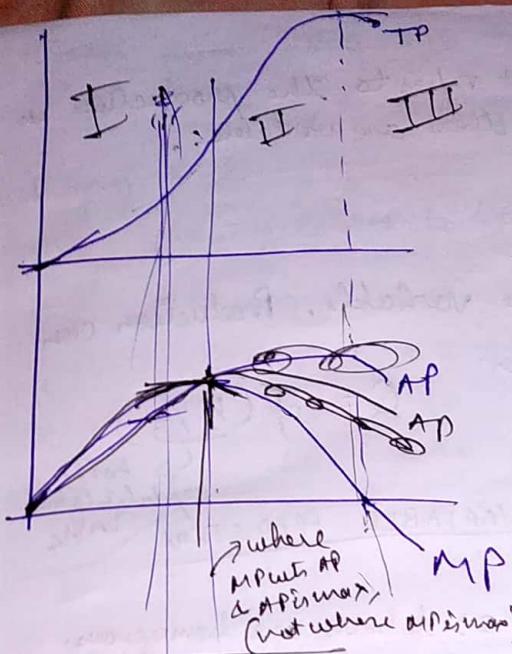
Labour	TP	AP	MP	
1	10	10	10	Increasing return
2	25	12.5	15	
3	37	12.3	17	
4	47	11.8	10	Starting decreasing return
5	55	11.0	8	
6	60	10	5	
7	63	9	3	
8	63	7.9	0	
9	62	6.8	-1	III Negative return



$$MP = \frac{\Delta TP}{\Delta L}$$

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

A rational producer will stop prod  
1 labour as soon as MP becomes neg.



This theory works in short-run (labor variable inputs).

- Assumptions
- No change in technology
- Labour are homogeneous
- No change in fixed factor (Capital)
- Only one factor changes (labor)

MP cuts AP at its  
max point.

### Notes:- Production Possibility Curve (PPC)

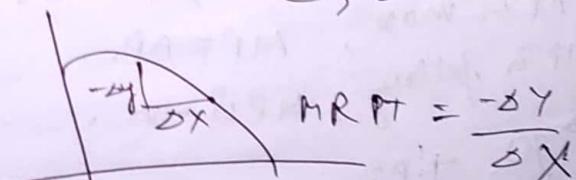
It is the locus of all possible combinations of 2 goods that a country can produce by using available resources. The shape of PPC is concave to origin.

- o Any point on PPC shows maximum utilization of resources.
  - o Any point below PPC shows under utilization of resources.
  - o Any point above PPC shows over utilization is impossible for nation (resources are limited).
- (possible only when there is technological improvement and productivity of labour & capital ↑.)

→ Marginal Rate of product transformation  
It is the rate at which one product is transformed into another.

It is the slope of PPC.

Combination	X	Y
A	0	15
B	1	14
C	2	12
D	3	9
E	4	5
F	5	0



constant returns production & others  
which same factors are present

$$Q = f(K, L) \rightarrow \text{Inputs}$$

Fixed

factors are variable, Production can

vary from production for all factors of production  
to  $\uparrow$  by all factors of production

$$Q = f(K^L)$$

An other  
factors like labor  
are given  
variable

$\rightarrow$  Short Run profit for  $\rightarrow$  firm or variable

Assumption:  
1) Technology remains constant  
2) Fixed factors that cannot  
be withdrawn from production

$\Rightarrow$  Returns are diminishing  
1) there are only 2 factor fixed  
and it makes fixed variable

TR: Total output resulting from use of quantity of inputs.  
 $(TR = \frac{PQ}{L})$

MP: Marginal product resulting by increasing TR with variable input.  
(MP =  $\frac{\Delta TR}{\Delta L}$ )

MP: Additional product obtained from additional use of inputs.

$$\frac{TR_n - TR_{n-1}}{L_n - L_{n-1}}$$

(See table & graph  
on previous page).

$\rightarrow$  MP  $\uparrow$  then  $\downarrow$ .

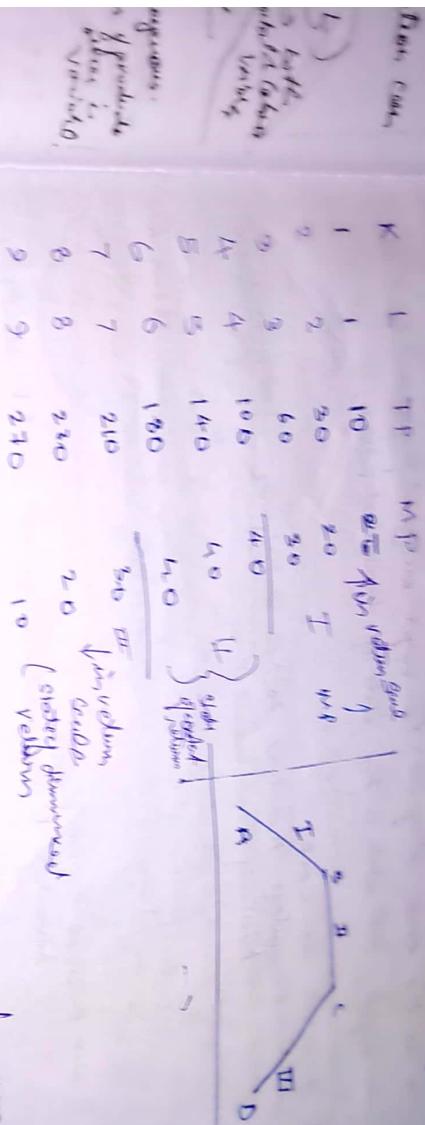
Relationship b/w TR - MP & MP.

- 1) When TR is maximum, MP = 0.
- 2) When MP is max., MP = AP.
- 3) When TR is falling, MP is -ve.
- 4) As long as TR is +ve, AP is also +ve.

Direction in

Some firms even fit  
laws of variable proportion.

Long run " "  
law of returns to scale. (both K & L can be changed)  
 $Q = f(K, L)$



Direction of change  
leads to specialization (concerning input factors) (no proof)  
Fayal

A firm first, L last ??

Notes :-

Long run prod. fit (law of Returns to scale).

Long run prod. fit (law of Variable Proportion).

Productivity both K & L are varied in same amount

Productivity both K & L are varied in same amount

Total output to change in all input, by the same

proportion.

Proposition, output will be proportional to inputs if all inputs in same proportion, output will be decreasing rate, if all inputs in same proportion, then constant rate then K & L can be varied, increasing rate, then constant rate K & L can be varied.

$$Q = f(K, L)$$

- Ife producer ↑ his scale of production, but making changes in all factor inputs, (such as capital & labour)
- o Eventually  $\frac{d}{dL} \uparrow$  in TP is more than proportion to total input, this stage is termed stage of returns ( $T_1$ )
  - o in the second stage ( $T_2$ ),  $\uparrow$  in total output will be proportional to  $\uparrow$  in total input, this stage is known as constant returns.
  - o in the third stage ( $T_3$ ),  $\uparrow$  in output will be  $<$  proportional to  $\uparrow$  in input, this stage is known as diminishing returns.

ECONOMIES OF SCALE

→ Advantages that lead to ↓ in  $\frac{\text{cost}}{\text{output}}$

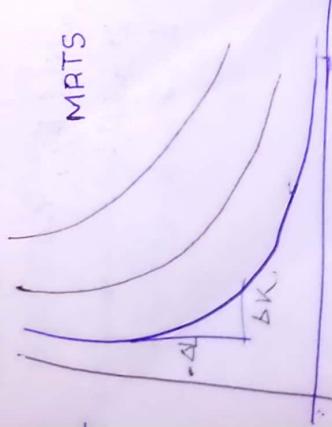
- o Availability of raw materials at cheap cost/ marginal efficiency
- o Division of labour & specialization
- o Division of labour leads to specialization in specific works. - It leads to ↑ in skill of labour which leads to ↑ in production. (↓ overhead in long running)

→ External economies of scale  
Advantages to the subsidiary or cost correlated sectors

- Causes of decrease in return.
- o Organiser is a fixed factor. — upto a level  $\frac{d}{dL}$ , the staff of labour can fully utilized, beyond that limit, it's return efficiency will.

- Management problem: (becomes unprofitable as organization becomes very large)
- o Exhausting Natural Resources → leads to scarcity of inputs that leads to increase in cost of inputs.

### ISO QUANTS



Def: locus of all possible combinations of 2 inputs that given same level of output & the price

Properties:- Convex to the origin

- o Slope &/a Marginal rate of technical substitution

$$MRTS = -\frac{\Delta L}{\Delta K}$$

- Fluglen ~~der Raum~~ senkt die ~~Fluglen~~ Zeit
  - Neutropics extrakt nach oben

## THEORY OF COST

- (1) factor price differential  
 (2) Q. limit of technology  
 (3) t, level of technology

$$c = f(\alpha; \beta_1, \beta_2)$$

$$\frac{C}{Z} = f(\text{Q.t.}, \frac{S_1}{S_2})$$

long term ratio

Money spent & Real cost

### Implications & Examples

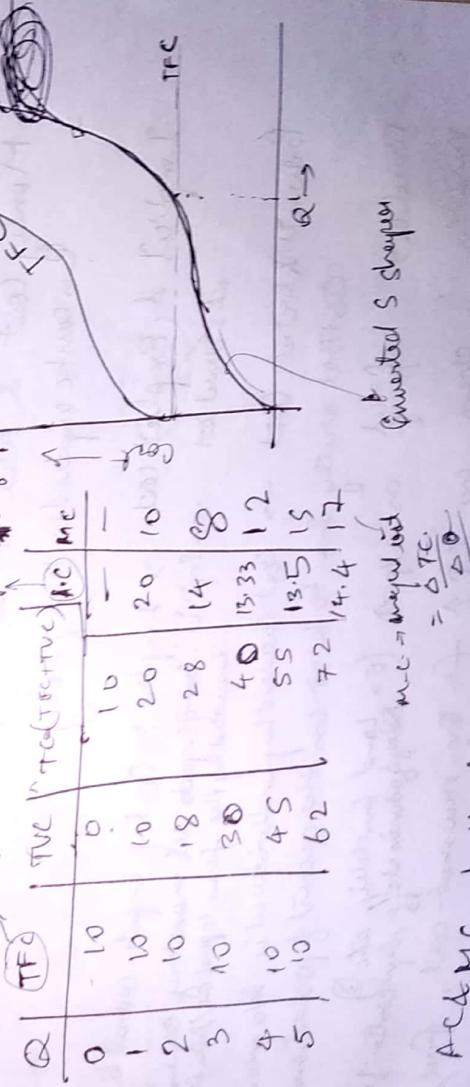
Pr. -? & word & off side out  
Platinum?

Wester?

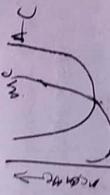
### Fixed cost

Coat doesn't change as weather changes. Coat of fur or pelts  
are ~~land~~<sup>so</sup>

Journal Entry



\* Actual both decrease to a min then ↑.  
 $= \frac{Q_1 C}{S_0}$



$\Rightarrow$  MC cuts AC at its min point.

### NOTES.

#### THEORY OF COST

- Cost is payment made to factors of production engaged in production activity.
- 3 major determinant of cost
  - i) factor price  $\rightarrow$  Rent, wage & interest
  - ii) Level of output
  - iii) Period of prod.

$$\text{Short run for, } C = f(Q + P_f \bar{P}_f)$$

$$\text{long " } C = f(Q, t, P_f)$$

$\Rightarrow ?$

$\Rightarrow$  Money cost & real cost  $\rightarrow$  it is pain suffer experienced by producer  
 can be expanded from money

Implied & Explicit cost  $\rightarrow$  Implicit: Cost of inputs required by producer  
 account cost  $\rightarrow$  Explicit: Cost of inputs are monetary expense incurred by the firm to produce their output.

Private & Social cost  $\rightarrow$  Cost incurred by individual in %/o form or  
 Cost that society has to bear on the account of production.

- Fixed cost: constant on Q/P  $\uparrow$ . (Ex: Land, building, etc.)
- Variable: changing on Q/P  $\uparrow$  for raw mat, cost, fuel, labor, electricity, cost etc.

\* See table & graph from previous page:

$$\begin{aligned} \text{A.C.} &\rightarrow \text{MC} \rightarrow \text{A.C. is per unit cost } \left( \frac{\text{TVC}}{\text{Q}} \right) = \text{AVC} \\ \text{MC} &\rightarrow \Delta \frac{\text{TC}}{\Delta \text{Q}} \text{ adduced to interval, or } \frac{\text{AVC}}{\text{Q}} = \frac{\text{MC} + \Delta \text{MC}}{\Delta \text{Q}} \end{aligned}$$

- o No opt. unitally, both A.C. same. b. (at this time  $\text{AC} > \text{MC}$ ),  
when  $\text{AC}$  is min.,  $\text{MC} \cong \text{AC}$ .
- o  $\text{MC}$  curve cuts  $\text{A.C.}$  at its minimum.
- o After that  $\text{MC} > \text{AC}$ .

debtors unengaged

AFC (Avg. fixed cost) : Resultant fixed cost  $\cdot \frac{\text{AFC}}{\text{Q}}$

A.V.C (Avg. variable cost) : Resultant variable cost  $\text{AVC} = \frac{\text{TVC}}{\text{Q}}$ .

~~AFC~~  $\Rightarrow$  AFC will continually  $\downarrow$   $\Leftrightarrow$  TVC in fixed & Q.

~~AFC~~  $\Rightarrow$  AVC  $\rightarrow$

$$\text{TC} = \text{TFC} + \text{TVC}$$

$$\text{TVC} = \text{TC} - \text{TFC}$$

$$\text{TFC} = \text{TC} - \text{TVC}$$

$$\text{MC} = \frac{\Delta \text{TC}}{\Delta \text{Q}}$$

$$\text{AC} = \frac{\text{TC}}{\text{Q}} = \frac{\text{TFC} + \text{TVC}}{\text{Q}} = \text{AFC} + \text{AVC}$$

expressed by producer,

$$\text{AFC} = \frac{\text{TFC}}{\text{Q}} \quad \cancel{\text{AFC} = \frac{\text{TFC}}{\text{Q}}} \quad \text{AVC} = \text{AC} - \text{AFC}$$

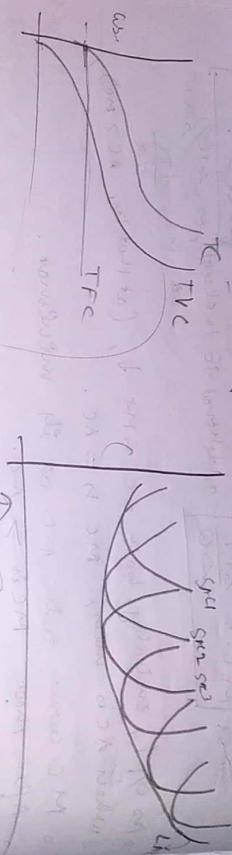
$$\text{AVC} = \frac{\text{TVC}}{\text{Q}} = \text{AC} - \text{AFC}$$

put original by producer,  
on variable cost line  
to produce / sell inputs,  
when before produced and  
in production.

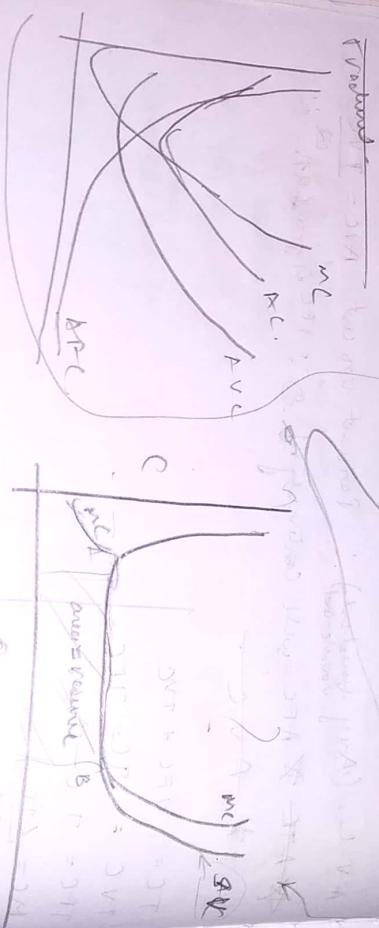
↓ of production.  
↓ of depreciation of machinery.  
↓ of depreciation of machinery.  
cost, fuel, labor  
etc.

TRADITIONAL COST CURVES vs. MODERN COST CURVES

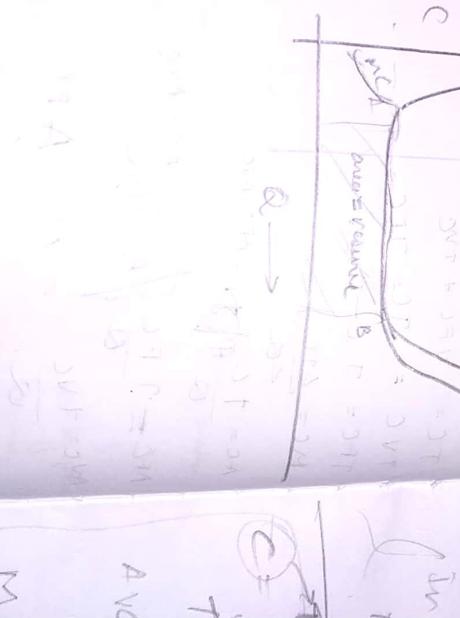
LONG RUN



Traditional costs have constant returns to scale (AVC = AC)



Modern costs have decreasing returns to scale (AVC > AC)



MC

Long run AC in all possible comb. of min. points on  
horizontal avg. cost.

It is also planning, ... An engineer can plan his kind of  
output in long run, from his short run experiences.

Modern Cost theory: Shape of avg var. cost curve and its  
curve or not 'U' shape, is always shaped, because  
will be a flattening over a range of output sizes of MC  
at min ave. cost. This is reserve capacity  $\rightarrow$  (reson)

$\hookrightarrow$  1) if a next demand fluctuates inward, 2) to all  
smooth flow of production in case breakdown of equipment 3) to make  
growing demand upto expansion of plant size.

In initial stages, when SMC falls below MC & 1

↓ Min ave. cost above SMC in the region after B.  
Short-run avg. cost

$$C = b_0 + b_1x + b_2x^2$$

TFC

+ Var

$$AVC = \frac{TVC}{x} = \frac{b_1x + b_2x^2}{x} = b_1 + b_2x + b_3x^2$$

$$MC = \frac{de}{dx} = b_1 + 2b_2x + 3b_3x^2$$

$$AC = \frac{TC}{x} = \frac{b_0}{x} + b_1 + b_2x + b_3x^2$$

$$C = \frac{100}{TFC} + 2x - 3x^2 + 4x^3$$

$$TFC = 100$$

$$TVC = 2x - 3x^2 + 4x^3$$

$$AFC = \frac{100}{x}$$

+ AFC

$$MC = \frac{dc}{dx} = 2 - 6x + 12x^2$$

$$AVC = \frac{TVC}{x} = 2 - 3x + 4x^2$$

$$AC = \frac{100}{x} + 2 - 3x + 4x^2$$

Optimum Firm  $\rightarrow$  optimum  $\rightarrow$  not maximum; a firm maximizing its  
level of profit per unit or min. avg. cost. At that pt., the  
firm utilizes its resources & technology effectively.