# PEEM

## ECONOMICS

- Oikos
  - ECO
  - House hold
- Nomeis
  - nomics
  - management

* Father of Economics "Adam smith"

Economics : according to Adam smith
Adam smith's Wealth definition

(A) → Economics : According to Adam smith 'Economics is the science of wealth' this definition is also known as wealth definition.

(**) → Economics : According to Alfred Marshall 'Economics is a study of man in the ~~country~~ ordinary business of life. It enquires how he gets his income and how he uses it'. this definition is also known as Welfare definition.

(*) Economics : According to prof. Lionel Robbins 'Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses'. this definition is also known as scarcity definition.

* Economics :- According to prof. Samuelson "Economics is the study of how man and society chooses, with or without the use of money, to employ scarce productive resources, which could have alternative uses, to product various ~~people~~ commodities over time and distribute them for consumption now and in the future among various people and groups of society. this definition is also known as Growth oriented definition.

* Theory of demand

Define the term demand :-

When a person is willing to buy and able to buy a particular product at a particular price over a given period of time.

* Demand schedule :- It is a tabular representation of relationship between price & quantity demand.

| price | quantity demand |
|---|---|
| 10 | 40 |
| 20 | 30 |
| 25 | 28 |
| 30 | 15 |
| 40 | 5 |

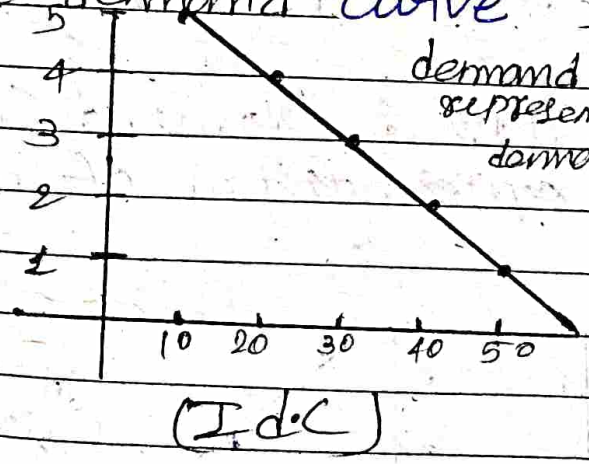
price $\propto \frac{1}{Q \cdot d}$

* Types of demand schedule
  (i) Individual demand schedule
  (ii) Market demand schedule

(i) Individual demand schedular :- It is a tabular representation of relationship between price & quantity demand only for a particular person.

| Price | Q.d |
|---|---|
| 5 | 10 |
| 4 | 20 |
| 3 | 30 |
| 2 | 40 |
| 1 | 50 |

(i) Individual demand curve :- (1.1) Individual demand curve is the graphical representation of Individual demand schedular



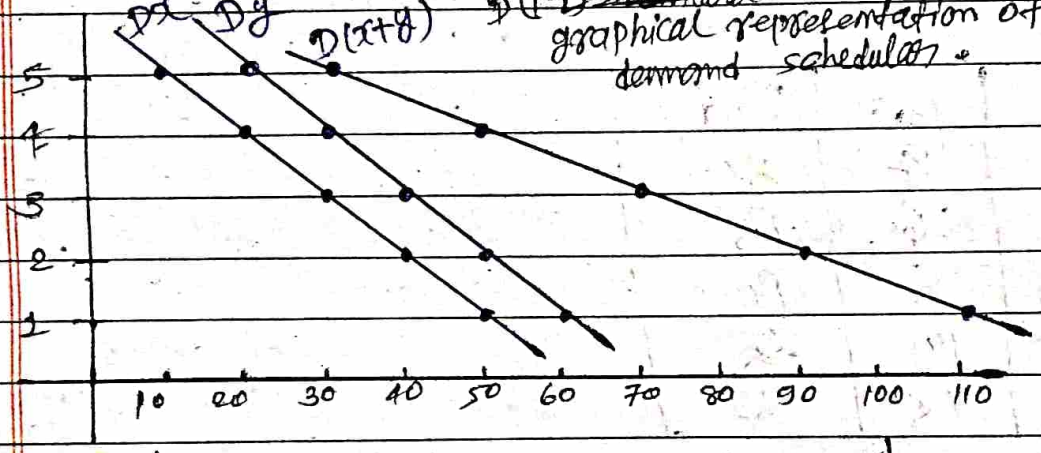

(ii) (1.2) Market demand schedule :- It is a tabular representation of relationship between price & quantity demand for sum of all individual demand.

| price | Q.D of x | Q.D of y | Sum of x+y |
|---|---|---|---|
| 1 | 50 | 60 | 110 |
| 2 | 40 | 50 | 90 |
| 3 | 30 | 40 | 70 |
| 4 | 20 | 30 | 50 |
| 5 | 10 | 20 | 30 |

(M D S)

1.2 D

Market Demand curve is the graphical representation of market demand schedules.

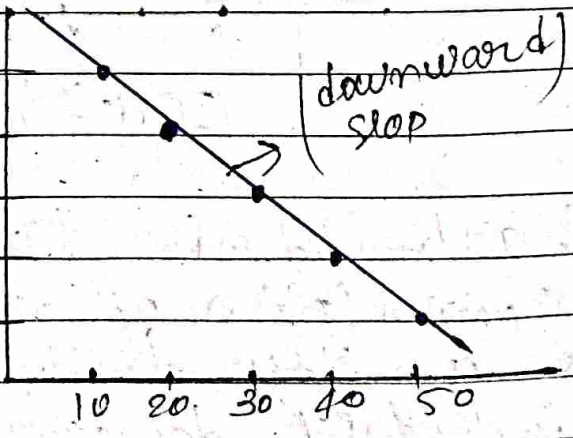



(Market Demand Curve)

* Demand Curve :- Demand Curve is the graphical representation of demand schedule.

| price | Q.D |
|---|---|
| 1 | 50 |
| 2 | 40 |
| 3 | 30 |
| 4 | 20 |
| 5 | 10 |

(Demand schedule)




(Demand Curve)

* Types of demand curve

(i) Individual demand curve (1.1)

(ii) Market demand curve (1.2)

* Types of demand
(i) Individual demand
(ii) Market demand

(i) Individual demand :- When only a particular person is willing to buy and able to buy a particular product at a particular price over the give period of time is called individual demand.

(ii) Market demand :- When all person or all customer are willing to buy and able to buy a particular product at a particular price over the given period of time is called Market demand.

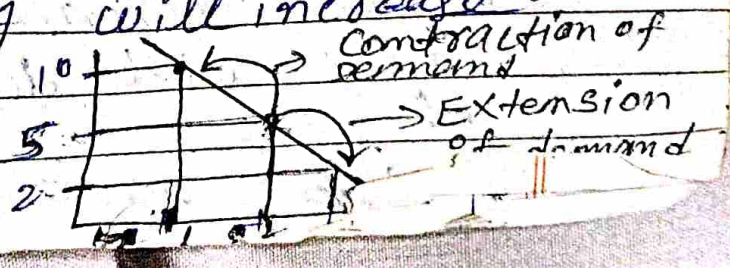
* factors Affecting Demand
(i) individual demand
(ii) Market demand

(i) factor Affecting individual demand

(i) price of Commodity :- we know that price is inversely related to quantity demand so if price of commodity will increase than demand of that commodity will decrease on the other hand price of commodity will decrease than demand of that commodity will increase.

$P \propto \frac{1}{D}$

| P | D |
|---|---|
| 10 | 1 |
| 5 | 2 |
| 2 | 5 |



(2) price of related goods :-

- Two types of related goods
  - (i) Substitute goods
  - (ii) Complimentary goods

(i) Substitute goods :- Substitute goods are those goods which can be used in place of each other.

Ex ⇒ Tea → Coffee
Coke → Pepsi

effect → Let Tea = x, Coffee = y
There is two substitute good x, y if If we increase in price of x than there will increase in demand of y
on the other hand
if we increase in price of y than there will increase in demand of x.

(ii) Complimentary goods :- Complimentary goods are those goods which can be used together

Ex ⇒ Car → Petrol
ink → pen
Bread → Butter

effect → Let Bread = x, Butter = y
There is two Complimentary goods x, y if we increase in price of x than there will decrease in the demand of y.
Vice - Versa

(2) Income of Consumer :-

goods

~~(i) Normal goods~~

(ii) Inferior goods

(iii) Necessity goods

(iv) Luxries goods

(i) Inferior goods :- Inferior goods are those goods which quality is bad but remain consumers buy because lack of income or money.

Ex ⇒ Toned milk

effect → If we decrease in income of consumer than there will increase in demand on the other hand if we increase in income of consumer than there will decrease in demand. There is income and demand is inversely proportnal to each-other.

$$\text{Income} \propto \frac{1}{\text{Demand}}$$

(ii) Necessity goods :- Necessity goods are those goods which Necessary for consumer even if price is up or down, Consumers have to buy

Ex ⇒ Salt, milk, oil, Medicine

effect → If we change in consumers income it can be increase it can be decrease but demand of consumers remain unchange. ~~There is~~ ~~no~~ and ~~demand is exactly~~ ~~zero~~

(iii) luxuries goods :- luxuries goods are those good which quality is very good which bought by higher income of consumer.
Ex ⇒ Car.

effect → If we increase in Income of Consumer than there will be increase in demand, if we decrease in income of consumer than demand will be decrease, It means Income and demand is directly proposnal (proportional) to each-other.

④ Taste and preferences of goods :- If the taste & preference of a commodity is favourable or very good than demand of commodity will be increase, if the taste & preference of a commdity is unfavourable or bad so demand of commodity will decrease. in this condition price & Income is constant.

⑤ future expectation of (consumer) :- If the price of a commodity is expected to increase in near future than, consumers will buy more and more of that commdity even when price is high it leads to increase in demand so expectation of commodity is directly proposnal to demand.
Ex ⇒ if the price of onion is expected to rise in the future its present demand will be increase.

* factor affecting Market demand :-
(i) same as 5 individual demand
(ii) population
(iii) season and weather
(iv) Distribution of income :-

(i) population :- If population is increase in market it leads to increase in demand : if population is decrease in the market it leads to decrease in demand so population is directly proportional to demand

(ii) Season and Weather :- Season and weather leads to increase and decrease in demand for example :-
In Winter :- In Winter season heater is necessary so demand increase of heater and cooler demand is decrease .
In summer season :- In Summer season cooler is necessary so demand increase of Cooler and heater demand is decrease

Weather :- In high temperature we need fans so demand increase of fans on the other hand - in raining season we need umbrella so demand of umbrella is increase and fans demand is decrease.

(3) Distribution of Income :- If distribution of income of a particular country is equal than demand will increase on the other hand if distribution of income of a particular country is unequal than demand will decrease.

* Law of demand :- law of demand state there is inverse relationship between price and quantity demand if we keep all other factors constant.

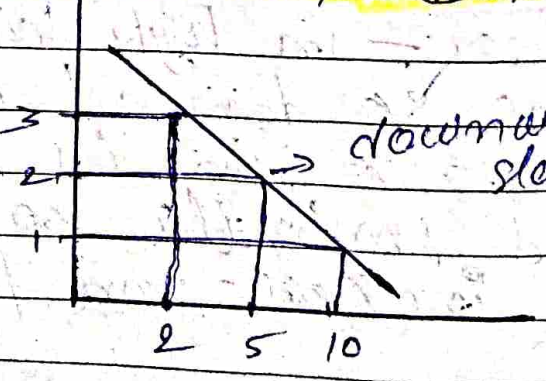
* Assumption of law of demand

(i) price of commodity is constant.
(ii) price of related goods is constant.
(iii) Income of consumer is constant.
(iv) Taste & preference is constant
(v) future expectation is constant
(vi) population is constant
(vii) Season & weather is constant.
(viii) Distribution of income is constant.

(*) Draw the diagram of law of demand

| P | Q. demand |
|---|---|
| 1 | 10 |
| 2 | 5 |
| 3 | 2 |

demand schedular




Demand Curve

diagram of law of demand

Utility → Satisfaction

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Explanation :- According to demand schedular and curve we can say that there is inverse relationship between price and quantity demand & shape of demand curve is downword.

* Reasons for law of demand

(1) Law of diminishing marginal utility :- As a consumer consumes more & more commodity, his marginal utility from each additional unit goes on falling. Thus the consumer will buy more units of commodity if whem price of commodity falls.

| units of Commodity | M.U | price |
|---|---|---|
| 1 | 10 | 5 |
| 2 | 8 | 5 |
| 3 | 6 | 5 |
| 4 | 4 | 5 |
| 5 | 2 | 5 |

(2) Income effect :- whem price of the Commodity decreases than real income of consumer increases thus demand of Commodity increases if price of the Commodity increase than real income of Consumer decreases thus demand of Commdity decreases.

(3) Substitution effect :- When we increase price of Commodity than second Commodity demand will increase. When we increase price of second commodity than first Commodity demand will increase.

Ex ⇒ Tea → Coffee
P↑ → D↑
D↑ → P↑

(4) Different uses :- Some Commodity have several uses like milk for Tea, Coffee, Butter, paneer, cheese, sweets if price of milk increase than it's several uses goes to restricted means we will use milk for only Tea thus increase in price of Commodity than decrease in Quantity demand on the other hand if price of milk goes to decrease than we will several use of milk like for Tea, Coffee, Butter, Ghee, drinking thus decrease in price of Commodity than increase in Quantity demand.

(5) Additional Customer :- When price of Commodity decreases many new consumer who were not able to purchase it they start purchasing it, old consumer also more purchasing it so demand of Commodity increases when price of Commodity decreases, when price of commodity increases demand of Commodity decreases.

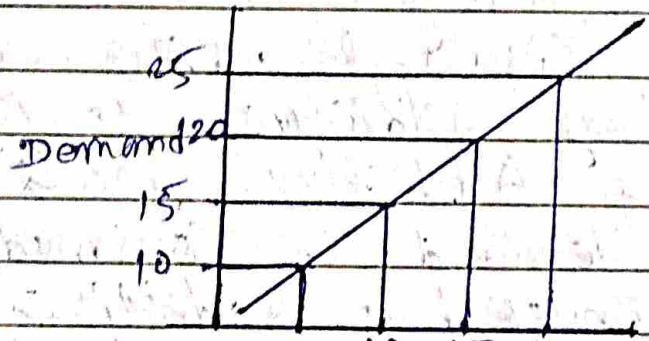
## Exceptions to law of Demand

paradox

(1) Giffen goods :- Giffem goods are special kind of inferior goods whose demand increases with increase in price and demand is decreases with decreases in price. Giffem goods or paradox is given by Sir Robert Giffen

| P | D |
|---|---|
| 5 | 10 |
| 10 | 15 |
| 15 | 20 |
| 20 | 25 |

demand schedule



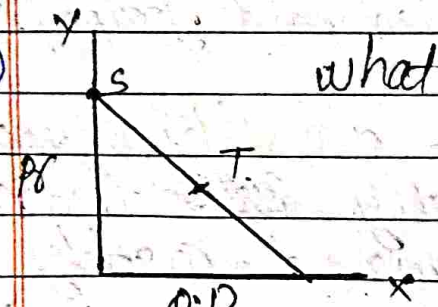

demand graph/curve

(2) Articles of Distinction or Veblem goods :- Veblem goods are basically luxries goods like :- gold, diamond, costly cars, costly phone whose demand increases with increase in price and ~~Giffem goods~~ demand is decreases with decrease in price.

(3) Ignorance :- Some consumers think that high price goods is of high quality so they purchase it thus demand of that commodity increases

④ future expectation :- If the price of a commodity expected to increase in near future than consumer will buy more and more of that commodity even when price is high it leads to increase in demand

⑤ Addictive goods :- Addictive goods are basically intoxication goods like :- wine, cigarette, drugs, consumers must buy addictive goods even if the price of Addictive goods are increase so demand of commodity increases, they must buy Addictive goods because consumers addicted of intoxication.

(*) 


what will be the elasticity at point S and T and why?

Elasticity at point $S = \frac{2}{0}$

$$\boxed{ES = \infty}$$

Elasticity at point $T = \frac{1}{1} = 1$

$$\boxed{ET = 1}$$

→ Elasticity at point $S = \infty$ and elasticity at point $T = 1$ because at point S there is no any upper segment so divided by 0 in any no is ∞

→ Elasticity at point $T = 1$ because lower segment and upper segment = 1 so 1 divid by 1 = 1

so $\boxed{T = 1}$ & $\boxed{S = \infty}$

* Difference between change in quantity demand and change in demand.

| change in quantity demand | change in demand |
|---|---|
| (i) It is also known as movement along demand curve. | It is also known as shifts in demand. |
| (ii) When the quantity of demand of the commodity change due to price increase or decrease. | When the demand of the commodity change due to other than price of the commodity. |
| (iii) Reason for quantity demand is price. | Reason for change in demand is other than price like - Population, Income |
| (iv) Types of movements → two<br>(i) upward movement<br>(ii) Downward movement | Types of shifts → two<br>(i) Leftward shift (ii) Rightward shift |

U.M

| P | Q.D |
|---|---|
| 1 | 10 |
| 2 | 8 |
| 3 | 6 |
| 4 | 4 |

D.M

| P | Q.D |
|---|---|
| 4 | 4 |
| 3 | 6 |
| 2 | 8 |
| 1 | 10 |

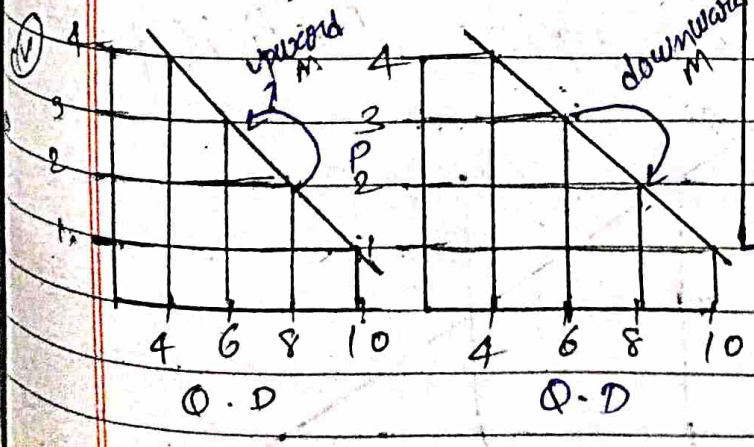
L.S

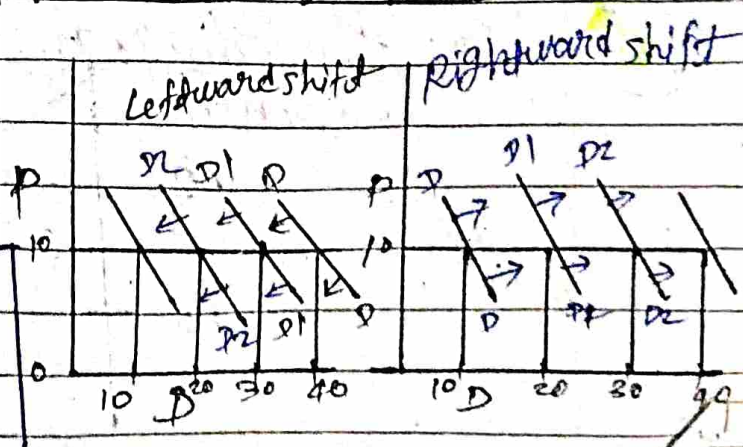
| P | D |
|---|---|
| 10 | 40 |
| 10 | 30 |
| 10 | 20 |
| 10 | 10 |

R.S

| P | D |
|---|---|
| 10 | 10 |
| 10 | 20 |
| 10 | 30 |
| 10 | 40 |

(v)



Q8 Define Elasticity of demand and its type and draw the diagram of price elasticity of demand

Ans Elasticity of demand:
percentage change in demand for a commodity with respect to percentage change in any of the factor affecting demand for that commodity

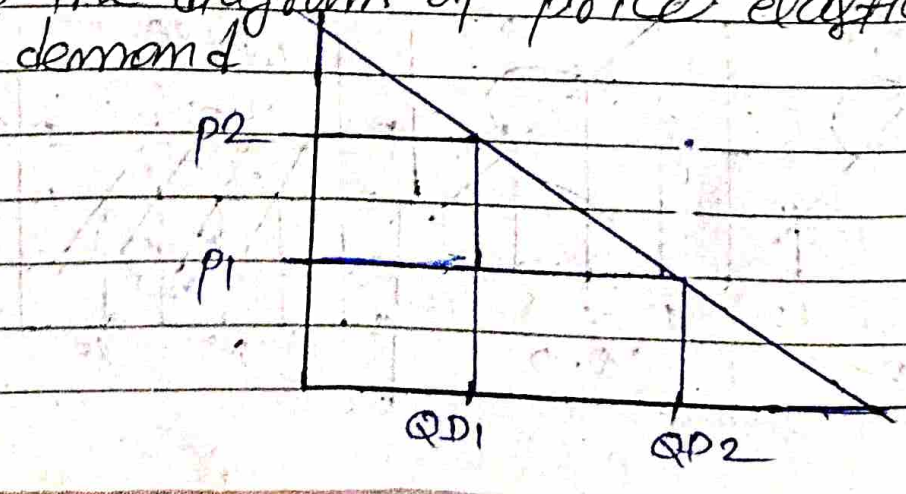
Elasticity of Demand = % Δ in Quantity demand of the x / % Δ in factor affecting demand of the x

Types of Elasticity of demand
(i) price elasticity of demand
(ii) Income elasticity of demand
(iii) Cross elasticity of demand

(i) price elasticity of demand: percentage change in demand for a commodity with respect to percentage change in the price of the commodity.

$$Ped = \frac{\%\ \Delta \text{ in Q.D of } x}{\%\ \Delta \text{ in price of } x}$$

Ans draw the diagram of price elasticity of demand



(ii) Income elasticity of demand :- percentage change in demand for a commodity with respect to percentage change in income of the commodity.

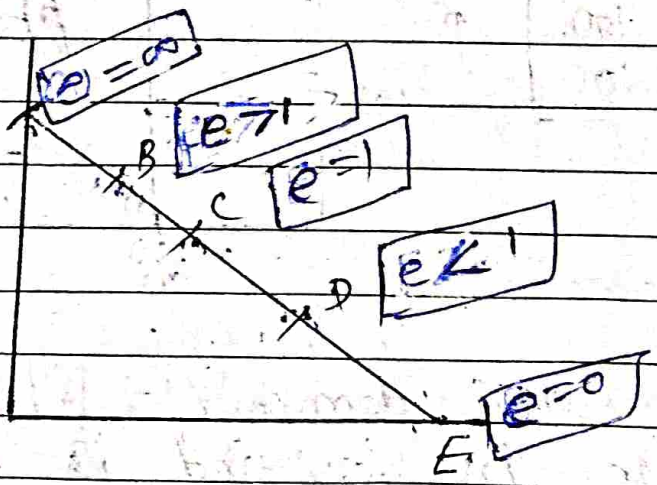
(iii) Cross elasticity of demand :- percentage change in demand for a commodity with respect to percentage change in price of related goods.

Draw

(*) Graph of point Method of elasticity of demand

→ Lower segment of demand curve with respect to upper segment of demand curve is known as point Method of elasticity of demand.

$EM = \frac{LSD}{USD}$




$E_A = \frac{AE}{0} = \infty$ ; $E_B = \frac{BE}{BA} \Rightarrow E_B = \frac{3}{1}$ $E_B = 3$

$E_A = \infty$

$E_C = \frac{CE}{CA} \Rightarrow E_C = \frac{2}{2}$ $E_C = 1$ $E_D = \frac{DE}{DA} \Rightarrow E_D = \frac{1}{3}$

$E_D = 0.33$ $E_E = \frac{0}{AE}$ $E_E = 0$

Pg 90 Explain methods of elasticity of demand

(i) Geometric Method or point Method

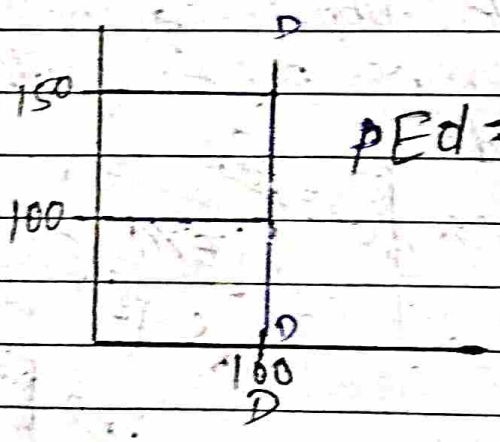
(ii) proportionate Method or percentage Method

(iii) Total expenditure Method

Pg 93 Degree of elasticity of demand along with diagram

(i) Perfectly Inelastic demand :- When percentage change in price has no effect on percentage change in demand.

| P | D. |
|---|---|
| 100 | 100 |
| 150 | 100 |



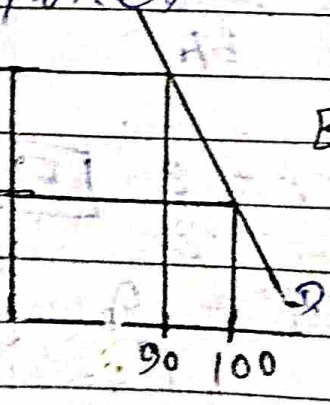

$$pEd = \frac{0}{50}$$

Ed = 0

Ed = 0

(ii) Less elastic demand :- When percentage change in demand is less than percentage change in price.

| P | Q.D |
|---|---|
| 100 | 100 |
| 150 | 90 |




$$ED = \frac{10\%}{50\%}$$

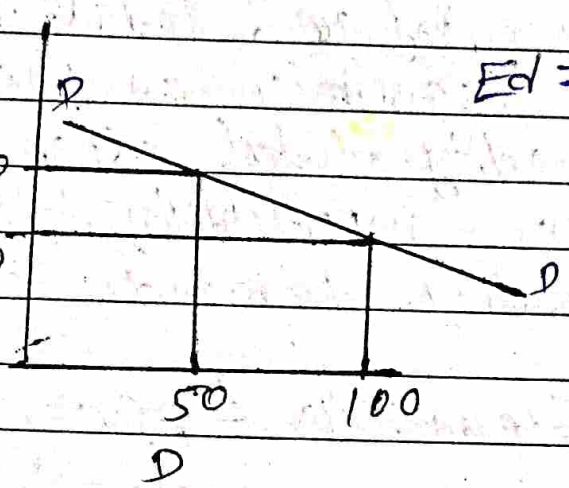
ED = 0.2

ED < 1

highly

(iii) More elastic demand :- When percentage change in demand is greater than percentage change in price.

| P | D |
|---|---|
| 100 | 100 |
| 110 | 50 |

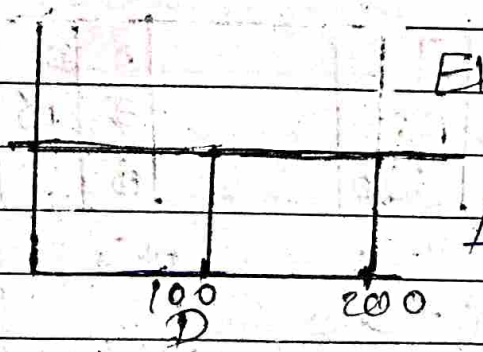



$Ed = \frac{50\%}{10\%}$ $Ed = 5$

$Ed > 1$

(iv) Perfectly elastic demand :- When percentage change in demand has no any effect on percentage change in price.

| P | D |
|---|---|
| 100 | 100 |
| 100 | 200 |

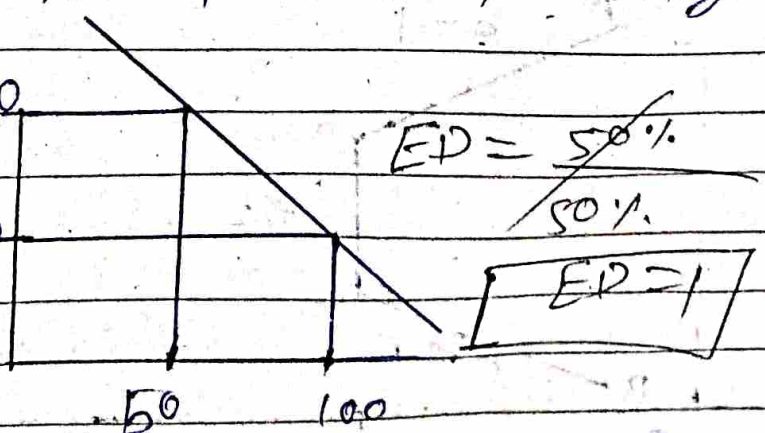



$EP = \frac{100\%}{0}$

$EP = \infty$

(v) Unitary elastic demand :- When percentage change in demand is equal to percentage change in price.

| P | D |
|---|---|
| 100 | 100 |
| 150 | 50 |




$EP = \frac{50\%}{50\%}$

$EP = 1$

q.2 D

* Draw the graph of Total expenditure method of elasticity of demand

PYQ

* Total expenditure : Total expenditure done by a consumer on the purchase of a commodity, total expenditure can be explain by multiplying the price with the quantity demand.

Total Expenditure = price × quantity demand

$$Te = P \times Q_d$$

(i) More elastic (ii) unitary elastic (iii) less elastic

| P | D | Te |
|---|---|---|
| 5 | 10 | 50 |
| 4 | 15 | 60 |

$PEd = \frac{5\%}{1\%} = 5$

$Ed > 1$

| P | D | Te |
|---|---|---|
| 5 | 6 | 30 |
| 6 | 5 | 30 |

$PEd = \frac{1\%}{1\%}$

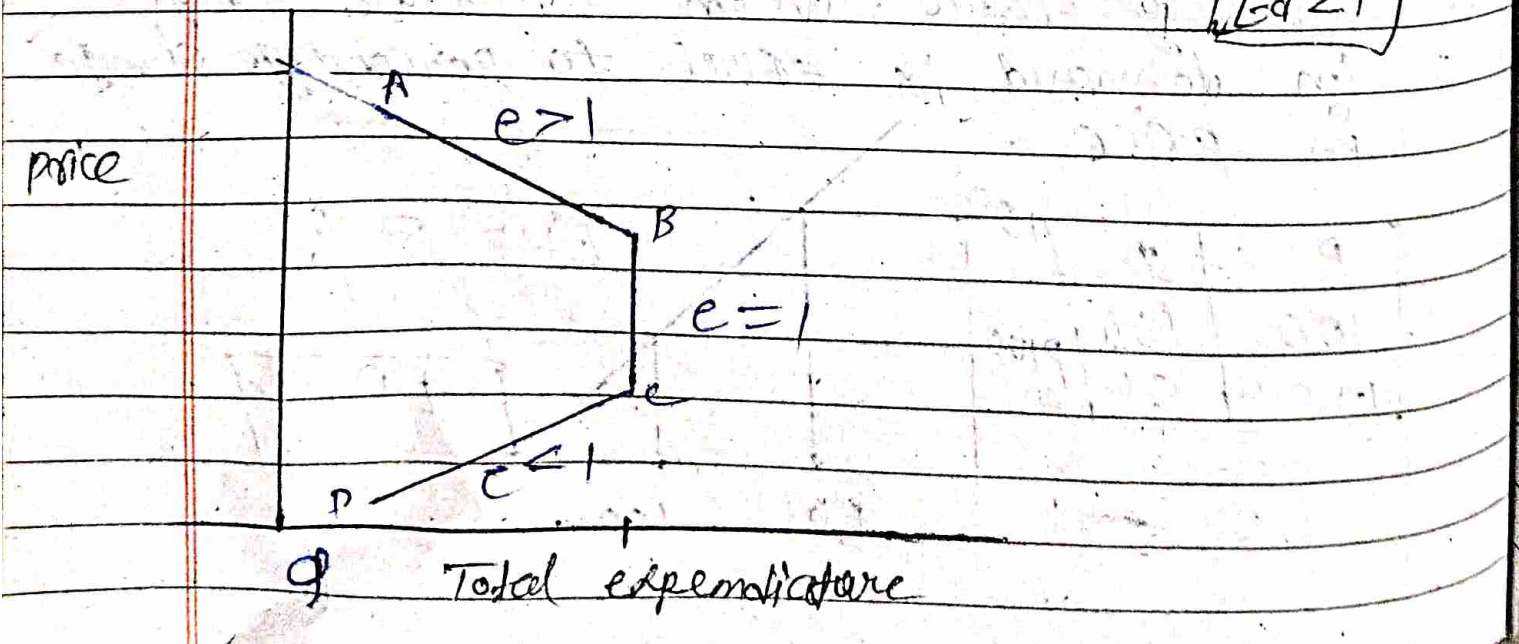
$Ed = 1$

| P | d | Te |
|---|---|---|
| 5 | 9 | 45 |
| 10 | 5 | 50 |

$PEd = \frac{4}{5} = 0.8$

$Ed = 0.8$

$Ed < 1$



(3) Proportionate Method :- proportionate change in quantity demand with respect to proportionate change in price is called proportionate Method

$$Ep = \frac{\%\ \Delta QD}{\%\ \Delta P}, \quad \%\ \Delta QD = \frac{Q1 - Q}{Q} \times 100$$

$$\%\ \Delta P = \frac{P1 - P}{P} \times 100$$

Q1 = New quantity
Q = old quantity
P1 = New price
P = old price

$$Ep = \frac{\frac{Q1 - Q}{Q} \times 100}{\frac{P1 - P}{P} \times 100}$$

$$Ep = \frac{Q1 - Q}{Q} \times 100 \times \frac{P}{P1 - P} \times 100$$

$$Ep = \frac{Q1 - Q}{P1 - P} \times \frac{P}{Q}$$

$$Ep = -\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

End ↑

Ex ⇒

| P | Q |
|---|---|
| 10 | 50 |
| 11 | 40 |

$$EP = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$$EP = \frac{50 - 40}{11 - 10} \times \frac{10}{50} \Rightarrow EP = \frac{10 \times 10}{1 \quad 50}$$

$$EP = \frac{100}{50}$$

$$EP = 2\%$$

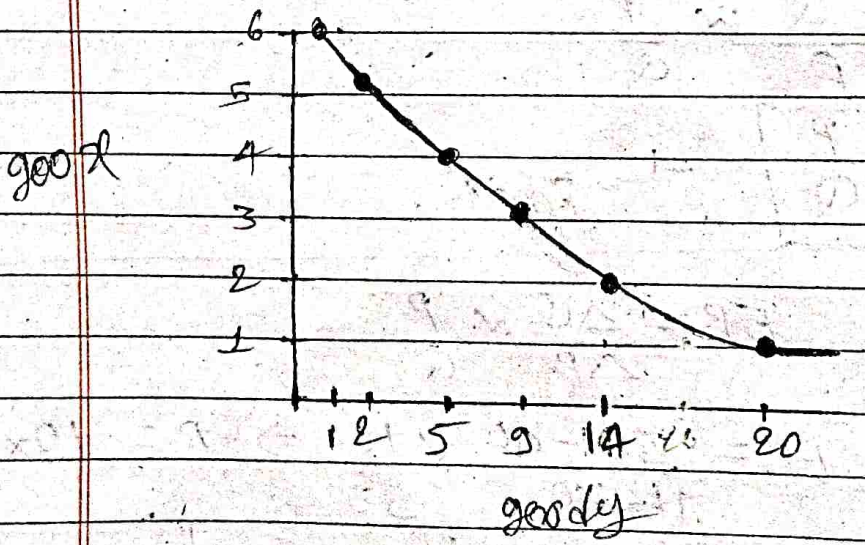
* factors affecting elasticity of demand

(i) Nature of Commodity → Necessary goods / Luxries goods
(ii) Availablity of Substitute → Tea, Coffee
(iii) Habitual goods → Wine, Cigrete
(iv) proportion of income spent
↓ small pro income
more pro income

## (A) Indifference curve & analysis

Indifference curve is the graphical representation of different combination of Two different goods where level of satisfaction is same.

| Combination | good X (APP) | good Y (Banana) |
|---|---|---|
| A | 1 | 20 |
| B | 2 | 14 |
| C | 3 | 9 |
| D | 4 | 5 |
| E | 5 | 2 |
| F | 6 | 1 |




Note = (i) → convex
(ii) → Concave

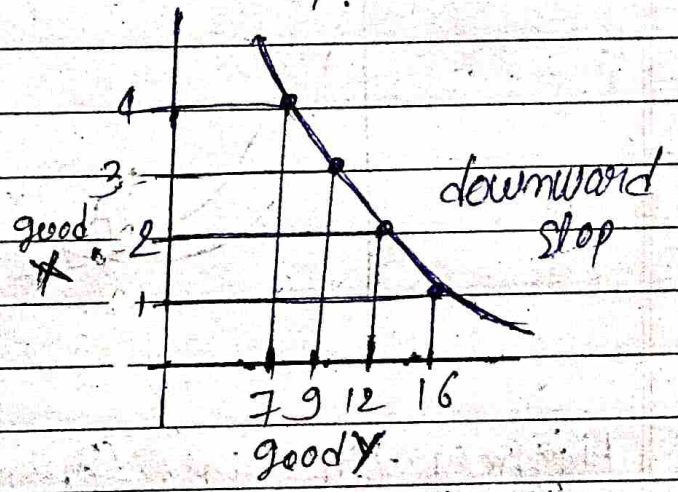
$$MRS = \frac{\text{Sacrifice goods}}{\text{gain goods}} = MRS = \frac{\Delta Y}{\Delta X}$$

## Properties of indifference curve

(i) Indifference curves is downward sloping :- indifference curves is downward sloping because consumer consume more and more quantity or unit of good x and sacrifice good y.

Reason → Indifference curve is downward because there is inversly relationship between good x and good y

| C. | good x | good y |
|---|---|---|
| A | 1 | 16 |
| B | 2 | 12 |
| C | 3 | 9 |
| D | 4 | 7 |

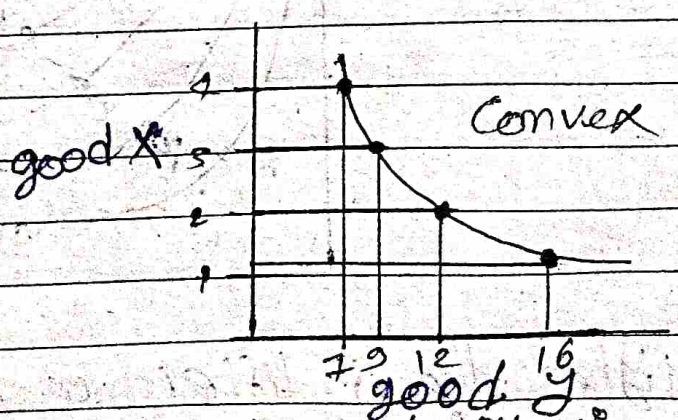



(ii) Indifference curves is convex to the origin :- Indifference curvex is convex to the origin because MRS decreasing between good x & good y

$MRS = \frac{4}{1} = 4:1$

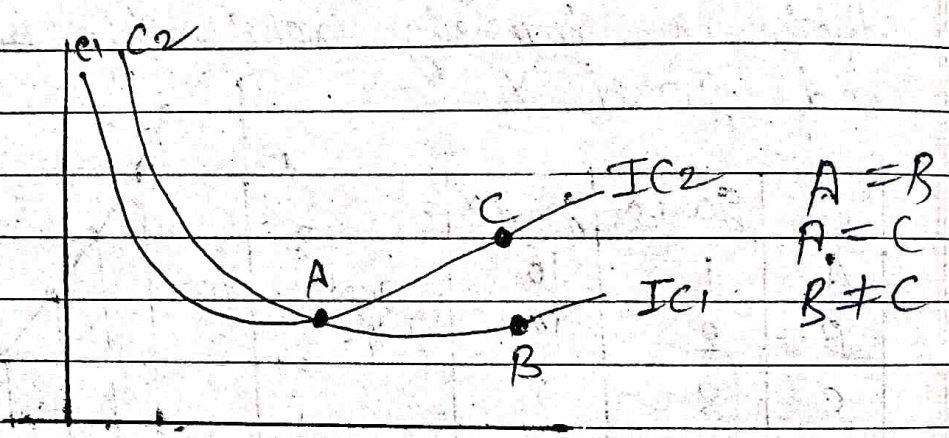
$MRS_B = \frac{3}{1} = 3:1$

$MRS = \frac{2}{1} = 2:1$

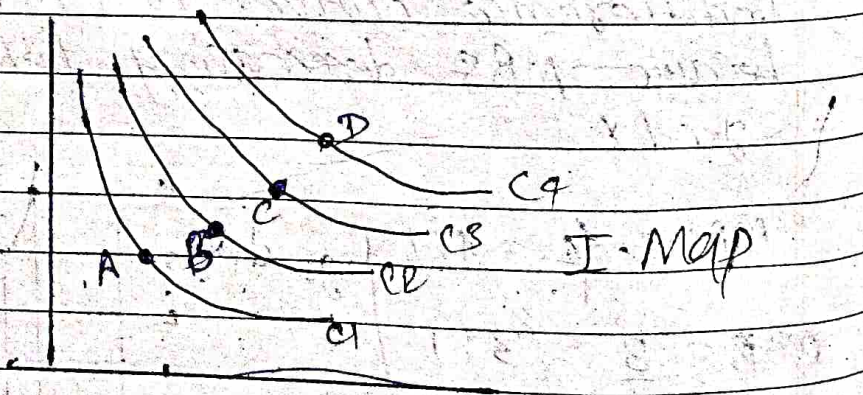



MRS → marginal rate of substitution

(iii) Two indifference curves can never intersect each-other. Two indifference curve never intersect each-other because Two curve in diagram where A is common point of C1 and C2 than A is equal B and A is equal to C but B ≠ C. So can never intersect two curve each-other.



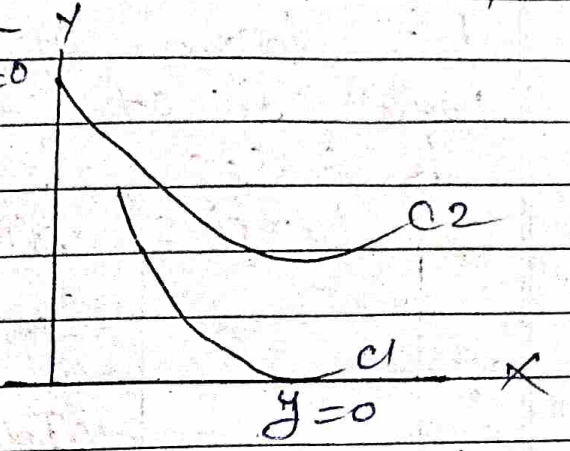

(iv) Higher the indifference curve higher the level of satisfaction




Higher the indifference curve higher the level of satisfaction because every level of satisfaction of every level of curve is different, satisfaction of C1 is less than C2 and C2 less than C3

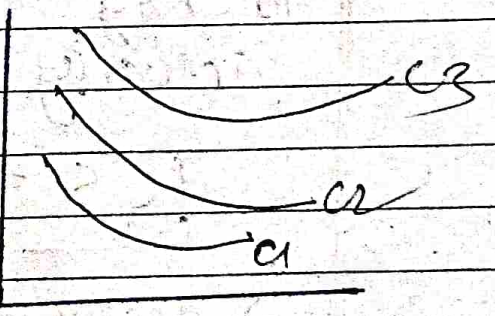
C1 < C2 < C3 < C4 level of satisfaction

(v) Indifference curve can never touch y axis & x axis -



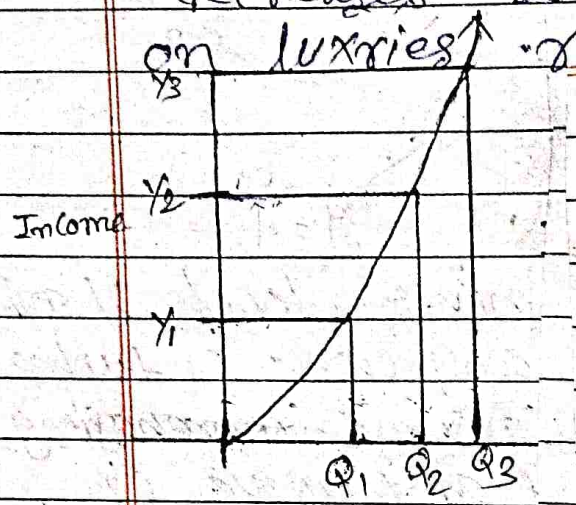

Indifference curve can never touch y axis & x axis because if any curve C1 touches x axis it means that consumer is purchasing only x unit like this if any curve C2 touches y axis I it means consumers are purchasing only y unit of commodity so I can never touch x, y axis.

(vi) Indifference curve may or may not be parallel to each-other.

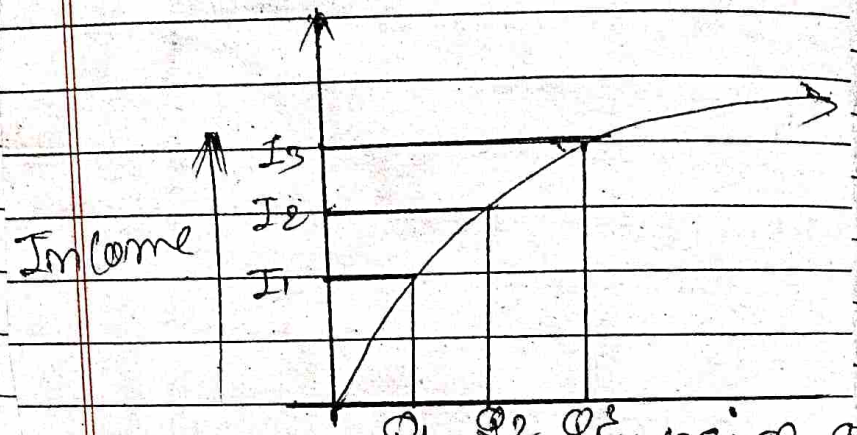



Indifference curve is not need that these are parallel always to each other, I.C may like C1 and C2 & C3
I.C may or may not be parallel to each-other because all time all combination is match to each-other can not possible, it can be possible in some time or rare time.

(Q8) Engel's law :- Engel laid state that as the income of the consumer arises proportion of expenditure on necessity decreases & proportion of expenditure on luxries rises.




Necessities goods
percentage in Q




luxries

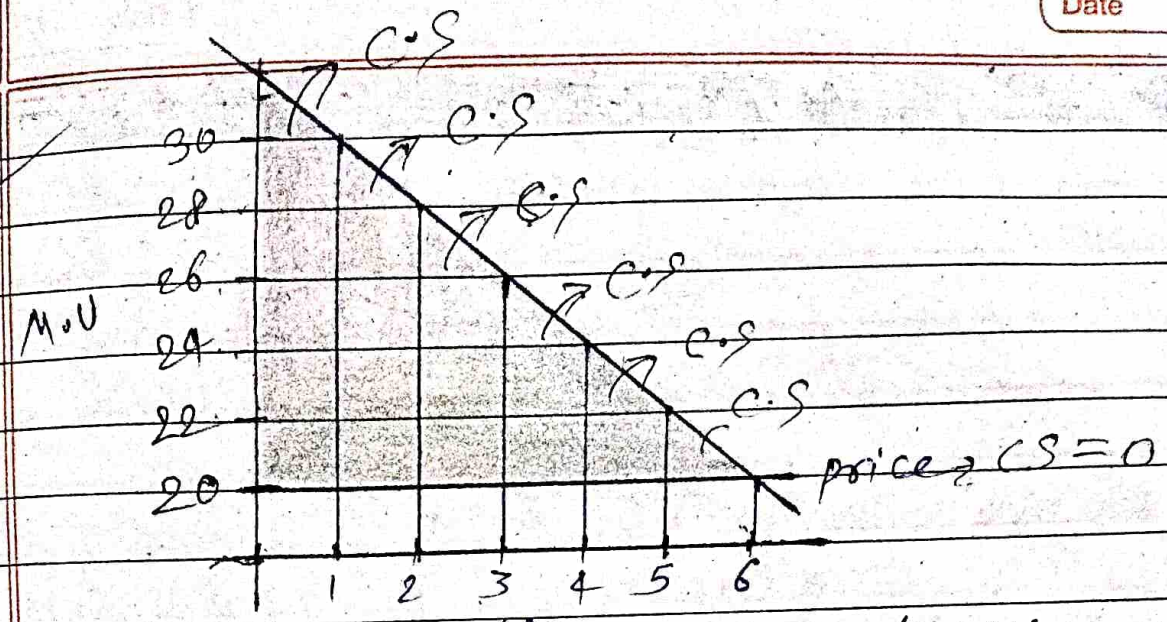
(Q9) Consumer surplus :- It is different between the amount consumer is willing to pay and the amount he/she actually paid. given by Marshyal

$$CS = PWP - PAP$$

Note → Marginal utility is the price of consumer is willing to pay for that unit

Cardinal Approach

| No. of unit | M.U | Price | C.S |
|---|---|---|---|
| 1 | 30 | 20 | 10 |
| 2 | 28 | 20 | 8 |
| 3 | 26 | 20 | 6 |
| 4 | 24 | 20 | 4 |
| 5 | 22 | 20 | 2 |
| 6 | 20 | 20 | 0 |




or Marginal utility curve
Demand curve

* Assumptions

(i) Marginal utility can be presented in cardinal numbers.

(ii) Marginal utility of Money remains constant.

(iii) Every commodity is an independent commodity and it has no subitute. It means utility of a commodity is not influenced by utility of another commodity

(iv) Income, fasion, custom, test etc of the Consumers remain constant

(v) Concept of consumer surplus is based on demand curve or marginal utility thus all the assumptions of demand curve also applied to this concept.

इसे डिटेल में assemption का उतना लिखना है।

# Chapter – 2

## Production and Cost

* **production :-** Production is the process of making or manufacturing goods and products from raw materials is called production.

* **Production function :-** Production function is a technique relationship between physical inputs and output of a good.

$$x \text{ chairs} = f(2L, 3K)$$

K ↔ capital

{Land, Money, Machinarry}

* **Short Run :-** In short run, some factors are fixed and some are variable, and fixed factors cannot be changed during a short span of time

* कुछ ऐसा Time period जिसमें कुछ factors change नहीं हो सकते हैं, short run

* कुछ ऐसा Time period जिसमें सभी factors change हो सकता है। → long run

* Product or output :- Product or output refers to the volume of goods produced by a firm or an industry during a specified period of time.

Types of product :-
(i) Total product
(ii) Marginal product
(iii) Average product
productivity

* Total product :- Total product refers to total quantity of goods produced by a firm during a given Period of time and with given number of inputs.

$$TP = TP_1 + TP_2 + TP_3 - - - - - TP_n$$

$$TP = \Sigma TMP$$

* Marginal product :- Marginal product refers to addition to total product

$$MP_n = TP_n - TP_{n-1}$$

n=10

$$MP_{10} = TP_{10} - TP_9$$

* If 10 labour make 60 kg of rice and 11th labours make 67 kg of rice then MP of 11 labour will be. $MP_{11} = TP_{11} - TP_{10}$

(my) $MP_{11} = 67 - 60$

$MP_{11} = 7$ kg

① Total product : Total product refers to total quantity of goods produced by a firm over a given period of time.

$$TP = TP_1 + TP_2 + TP_3 - - - - TP_n$$

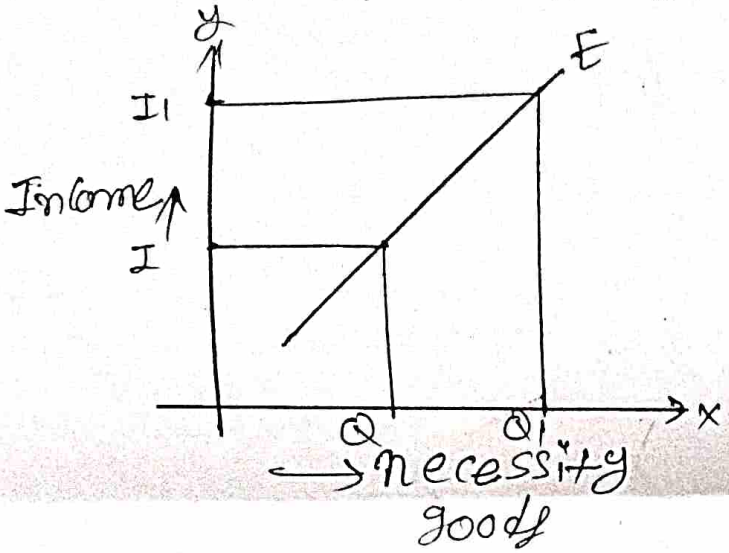
② Average product :- Average product refers to total product with respect to no of inputs is called Average product.

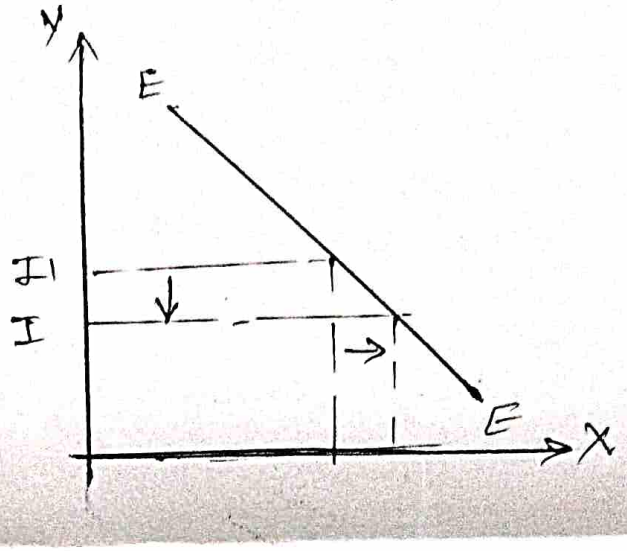
$$AP = \frac{TP}{\text{no of Input}}$$

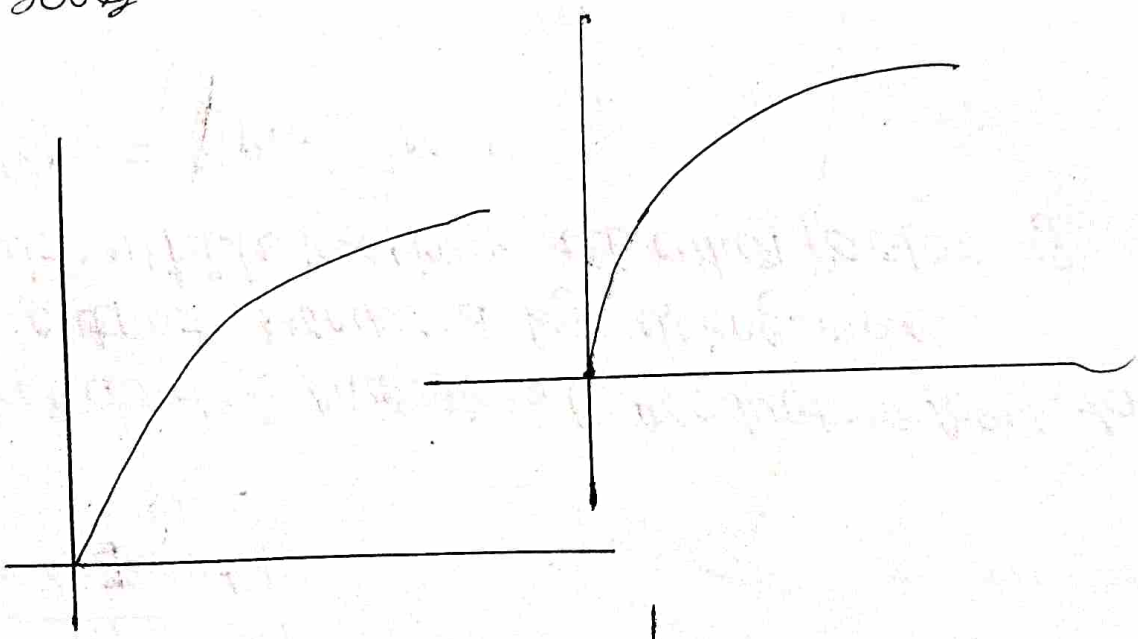
③ Marginal product :- Marginal product refers to the additional output produced by using one additional unit while keeping all other factor as Constant.

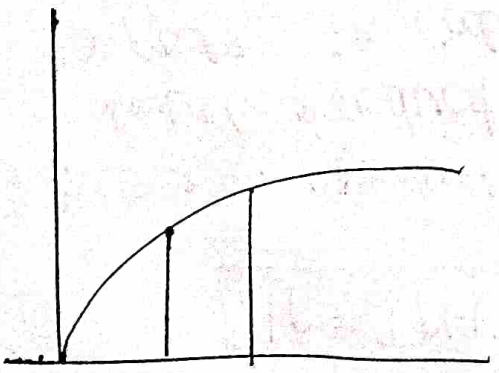
$$MP_n = TP_n - TP_{(n-1)}$$

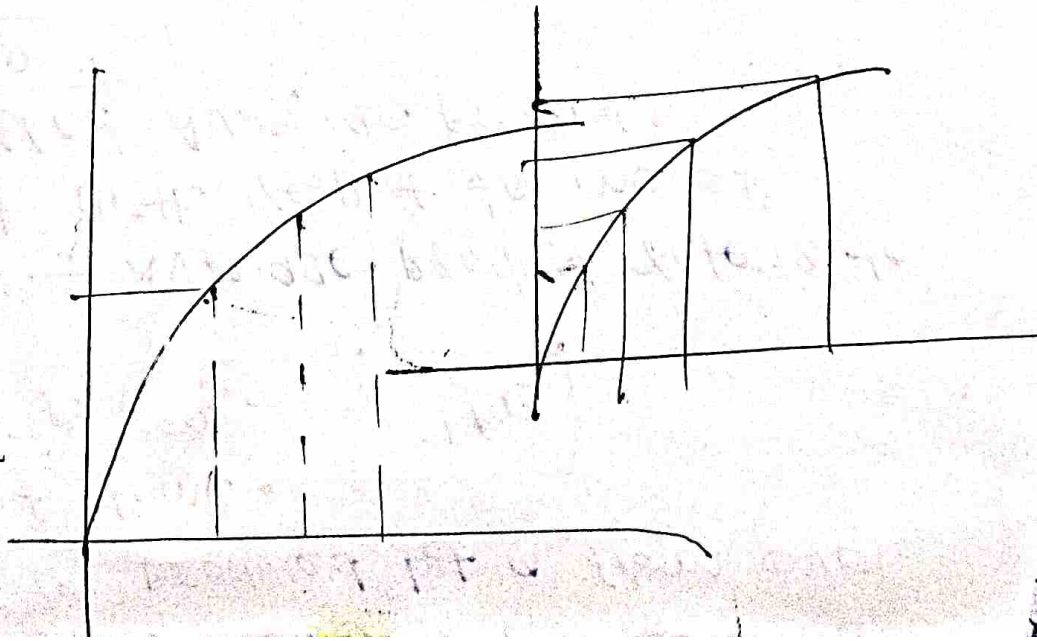
Engel's law :- Engel law state that as the income of consumer arises percentage expendiature on necessity goods decreases & percentage expendiature on luxries goods arises.







* Marginal product → MP

$MP = \frac{\text{change in total product}}{\text{change in units of variable factors}}$

$MP = \frac{\Delta TP}{\Delta n}$ where $n$ → change in units of variable factor

x → Suppose 2 labours produce 60 units and 5 labours produce 90 units, then MP will be

$MP = \frac{90 - 60}{5 - 2} \Rightarrow MP = \frac{30}{3} = \boxed{MP = 10}$

~~productivity~~

* Average product : Average product refers to output per unit variable input.

$AV = \frac{\text{Total product (TP)}}{\text{units of variable factor (n)}}$

$\boxed{TP = AP \times \text{units of variable factor}}$

* If TP is 60 kg of rice, produced by 10 labour the AP will be

Sol: $TP = 60$ kg

$AP = \frac{60}{10}$ $\boxed{AP = 6 \text{ kg}}$

* Relationship between A.p and M.p

(i) As long as M.p is more, than A.p rises

(ii) when M.p is equal to A.p than A.p is at its maximum.

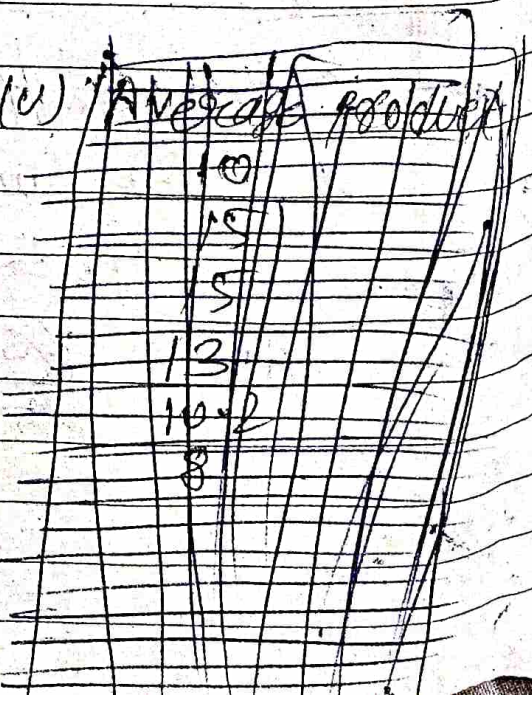
(iii) when M.p is less, than A.p, A.p falls

(iv) Therefore both A.p and M.p fall, but M.p becomes negative, whereas A.p remain positive.

(*) Law of variable proportion :-

Law of variable proportions states that as we increase quantity of only one input keeping all other inputs constant total product initially increases at increasing rate, then at a diminishing rate and finally at a negative rate.

| | Land | labour | T.P(U) | M.P(U) | Average product |
|---|---|---|---|---|---|
| S1 | 1 | 1 | 10 | 10 | 10 |
| | 1 | 2 | 30 | 20 | 15 |
| | 1 | 3 | 45 | 15 | 15 |
| S2 | 1 | 4 | 52 | 7 | 13 |
| | 1 | 5 | 52 | 0 | 10.2 |
| S3 | 1 | 6 | 48 | -4 | 8 |

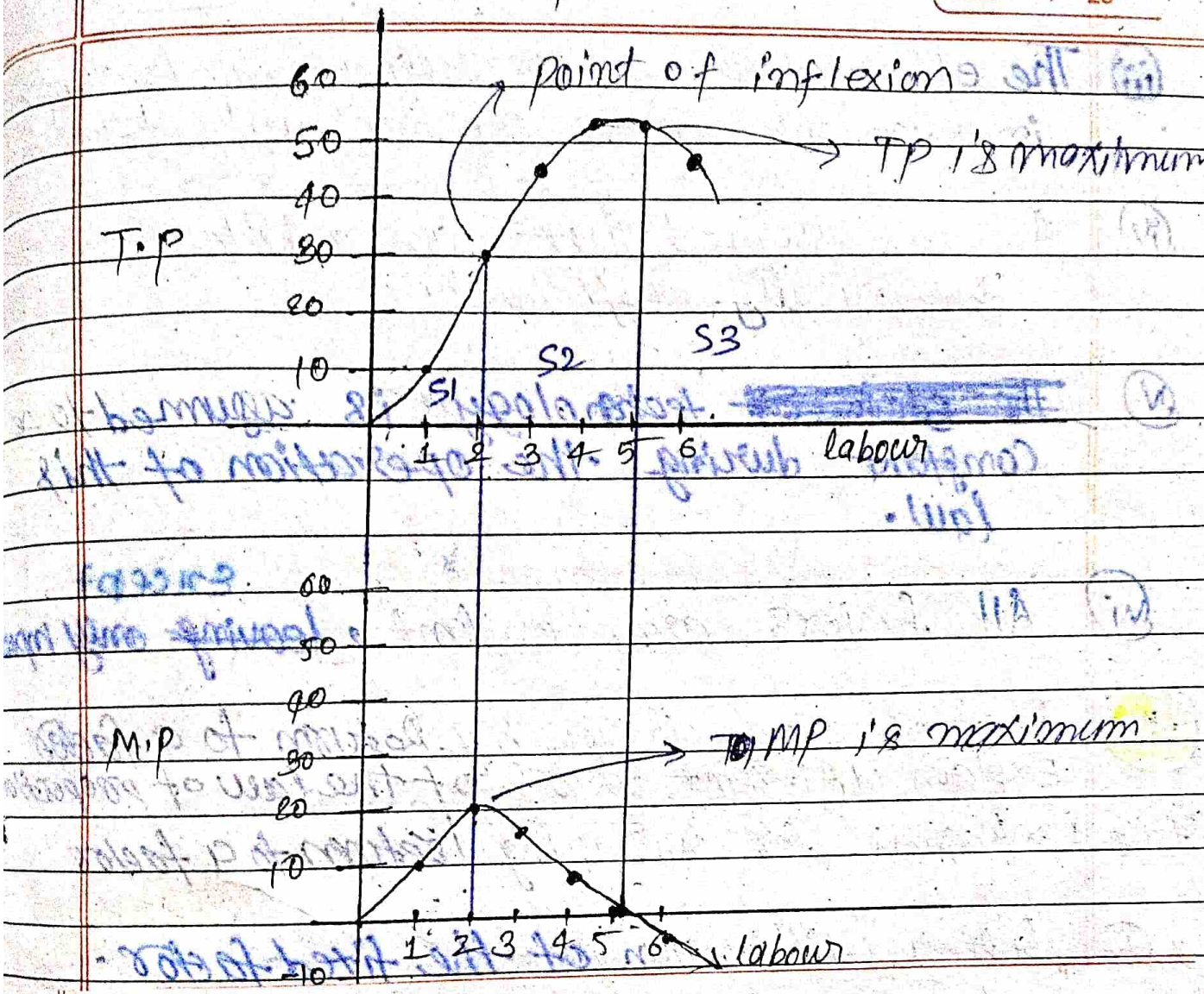


relationship among MP, AP, TP

↓

diagram of MP.






Stage-1 :- Increasing return to a factor: When MP is raising TP is increasing.

Stage-2 :- diminishing return to a factor: when MP is falling than TP is increasing at diminishing rate.

Stage 3 :- Negative return to a factor: When MP is zero than TP is maximum & when MP is Negative than TP is falling.

(iii) The effect of change in output due to change in variable factor can be easily determined.

(iv) It is assumed that all variable factors are equally efficient.

(v) ~~The state of~~ technology is assumed to be constant during the operation of this law.

(vi) All factors are constant, except ~~leaving~~ only input.

(*) Reasons for increasing Return to a factor
Explain different stages of the law of proportion

Stage 1 → Reasons for increasing return to a factor

(i) Better utilization of the fixed factor.

(ii) indivisibility of fixed factor.

Stage 2 → Reasons for diminishing return to a factor

(i) imperfect substitutes.

(ii) optimum combination of factors

Stage 3 → Reasons for Negative return to a factor

(i) Limitation of fixed factor

(ii) Poor coordination between variable and fixed factor

Law of return to scale :- The term return to scale refers to change in output when all factors change in same proportion.

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

product > L, K

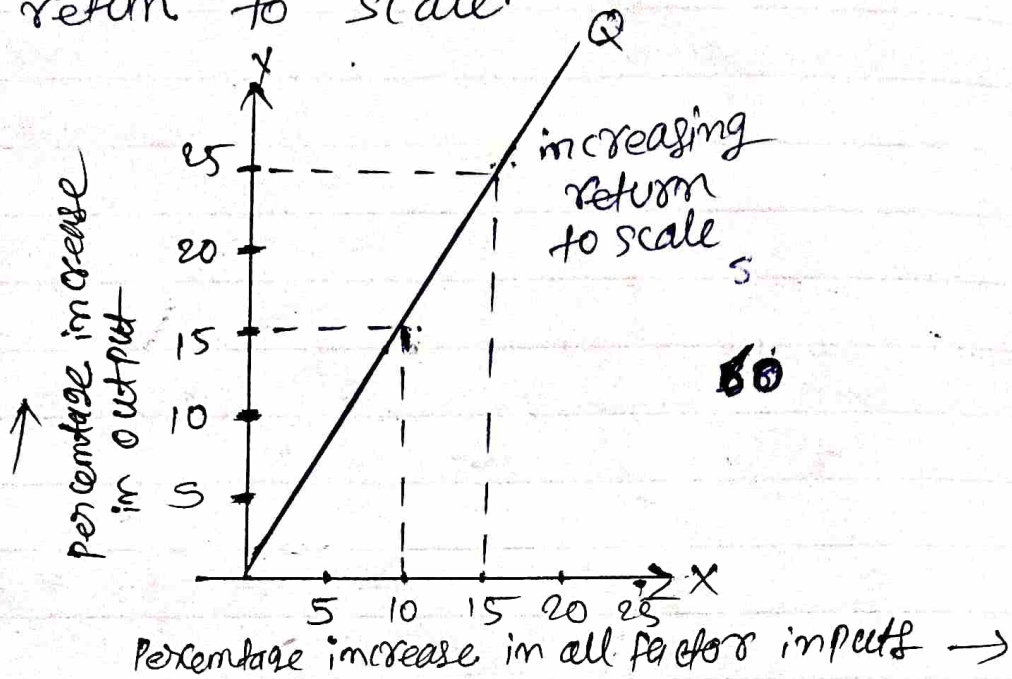
| Unit of land | units of labour | % change in land & labour | T.P | % change in TP |
|---|---|---|---|---|
| 1 | 2 | — | 10 | — |
| 2 | 4 | $\frac{4-2}{2} \times 100 = 100\%$ | 30 | $\frac{30-10}{10} \times 100 = 200\%$ |
| 3 | 6 | $\frac{6-4}{4} \times 100 = 50\%$ | 60 | $\frac{60-30}{30} \times 100 = 100\%$ |
| 4 | 8 | $\frac{2}{6} \times 100 = 33\%$ | 80 | $\frac{80-60}{60} \times 100 = 33\%$ |
| 5 | 10 | $\frac{2}{8} \times 100 = 25\%$ | 100 | $\frac{100-80}{80} \times 100 = 25\%$ |
| 6 | 12 | $\frac{2}{10} \times 100 = 20\%$ | 110 | $\frac{110-100}{100} \times 100 = 10\%$ |
| 7 | 14 | $\frac{2}{12} \times 100 = 15$ | 120 | $\frac{120-110}{110} \times 100 = 9\%$ |
| 8 | 16 | $\frac{2}{14} \times 100 = 14$ | 135 | $\frac{135-120}{120} \times 100 = 12\%$ approx. |

→ Increasing return to scale

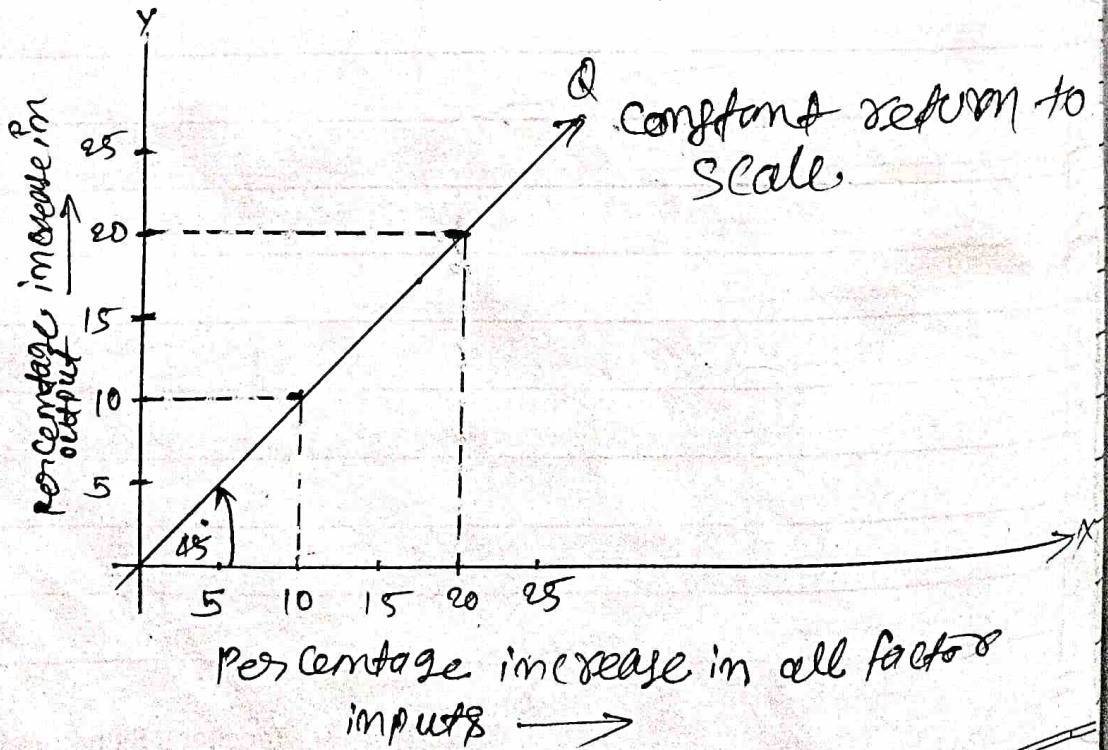
→ Constant return to scale

→ diminishing return to scale

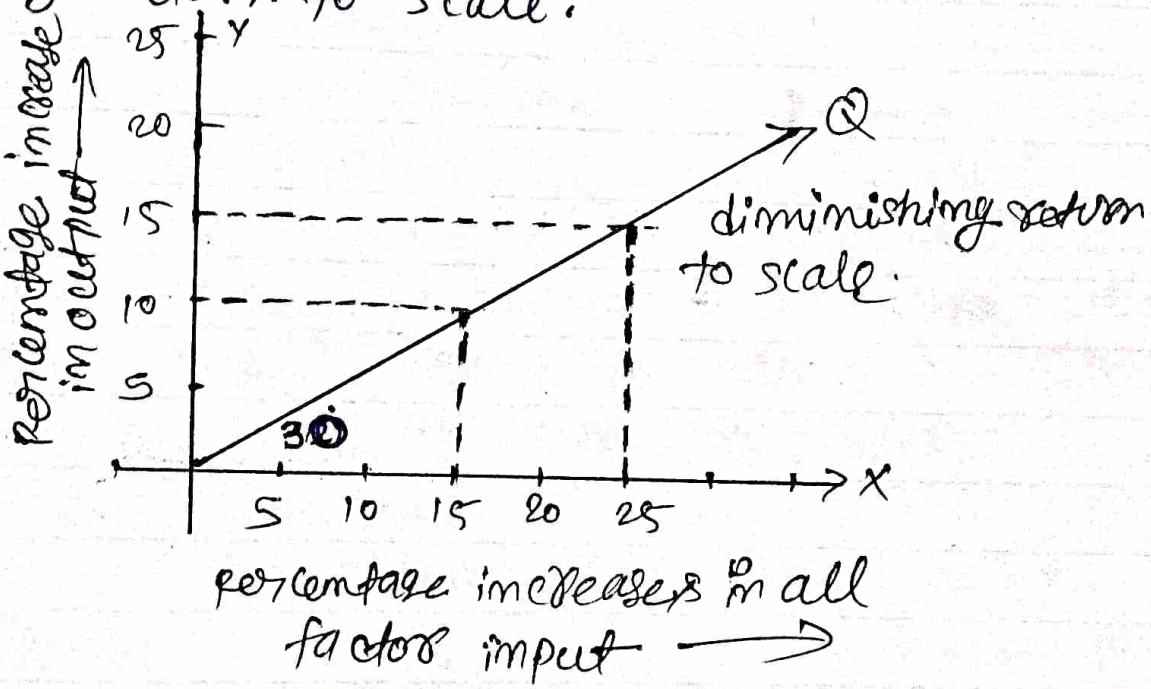
1) Increasing return to scale :- When a firm increases its input by certain proportion and it's output increases by a larger proportion, it is said to be increasing return to scale.




2) Constant return to scale :- When a firm increases its inputs by a certain proportion and its output increases by same proportion it is said to be constant return to scale.



③ diminishing return to scale :- When a firm increases its inputs by certain proportion and its output increases by smaller proportion, it is said to be diminishing return to scale.



of production

(*) Economy of scale :- Economy of scale refers to benefits due to large scale of production.

Economy of scale

internal economy | External Economy

(i) Internal economy :- Benefits of large scale production which are available to a firm within its own operation.

(ii) External economy :- Benefits of large scale production which are shared in by all the firms in an industry.

Internal economy
(i) real economy
(ii) pecuniary economy

(i) real economy :- The real economy refers to all real or non financial elements of an economy.

(ii) Pecuniary economy :- Large firms enjoys discounts because they buy raw material in bulk and they also get concessions (&) from banks and commissions on advertisement and publicity of their product.

## Real economy types

1. Specialization
2. Individuality / Technical economies
   a. Economies of dimension
   b. Economies of linked process
   c. Economies of the use of by-product
3. Inventory economies
4. Selling Economies / Marketing economy
5. Marginal economies
6. Transport and storage Economy

1. Specialisation :- When scale of production increases then it leads to labour specialisation, which result in improvement of skills and also saves time and also reduce cost

Technical economies

2. Individuality :- large firms can easily install different types of machines and can easily make their fuller utilisation but small scales industries cannot make fuller utilisation.

3. Economies of increased dimension :- By increasing size of its plant, large scale industries can earn more returns for eg :- double decker bus does not involve much cost but gives more return.

(b) Economies of linked process :- large scale firm can do all the linked work by itself which leads to reduction in cost by making raw material itself and open its own showroom for distribution which will save money & time.

(c) Economies of the use of by-product :- large scale firms make use of waste material in its further production which gives increasing returns to them for ex-> suger mill make use of molases to make alcohal and paper mill make paper out of cotton waste.

(3) Inventory economies :- large scale firms can easily store their raw material in their warehouses but small scale firms do not have much money and space to store raw material. It helps large scale firms to do production without any stoppage which gives increasing returns to them.

(4) Marketing economies :- A large scale firm can do advertisements, research and development work which helps to increase the production and its quality and also reduces cost, which gives increasing return to them.

(5) Marginal Economies ÷ Large scale firms can delegate and decentralise it's tasks by appointing good mangers, which increases production and reduces cost.

(6) Transport and storage economics ÷ large scale firms can create transport services on their own, Big firms have own trucks to carry raw material. They also own their warehouse on account of storge purpose, It increase their production of reduce lost which result in increasing to scale.

(2) External economy

(i) Economies of Concentration ÷ When several firms are concentrated at one place they enjoy many benefits - like - transportation & communication, development of new inventions and innovation, financial help etc.

(ii) Economies of Information ÷ large scale industries get regular information through journals about its competitors, new techinques of production, development in various fields etc.

Economics of disintegration :-

Disintegration refers to division of task. Every firm is specialised in a particular activity. Some firms makes some hubs in case of cycle industry. It is of two types :- (a) Horizontal (b) Vertical In horizontal disintegration firms are specialised in one activity only but in vertial disintegration firms specialised in different tasks.

Diseconomy of scale of production :- demerits of increasing large scale of firms & economy.

Diseconomies of scale

(i) internal diseconomies (ii) external diseconomy

(1) internal diseconomies :- internal diseconomy do not effect industry, it effects only on individual firms.
(आंतरिक हानियां)

(i) Unwieldy Management :- When a large scale industry expands, it is difficult to manage its work due to some coordination problems and supervision problem. It effects efficiency of the firm.

(ii) Technical difficulties :- large scale industries uses large machines which are imported from another country. Some technical problems arises when machines stops working properly which also takes time in its repair. So here economies turns into diseconomies

(2) External diseconomies :- ~~There are~~ When a industry is concentrated at one place, then the problem of traffic aries due to transportation and it rises cost. On the other hand prices of raw material goes up due to more demand so, it leads to diseconomies.

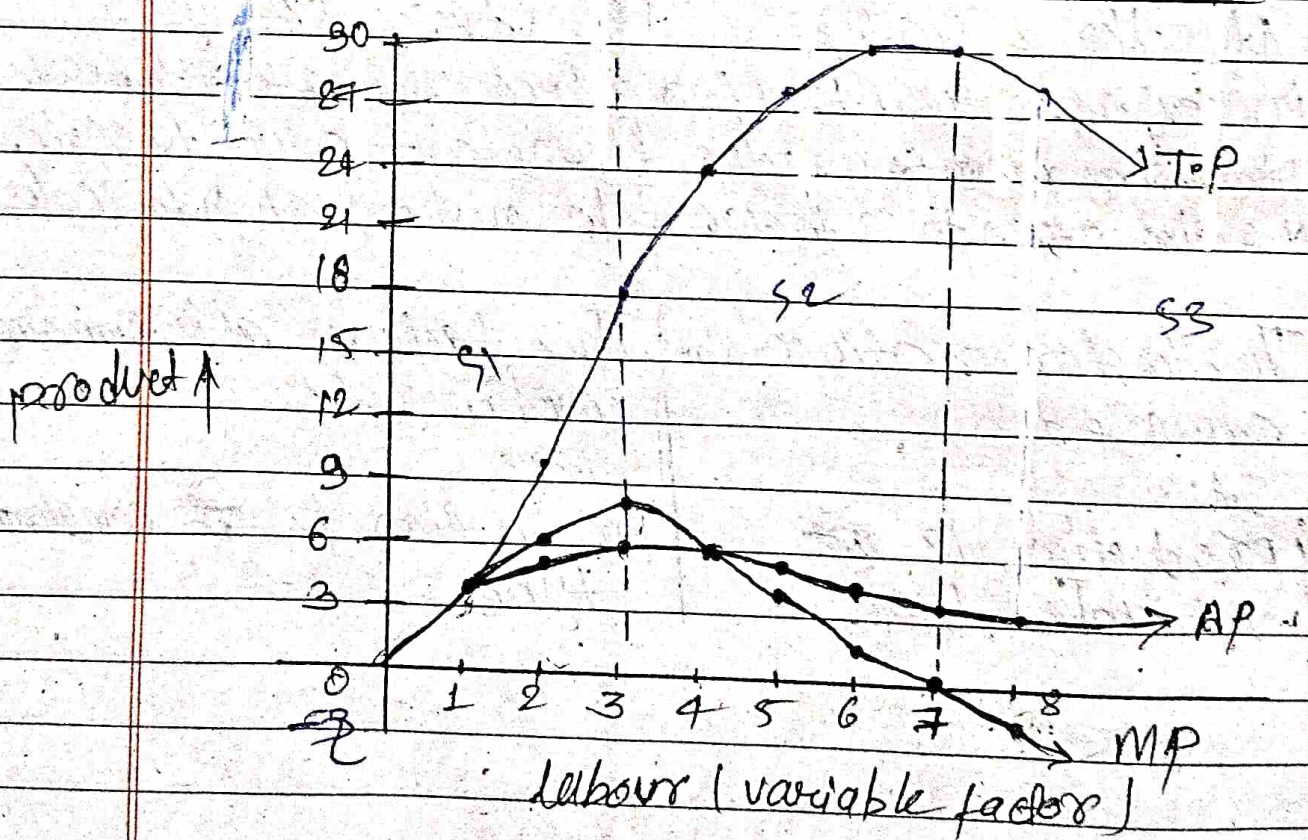
## Difference between law of variable proportion & law of return to scale.

| law of variable pro | law of return to scale |
|---|---|
| (i) It describes short-run production function | It describes long-run production function. |
| (ii) only one factor is variable all the other factors are constant. | All the factors are variable. |
| (iii) It comprises of or it three stages<br>(a) increasing return to a factor<br>(b) Diminishing return to a factor<br>(c) Negative return to a factor | It comprises of or 3's three stages<br>(a) Increasing return to scale<br>(b) constant return to scale<br>(c) diminishing return to scale |
| (iv) The factor ratio remains changed<br>3's<br>production is variable type. | The factor ratio remains unchanged.<br>3's<br>production is constant type. |

Pg 8

Relationship among Marginal product (MP), Total product (TP) and average product (AP) with graph.

| Labour | Labour | TP | AP | MP |
|---|---|---|---|---|
| 1 | 1 | 4 | 4 | 4 |
| 1 | 2 | 10 | 5 | 6 |
| 1 | 3 | 18 | 6 | 8 |
| 1 | 4 | 24 | 6 | 6 |
| 1 | 5 | 28 | 5.6 | 4 |
| 1 | 6 | 30 | 5 | 2 |
| 1 | 7 | 30 | 4.3 | 0 |
| 1 | 8 | 28 | 3.5 | -2 |



Stage 1 :- Whem Mp is raising, Tp is increasing and Ap is raising below Mp.

Stage 2 :- Whem Mp is falling, Tp is increasing at diminishing rate and Ap is falling but above Mp & whem Ap is equal to Mp, Tp is increasing at diminishing rate.

Stage 3 :- Whem Mp is zero than Tp is at maximum and Ap is positive & whem Mp is negative than Tp is falling but Ap remain positive.

14 principles of management given by Henry Fayol

(i) Division of work :- Work should be divide into small tasks because if we donot divide work into small tasks so manager will not be able to perform & achieve prime objective, manager's specialisation gets distroy so we should divide work into small tasks so that manager can perform prime objective and make in a perticular task specialist.

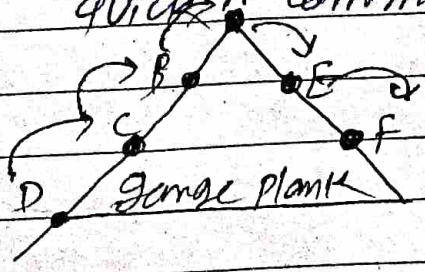
(ii) Unity of Command :- There should be unity of Command in management because if an ~~employee~~ supervisior give a task to an employee to perform this task, at that time and a second supervisior give a task to employee at the same time so employee gets confused and panic so they will not be able to perform any of task because if employee performy one of supervisors task so another supervisiour gets angry so there should be unity of Command to perform correctly task.

(iii) Unity of direction :- There should be unity of direction in an any organization because in an organization different different manager's have different direction.

so organization gets in lost and won't be grow so all the manager & employee should be only one particular direction there should be unity of direction in order to grow the organization.

(iv) principle of order :- Things should be properly and orderly arrangement of all things in an organization so that every work and task can be done in order way such as there should be orderly arrangement of offices, kavins, help desk, things etc. in any organization.

* Gangplank :- Gangplank refers to an arrangement in which two managers working at the same level of organization can communicate with each-other directly for quick communication.




* Paternalistic style :- Paternalistic style is a management style where a manager treats employees as family members. in which the manager supports the employee in his bad whites. They support him in his happiness and sorrow.

Pro Differentiate between Management and scientific management.

| | Management | Scientific management |
|---|---|---|
| (i) | father of management is 'fayol'. | father of scientific management is 'Taylor'. |
| (ii) | It's aim to increase production at the organisation level. | It's aim is to increase production at the shop level. |
| (iii) | Workers efficiency. | management efficiency. |
| (iv) | Managers. | Engineers. |

Q9) Difference b/w unity of Command & unity of direction

| unity of Command | unity of direction |
|---|---|
| (i) There should be only one supervisor on one employee. | There should be only one direction of managers. |
| (ii) The main purpose of unity of Command is to avoid confusion. | The main purpose of unity of direction is to avoid wastage of resources. |
| (iii) unity of Command focuses on a single employee. | unity of direction focus on the entire organisation. |
| (iv) unity of Command affects individual employee | unity of direction affects entire organisation. |

# Cost Sheet

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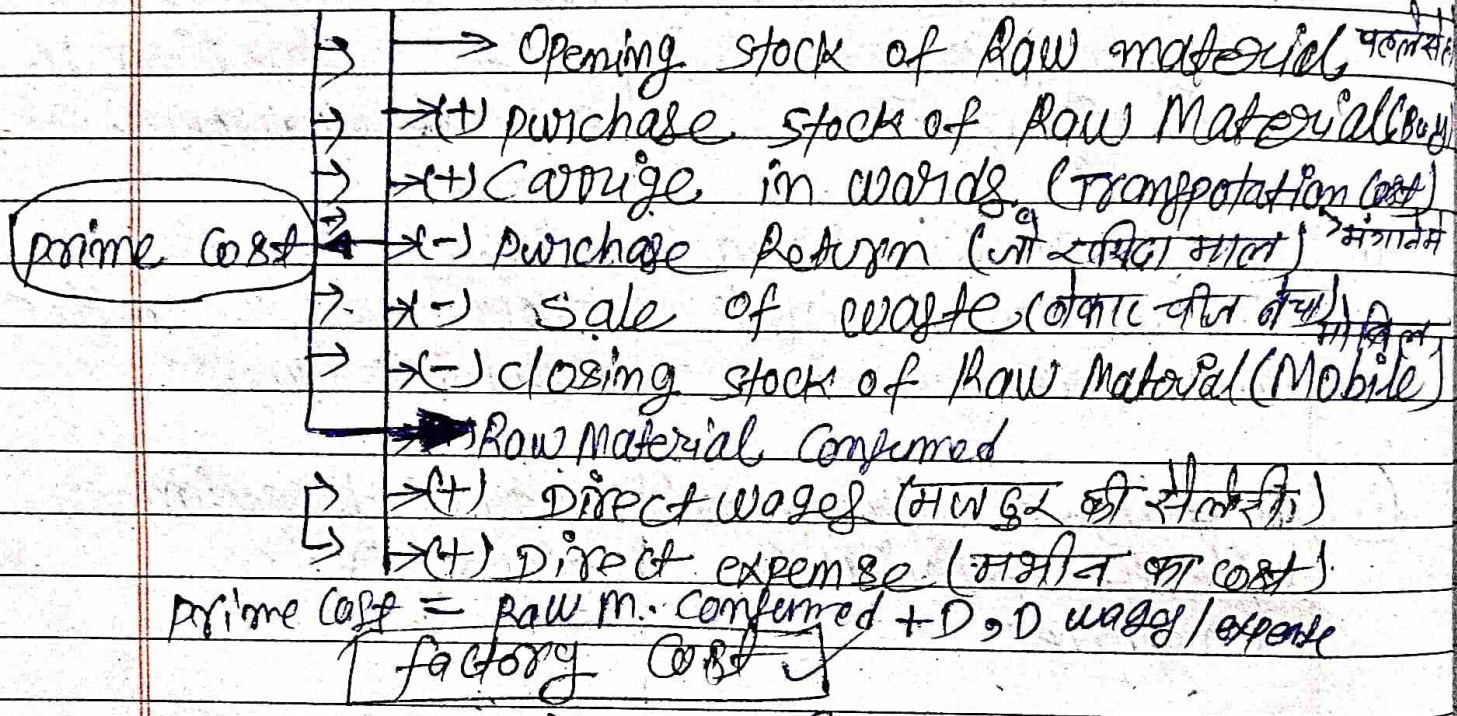
Date / 20

Particular :-

## Cost Sheet

(i) prime cost (ii) factory overhead (iii) office & administration

(iv) selling & distribution




Net factory cost = primary cost + Gross factory cost + opening + closing stoke of work in progress

work cost

Direct wages, direct labour, ~~Direct~~ productive

# Cost Sheet

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Date / 20

③ Office & administration

(report / paper)
legal expense +
Audit fee (checking) →

(+) Office lightining
(+) Rent
(+) stationary (office)
(+) Director's fee
(+) Depreciation
(+) Repairs
(+) Manager's Salary
→ Cost of production
opening stock of Finishing goods
closing stock of finishing goods
finished माल

Cost of goods sold → primary + factory + Cost of production + opening + closing stock of fg.

④ Selling & distribution

(+) Salesman salary
(+) Advertisement (ad)
(+) carriage out wards (Transportation cost)
→ (बेचने में)

Total Cost = primary Cost + factory overhead + office + Selling

→ Cost of sale = Total Cost + Profit
profit = Sale − Total Cost

* prepare statement of cost, profit and sales from the falling data;

| particulars | | Amount in Rupees |
|---|---|---|
| ① Opening stock of raw M | (P) | ~~Amount of Rupees~~ 12,00 |
| • Direct wages | (P) | 35,000 |
| • Closing stock of raw M | (P) | 30,000 |
| • Electric power | (F) | 5,500 |
| • Lighting factory | (F) | 2,250 |
| office | (O) | 700 |
| • purchase of raw M | (P) | 1,30,000 |
| • Rent factory | (F) | 5000 |
| office | (O) | 1,200 |
| • purchase returns | (P) | 25,000 |
| • carriage inwards | (P) | 435 |
| • office stationary | (O) | 400 |
| • Director's fee | (S) | 1,300 |
| • Salesman's salary | (S) | 1,400 |
| • Advertisement | (S) | 1,200 |
| • depreciation: factory | (F) | 600 |
| office | (O) | 1000 |
| • Manager's salary | (S) | 5000 |
| • Repairs: factory | (F) | 3200 |
| office | (O) | 450 |
| • Direct Expenses | (P) | 4000 |
| • carriage outwards | (S) | 325 |

profits are 12% of sales.

| particulars | Amount in rupees |
|---|---|
| (+) opening stock of RM | 12000 |
| (+) Purchase of RAW M | 1,30,000 |
| (+) Carriage inwards | + 435 |
| Closing stock of RM | -30,000 |
| purchase returns | -25,000 |
| Raw material consumed = | 87,435 |
| Direct wages | 35000 |
| Direct expenses | 4000 |
| → prime cost = | 126,435 |
| add prime cost | |
| Electric power | 5,500 |
| Lighting factory | 2,250 |
| Rent factory | 5000 |
| Depreciation factory | 600 |
| Repairs | 3200 |
| Gross factory cost = | 142985 |
| opening / closing stock of w.i.p | 0/0 |
| → Net factory cost | 142985 |
| → add prime + factory cost | |
| lighting office | 700 |
| Rent office | 1,200 |
| office stationary | 400 |
| Depreciation office | 1000 |
| Repairs office | 450 |
| → cost of production | 146,735. |
| opening / closing stock of finishing goods | 0/0 |
| Cost of goods sold = | 146,735 |

Add prime + factory + office

| Selling & distribution | amount in Rupees |
|---|---|
| directors fee | 1,300 |
| Salesman Salary | 1100 |
| Advertisement | 1200 |
| Manager's Salary | 5000 |
| Carriage outwards | 305 |
| total cost | 155,960 Rs |

Sale = TC + profit, profits are 12% of sale.

$155960 + \frac{12}{100}x = x$ (sale)

$155960 + 0.12x = x$

$155960 = x - 0.12x$

$155960 = 0.88x$

$x = \frac{155960}{0.88}$

$x = 177,227.273$ Rupees

Sales = 177,227.273 Rupees

profit = sale − TC

profit = 177,227.275 − 155960

profit = 21,267.273 Rupees

## Cost Sheet / Statement of Cost

A Cost Sheet is a statement that shows the various components of total cost for a product and shows previous data for comparison.

(A) From the following data calculate Net factory Cost - closing stock of raw Material - Rs. 800,000, Direct wages Rs - 3,45,000 - Carriage inwards - 10,000, opening stock RM - 75000, Depreciation on office building - 80,000, Heat, light, and power - Rs - 90,000, factory repairs 24,500, factory Supervision Rs - 67,85, Closing stock of work in progress 87900, Purchase of RM - 1500, Purchase returns 2000, Sale of waste 2900, Sale of scrap - 9500 Heat, light and power is to be distributed in the ratio of 5 : 4 : 1 among factory office and Sales respectively.

(B) Define works cost

Let Heat = 5x
light = 4x
power = x

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Heat, light, power
$5x + 4x + x = 90000$
$10x = 90000$
$x = 9000$ so Heat = 5x
Heat = $5 \times 9000$
Heat = 45000

| particular | (Rs) amount |
|---|---|
| opening stock of RM | 75000 |
| purchase of RM | 4500 |
| carriage inwards | 10,000 |
| closing stock of RM | -800000 |
| purchase return | -4000 |
| sale of waste | -3890 |
| raw M consumed | = -716,390 |
| Direct wage | 3,48,000 |
| → Prime cost | -371,390 |
| factory overhead | |
| factory repairs | 24,500 |
| factory supervision | 6785 |
| sale of scrap | 9800 |
| Heat | 45000 |
| Gross factory cost | -304905 |
| opening stock of WIP | 60,000 |
| closing stock of WIP | -87900 |
| Net factory cost | -332805 |

* Works cost = Sum of prime cost + factory overheads is called works cost.

Ans Cost :- Total expenditure incurred in producing a commodity known a cost.

Ans price :- price is the sum of total cost and profit. is called price.

Ans difference between price and cost

| | Cost | price |
|---|---|---|
| (i) | Total expenditure incurred in producing a commodity | price Sum of cost and profit |
| (ii) | Cost of inputs rise or fall. | price of product increase or decrease |
| (iii) | Seller pays cost to holeseller | Customer pay price to Seller. |

Ans profit :- profit is defined as subtraction of price and cost is called profit

$$\text{profit} = \text{price} - \text{cost}$$

* calculate value of raw material consumed from the following, opening stock of Raw Material = Rs 35000, Purchase = 95000, closing stock of raw materials = 20000 labour 10000, Purchase return = 3000

| Particulars | amount in rupees |
|---|---|
| opening stock of RM | 35000 |
| purchase | 95000 |
| closing stock of RM | -20000 |
| -purchase return | - 3000 |
| Raw Material Consumed | 107,000 |

* PEEM peter final page no (6) question no (7)
from the following data prepare a cost sheet and calculate profits. profits @ 20% of sales

| particular | amount (Rs) |
|---|---|
| O.S of RM → | 22000 |
| C.S of RM → | -20000 |
| purchase of RM → | 150000 |
| purchase return → | -15000 |
| carriage inward → | 600 |
| → RM Consumed → | 137600 |
| Direct wage | 45000 |
| Direct expense | 5000 |
| prime cost | 187600 |
| → factory overhead | |
| electric power → | 7000 |
| lightning → | 2000 |
| Rent → | 9000 |
| Depreciation → | 3900 |
| repairs → | 2600 |
| Gross stock Product → | 213,100 |
| Opening/ closing stock of WIP → | 0/0 |
| Net factory cost → | 213100 |

| office overhead | |
|---|---|
| repair | 950 |
| lightning | 1000 |
| Rent | 9200 |
| Stationary | 500 |
| Director's fee | 5500 |
| depreciation | 2000 |
| Manager's Salary | 5800 |
| cost of production → | 230850 |
| Open/closing of FG → | +0/-0 |
| cost of good sold → | 230850 |
| sell & distribution | |
| Salesman Salary | 2000 |
| advt | 2100 |
| Carriage outward | 825 |
| Total cost → | 23.925 |

Net profit on sales →
$\frac{20x}{100} + 234225 = x \Rightarrow 234225 + 0.2x = x$
$234225 = x - 0.2x = 0.8x$
$x = \frac{234225}{0.8}$
Sales (x) = 292781.25
profit = sale - T.C
PROFIT = 58,556.25

C.sheet → Q → page - 10 Q - 6
page - 13 Q - 9 ans OR
page - 15 Q - 9
page 16 Q - 6
page - 17 Q - 9 ans OR

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* from the following data calculate Prime cost

| Particulars | amount in ₹ |
|---|---|
| opening blance of RM | 25600 |
| purchase | 93400 |
| carriage inwards | 2000 |
| purchase return | -1000 |
| - closing stock of RM | - 7000 |
| Raw Material Confumed | 60,000 |
| Direct labour | 20300 |
| direct expenes | 3970 0 |
| prime Cost | 115000 |

* Works Cost :- Works Cost is the summation of prime cost and factory overheads that includes indirect material, indirect labour, indirect expenes of factory, It is also know as work cost, manufacturing Cost, production cost, factory cost.

* Calculate prime cost when value of RM used Rs = 35,500, Direct wages are 25% of RM used and direct expense are 15% Direct wages.

| Particular | amount |
|---|---|
| raw Material used | 35500 |
| raw M Confumed | = 35500 |
| Direct wages | 8875 |
| Direct Expenes | - 1331.25 |
| Prime Cost | 15706.25 |

PEE final paper page (8) Question (7)

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| particular | | |
|---|---|---|
| (a2) opening S. of. RM | 32000 | + Opening S. of f. G = 130000 |
| purchase of R. M | 190,000 | - closing S. of f. G = 80000 |
| carriage inwards | 1000 | Cost of goods sold = 430450 |
| purchase return | 5000 | Selling & distribution |
| - closing stock of RM | -20,000 | |
| Raw Material consumed | 178000 | Sales & man salary - 5000 |
| Direct labour | 95000 | Ad - 9200 |
| Direct expence | 8000 | Carriage outward - 2000 |
| prime Cost | 281000 | Travelling expense - 3000 |
| Add factory overheads | | |
| Electric power | 15000 | Total cost - 444650 |
| lighting | 7000 | profits are 25% on sales |
| Rent | 8000 | $444650 + \frac{25}{100}x = x$ |
| Depreciation | 6900 | $444650 + 0.25x = x$ |
| Repairs | 5600 | $444650 = 0.75x$ |
| indirect expence | 3500 | $x = 592866.667$ |
| Gross factory cost | 327000 | Sale = 592866.667 rupees |
| + Openig S. of WIP | 48000 | |
| - closing S. of WIP | -30000 | profit = Sale - T.C |
| Net factory Cost | 342000 | profit = 592866.667 - 444650 |
| add office overhead | | |
| lighting | 4000 | profit = 148216,667 Rupees |
| - Rent | 200 | |
| legal expence | 4000 | |
| Audit fee | 8000 | |
| Office Stationary | 900 | |
| Director's fee | 10700 | |
| Depreciation | 1000 | |
| Manager salary | 9800 | |
| Repairs | 1850 | |
| Cost of production | 380450 | |

* Calculate profit and Sales when: Cost of production is Rs 1,90,500, Selling and Distribution overheads are 30% of Cost of production and profits are 25% on Sales.

Cost of production = 1,90,500

Selling & distribution overheads are 30% of Cost of production

$190500 \times \frac{30}{100} \Rightarrow 190500 \times 0.3$

$= 57150$

Total Cost = 1,90500 + 57150

= 247,650

25% profit on Sell

$247650 + \frac{25x}{100} = x$ (Sales)

$247650 + 0.25x = x$

$247650 = x - 0.25x$

$247680 = 0.75x \Rightarrow$ Sales$(x) = \frac{247650}{0.75}$

**Sales = 330200**

profit = Sales − T.C

profit = 330200 − 247650

**profit = 82550**

Calculate profit and sales from following data, opening blance of Raw Materials = 400,000 closing stock of Raw materials = RS 1,20,000 carriage inwards 20,000, purchases returns 30,000, Direct wages are 75% of raw material Consumed Direct expense are 10% of direct wage, factory overheads are 40% of factory cost office and administration overhaads are 45% of works cost selling and distribution overheads are 25% of cost of production opening stock of finished goods RS = 50,000 closing stock of finished goods = 40,000 and profits are 20% on sales.

PEE final page (13) Q.9 ST OR

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| Particulars | Amount |
|---|---|
| opening stock of RM | 170,000 |
| purchase of RM | 400,000 |
| carriage inwards | 20,000 |
| purchase returns | - 30,000 |
| closing stock of RM | - 1,20,000 |
| → Raw Material Consumed | 440,000 |
| Direct wages | 330,000 |
| Direct expense | 33000 |
| prime cost | 803000 |
| add factory overheads | |
| factory overheads | 535333.33 |
| Gross factory cost | 1338333.33 |
| Net factory cost | 1338333.33 |
| add office & administration overhead | 602299.999 |
| Cost of production | 1940583.33 |
| opening stock of FG | 80,000 |
| closing stock of FG | 90,000 |
| Cost of goods sold | 1950583.33 |
| add selling & distribution | |
| selling & distribution overheads | 485145.833 |

Total Cost = 2435729.16

20% profit on sale

$2435729.16 + \frac{20}{100}x = x$ (sale)

$2435729.16 + 0.2x = x$

$2435729.16 = x - 0.2x$

$x = \frac{2435729.16}{0.8}$

(Sale) $x = 3044661.45$

profit = sale - T.C

profit = 3044661.45 - 2435729.16, Profit = 608932.29

factory cost of = Net factory cost of

let factory overhead are = x

Cost

$x = 40\%$ [redacted] $(F.O) + P.C$

$x = 40\%$ [redacted] $(F.O) + P.C$

$x = \frac{40}{100} x$ [redacted] $x + 803000$

$x = 803000 + 0.4x$ → $803000$

$803000 = x - 0.4x$ → $0 = 0.6x$

$x$(factory overhead) = $\frac{803000}{0.6}$

[redacted]

$x =$

factory cost = 1338333.33

from the following data prepare a cost sheet and calculate profits.

Pyq

| particulars | |
|---|---|
| • opening stock of RM | 160000 |
| • opening stock of finishing goods | 70000 |
| • Plant and Machinery | 370,000 |
| • Sales | 898000 |
| • Material purchased | 3,28,000 |
| • purchased returns | 5,800 |
| • indirect labour | 19,006 |
| • factory repairs | 17000 |
| • Carriage outwards | 2000 |
| • Sales promotion | 20,800 |
| • office salaries | 9600 |
| • closing stock of work in progress | 1,86,000 |
| • opening stock of work in progress | 300000 |
| • office Appliances | 19000 |
| • Buildings | 1,80,000 |
| • sales returns | 10,000 |
| • freight on materials purch | 12000 |
| • Direct labour | 1,70,000 |
| • factory supervision | 11,000 |
| • Heat, light & power | 75000 |
| • Sales travelling | 9000 |
| • Distribution department Salaries & wages | 17000 |
| • closing stock of RM | 170,000 |
| • closing stock of finished goods | 105000 |

Depreciation should be provided @ 5% on office appliances 10% on Machinery and 4% on Buildings, Heat, light & power should be distributed in the ratio of 8:1:1 among factory, office and selling & distribution respectively.

Note: plant & Machinery, office appliances को consider नहीं किया जाता है cost sheet में केवल सीधा depreciation को consider किया जाता है।

Note: only building → office में जाता है।
plant → factory में जाता है।

Heat, light, power का ₹75000 है factory, office & selling का 8:1:1 के अनुपात में तो केवल factory का होगा

$8x+x+x = 75000$
$10x = 75000$
$x = 7500$

factory ⇒ $8x = 7500 \times 8 = 60,000$
office = 7500
selling & d = 7500

~~Machinery~~ Depreciation on machinery is 10% on machinery (370000)

$370{,}000 \times \frac{10}{100} = 37000$

Depreciation on office app 5% on office applies

$19000 \times \frac{5}{100} = 950$

Depreciation on building 4% on building

$180000 \times \frac{4}{100} = 7200$

| particular | | |
|---|---|---|
| (+) Opening stock of RM | 160,000 | Total cost |
| (+) Material purchased | 328000 | = 798750 |
| (+) freight on material purch | 12000 | sales = 888000 |
| - Purchase returns | 5800 | profit = Sales - T.C |
| - Closing stock of RM | 170,000 | |
| Raw material Consumed | 324200 | |
| (+) direct labour | 170,000 | profit = 89250 |
| Prime Cost | 494200 | |
| Add:- factory overheads | | |
| → Depreciation on Machinery | 37000 | |
| indirect labour | 19000 | |
| factory repairs | 17000 | |
| factory supervision | 11000 | |
| Heat, light, power | 60,000 | |
| gross factory cost | 638200 | |
| (+) Opening stock of WIP | 200,000 | |
| (-) Closing stock of WIP | 186000 | |
| Net factory cost | | 752200 |
| Add Office overheads | | |
| office salaries | 9600 | |
| Depreciation on office app | 950 | |
| Depre " " building | 7200 | |
| Heat, light, power | 7500 | |
| Cost of production | | 777450 |
| (+) Opening stock of finishing goods | 70,000 | |
| (-) closing stock of finishing goods | 105000 | |
| Cost of goods sold | | 742450 |
| Add:- Selling & distribution exp | | |
| Carriage Outwards | 2000 | |
| Sales promotion | 20800 | |
| Sales Travelling | 9000 | |
| Heat, light, power | 7500 | |
| Distribution dept Salaries & wages | 17000 | |

MST-P → Calculate cost of production when prime cost = 700000, factory overheads are 50% of factory cost and office and administration overheads are 40% of factory cost.

(1) Prime cost - 70,0000

Net factory overheads are 50% of factory cost

Let factory cost = x

(factory overheads = 50% of prime cost)

$x = \frac{50}{100}(x) + 700000$ | off & add 40% of f.c

$x = 700000 + 0.5x$

$700000 = x - 0.5x$

$0.5x = 700000$

$x = \frac{700000}{0.5}$

1400000 = x

(2) factory overheads = 70,0000

(3) gross factory cost = 1400000

(4) opening stock of WIP = 0

(5) closing stock of wip = 0

Net fact cost = 1400000

add office & admn = 560,000

cost of production = 19,60,000

(Pro) from the following data prepare a cost sheet and calculate profits. Opening stock of Raw material Rs 40,000; opening stock of work in progress, Rs 20,000; Opening stock of finished goods Rs 80,000; plant and Machinery Rs 5,60,500; Building Rs, 4,00,000; Material purchased Rs 3,40,000; freight on materials Rs 15,000; Purchase returns Rs 5,800; Direct labour Rs 100000; indirect labour Rs 30,000; factory supervision Rs 15,000; factory repairs; Rs 12,000; Heat, light & power Rs 70,000; Sales travelling Rs 15,000; Advertisement Rs 25,500; sales department salaries & wages Rs 19,000; office salaries Rs 9800; closing stock of ~~finished goods Rs 115000; Depreciation should~~ Raw Material Rs 150000; closing stock of work in progress Rs 12000 & closing stock of finished goods Rs 115000; Depreciation should be provide @10% on Machinary and 6% on Buildings; Heat, light & power are to be distributed in the ratio of 5:1:1 among factory, office and distribution respectively, depreciation on buildings to be distributed in the ratio of 8:1:1 among factory, office and distribution respectively, profits are 25% on Sales.

Plant & Machinery 5,60,500
Building 4,00,000
Heat, light, power - 70,000
Depreciation should be provided @ 10% on Machinery and 6% on Building.
Heat light power is distributed among factory, office, distribution 5:1:1

$5x+x+x = 70000$ — 5x → factory H.L.P = 50k
$7x = 70000$ — x → office H.L.P = 1k
$x = 10000$ — x → distrib H.L.P = 1k

Depreciation on machinery 10% of 5,60,500
$560500 \times \frac{10}{100} = 56050$ dep of Machinery

Depreciation on build is 6% on building
$400000 \times \frac{6}{100} = 400000 \times 0.06$
Depreciation building $= 24000$ find

founded depreciation on building 24000 is distributed among factory, office & distribution respectively 8:1:1

$8x+x+x = 24000$
$10x = 24000$
$x = 2400$

b. dep of fact $\Rightarrow 8x = 19200$
b. dep of office $\Rightarrow x = 2400$
b. dep of dist gate $\Rightarrow x = 2400$

$8x = 8 \times 2400$
$= 19200$

| particulars | amount |
|---|---|
| • Opening Stock of RM | 40,000 |
| • Material purchased | 3,40,000 |
| • freight on materials | 15,000 |
| (-) • Purchase return | 5,800 |
| (-) • closing Stock of RM | 150000 |
| Raw material consumed | 239,200 |
| • Direct labour | 1,00,000 |
| prime cost | 3,39,200 |
| add factory overheads | |
| • indirect labour | 30,000 |
| • factory supervision | 15,000 |
| • factory repairs | 12000 |
| • Head light power | 50000 |
| • depreciation on building, factory depre | 19200 |
| | 560 50 |
| • Gross factory cost | 521,450 |
| (+) • opening stock of WIP | 20,000 |
| (-) • closing stock of WIP | 12000 |
| • Net factory cost | 529,480 |
| add office & administration | |
| • office salaries | 9800 |
| • Head light & power | 10000 |
| • building depreciation | 2400 |
| cost of production | 551650 |
| (+) • Opening stock of finished good | 80,000 |
| (-) • closing stock of FG | 115000 |
| Cost of goods sale | 516650 |
| add distribution & Sales | |
| Head light power | 10,000 |
| Sales travelling | 15,000 |
| advertisement | 25,500 |
| Sales department & salaries & wages | 19000 |

• depreciation on building → 2400

Total cost = 588,550

profit are 25% on sale → tot sale = x

$x = T.C + Profit$

$x = 588550 + \frac{25}{100}x$

$x = 588550 + 0.25x$

$588550 = 0.75x$

$sale(x) = \frac{588550}{0.75}$

$Sale = 784733.333$

$\therefore profit = Sale - T.C$

$profit = 784733.333 - 588.550$

profit = 196183.333

Total

## Principles of cost accounting

1. Cost is related to its cause.
2. A cost is charged after it has been incurred. (>खर्च देना)
3. Abnormal costs are not charged to production.
4. past cost are not charged to future period.

1. **Cost is related to its cause**: A cost is related as closely as possible to its cause, for example rent of the factory cannot be charged as office expenses.

2. **A cost is charged after it has been incurred**: while determing the cost of individual units only those cost which have been incurred should be considered.
   ex → a product is not charged with selling costs while it is still in the factory.

3. **Abnormal costs are not charged to production**: abnormal cost are not charged to production because they are not related to production. only normal costs of service are charged to cost.

④ Past costs are not charged to future period. Such past cost whose benefits will be found in the future, those cost charge can be considered in future period, but such past cost whose benefits have been found those cost charged can't be considered in future period.

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Advantage of costing aid to management

(1) Helps in decision making :- Cost accounting helps in decision making. It provides vital (important) information necessary for decision making, cost accounting helps in deciding

(i) whether to make a product and buy a product?
(ii) whether to accept or reject an export order.

(2) ~~Whether~~ Helps in fixing prices :- Cost accounting helps in fixing prices. It provides cost data of each product which enables fixation of selling price.

(3) Avoidance of Wastage : Cost accounting reveals the sources of losses or inefficiencies such as spoilage, leakage

(4) formulation of future plans : On the basis of past experience, it helps in the formulation of definite future plans in quantitative terms.

(A)

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Costing is aid to management. Comment.

(Q) ~~principles of Cost accounting~~ Costing is an aid to management Comment

Ans → Cost accounting is to serve management in the execution of polices and in comparison of actual and estimated results in order that the value of each policy may be appraised and changed to meet the future conditions.

~~Some principles given below for of CA~~ function of costing is aid to management

(i) To disclose sources of wastage in the process of production.

(ii) To reveal sources of economy in production process.

(iii) To suggest management of futur expansion policies.

(iv) To supply timely information for various decisions.

(v) To provide effective system of stores, materials etc.

(vi) To organize the internal audit system.

dis close sources

# Theory of Cost

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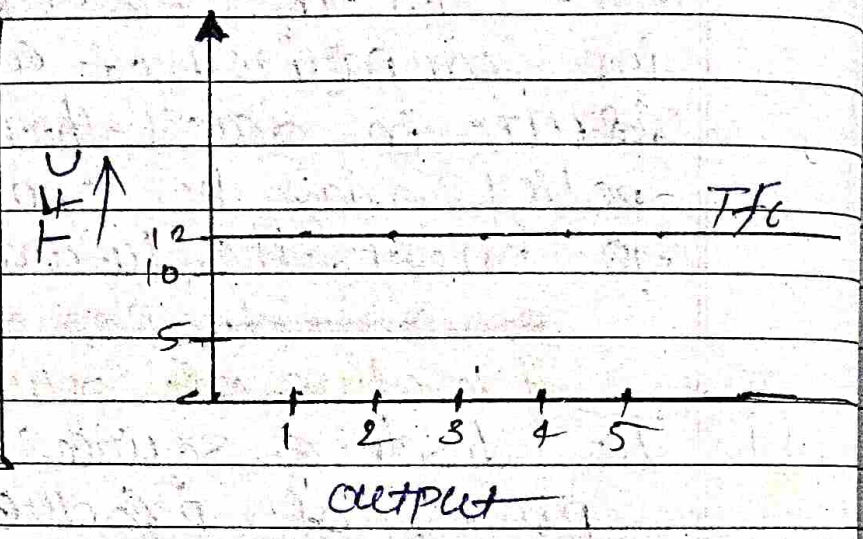
(*98) Fixed cost or Total fixed cost

∴ It does not vary directly with the level of output.

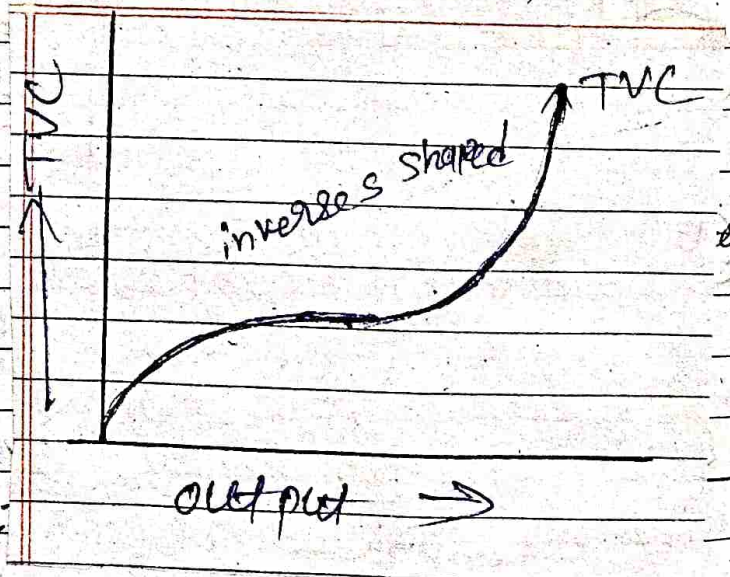
| Output | T.F.C |
|---|---|
| 0 | 12 |
| 1 | 12 |
| 2 | 12 |
| 3 | 12 |
| 4 | 12 |
| 5 | 12 |




(P40) Variable cost or Total variable cost

∴ It vary directly with the level of output.

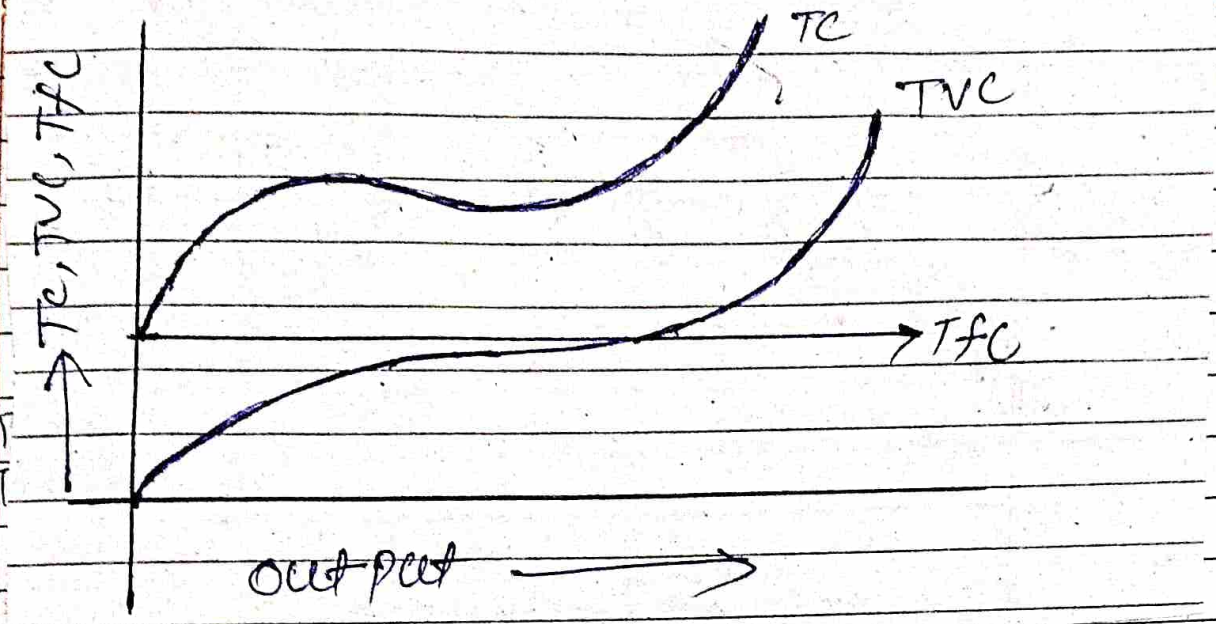
| output | T.V.C |
|---|---|
| 0 | 0 |
| 1 | 6 |
| 2 | 10 |
| 3 | 15 |
| 4 | 24 |
| 5 | 25 |
| 6 | 30 |




* Total Cost ∴ Total Cost is the summation of total fix cost and total variable cost.

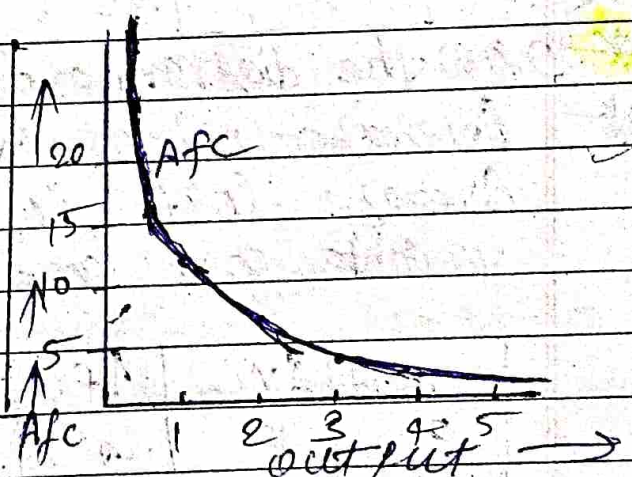
| output | T.f.c | T.V.C | T.C |
|---|---|---|---|
| 0 | 12 | 0 | 12 |
| 1 | 12 | 6 | 18 |
| 2 | 12 | 10 | 22 |
| 3 | 12 | 15 | 27 |
| 4 | 12 | 24 | 36 |

* Relationship between TC, TVC, TFC



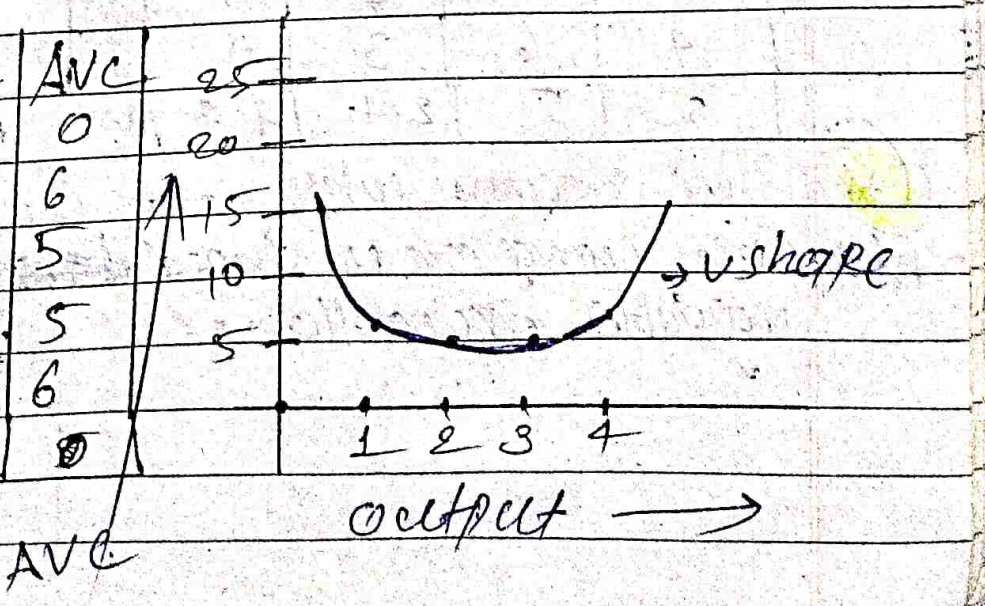

* Average fixed cost :- Average fixed cost refers to per unit fixed cost.

| output | T.f.C | AFC |
|---|---|---|
| 0 | 12 | ∞ |
| 1 | 12 | 12 |
| 2 | 12 | 6 |
| 3 | 12 | 4 |
| 4 | 12 | 3 |




* Average variable cost :- Average Variable Cost refers to per unit variable cost.

| output | T.V.C | AVC |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 6 | 6 |
| 2 | 10 | 5 |
| 3 | 15 | 5 |
| 4 | 24 | 6 |
| 0 | 0 | 0 |



Average cost refers to per unit Total cost

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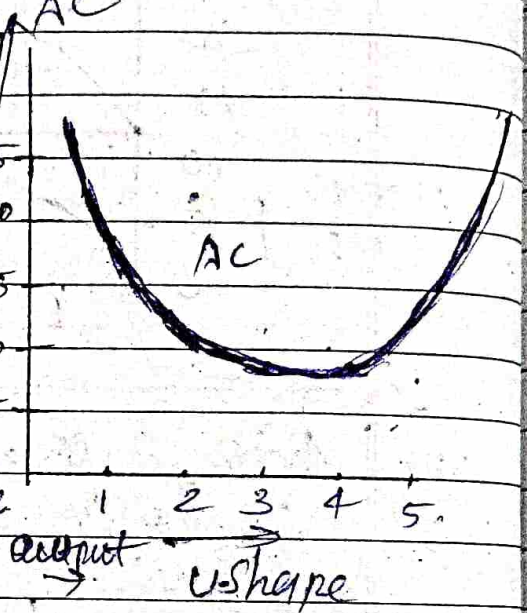
Q*) Average cost :- Average cost refers to per ~~unit total cost~~.
Average cost ~~cost~~ refers to total cost with respect to output.

$$AC = \frac{TC}{O \cdot P}$$

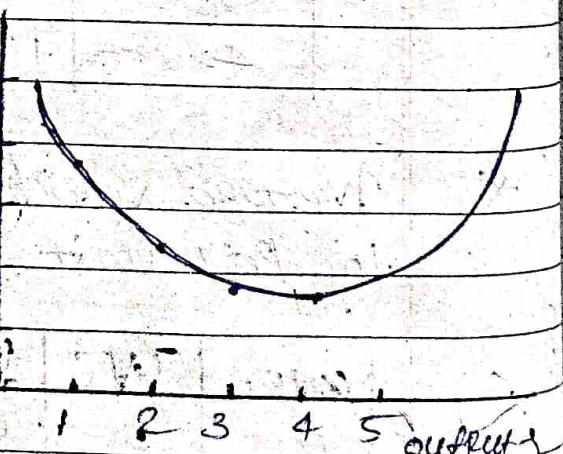
| output | T.C | A.C |
|---|---|---|
| 0 | 12 | ∞ |
| 1 | 18 | 18 |
| 2 | 22 | 11 |
| 3 | 27 | 9 |
| 4 | 36 | 9 |
| 5 | 37 | 7.4 |




(*) Draw the diagram and give reason.

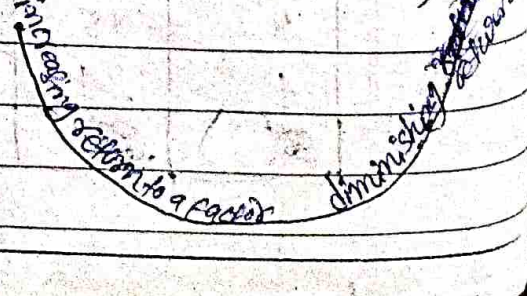
* Average cost or Average total cost :- Average cost is the summation of Average variable cost and average fixed cost.

| output | AVC | AFC | AC |
|---|---|---|---|
| 0 | 0 | ∞ | ∞ |
| 1 | 6 | 12 | 18 |
| 2 | 5 | 6 | 11 |
| 3 | 5 | 4 | 9 |
| 4 | 6 | 3 | 9 |
| 5 | 5 | 2.4 | 7.4 |



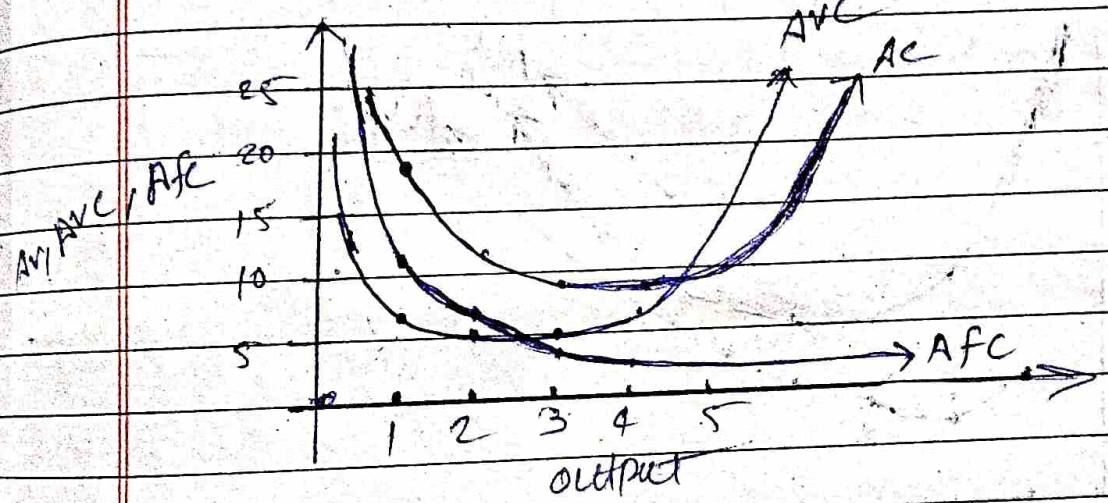

(*) give reason why cost curves are U shaped?

Ans:- Cost curves are U shaped ~~because~~ due to law of variable proportion.



* relationship between AC, AVC, AFC

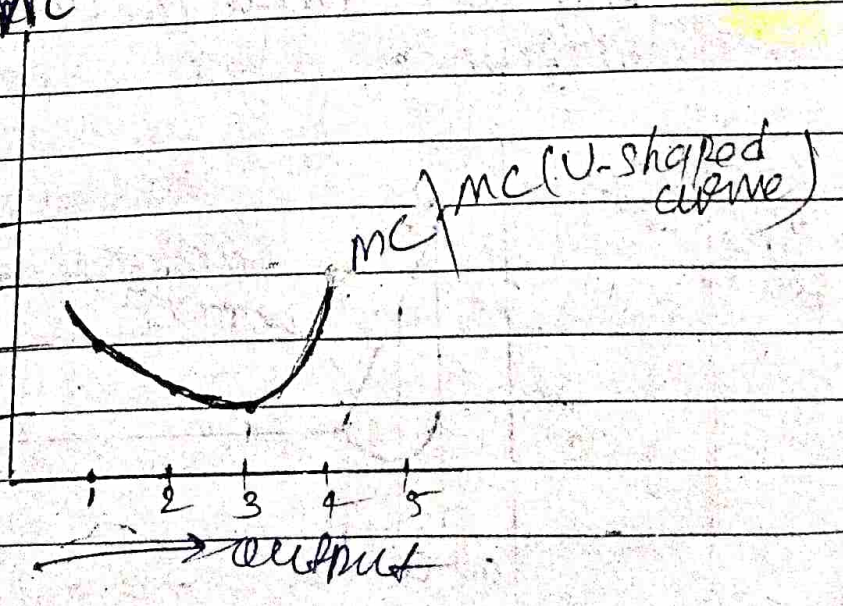
| output | AC | AVC | AFC |
|---|---|---|---|
| 0 | ∞ | 0 | ∞ |
| 1 | 18 | 6 | 12 |
| 2 | 11 | 5 | 6 |
| 3 | 9 | 5 | 4 |
| 4 | 9 | 6 | 3 |




Marginal cost :- Marginal cost refers to addition to total cost when one more unit of output is produced.

$$MC = TC_n - TC_{n-1}$$

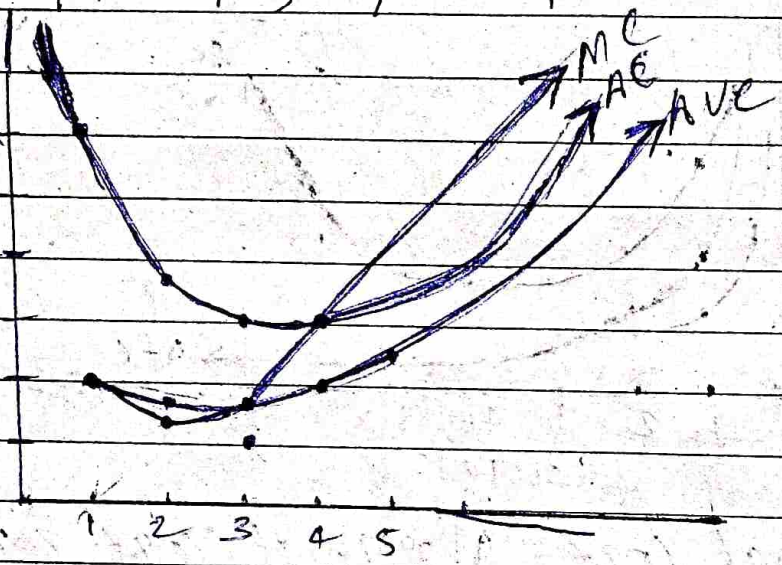
| output | T.C | MC |
|---|---|---|
| 0 | 12 | |
| 1 | 18 | 6 |
| 2 | 22 | 4 |
| 3 | 27 | 5 |
| 4 | 36 | 9 |
| 5 | 47 | 11 |



Explain.

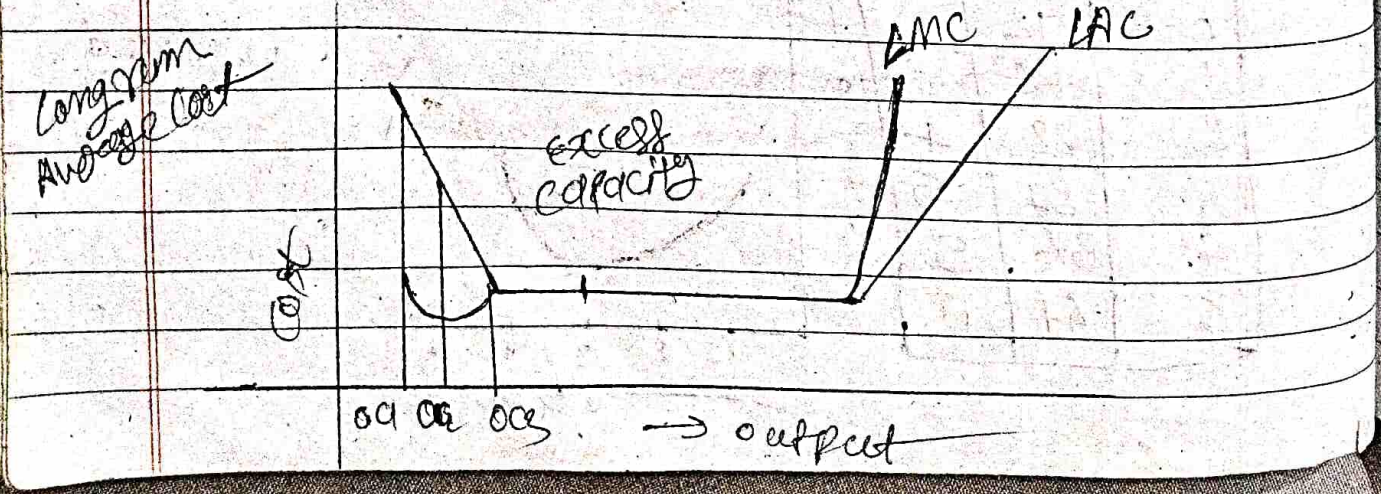
* Relationship between AC, AVC, MC

| Output | AC | AVC | MC |
|---|---|---|---|
| 0 | ∞ | 0 | |
| 1 | 18 | 6 | 6 |
| 2 | 11 | 5 | 4 |
| 3 | 9 | 5 | 5 |
| 4 | 9 | 6 | 9 |
| | 7.4 | 5 | 11 |




(i) When MC below the AC, and AVC falling
(ii) When MC is minimum than AC, AVC minimum
(iii) When MC is above than AC and AVC raising.

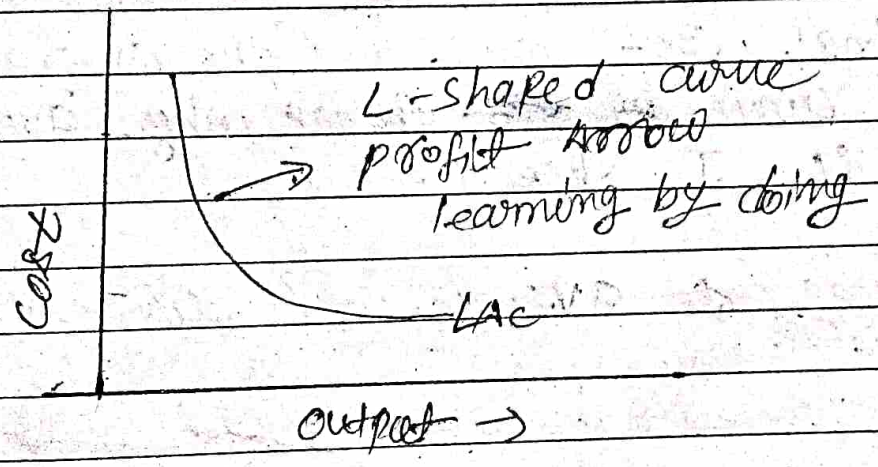
PYQ Why cost curve is Dish shaped, draw the diagram.



Cost curve is dish shaped due to technical and managerial economy we are denying the time period of increasing cost, we are developing and flattem it so much so cost curve is dish shaped.

PYQ Draw the diagram and explain why cost curves are L shaped?

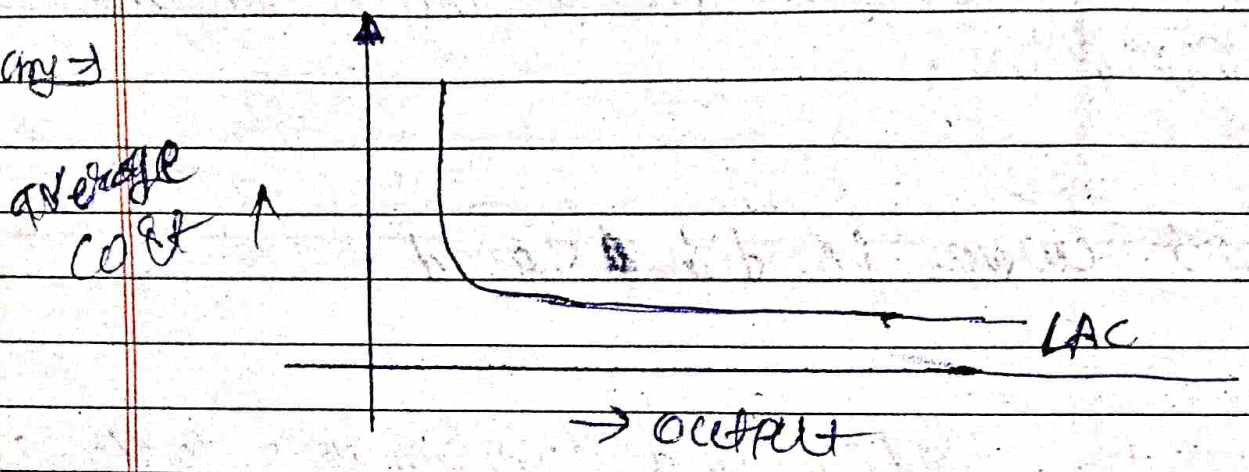
Ans ⇒




~~Cost curves are L shaped due to the relationship between fixed cost and variable cost~~

In other words → Cost curves are L-shaped ~~due to long~~ due to managerial and technical economic in long run Cost curve is reducing per unit, because we take combination of short run in long run. The mistake we make in short run, we don't repeat that mistake in long run with the help of learning by doing. So that's why cost curves are L shaped.

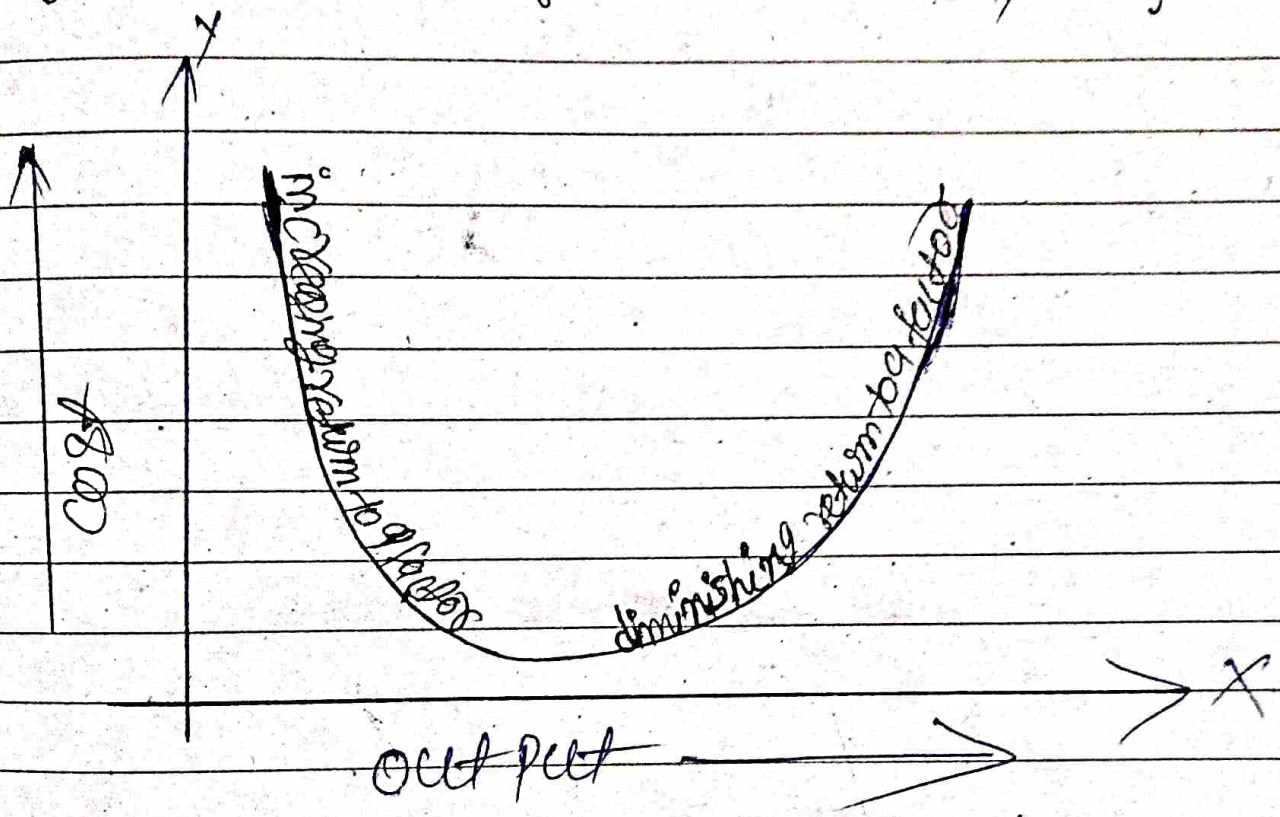
(*) Draw the graph and explain why average cost curve is J shaped.




The average cost curve is J-shaped because it is derived from the combination of the marginal cost curve and the average variable cost curve that's why average cost curve is J shaped.

Note : long run average cost curve ~~दिखाई~~ दिखाई नहीं,

PYQ Draw the diagram and give the reason why cost curves are U shaped?




Region →

Cost curve is U shaped due to "law of variable proportions" according to this law cost curve initially a downward slop till it reaches its minimum point and thereafter it starts rising. Therefor cost curve U-shaped.

* ARR : Average rate of Return method

$$ARR = \frac{\text{Average annual net earning after taxes}}{\text{initial investment}} \times 100$$

Q) A Real state investement that is likely to generate returns ₹ 25,000 in year 1 and ₹ 30,000 in year 2. And ₹ 35,000 in year 3 The initial investment is ₹ 3,50,000 with a salvage value of ₹ 50,000 and estimates life of 3 years.

Sol^n : Note that here salvage → scrap

$$\text{Avg annual earning} = \frac{25000 + 30,000 + 35000}{3}$$

$$\text{Avg} = \frac{90,000}{3} \qquad \boxed{\text{Avg} = 30,000}$$

$$ARR = \frac{30,000}{350,000 - 50,000} \times 100 = \frac{30,000}{300000} \times 100$$

$$= \frac{1}{10} \times 100 = 10\%$$

Q) Security A
initial investment
↳ 50,000
Net earning annual.
year 1 → 5000
2 → 10000
3 → 12000
Projected life 3 years

Security B
initial investment
65,000
Net earning annual
year 1 → 7000
→ 12000
10000.
3 years

Sol :- Security A

$$avg = \frac{5000+10000+12000}{3} = \frac{27,000}{3}$$

**Avg = 9000**

$$ARR = \frac{9000 \times 100}{50,000} = 0.18 \times 100 = 18\%$$

Security B →

$$Avg = \frac{7000+12000+14000}{3} = \frac{33000}{3}$$

**Avg = 11000**

$$ARR = \frac{11000}{65,000} \times 100 = 16.92\%$$

**Invest in security A**

* Net present value Method

Q) investment = ₹ 25000

| Year | Cash inflows | PV factor @12 |
|---|---|---|
| 1 | 10000 | 0.893 |
| 2 | 8000 | 0.797 |
| 3 | 9000 | 0.712 |
| 4 | 6000 | 0.636 |
| 5 | 7000 | 0.567 |

Note :- ₹ in place of PV factor there can be discounting factor

Q1

| Years | Cash inflows | PV factor @ of 12% | Present value |
|---|---|---|---|
| 1 | 10,000 | 0.893 | 8930 |
| 2 | 8000 | 0.797 | 6376 |
| 3 | 9000 | 0.712 | 6408 |
| 4 | 6000 | 0.636 | 03816 |
| 5 | 7000 | 0.567 | 3969 |
| | | Total = | 29499 |

Net present value (NPV)

NPV = Total present value − initial investment

NPV = 29499 − 25000

NPV = 4499

Q

| Year | Cash inflows A | Cash inflows B | PV factor @ 10% |
|---|---|---|---|
| 1 | 35000 | 18000 | 0.909 |
| 2 | 12000 | 4000 | 0.826 |
| 3 | 4000 | 25000 | 0.751 |
| 4 | 7000 | 5000 | 0.683 |
| 5 | 2000 | 12,000 | 0.621 |
| investment | 40,000 | invest 50,000 | |

↓ year n

| Sol :- | Cash inflows A | Cash inflow B | PV. fact @ 10% | Present value for A | Present Value for B |
|---|---|---|---|---|---|
| 1. | 35000 | 18000 | .0·909 | 31815 | 16362 |
| 2 | 12000 | 4000 | 0·826 | 9912 | 3304 |
| 3 | 4000 | 28000 | 0·751 | 3004 | 18775 |
| 4 | 7000 | 5000 | 0·683 | 4781 | 3415 |
| 5 | 9000 | 12000 | 0·621 | 5589 | 7452 |
| investment | 40000 | 50,000 | | 55101 | 49.308 |

NPV = TPV − investment

NPV = 55101 − 40000 = 15101 (A).

NPV(B) = 49308 − 50000 = −692

| Year | Cash inflows of project A | Cash inflows of project B | PV factors @ 12% discounting factor |
|---|---|---|---|
| 1 | 290,000 | 260000 | 0·892 |
| 2 | 265000 | 240000 | 0·797 |
| 3 | 235000 | 225000 | 0·712 |
| 4 | 105000 | 100000 | 0·635 |
| 5 | 85000 | 80000 | 0·567 |
| 6 | 70000 | 45000 | 0·507 |

Sol :- Scrap value of project A = 20,000
Scrap value of project B = 10,000
Project A : initial investment of the project = 570000
Project B : initial investment of the project = 520000
जहाँ पर scrap की भी हम project A तथा B में add करेंगे और उसका PV factor last वाला ही लेंगे।।

| Cash inflows of project A | Cash inflows of project B | PV factor @12% | Present value of A | P.V of B |
|---|---|---|---|---|
| 290,000 | 260000 | 0.892 | 258680 | 231920 |
| 265000 | 240000 | 0.797 | 211205 | 191280 |
| 235000 | 225000 | 0.712 | 167320 | 160200 |
| 105000 | 100000 | 0.635 | 66675 | 63500 |
| 85000 | 80000 | 0.567 | 48195 | 45360 |
| 70000 | 45000 | 0.507 | 35490 | 22815 |
| 20,000 | 10,000 | 0.507 | 10140 | 5070 |
| | | Total for A = | 797705 | Total for B = 720145 |

NPV(A) ⇒ 797705 − 570000 = 227705

NPV(B) ⇒ 720145 − 520000 = 200145

(A)

(1) Reasons for replacement
(घिसावट ; ह्रास)

(i) Deterioration :- decline in the performance of an asset due to wear and tear it is indicated by (ह्रास - ह्रास)
(i) reduction in quality and rate of production
(ii) reduction in production rate of
(iii) increase in labour cost
(vi) loss of operating time due to break down
(पुराना होजाना)

(2) Obsolescence :- (i) reduction in profits
(ii) impair competetion
(iii) loss in the value of Machinery
विस्थापित

(3) Inadequacy :-
(i) when the existing equipment becomes inadequate to need the demand or it is not able to increase the production rate to desire level. reasons for replacement arises.
अपर्याप्त

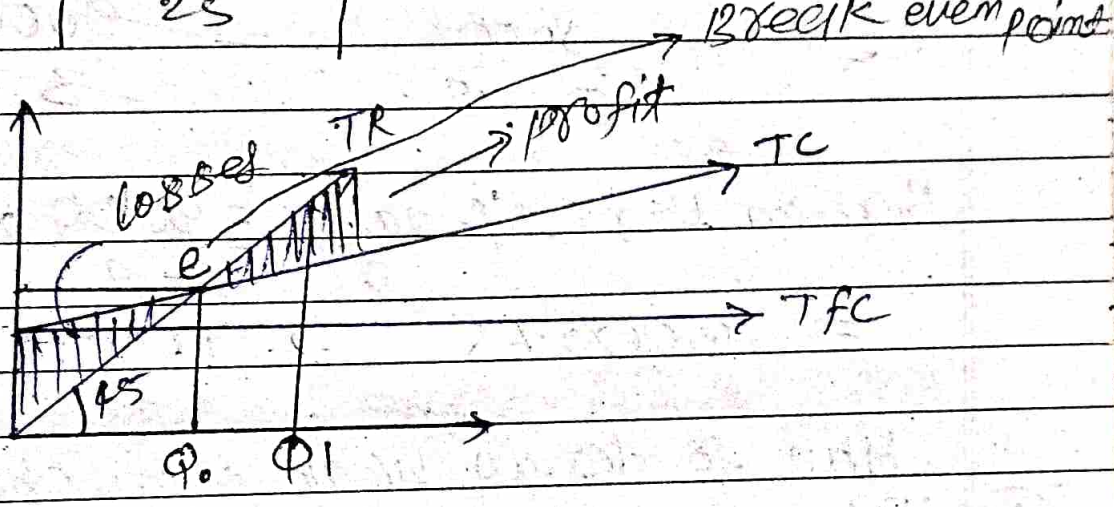
(4) Working Condition :- The old equipment and machinery which creats unpleasents noise, unsafe working condition for workers and leads to accident and making the environment smokey etc.

DO I work
↑↑ ↑ ↑

factors responsible of replacement
(i) ~~technical~~ technical factor :-
(ii) ~~financially factor~~ financial factor :-
(iii) Tangible factors :-

(PYQ) Break even chat & point

| Q | PX | TR (PXQ |
|---|---|---|
| 1 | 5 | 5 |
| 2 | 5 | 10 |
| 3 | 5 | 15 |
| 4 | 5 | 20 |
| 5 | 5 | 25 |




formula

* Break even point in terms of unit

$$\text{Bep-Unit} = \frac{\text{fixed cost}}{\text{Selling price per unit} - \text{variable cost per unit}}$$

Contribution margin → selling price per unit − variable cost per unit

$$\text{Bep-U} = \frac{\text{fixed cost}}{\text{Contribution margin}}$$

* Break even point in Sales/cost/money

$$\text{Bep-Sale/m} = \frac{\text{fixed cost}}{\text{Contribution margin}} \times \text{Selling price per unit}$$

(Pro) Calculate break even point in terms of unit and in terms of sales when fixed cost is equal to rupees 9000 selling price per unit Rs = 5 and variable cost per unit = 2 also draw breakeven ~~point~~ chart

ans ⇒ Bep in terms of unit

$$= \frac{9000}{5-2} = \frac{9000}{3} = 3000$$

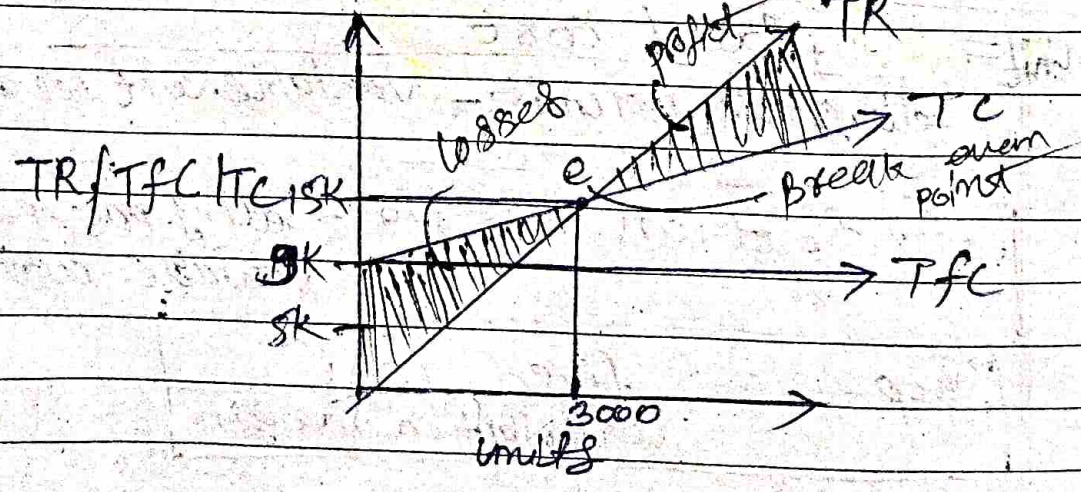
Bep in terms of sales $= \frac{9000}{5-2} \times 5$

$= 3000 \times 5 \Rightarrow 15000$

How to draw break even chart

(i) Take x and y axis where on the x axis keep units and on y axis keep ₹/TR/TFC/TC

(ii) draw TR at the angle of 45° to the x axis. and



(PYQ) Draw Breakeven chart from the following data also verify numerically.
fixed cost = Rs 2,50,000; variable cost = Rs 20 per unit; Selling price = Rs 45 per unit

Sol^n

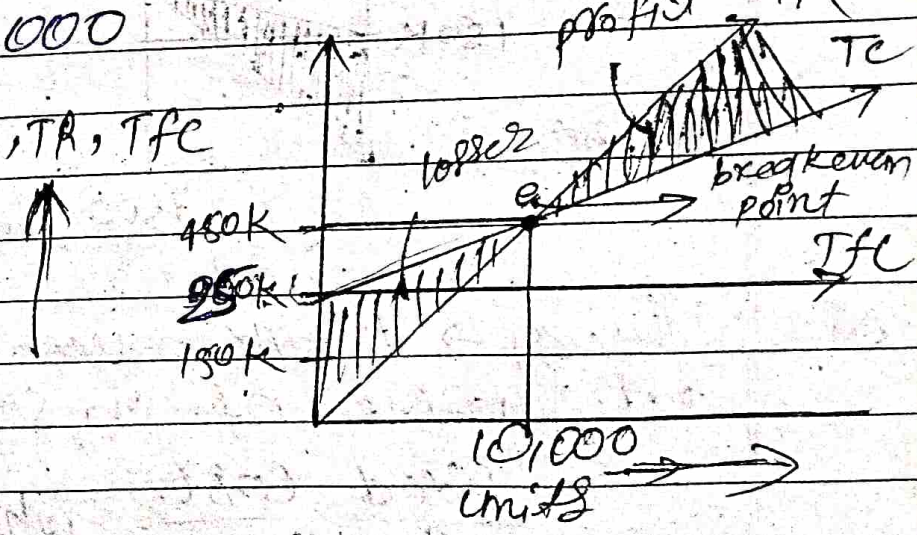
Given fixed cost = 2,50,000
Selling P = 45 per unit
variable cost = 20 per unit

$$\text{BEP in terms of unit} = \frac{2,50,000}{45-20}$$

$$= \frac{2,50,000}{25} = 10,000$$

$$\text{BEP in terms of sales} = \frac{2,50,000 \times 45}{45-20}$$

$$= 10,000 \times 45$$
$$= 4,50,000$$



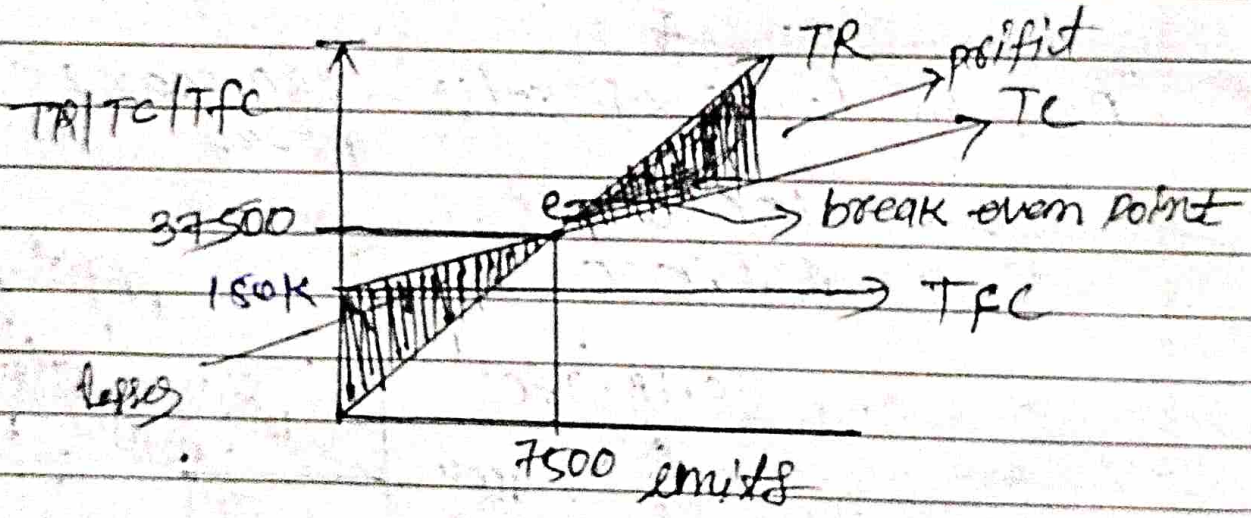
(PYQ) Draw the graph and calculate Break even point when fixed cost = RS 150000, selling price = RS 50/unit and variable cost Rs 30/unit.

ans ⇒ BEP in terms of unit = $\frac{150000}{50-30}$

$= \frac{150000}{20} = 7500$

BEP in terms of sales = $\frac{150000 \times 50}{50-30}$

$= 7500 \times 50 = 37500$




* Theory ⇒ Break even point in terms of alternatives of in sales

$\frac{\text{fixed cost}}{\text{f ratio}}$ where P is profit

V is volume

f ratio = $\frac{\text{Contribution margin} \times 100}{\text{selling price per unit}}$

* Marginal of Safety : actual sale - break even sale.

(EOQ)

* Economics order quantity = $\sqrt{\frac{2AO}{C}}$

where A → Annual consuption
O → ordering cost
C → carry cost / holding cost

$$\text{No of order} = \frac{A}{EOQ}$$

Q Suppose a company purchases rawmaterial with annual demand of 25000 units the carrying cost per unit is rupees 6.4 and cost of placing and order is rupese 32 find EOQ no of order.

ans ⇒ $EOQ = \sqrt{\frac{2AO}{C}}$

$A = 25000, \quad O = 32$

$C = 6.4$

$EOQ = \sqrt{\frac{2 \times 25000 \times 32}{6.4}}$

$EOQ = \sqrt{\frac{5 \times 32 \times 10^4}{6.4}} = \sqrt{\frac{16 \times 10^5}{6.4}}$

$EOQ = \sqrt{250000}$

$EOQ = 500$ N. of order $= \frac{A}{EOQ}$

$= \frac{25000}{500}$

Q Calculate EOQ and number of orders when annual consumption is 300000 units ordering cost = 30 per unit and carrying cost = 2 per unit.

ans A = 300000. $EOQ = \sqrt{\frac{2AO}{C}}$
O = 30
C = 2

$$EOQ = \sqrt{\frac{2 \times 300000 \times 30}{2}}$$

$$EOQ = \sqrt{\frac{18 \times 10^6}{2}}$$

$$\boxed{EOQ = 3000}$$

No of order $= \frac{300000}{3000} = 100$

Q ** pay back period →
It is always represent in years

(i) Evem cash inflows

$$ECI = \frac{\text{Initial investment}}{\text{Net earnings / annual cash inflow}}$$

Q The Company is planing to purchase a machine known as machine-X it would cost ₹ 25000 with a usefull life of 10 years the expected annual cash inflow is ₹ 10,000 Compute pay back period and conclude whether or not the machine would be purchased if the machine desired pay back Period is 3 years.

Ans → evem cash inflows = $\frac{\text{initial investment}}{\text{net earning / annual cash inflow}}$

$$ECI = \frac{25000}{10,000} = 2.5 \text{ year}$$

Yes machine would be purchased investment is profitable.

Note → ECI formula works on when annual cash inflow same per year a.c.i Constant per year then it formula will be applied. other wise you have to apply another formula.

formula of Payback Period

Year before full recovery + Unrecovered cost at the start of the year / Cash inflow during the year

Q investment – 600000

| Year | Cash inflows | Cumulative cash inflow |
|---|---|---|
| 0 | (600000) | (600000) |
| 1 | 120,000 | 480000 |
| 2 | 140000 | 340000 |
| 3 | 180000 | 160000 |
| 4 | 200000 | +40,000 |
| 5 | 250000 | |

$PbP = 3 + \frac{160000}{200000}$ $3 + 0.8$

Pay back Period = 3.8 years

PYQ → Rank the projects from the following data according to pay back period Method initial investment required for the project A = RS = 3,75,000 initial investment required for the project B = RS 3,70,000 Net profits before tax and after depreciation are as follow.

| Year | Project A | Project B |
|---|---|---|
| 1st | 1,50,000 | 1,60,000 |
| 2nd | 1,40,000 | 1,35,000 |
| 3rd | 1,05,000 | 1,00,000 |
| 4th | 80,000 | 95,000 |
| 5th | 60,000 | 65,000 |

| Year | Project A | Cumulative cash inflow | Project B | Cumulative cash inflow |
|---|---|---|---|---|
| 0 | (3,75,000) | (375000) | (3,70,000) | (370000) |
| 1 | 1,50,000 | 225000 | 1,60,000 | (210,000) |
| 2 | 1,40,000 | 85000 | 1,35,000 | 75000 |
| 3 | 1,05,000 | +20,000 | 1,00,000 | +25,000 |
| 4 | 80,000 | | 95,000 | |
| 5 | 60,000 | | 65000 | |

A → $2 + \frac{85000}{105000}$ = 2.80 year

B → $2 + \frac{75000}{100000}$ 2.75 year

So rank the project of B because its pay back period is less than project of A. It is profiable.

## * Internal rate of return :

Eg ⇒ initial outlay = Rs 2,00,000, Net cash inflow per annum = Rs 45,000, Estimated life of the project is 7 years and required rate of return is 9%. Discount factor at 11% is 4.7122 and Discount factor at 17% is 3.9224. Give your opinion whether the project should be accepted or rejected.

(Cash inflow) (Discount factor)

Net present value at 11% = CI × DF

11% = 45000 × 4.7122

11% = 212049

Net Present value at 17% = 45000 × 3.9224

17% = 176508

$$IRR = \gamma L + \frac{(NPV \text{ at } \gamma L - \text{initial outlay}) \times (\gamma H - \gamma L)}{(NPV \text{ at } \gamma L - NPV \text{ at } \gamma H)}$$

$$IRR = 11 + \frac{(212047 - 200000) \times (17 - 11)}{(212047 - 176508)}$$

$$IRR = 11 + \frac{12047}{35539} \times 6$$

IRR = 11 + 0.3389 × 6

IRR = 11 + 2.033

**IRR = 13.033**

profitable & acceptable

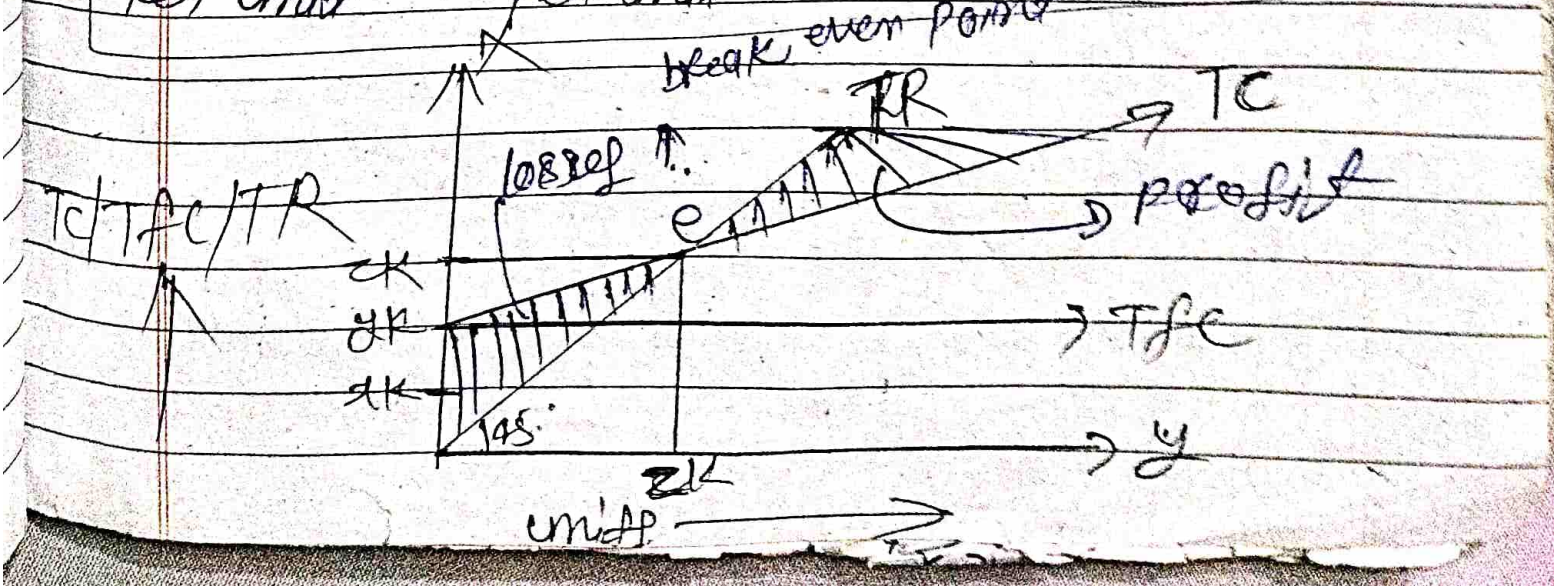
Note: Question will be asked you if in the exam that explain ~~the~~ Marginal productivity theory in n Marks. than you have to write definision of MPT and 10 assumptions only headings further draw table and diagram and explain diagram and industry view & its diagram and explain and further critisium Heading & explanation every headings.

(6) Break even point →

BEP in terms of unit = $\frac{\text{fixed cost}}{\text{selling price per unit} - \text{variable cost per unit}}$

BEP in terms of sale/cost/money

= $\frac{\text{fixed cost}}{\text{selling price per unit} - \text{variable cost per unit}} \times \text{selling price per unit}$



(PYQ) Explain Marginal productivity theory ~~or Explain the assumptions of Marginal productivity theory.~~

ans→ Marginal productivity theory founded in the year 1826 by

Definition: According to this theory every factor including entrepreneur would get a ~~perfect~~ remuneration equal to marginal product.

Assumption of the Marginal productivity theory

(i) Perfect Competition in product market: There is perfect competition in the market where produced goods are sold. ~~Accordingly, Marginal revenue and average revenue and average revenue of the product will be equal.~~ it means there will be no change in the price of the product when its output is increased by a firm.

(ii) perfect Competition in factor Market: There is perfect competition in factor market. It means each firm will have to pay the prevailing price of the factor. ~~On account of~~ → प्रचलित

(iii) Homogeneous factors: All units of a given factor are homogeneous and so the same any perfect Substitutes of one another.

(iv) Substitutable factors: Different factors are perfectly substitable for one another. It means capital can be substituted for labour

(v) Perfectly Mobile: Each unit of the given factor is perfectly mobile. Consequently, price of a factor in different occupations will be the same.

(vi) Divisible factor: Different factors of production can be divided into small units.

(vii) Maximum profit: Every producer aims at maximizing profit.

(viii) Full Employment: There is full employment in the economy. It means the supply of factor is fixed.

(ix) Variable input co-efficient: factors of production can be used in different proportions. That is, proportion of one factor can be increased or decreased while keeping the other factors constant for instance, on a given farm measuring one hectare four or five workers can be employed

(x) Technology remains Constant: There is no change in the technique of production.

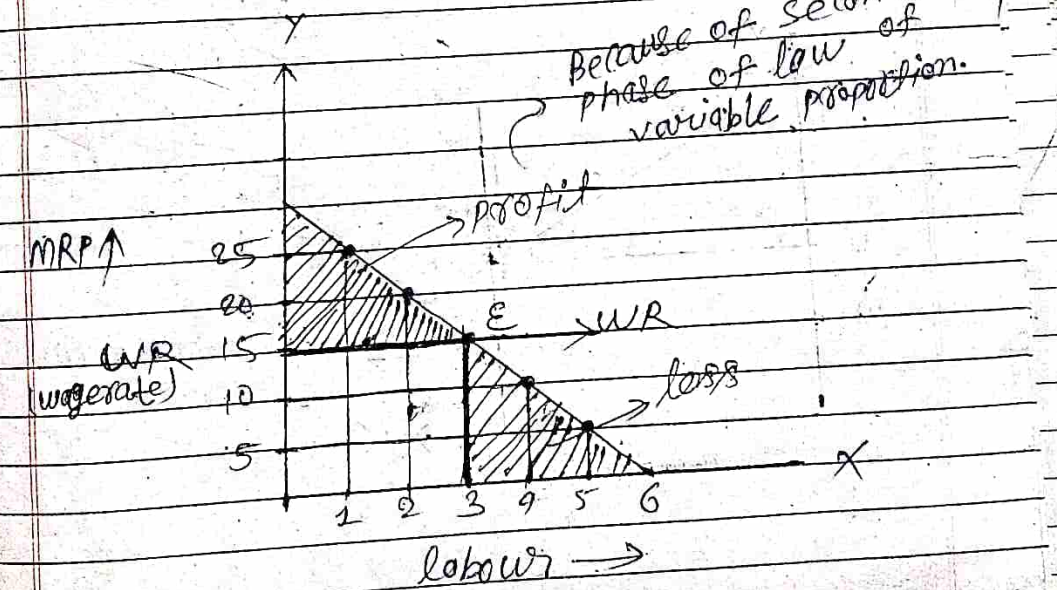
marginal revenue productivity — value of marginal product

| Sle | land | labour | T.P | MP | T.R | price | MR =AR | AR= | MRP= MP×MR | VMP= MR×AR |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 25 | 25 |
| 2 | 1 | 2 | 9 | 4 | 10 | 5 | 5 | 5 | 20 | 20 |
| 3 | 1 | 3 | 12 | 3 | 15 | 5 | 5 | 5 | 15 | 15 |
| 4 | 1 | 4 | 14 | 2 | 20 | 5 | 5 | 5 | 10 | 10 |
| 5 | 1 | 5 | 15 | 1 | 25 | 5 | 5 | 5 | 5 | 5 |

| wage rate |
|---|
| 15 |
| 15 |
| 15 |
| 15 |
| 15 |

perfect competition ⇒ P = AR = MR = AR
= MRP = VMP

MRP or labour curve

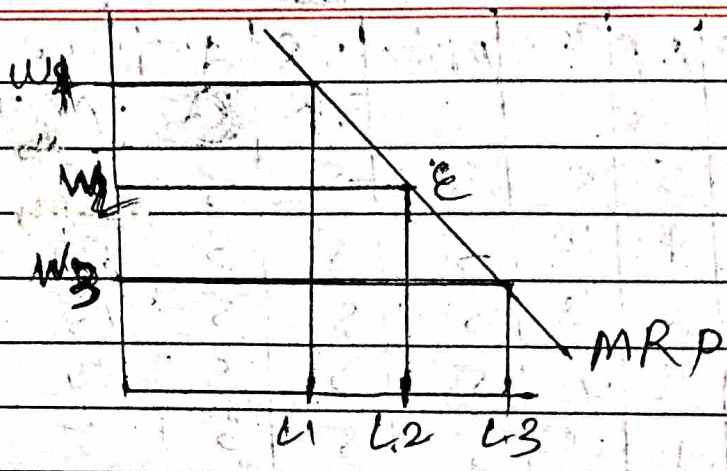



The above graph is called marginal rate of production or labour curve. It represents labour that is on x axis and mrp that is on y axis

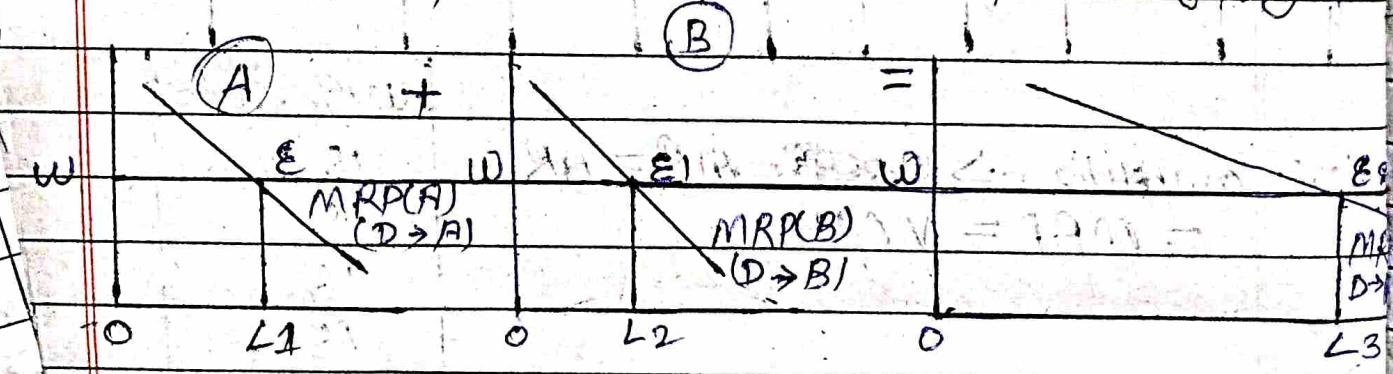
As we know marginal product defination

Till point E firm will hire more labours to increase it's production. At point E rate of labour wage is equal to their marginal product. above E firm will be in profit.

before E firm will stop hiring more labours, as labour wage would be more than their marginal productivity and firm will be in loss.




∴ from the point of view of industry



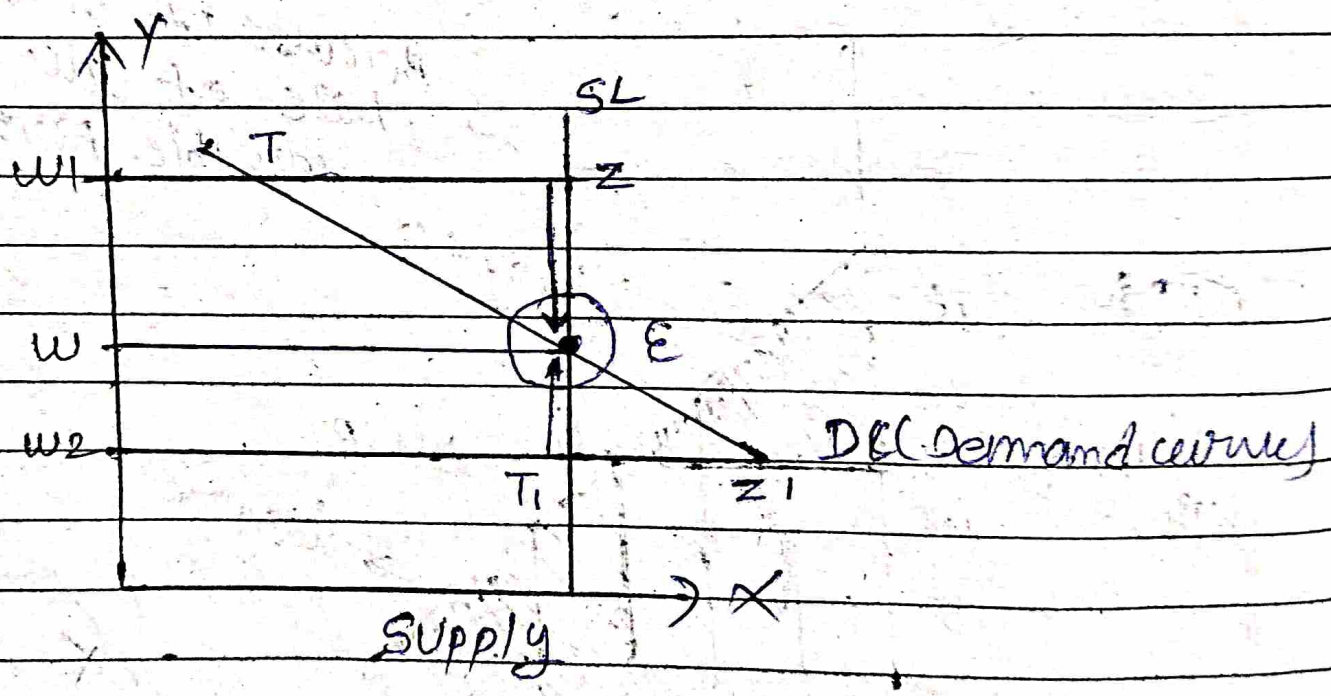

A + B = industry (C)

$\boxed{C = OL3 = OL1 + OL2}$

from the point of view of industry the graph represents two labour curves with wage [redacted] labour on x axis and wage on y axis. The sum of two graphs of labour curve A and B that is A+B = labour curve for industry, That is [redacted] sum of A+B is equal to industry as a whole.

A + B = industry (C)

$\boxed{C = OL3 = OL1 + OL2}$



The above curve is wage and supply curve with wage w, w1, w2 on y axis and supply on x axis, the wages w2 and w1 try to approach e which is equilibrium point, it is most ideal situation for a firm as cost of services of factors is equal to their marginal productivity.

## Criticism

① Unrealistic Assumptions : Marginal productivity theory is based on many unrealistic assumptions such as, perfect Competition, perfect mobility, full employment etc.

② Heterogeneous factors : This was assumed that all the units of a given factor are homogeneous. It is wrong. In reality different units of a given factor are heterogeneous. Ex⇒ labourers are not equally efficient and intelligent.

③ Indivisible factors : This was also assumed that factors can be divided into small parts. It is wrong. There are several machines which cannot be reduced to small unit size.

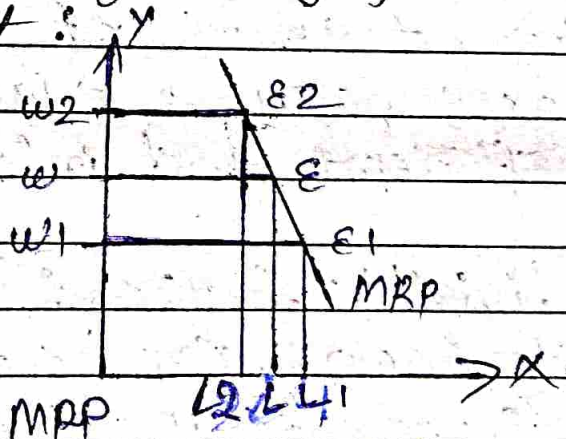
④ Cause and effect : Marginal productivity is the cause and factor-pricing the effect. but according to Webls ; factor price also effects marginal productivity.

⑤ fail to Determine factor pricing : Marginal productivity theory does not determine price of the factors under perfect competition. The price is determined by industry at the equilibrium point.

(6) Difficulties in the measurement of Marginal productivity:

: It was not possible to measure the marginal productivity due to several reasons for example: the theory say that marginal productivity of a factor is measured by increasing one unit of that factor alone while keeping other factors constant.

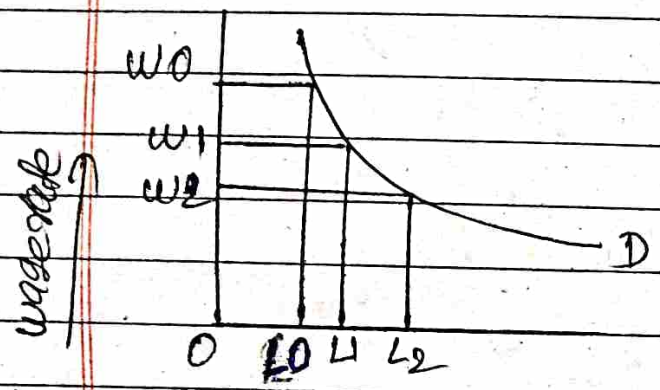
(7) Wrong conclusions regarding factor pricing and employment:




The above graph made with labour and wage rate, labour L1, L2, L3 on the x axis and W1, W, W2 on y axis.

Q.10 Explain Modern productivity of theory or Modern Theory of factor pricing.

ans. ⇒ According to modern theory of factor pricing, price of each factor is determined by its demand and supply.

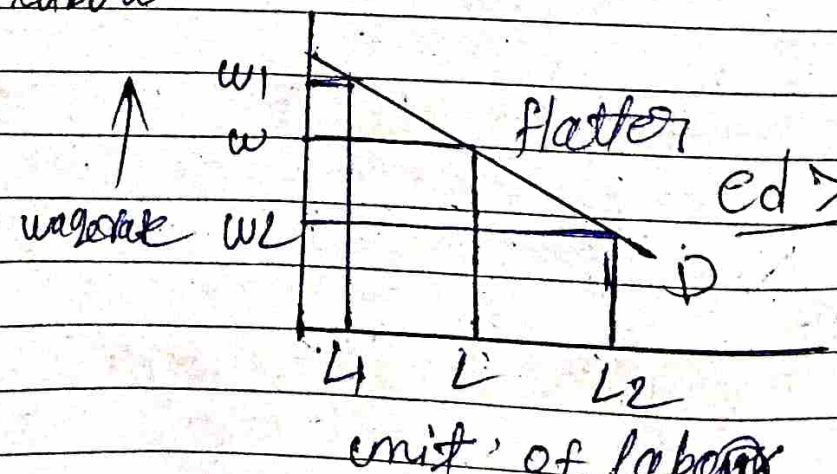



This curve is for labour, units of labour on x axis and wage rate on y axis. Labour demand is called as derived demand. It means labour's demand depend on wage rate.

Elasticity of demand for labour.

(1) Highly elastic demand :- % change in wage rate is less than the % change in demand for labour

(2)

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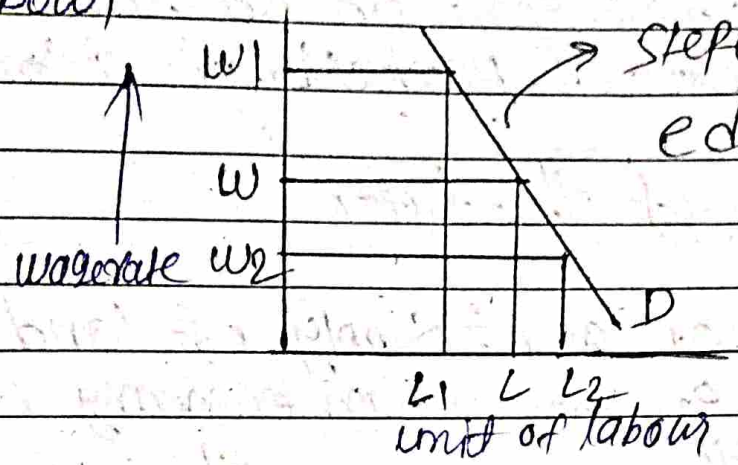
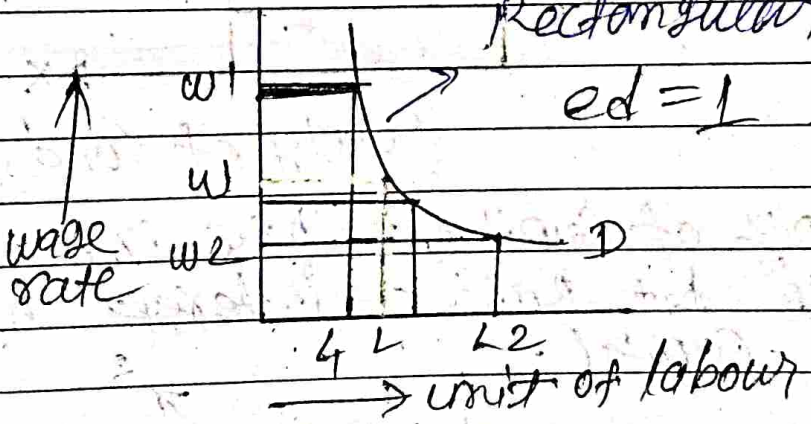
② Lesser elastic demand :- % change in wage rate is more than the % change in demand for labour




③ unitary elastic demand :- % change in wage rate is equal to % change in demand for labour.




* factor effecting the elasticity of the demand for the labour.

① elasticity of the product :- Elasticity of demand for factor, depends on the elasticity of demand for the product, that it produces.

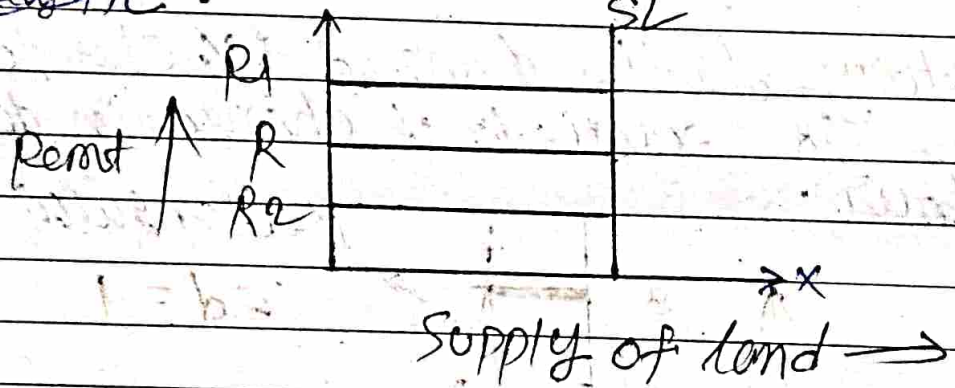
② substitution between factors :- Demand for a factor will be elastic. If it can be substituted for another factor.

(IPSQ)

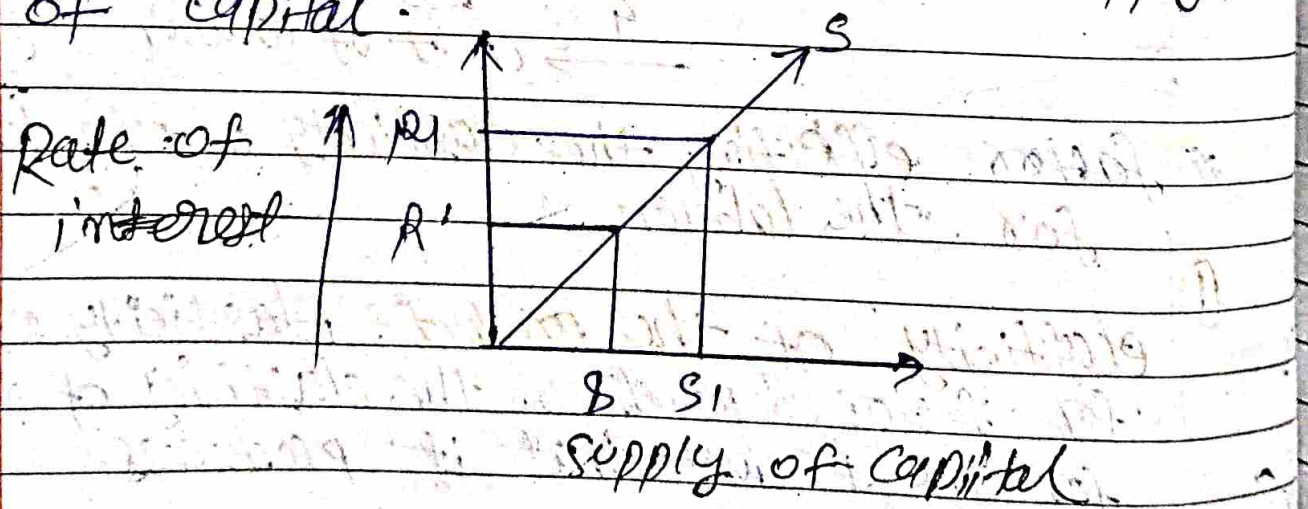
(3) Quantity of the factor :- Elasticity of demand for a factor depends upon the proportion of expenditure spent on that factor out of the total cost of production of a commodity.

(4) Supply of the factor

(i) Supply of land :- Supply of land, from the point of view of an economy is perfectly inelastic.

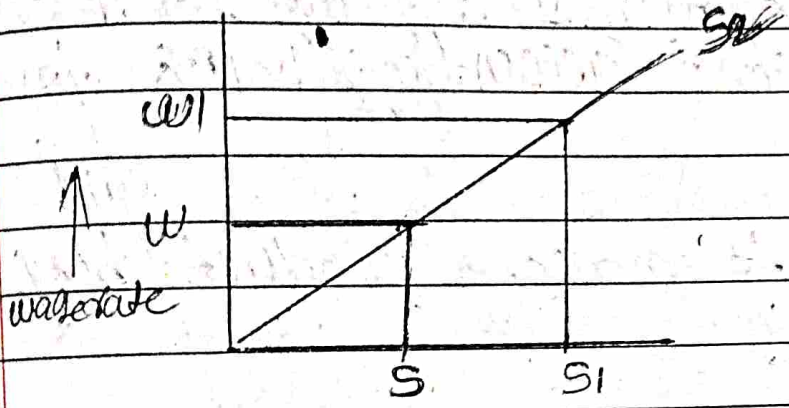



(ii) Supply of Capital :- There is positive relation-ship bet Rate of interest and supply of Capital.

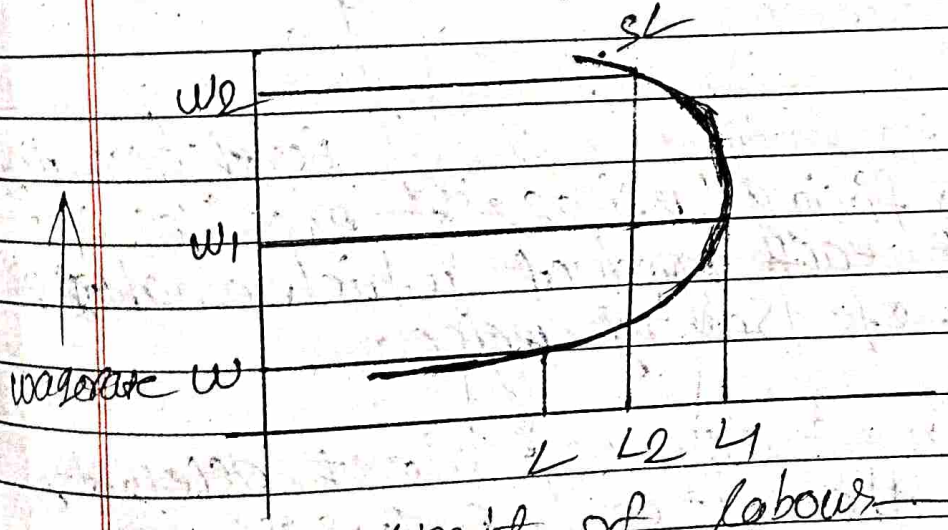



(iii) Supply of Entrepreneur :- There is no definite relation between supply of an entrepreneur and his price or profit.

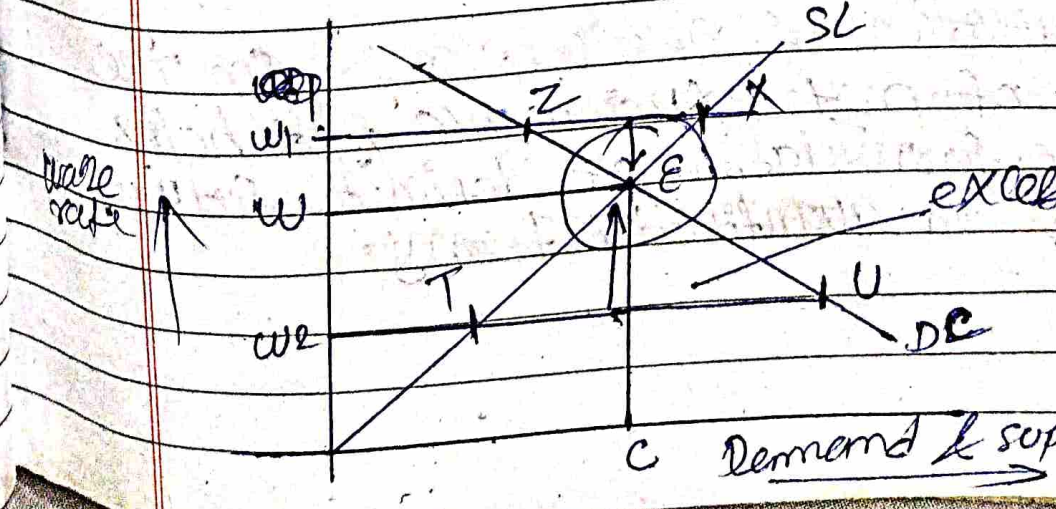
(iv) Supply of labour → Supply of labour means the number of hours, for which a labourer is willing to sell his services at a given wage rate.




Supply of labour →




(v) Wage rate determination



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(Q4) Define challenger and defender

defender :- If the existing equipment is considered for replacement with a new equipment, then the existing equipment is known as defender.

Ex ⇒ CFL bulb.

challenger: New equipment is known as challenger, which challenge the old asset for replacement.

Ex → LED bulb.

(Q5) Defined the term carrying cost.

Ans⇒ Carrying cost is the amount that a business spends on holding inventory over a period of time.

(Q6) Different between carrying cost and ordering cost:

| Carrying Cost | Ordering Cost |
|---|---|
| (i) Carrying cost is holding the inventory | ordering cost is purchasing and receiving the inventory |
| (ii) cost encurred to hold the inventory | cost encurred to purchase and receive the inventory. |

Pg8 Explain Esprit De corps.

ans ⇒ 'Esprit de corps' is a French phrase that indicates 'group spirit'.
→ As per the principle the Supervisors should try to develop a team spirit among the employes for this purpose the supervisors should make the use of word 'we' instead of using 'I' while communicating with subordinates.

Pg9 Define (i) Direct cost (ii) work in progress.

ans ⇒ Direct cost ÷ Direct cost can include the cost of raw materials in manufacturing,
→ direct cost includes direct labour, direct expense, direct material all other costs are associated with the production process.

work in progress ÷ work in progress process refers to the partially completed products or services that are still in the production process but not yet finished or delivered to the customer.

Pg10 Management ÷ The process of planning, organising, staffing, directing and controlling such that the goals of the organisation and goals are achieved successfully with minimum cost and resources.

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(a) Sales = TC + Profit
(b) TC = ΣTVC + Tf.C

S - V = _____ + _____

Dd = f(_ _ _ _ _ _)

ans → Dx = f(Px, Ps, Pc, Y, T, E, N, D, U)

Consumer's surplus = PUP - PAP

Remuneration of employee :- The employee must be paid fairly to give them maximum satisfaction and they would live a reasonable standard of living.

Giffen's paradox is exception to law of demand, why?

ans →

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# contribution = sales - variable cost

pg9 ⑨

| particulars | proj. A | project B |
|---|---|---|
| variable cost | RS 25,000 | RS 18,000 |
| sales | RS. 315,000 | RS 158,000 |

Fixed cost is RS 85,000 for both proj.

Calculate contribution?

Soln → contribution = sales - variable cost

$(\text{contrib}^n)_A = 315,000 - 25,000$

$= 2,90,000$

$(\text{contrib}^n)_B = 158,000 - 18,000$

$= 1,40,000$

* Internal economy →
* External economy →