

UNIT - 3

Production & cost Analysis

Production is an activity that transforms i/p into output.

e.g. - sugar mill uses inputs such as sugarcane, labour, machinery, capital etc. to produce sugar.

→ Production function means the relationship b/w inputs & outputs. The relation is ~~purely~~ physical or technological in character & ignores the prices of i/p & o/p's.

→ The production function tries to explain how to produce the max. quantity of o/p within a given set of resources.

definition of Production :-

Production is the transformation of inputs such as Raw-material, labour, etc. into outputs such as final product or service.

Methods of creation of utility in Production:

1) form utility : if by changing the form of a good, capacity to satisfy wants is created it is called the Form utility.

ex: wood into furnitures, wheat into biscuit

→ utility is also created by changing the place of goods it is called place utility

ex:- sand is collected from the river bank & transported to the construction places

→ If by an acts of storage of good for some time its utility rises it is called time utility

ex:- Food grains, storing apples, oranges & other fruits in cold storages & selling them when price rises.

→ service utility : if the service of a man satisfy our wants, it is called service utility

ex: shirt stitched by a tailor

treatment of a doctor, Professor teaching a class

→ If the change of possession of mood. Yes it's utility, it is called Possession utility (ownership-transform)

Ex:- The utility of a bike it's not great for
a dealer as it is for a student or job holder

→ when the utility of a good Yes by \uparrow ing People's knowledge about the goods, it is called knowledge utility

Ex:- Advertisement of SONY TV, LC washing machine

Factors of Production :-

→ Land : Land is that factor of Production which is freely available from nature

Ex:- Forest, water, Minerals etc

→ Labours : it is a human factor of Production it includes physical & mental activities of a person in order to earn money

Ex:- services of software engineer

capital :- amount that is invested in the business which is used for more production

ex:- purchase of tools, machinery, raw-material

Inputs :- IP's for a production are
raw-material.

Labour

Capital

Machinery

Technology

Packaging charges

advi charges etc

The above inputs are classified into 2 types

i) **fixed inputs :-** These IP's does not change for a longer period of time, which does not affect the production.

Ex:- Land, buildings, Machinery

ii) **variable inputs :-**

These IP's change within a short period of time & which effects the production

Ex:- raw-material, Labour, Capital,
transportation charges etc

→ Law of Variable Proportions and Production Function with one variable factor :-

Labour	Total Product	Marginal Product	Average Product
1	3	3	3
2	8	5	4
3	18	10	6
4			
5	24	6	6
6	26	2	5.2
7	26	0	3.7
8	24	-2	3.0

- The production fun with 1 variable i/p is also called law of variable proportions
- The law of variable proportions means in production fun one i/p factors is variable & other i/p factors are constant.
- If no.of i/p's of 1 variable is fed continuously keeping other factors constant, how o/p changes is explained by law of variable proportions
- If the i/p of 1 variable factor is fed continuously keeping other i/p's constant, o/p rises upto a certain point beyond that

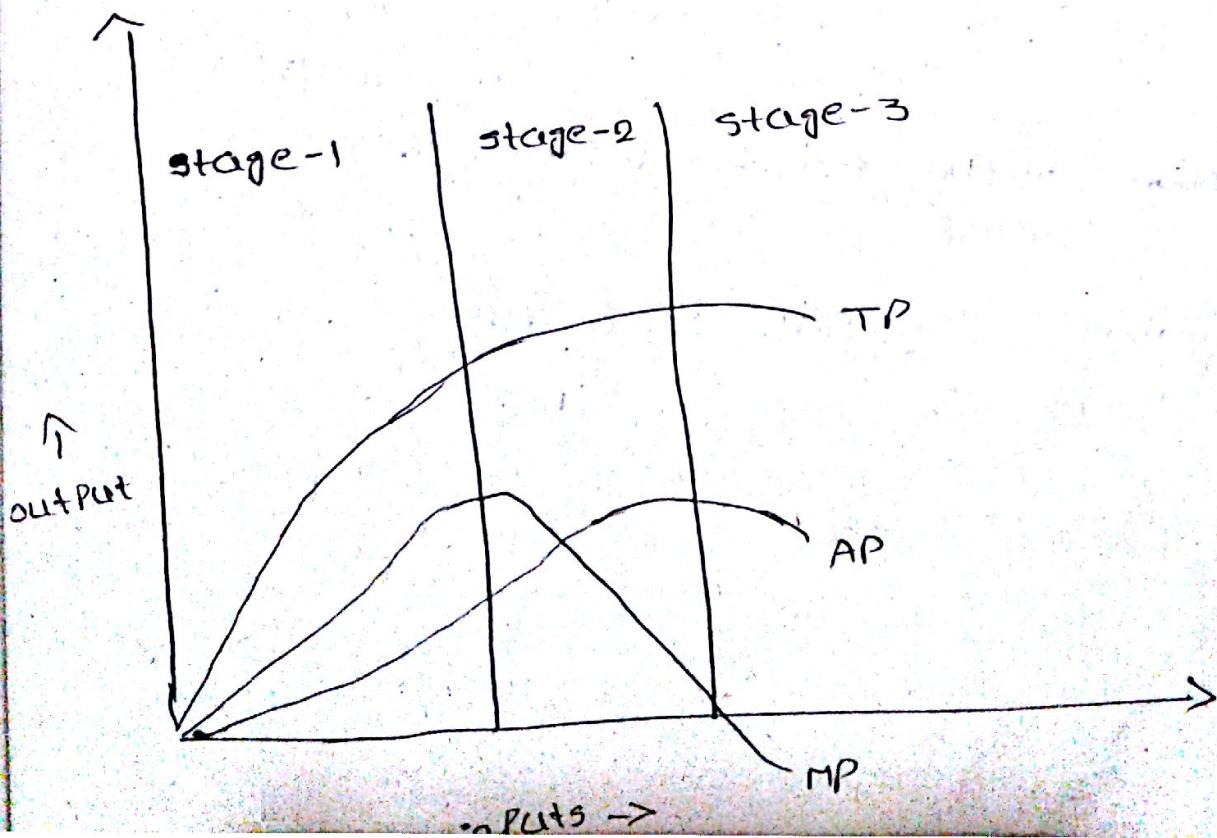
particulars Point OIP lies. This can be explained by above table.

$$\text{avg' Product} = \frac{\text{Total OIP}}{\text{no.of Labours}}$$

Points to be noted :

first

- Point out the max value in the marginal Production column i.e., 10
- Point out the max value corresponding to the marginal Production value in the avg Production column.
- At this intersection Point indicates best no. of employees to have maximum production. i.e., 3 employ max. Production = 18



Stage 1 : Maximum value of MP = 10

Max. value of Avg Product AP = 6.

This is intersection point where the max. 18 units of Production can be done by employing 3 workers. upto this point it is called Increasing returns stage.

Stage 2 : When we employ more than 3 labours total Production is Increasing, marginal Production is \downarrow ing & avg Production is constant.

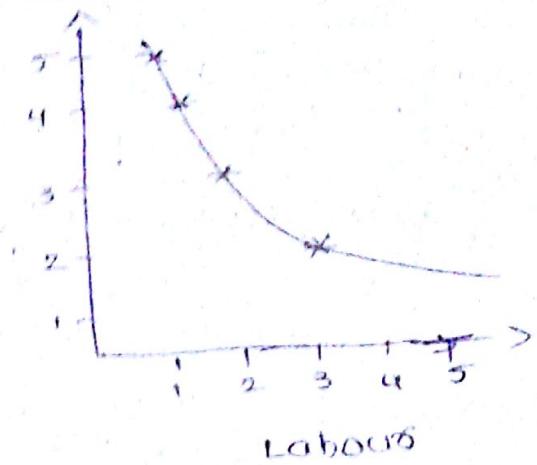
It is called Constant returns to production.

Stage 3 :- At 7th Labours the marginal Production is -ve & avg Production is \downarrow ing. It is called -ve returns stage.

Production Function with 2 variables FPL's :-

<u>Labours</u>	<u>Capital</u>	<u>Output</u>
1	5	10
2	4	10
3	3	10
4	2	10
5	1	10

the firm can fix the output by using 2 variable IIP's i.e., labour & capital and by keeping all the IIP factors in a constant.



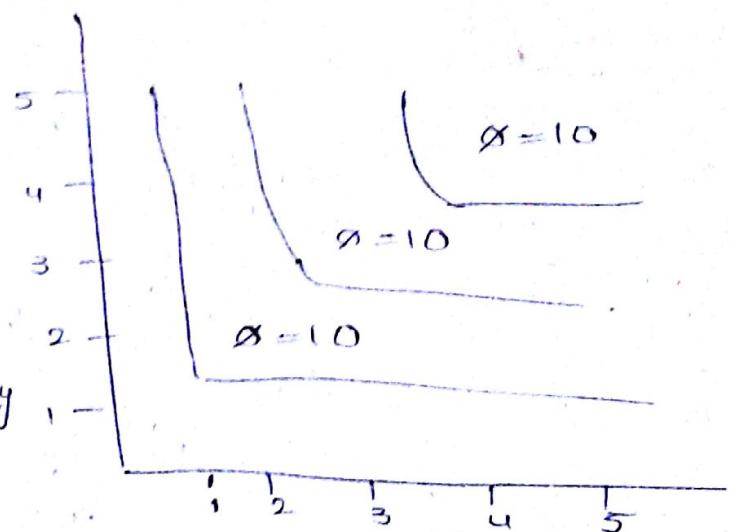
Isoquant :

Iso equal

Quant - Quantity

Iso Quant = equal quantity

quantity



Iso Quant :-

An ISO Quant is a line joining combination of IIP's which generate the same level of output.

-> ISO Quants are also called ISO Product curves & ISO - Quant curves. They show various combination of 2-input factors such as capital & labours, which providing the same level of output.

Factors of an ISO Quant :-

downward sloping :-

ISO quants are downward sloping curves because of one input factor fixed, the other input factors varies there is no quant of increases in both the factors to get a same output. ISO Quant curves slopes downward from left to right.

→ convert to origin, It is because the input factors are not substitutes.

DO not intersect :-

TWO ISO Products (or) ISO quants do not intersect with each other. It is because, each of these denotes a particular level of O/P.

DO not touch axes :-

The ISO quant curves, neither touches x-axis or y-axis, as both inputs are required to produce a given level of output.

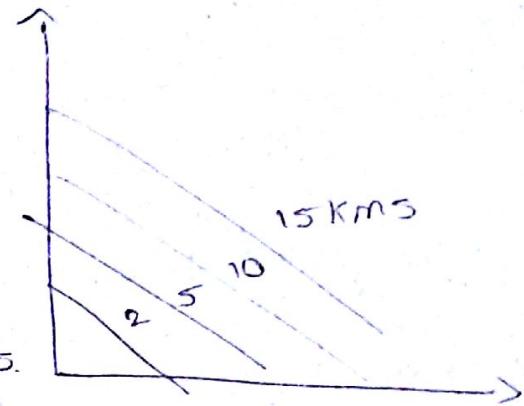
Types of ISO quants :-

Linear
ISO quant

Right - angle
ISO quant

Convex
ISO quant

Linear ISO - Quant are formed when the I/P's are perfect substitutes.



E.g.: If a car is equipped (or) can run either Petrol (or) Gas.

they are considered as perfect substitute hence the ISO quants are straight lines.

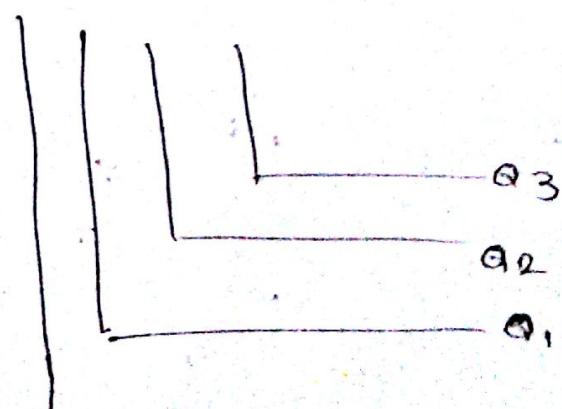
Right - angle ISO quant :-

when the I/P's are not perfect substitute those are called.

These type of ISO quants are formed when there is complete non-substitution b/w the I/P's

fatality b/w the I/P's

that exist.



Battery

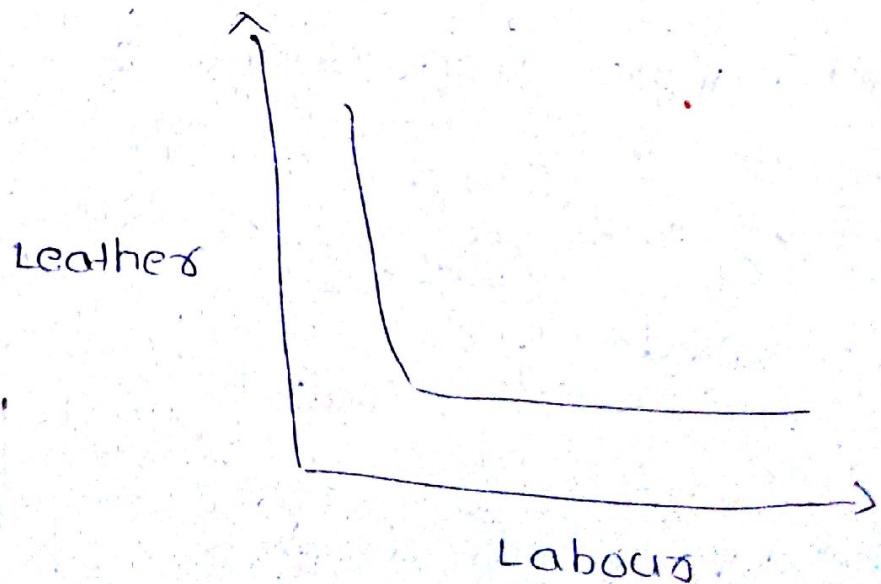
E.g.: A bulb & battery both are required to light a torch.

Convex ISO Quant :-

Here, there is a substitutability of inputs but the substitutability is not perfect.

E.g.: A leather coat can be made with less labour & more leather.

The same coat be made with less leather & more labour, but the tailors have to cut the leather more carefully in order to reduce the wastage.



Marginal Rate of Technical substitution (MRTS) :-

The Principle of MRTS is based on Production function. It explains that 2 factors can be substituted in variable proportion's in such a way to produce the same level of output.

→ In other words, the lesser units of one input must be compensated by increasing amount of another input to produce the same level of output.

→ MRTS explains how much amount of an input (labour) can be reduced & how much amount of another input (capital) has to be used to produce same output.

→ The process of compensating the loss of a particular input with additional units of another input factor is explained by MRTS.

<u>combination</u>	<u>Labours</u>	<u>capital</u>	<u>MRTS</u>	<u>O/P</u>
1	9	5	3/5	100
2	6	10	6/5	100
3	4	15	4/5	100
4	3	10	3/5	100
5	2	15	2/5	100
6	1	20	1/5	100

Production function with all variable inputs

<u>S.NO</u>	<u>capital</u>	<u>Labours</u>	<u>Total Product</u>	<u>Marginal Product</u>
1	1	2	3	3
2	2	4	7	4
3	3	6	12	5
4	4	8	18	6
5	5	10	24	6
6	6	12	30	6
7	7	14	36	6
8	8	16	44	5
9	9	18	45	4
10	10	20	48	3

Production Fn with all variable inputs may be defined as the behavior of Production

when all the Production factors are fed combined simultaneously in the same ratio.

- Law of Returns explains the behavior of production when quantity of some factors of production are kept constant and others remains changed.
- the above table explains that ↑ in scale of factors results in ↑ in output, ↓ in scale of factors results in constant returns. & ↑ in scale of factors results in decreasing returns.
- varying all the inputs results in 3 situations

- 1) ↑ in returns to scale
- 2) constant returns to scale
- 3) decreasing " "

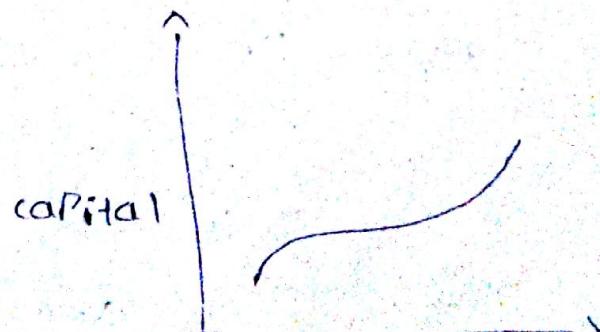
1) ↑ in returns to scale :-

In Proportional ↑ in the O/P is $>$ than

Proportional ↑ in the ip then we have ↑ in returns to scale

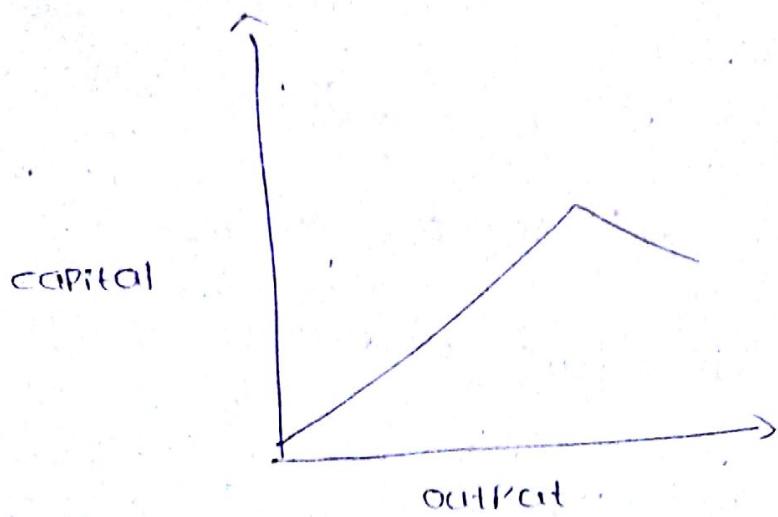
This can be explained with the help of

the following diagram



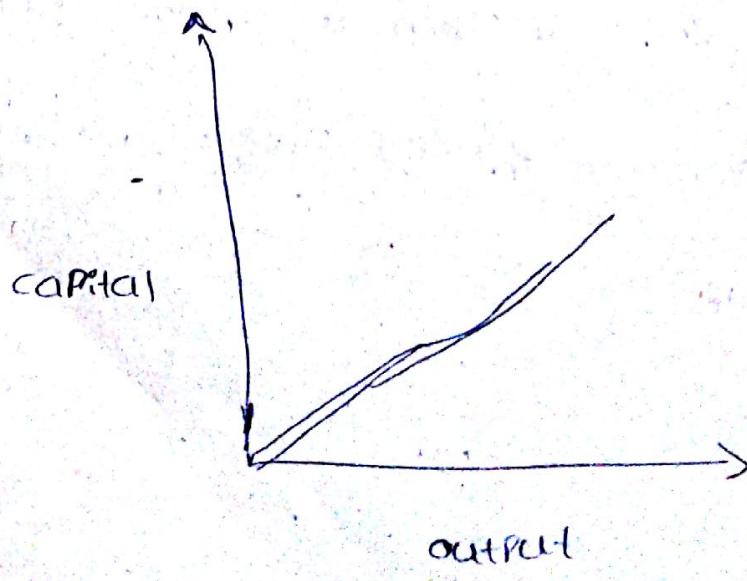
2) Increasing returns to scale :-

If the Proportionate decrease in the O/P is larger than Proportionate decrease in the I/P we have increasing returns to scale.



constant returns to scale :-

If the Proportional increase in the O/P is equal to Proportional increase in the input, we have constant returns to scale.



costs

22/10/2019

The expenses which are incurred by the producer in the production is called cost.

- It includes
 - * Purchase of land
 - * construction of building
 - * Installation of machinery & equipment
 - * wages to workers
 - * Purchase of raw material
 - * Packing charges
 - * Transportation charges
- It refers to the expenditure incurred to produce a particular product or service.
- All costs involve a sacrifice of some kind or other to acquire some benefits.
Ex:- If I want to purchase a pen I have to sacrifice money.
- Total revenue i.e. income is realized on the scale of the products manufactured.
- financial records can not provide all information regarding the costs.
- They provide the information regarding the expenses incurred in the past.

then, Managerial economist must develop a sense of knowledge regarding cost analysis

Types of costs :-

i) Total cost :- Total cost are divided into 2 types

ii) Fixed cost :- The costs which remain fixed or in a constant manner and which does not change with the changes in production are called fixed costs.

→ Fixed costs are incurred even when the production (or) output is zero (or) nil

→ Fixed cost include

- * Purchase of land
- * construction of building
- * installation of machinery or equipment

iii) variable costs : variable costs change according to changes in production

→ If the production is temporarily suspended these will not be any variable costs. In other words

The more the production, the more the variable costs.

→ It includes

- wages of workers
- purchase of raw material
- packing charges
- transportation charges etc.

2) semi fixed costs semi variable costs :-

→ semi fixed or s.v.c refers to such costs that are fixed some extent beyond which they are variable ex:- telephone charges, electricity charges, internet charges.

→ If we have charges we have to pay the min charges i.e., fixed. The more you use the facility the more you get bill which are variable costs

3) long run vs short run costs :-

long run cost :- the expenses which are incurred for a longer period of time are called long run costs

→ it includes

- establishing a new plant / factory
- purchase of machinery & equipment
- introducing a new product into market

- purchase of land
 - construction of building
- These costs help both in the initial stage of expansion of existing company new company as well as

short run cost :-

→ The costs which are incurred for a short period of time < 1 year are called short run costs

→ It includes

- Purchase of raw material
- wages to workers
- packing charges etc..

4) explicit cost :-

23/10/2019

Assignment

- 1) nature & scope of Marginal economics
- 2) Law of demand
- 3) elasticity of demand
- 4) Production function with 2 variables
- 5) all all variable
- 6) costs. types of cost
- 7) Price strategies.

8) Monopoly market

9) Perfect competition.

Explicit cost vs Implicit cost :-

Explicit cost : The payments which are made to the outsiders of the company are called explicit cost. This costs are recorded in the books of accounts.

It includes

- Purchase of Raw material from suppliers
- wages paid to workers
- Advertising cost
- Transportation cost
- Insurance Premium
- licence fee : etc.

Implicit cost :- the cost which are not recorded in the books of accounts & which do not take the form of cash are called implicit cost

→ It includes

- owner's salary
- rent on land & building which belongs to owner

& which are used in Production

- owner's own vehicle used in Production
- interest on own capital invested in the business

Opportunity cost :-

It refers to the cost of the next best alternative forgone. When one alternative is selected it's means the opportunity of gaining benefits from other alternative is forgone.

Ex:- In eng we have various branches (CSE, ECE) if we select 1 branch, we have forgone the opportunity of studying other branches

Actual cost :- The actual expenditure incurred by the producer in the production.

It includes :-
- rent on building
- raw material cost
- building cost etc.

out of pocket cost :- those costs that involved immediate out flow of costs. These are spent in the day to day working life of business such as petty expenses like tea or coffee to guests, snacks etc.

Marginal cost :- It refers to additional cost incurred for producing an additional unit of O/P. It is useful for make/buy decision.

book cost :- These are costs which are incurred in depreciation (Decrease in the value of an asset) which do not require present cash expenditure.

sunk cost :- Sunk costs are those costs per which an expenditure is made in the past that can not be changed over management have no control. They do not affect the present production.

blocked even then neither be charged nor contd
ned.

→ if a firm spent 1 lakh Rs for new machinery later suppose if it is offers another machine of good quality for 70,000. 30,000 is a sunk cost.

bad debts are comes under sunk cost.

Incremental costs:- Incremental costs are those additional costs that are incurred due to the change in the level or nature of product.

Ex:- new advertisement, purchase of new technology

24/10/2019

Break even analysis (or) cost-volume - Profit Analysis

Break even analysis refers to analysis of break even point. the b.e.p. is defined as no profit (or) no loss point.

It is imp to determine the b.e. point because it denotes the min volume of production to be

undertaken to avoid losses.
In other words, it points out how much minimum
is to be produced to see the profits. It is
considered as a valuable technique for profit
planning & control. Therefore is considered
valuable managerial tool.

→ B.e.A is defined as analysis of costs & their
possible impact of revenue

hence it is also called as cost volume Profit Analysis

A firm is said to attain the b.e.p. when its
total revenue is equal to total cost ($TR = TC$)

Formulas :-

* Total cost comprises of fixed cost & variable cost

* Fixed cost :

fixed cost remains in fixed manner & which
doesn't affect the production

* Variable cost :

The cost which affects the production. Therefore

$$\text{Total cost} = \text{Fixed cost} + \text{variable cost}$$

- * Total Revenue = selling Price per unit * no. of units sold
- * Contribution Margin : It is the diff b/w the selling Price per unit & the variable cost per unit
 $cM = \text{selling Price} - \text{variable cost}$
- * It is also determined as (Fixed cost per unit + Profit per unit). These four
- $\text{Profit} = \text{contribution margin} - \text{fixed cost}$
- * Contribution Margin ratio : It is the ratio b/w contribution per unit & selling Price per unit
- * Margin of safety in units : The excess of actual sales (in units) minus the B.E.P (in units)
- * Margin of safety in sales volume : The excess of actual sales (in Rs) - the B.E.P (in Rs)
- * P/V ratio :- The ratio b/w the contribution and sales.
- * Determination of Break even Point :-

The following are the key terms used in determination of B.E.P

* Selling Price = Fixed cost + variable cost + Profit

$$\text{Selling Price} - \text{variable cost} = \text{fixed cost} + \text{Profit}$$
$$= \text{contribution}$$

$$\text{contribution per unit} = \frac{\text{Selling Price per unit}}{\text{variable cost per unit}}$$

Determination of

Having studied the nature of fixed & variable cost. we will now discuss how to determine B.E.P

i) Determination of B.E.P in units :-

$$\text{B.E.P} = \frac{\text{Fixed cost}}{\text{contribution margin per unit}}$$

where contribution margin per unit =
Selling Price per unit - variable cost

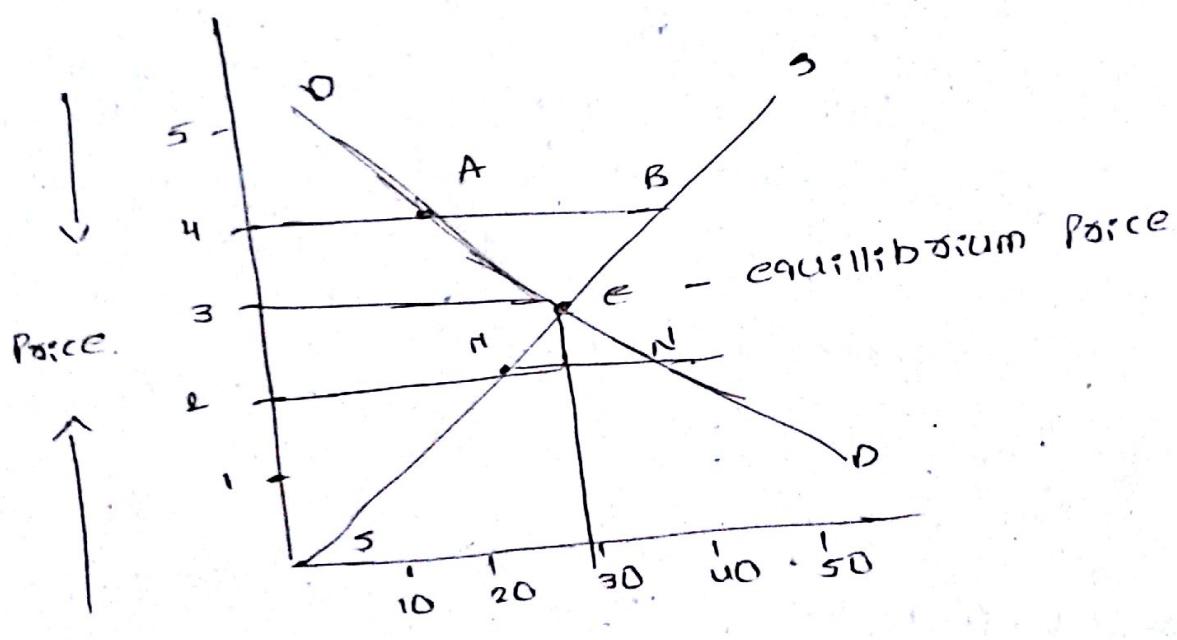
ii) Determination of B.E.P in value :-

$$\text{B.E.P (in value)} = \frac{\text{Fixed cost}}{\text{contribution Margin ratio}}$$

where C.M. ratio is the ratio of contribution
Margin per unit to selling Price per unit

- i) A firm has a fixed cost of Rs. 10,000, selling price per unit is Rs. 5 & variable cost per unit is Rs. 3
- ii) Determine B.C.P in terms of value & also sales value
- iii) calculate the margin of safety considering that the actual production is 8,000 units.

31/10/2019



Quantity demanded, supplied

→ changes in Price

→ As price rises, demand lies

→ when price lies, demand lies

* when Price ↑es, supply ↑es
when Price ↓es, supply ↓es

there is -ve relationship b/w Price & demand.

Always there is a +ve relationship b/w Price & supply.

- every time a change in Price is causing some change in supply & demand.
- But at one price Rs. 3, demand & supply are equal this is called equilibrium Price.

This process is explained with the help of above diagram.

The supply & demand curves are drawn in the diagram. They tell us the quantity demanded and supplied at different place.

The supply curve is always upward sloping, it means at higher prices more quantity & at lower prices less quantity is supplied by the producers.

on the other hand, demand curve is a sloping, i.e., at higher prices less quantity & at lower prices more quantity is demanded by the consumer.

Let us understand how the market brings a balance b/w the supply and demand

From the above diagram Price is taken on y-axis, quantity demanded, supplied on x-axis

* DD - demand curve -

It slopes downwards from left to right

SS - supply curve - it slopes upwards

from left to right

From equilibrium price where demand is equal to supply, at price Rs. 4 demand \uparrow yes &

supply \uparrow yes. that is at this price less is demanded by consumers, but more is supplied by suppliers.

The excess supply is AB in the diagram. The excess supply leads to competition among sellers and Producers.

At Price Rs.2, Price lies between demand & supply lies. That is more is demanded by consumers but less is supplied by producers. The excess demand is shown in the diagram. Thus more competition b/w buyers.

Thus at Rs.3 equilibrium price i.e., no loss to the buyers and sellers.

Monopoly :-

30/10/2019

UNIT-4

Markets

Classification of Markets

