production.

Explain law of variab' returns with appropriate examples.

(OR)

Explain production function with one variable input & law of returns.

(OR)

Explain law of returns increasing return to scale; constant return to scale, decreasing return to scale.

A⊦ The law of return states that when atleast one factor of production is fixed (or) factor I/p is fixed and when all other factors are varied that total o/p in the initial stages will increase at an increasing rate and after reaching certain level o) o/p The total o/p will increase at declining rate. If variable factors I/p are added further to the fixed factor I/p

the total o/p may decline.

This law is of universal nature and it proved to be true in agriculture & Industry also. The law of returns is also called the law of variable proportions. con the <u>law of dimnishing return to scale</u>.

There are 3 laws of returns governing producth Jne they are

a) law of increasing return to scale.

b) law of constant return to scale.

c) " " decreasing " " "

a) law of ↑ return to scale:

This law states that the volume of o/p keep on ↑ with every increase in the i/p's.

b) law of constant return to scale:-

when the scope of division of labour gets restricted, their rate of ↑ in the total o/p remains constant.

c) law of decreasing retun to scale :- where the proportionate ↑ in the i/p's does not lead to equivalent ↑ in o/p the o/p ↑ at ↓ rate.

These laws can be illustrated with an example of <u>agricultural</u>

land. Take 1 acre of land if you till the land with well

adequate bags of fertilizers & quality seeds the volume of o/p

increases.

Diagramatic Representation :-
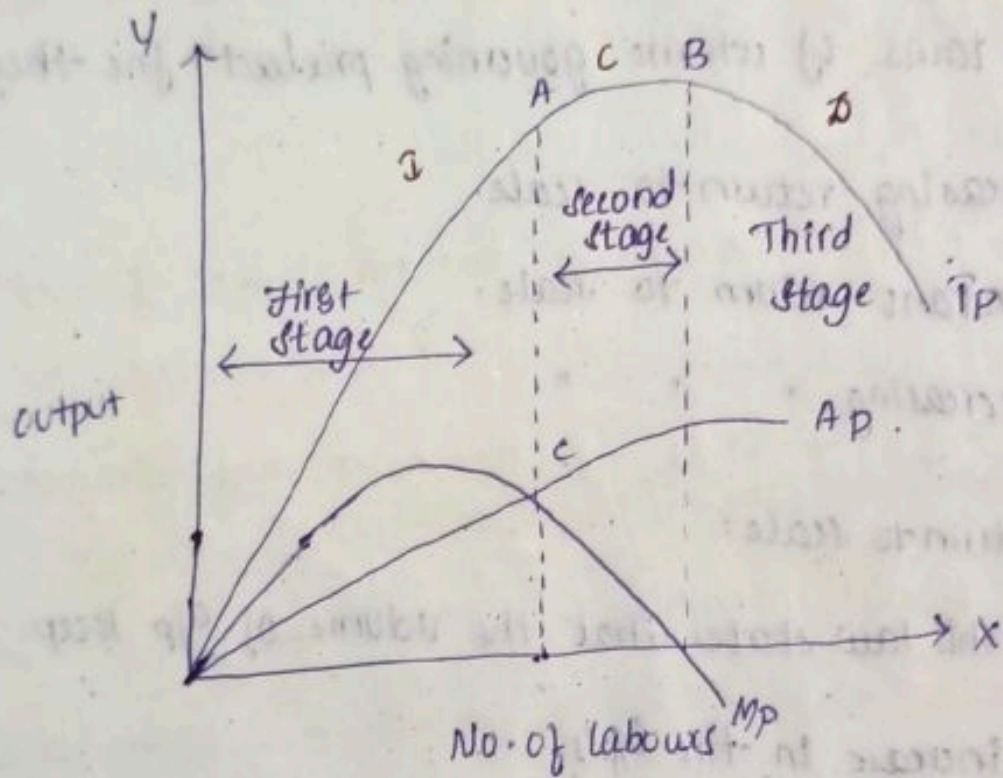
In the above diag. ox represents the no. of labour, OV denotes size of

o/p . Tp → total product term, Mp → marginal product term.

Ap → Avg. product term.

At first stage at point c marginal product & avg product are equal

Here the marginal product term intersects the avg product term
and slopes converts steeply. Upto this pt total product increases
            downwards
at a rapid rate. Upto here the proportion of o/p is greater than the

proportion of the O/p's. The farmer at this stage will be in increasing return to scale.

At 2nd stage after pt C constant return operates. Here the proportion of increase in O/p and the proportion of increase in i/p is remain equal.

At pt B on Ox-axis the total product is maximum and marginal product is zero. The second stage namely constant returns ends here.

3rd stage:- Later on the 3rd stage starts after crossing pt B. The marginal product term will be crossing the Ox-axis then it is said to be -ve slope. This is due to the operation of diminishing return to scale. Here the cost exceed the o/p or revenue.

Fixed Factor : Land (one hectare)

No. of labours	Total product	Marginal Product		Average product	Stages
1	5		5	5	First stage
2	12	12-5	7	6	increasing return
3	18	18-12	6	6	to scale.
4	20	20-18	2	5	Second stage
5	20	20-20	0	4	const return to scale.
6	18	18-20	-2	3	Third stage
7	14	14-18	-4	2	Diminishing return to scale.

Total product is the product obtained due to the employment of particular no. of labours.

Avg. product is obtained by dividing the total product with no. of labour.

Marginal product is the addition product obtained due to one more unit of labour.

Causes of increasing return to scale.

1. Skilled labour

2. perfect substitutes.

3. Factors are homogeneous.

4. External Economies

causes of dimnishing return to scale:

1. Scarcity of factor

2. Imperfect substitutes

3. wrong combination.

4. Factors are not homogeneous.

5. No specialization of labours.

BREAK EVEN ANALYSIS

Break Even Analysis:

It refers to analysis of bep define as no profit or no loss why is it necessary to determine bep whether there is no profit or loss. It is important because the min volume of production to be undertaken to avoid losses.

In other words it points out how much min to be produced to see the profits. It is a technique for profit planning & control & therefore is considered a valuable managerial tool.

Break Even Analysis is defined as analysis of cost and their possible impact on revenue & volume of the firm. Hence it is also called the cost volume profit analysis.

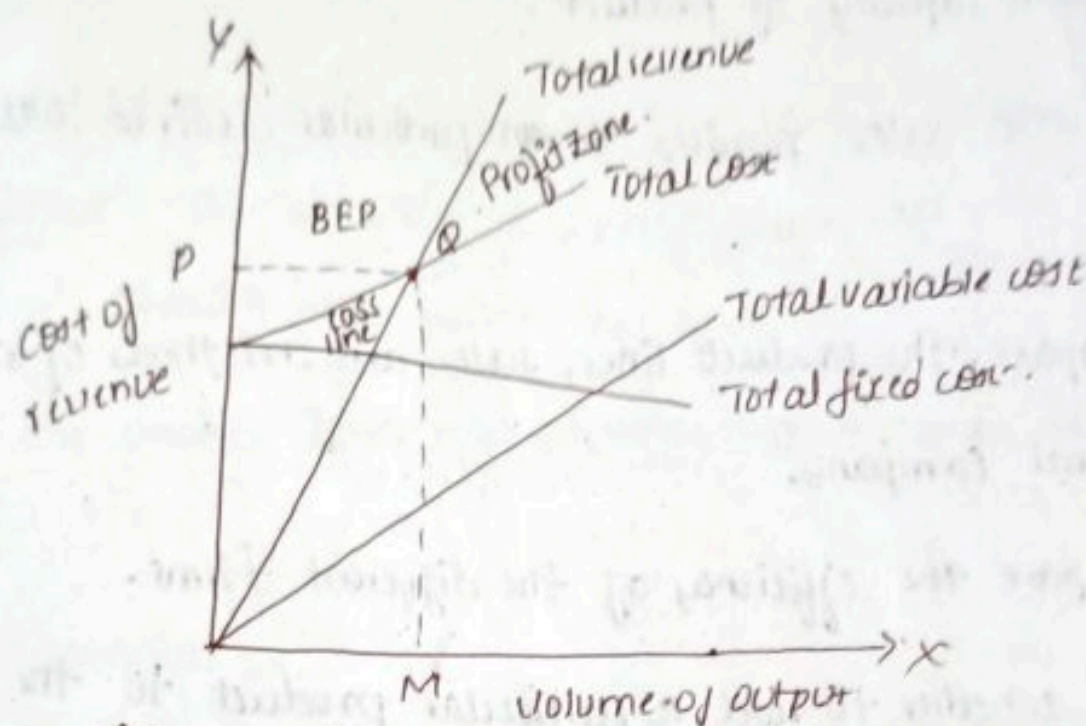**Assumptions of Break Even Analysis:-**

i) The total cost is divided into 2 parts
   Fixed cost & variable cost.

ii) There is no change in the behaviour of fixed cost & variable cost

3) There is no change in price even though there are change in o/p.

4) There is no change in the management policy.

5) There is no change in efficiency level.

6) Constancy is sales mix

Diagramatic representation of BEP.

In the above diagram Ox represents volume of productⁿ & OY. represents cost & revenue. The manufacturer in order to retain in the market he will not stop his product until he gets loss. Here the manufacturer have a tool to stop his productⁿ upto Q point where there is no loss and no profit. This is nothing but the manufacturer in order to meet the fixed cost OM. it produces OM of o/p with OP cost

Significance of Break even Analysis

i) To ascertain the profit on a particular level of sales volume

ii) or a given capacity of production.

ii) To calculate sales required to earn particular desired level of profit.

iii) To compare the product lines, sales area, methods of sale for individual company.

iv) To compare the efficiency of the different firms.

v) To decide whether to add a particular product to the existing product line or drop 1 from it.

vi) To decide to 'make or buy' a given component or spare part.

viii) To decide what promotion mix will yield optimum sales.

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Limitations of Break even Analysis :

i) Break Eun pt is based on fixed cost, variable cost & total revenue. A change in one variable isgng to affect the BEP.

ii) All costs cannot be classified into fixed & variable cost. We have semi variable costs also.

iii) In case of multi product firm a single chart cannot be ...

iv) Series of charts have to be made use of.

v) It is based on fixed cost concepts and hence holds good only in the short run.

v) Total cost & total revenue lines are not always state as shown in the figure. The quantity & price discount are the eg usual phenomena affecting the total revenue line.

vi) where the business cond^n are uncertain, BEP cannot give stable results.

Terms & Formulas :-

1. **Fixed Expenses.** [F] : The expenses which remain same irrespective of the increase or decrease in the product^n are called fixed expenses.

Ex:- Factory fixed expenses, office fixed expenses, other fixed expenses

Ex:- Labour - wages, salaries, Rent, Royalty to lease holders.

2. **Variable Expenses** [V] :- The expenses will change according to the change in the production are called variable expenses.

Ex:- Direct material, direct wages & other variable expenses.

3) **Contribution** [C] : The difference b/w selling price & variable expenses is called contribution. In this case we may find

unit contribution (or) total contribution.

contribution = Sales price - variable expenses.

(or)

Fixed Expenses + profit (or) $\dfrac{\text{Diff in profits}}{\text{Diff in BEP units}}$

iv) **Profit volume ratio:-** The ratio b/w contribution & sales is called profit volume ratio. In the case of higher demand high P/B ratio product is preferable to produce.

Profit volume ratio (P/v ratio) = $\dfrac{\text{contribution}}{\text{Sales}}$ (or)

$\dfrac{\text{Diff in profits}}{\text{Diff in BEP Rupees}}$

(or) $\dfrac{\text{Fixed Expenses}}{\text{BEP rupees}}$ (or) $\dfrac{\text{Profit}}{\text{Margin of safely}}$

v) **Break Even Point :- (BEP)**

It is a pt. of product^n & sales where there is no profit nor loss to the company. It can also be called as no profit no loss point.

BEP units = $\dfrac{\text{Fixed Expenses}}{\text{Contribution}}$ b) BEP rupees = $\dfrac{\text{Fixed Expenses}}{P/v \text{ ratio}}$

vii) **Margin of safety (MOS) :-**

Excess sales over & above BEP is called margin of safety. MOS = Actual sales - BEP sales. (or) Profit / P/v ratio.

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vii) **Required sales to earn budgeted profit (or) estimated profit:**

a) $BEP_{units} = \dfrac{Fixed\ Expenses + Required\ Profit}{Contribution}$

b) $BEP_{rupees} = \dfrac{Fixed\ expenses + Required\ profit}{P/v\ ratio}$

A firm has a fixed cost of Rupees 10,000 selling price per unit is Rs 5 and variable cost per unit is Rs 3.

i) Determine BEP in terms of $\underset{units}{volume}$ and $\underset{rupees}{sales\ value}$.

ii) Calculate the MOS considering that the actual production is 8000 units.

Sol :- i) $BEP_{units} = \dfrac{Fixed\ Expenses}{Contribution\ Margin\ per\ unit}$ = selling price - Variable expenses

$volume - units.$

$5 - 3 = 2.$

$= \dfrac{10,000}{2}$

$= 5000.$

ii) Values - Rupees.

$BEP_{rupees} = \dfrac{Fixed\ Expenses}{P/v\ ratio} \longrightarrow \dfrac{sale\ price - Variable\ expenses}{sales\ price}$

$= \dfrac{5-3}{5} = 2/5 = 0.4..$

$BEP_{Rs} = \dfrac{10,000}{2/5} = 25,000.$ $BEP \times \underset{price}{selling} = 5000 \times 5 = 25000.$

iii) Margin of safety:

$$MOS = Actual\ sales - BEP\ sales$$
$$= 8000 - 5000$$
$$= 3000.$$

2) Mr A lathe workshop owner uses 150 units of certain spare part. He buys this from the market for Rs. 250 this same can be manufactured in work shop with a fixed cost of Rs. 40000 variable cost of Rs. 50. do u suggest him to make or buy from the market It is possible that u can sell 5000 units of same spare part to other lathe shops in the town.

solⁿ $\quad BEP\ units = \dfrac{Fixed\ Expenses}{Contribution} \qquad \dfrac{40,000}{200}$

$$250 \times 50$$

$$= 200\ units.$$

BEP is 200 units this means that producing less than this is not economical. The total demand for the spare part is 650 units (150 + 500). It is recommended that this can be manufactured.

3) A firm has fixed cost of Rs 50,000, selling price per unit is Rs 50 variable cost is as Rs. present level of product is 3000.

i) Determine BEP interms of volume & sales value.

ii) calculate mos   iii) Cadeu what is the change in BEP & MOS if fixed cost ↑ from n

(i) $BEP_{units} = \dfrac{50,000}{50-25} = 2000.$

Sales value$_{Rs}$ = $\dfrac{Fixed}{P/v\ ratio}$ = $\dfrac{50,000}{1/2}$ = Rs. $1,00,000.$

(ii) $MOS = 3500 - 2000$

= $1500.$

(iii) $BEP_{units} = \dfrac{60,000}{25} = 2400.$

$MOS = 3500 - 2400$

= $1100.$

The above calculation shows that the firm has to produce 400 more units (2400-2000) in the event of ↑ in fixed cost by Rs. 10,000. This reduces margin of safety also by 400 units (1500-1100)