

8/4/22

2. Theory of production

Factor of production: *

- 1) Land
- 2) Labour
- 3) Capital
- 4) Organization
- 5) Technology

Production function: The inputs for any service or product, land, labour, capital and Technology. In other words the production function, here is the function of five variable inputs. Mathematically this is expressed as

$$Q = f(L_1, L_2, C, O, T)$$

where

Q - quantity of production

f - explains the function, that is determines the type of relationship b/w input & outputs.

L_1, L_2, C, O, T - Refers to land, labour, capital, organization & Technology respectively.

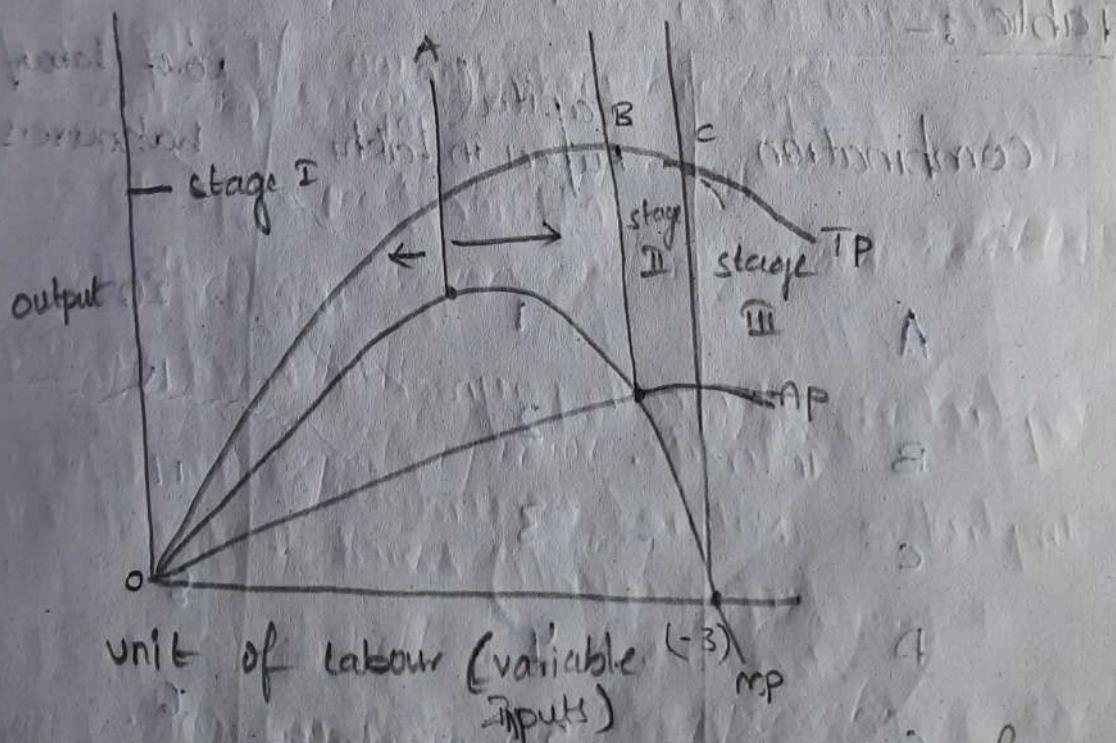
This inputs have been taken conventional terms in reality materials also can be included in a set of inputs.

*production function with one variable input & law of returns (or) law of diminishing returns. (or)
law of variable proportions. *

* Table :- output with fixed capital & variable labour ilp.

unit of labour	Total products (TP)	Marginal products (MP)	Average product (AP)	Stages
0	0	0	0	Stage-I
1	10	10	10	
2	22	12	11	
3	33	11	11	Stage-II
4	40	7	10	
5	45	5	9	
6	48	3	8	
7	48	0	6.85	Stage-III
8	45	-3	5.62	

total product / no. of products
produced = AP



* Total product Average product and Marginal product.

production function with two variable inputs & laws of returns (changing labour and capital substitution)

Let us consider, A production process that requires two input (C) Capital, Labour (L) to produce a given output (Q). There could be more than two inputs in a real life situation but for a simple analysis we restrict the number of input to two only.

In other words, the production based on two input can be expressed as

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

where

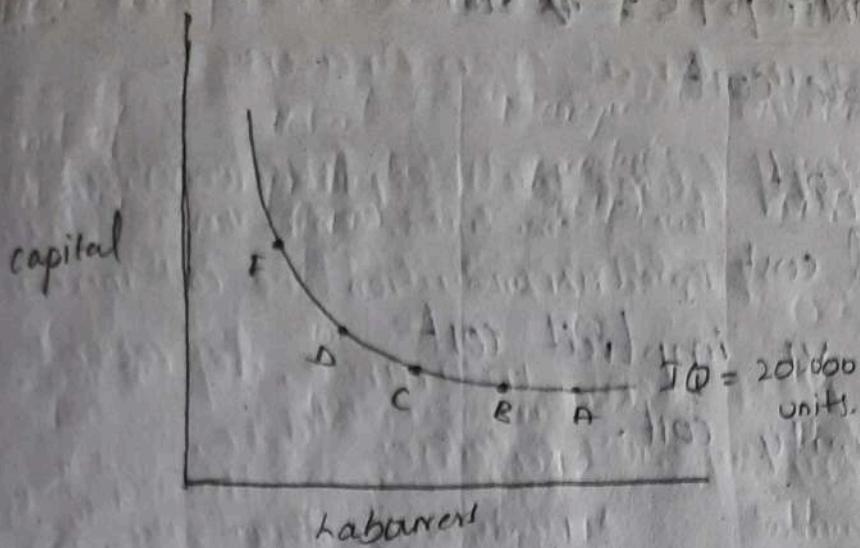
$C \Rightarrow$ Capital

$L \Rightarrow$ Labour

500 quantity
↓
equal quantity

Table :-

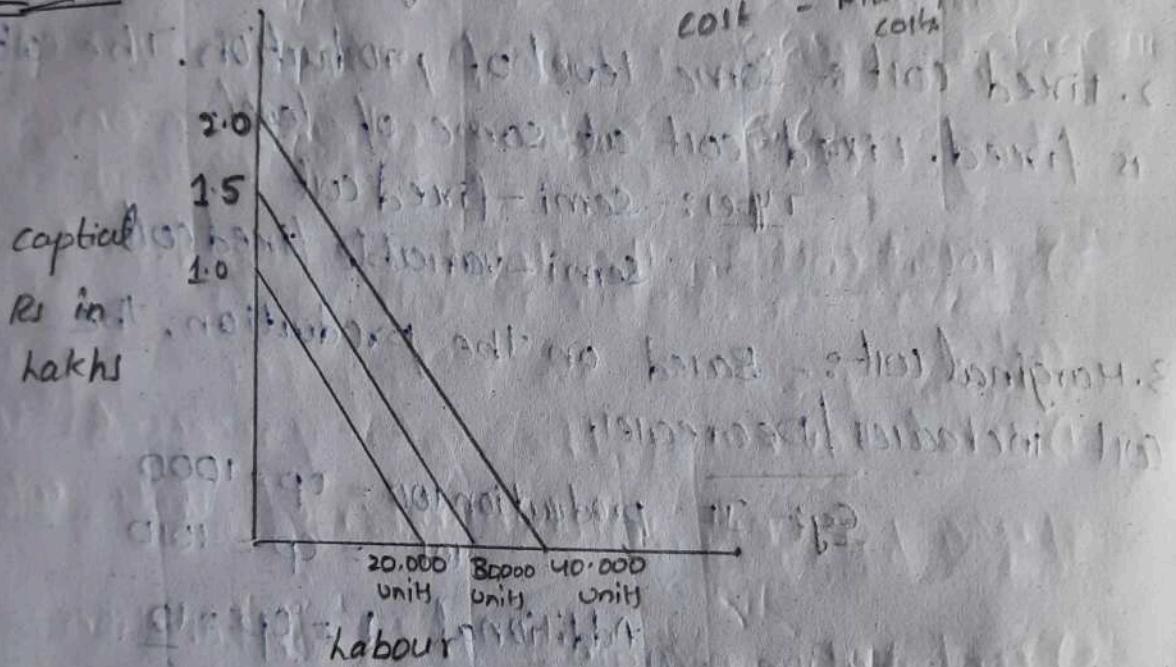
combination	capital Rupees in Lakhs	no. of Labour/ labourers
A	1	20
B	2	15
C	3	11
D	4	8
E	5	6
F	6	5



12/4/22

* ISO-cost :-

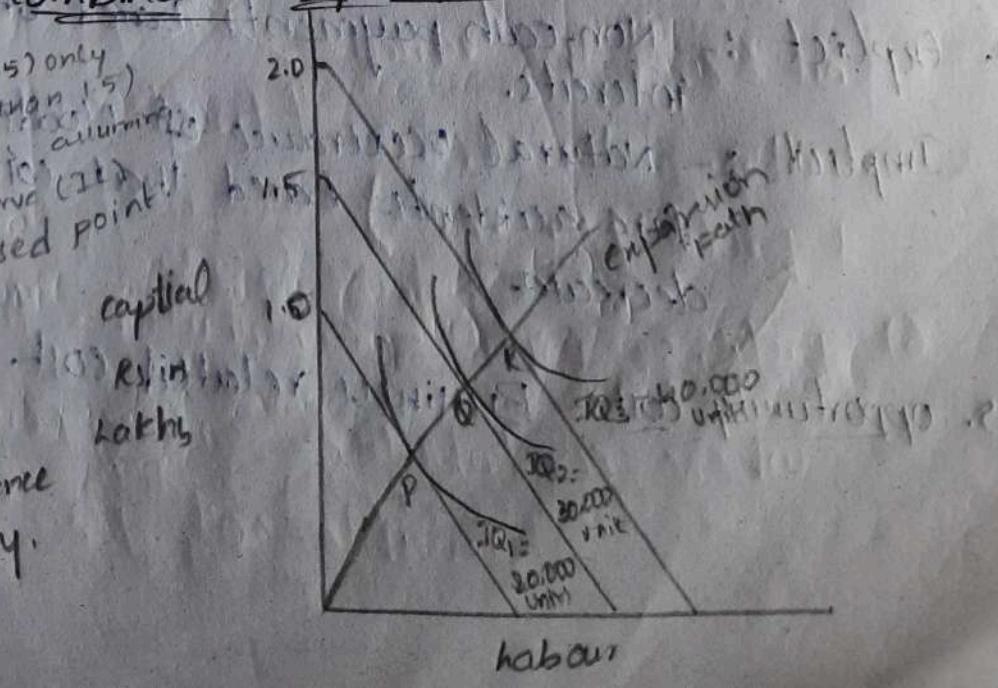
ISO - equal
cost - Manufactured
costs



least cost combinations of inputs :-

- (Inverted 1.5) only not more than 1.5
- where 2.0 is available
- # Indifference curve (2.0)
- # Super imposed point P

IQ = Indifference
Quantity.

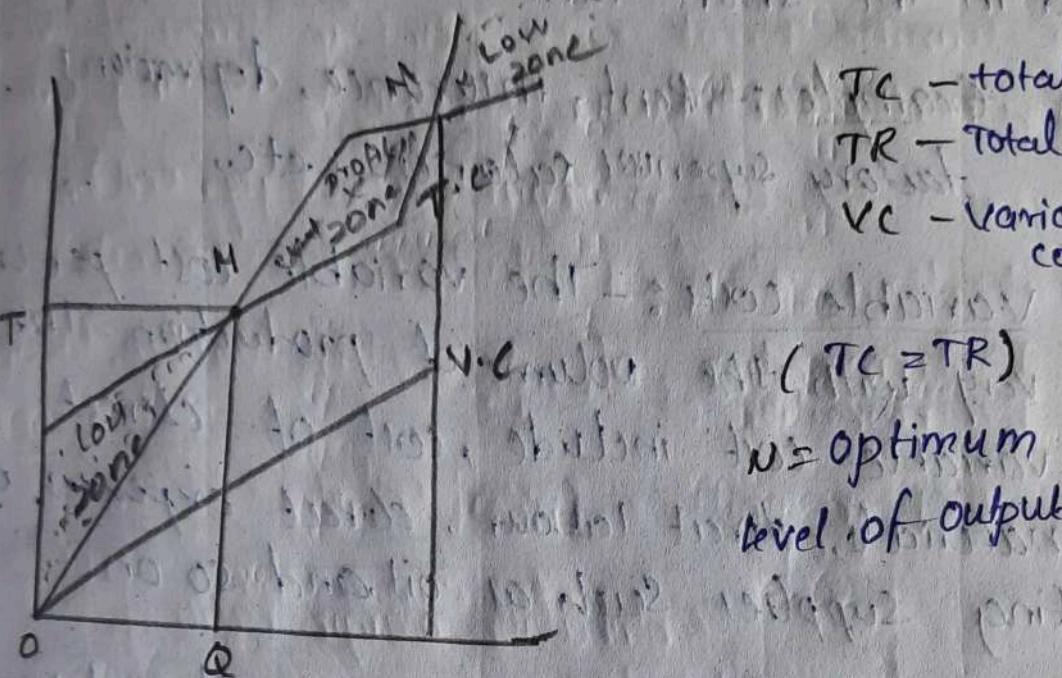


* COST CONCEPTS :- (20)

1. Variable cost
 2. Fixed cost (some level of production) Fixed cost (some level, semi fixed, semi-variable fixed)
 3. Marginal cost Based on production, the cost increases.
 4. Explicit vs implicit cost
 5. opportunity costs:
Business related cost
Non-cash payment → flood, wars, earth quakes etc.
based on that cost
increased/decreased
1. variable costs:- cost can change continuously.
2. fixed costs:- some level of production. The cost is fixed. Fixed cost at some levels.
Type:- semi-fixed cost
semi-variable fixed cost.
3. Marginal costs:- Based on the production, the cost increases / decreases.
- Eg:- If production 100 = CP = 1000
101 = CP = 1010
Additional 1 = CP = 10
Marginal cost
4. Explicit :- Non-cash payments based on capital interests.
Implicit :- Natural occurrence of Floods, wars, fire accidents... based that cost increased / decreased.
5. opportunity costs:- Business related cost.

* Break even Analysis:- (Break even point).

Break even point is (or) NO profit NO loss point.



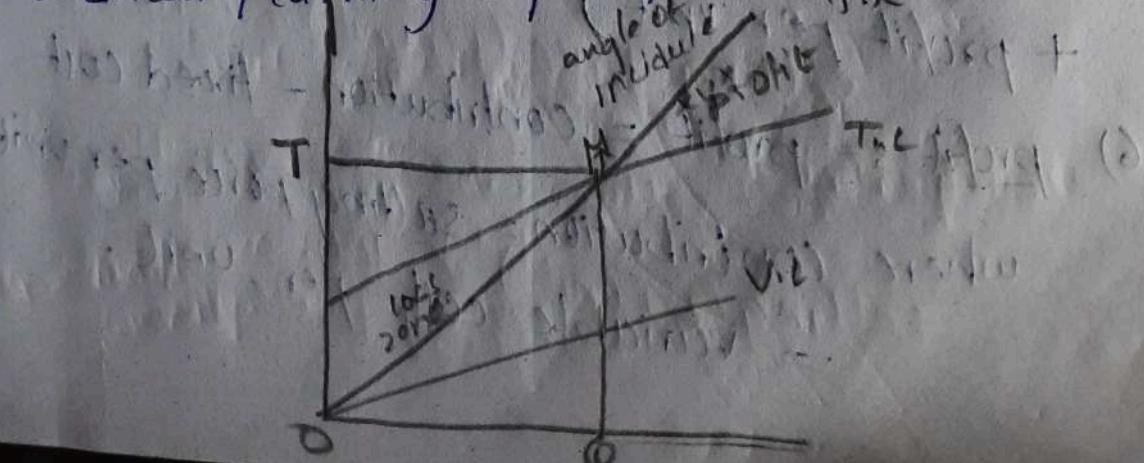
TC - total cost
 TR - Total revenue
 VC - Variable cost.

($TC = TR$)
 N = optimum level of output.

* After the point 'N' the manufacturer gets profit by decreasing total cost and increasing total revenue.

* But, upto an optimum level profit occurs for manufacturer if he/she continues the production then loss zone occurs.

* Angle of incidence decides the profit of business / earning capacity of business.



Key terms in Break even Analysis :-

1) Fixed costs :- The fixed costs remain fixed in the short run.

Example:- Rent, insurance, deprecations, factory supervisor salaries etc.

2) variable costs :- The variable cost per unit vary with the volume of production. The variable cost include, cost of direct materials, direct labour, direct expenses, operating supplies such as oil and so on.

3) total cost :- The total of fixed and variable costs.

4) Total Revenue :- The sales proceeds ("selling price per unit into number of units sold")

5) contribution margin :- The contribution is difference b/w the selling price per unit and the variable cost per unit, it is also determined as (fixed cost per unit + profit per unit)

6) profit :- profit = contribution - fixed cost

where contribution = selling price per unit - variable cost per unit.

7) contribution margin ratio:- It is the ratio b/w contribution per unit and the selling price per unit.

8) margin of safety in units:- The excess of actual sales (in units). The Break even point (in units).

9) margin of safety in sales volume:- The excess of actual sales (In Rupees) - The Break even point (in rupees).

10) Angle of Incidence:- The angle formed where total cost curve cuts the total revenue curve.

11) PV (profit volume ratio):- The ratio b/w the contribution and sales.

Determination of Break even point:- The following are the key terms used in the determination of break even point:-

1) Selling price = fixed cost + variable + profit
cost

2) selling price - variable = fixed cost + profit.
= Contribution.

3) contribution (per unit) = selling price (per unit) -
variable cost (per unit)

* Determination of Break even point in units:-

$$\boxed{BEP = \frac{\text{fixed cost}}{\text{contribution margin (per unit)}}}$$

\Rightarrow where contribution (per unit) = selling price (per unit) - variable cost (per unit).

* Determination of BEP in value (Rupees)

$$\boxed{BEP = \frac{\text{fixed cost}}{\text{contribution margin ratio}}}$$

\Rightarrow where contribution margin ratio of contribution margin per unit to selling price per unit.

* PV ratio (profit volume ratio):

$$\boxed{\frac{\text{Contribution}}{\text{Sales}} \times 100}$$

(or)

$$\frac{\text{Selling price (per unit)} - \text{variable cost (per unit)}}{\text{Selling (per unit)}} \times 100.$$

This has been derived from the following basic formulae.

$$P/V \text{ ratio} = \frac{\text{fixed cost} \times \text{sales}}{\text{sales} - \text{variable cost}}$$

(or)

$$PV = \frac{\text{fixed cost}}{P/V \text{ ratio}}$$

* Margin of safety can be determined by the following formula.

$$\text{Margin Safety (MS)} = \frac{\text{profit}}{\text{P/V ratio}}$$

* To ascertain the volume of sales required to achieve a targeted amount of profit.

$$\text{volume of sales to attain a target profit} = \frac{\text{fixed cost} + \text{targeted profit}}{\text{contribution margin.}}$$

2nd year problems :-

1. XYZ limited has a fixed cost of rupees ten thousand (10000) selling price per unit is rupees variable cost per unit rupees 3.
- Determine break even point in terms of volume and sales value
 - calculate the margin of safety considering that the actual production is 8000 units

Sol:- i) Determination of BEP:-

$$\text{BEP in units} = \frac{\text{fixed cost}}{\text{contribution margin per unit}}$$

where $\text{contribution margin} = \frac{\text{selling price per unit} - \text{variable cost per unit}}{\text{selling price per unit}}$

$$\Rightarrow 5 - 3 = 2 \text{ Rs/-}$$

So, BEP in units = fixed cost as given

$$= \frac{10,000}{2} = 5000$$

= 5000 units

$$\text{BEP in values (Rs)} = \frac{\text{fixed cost}}{\text{contribution margin ratio}}$$

where contribution margin ratio

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

$$= \frac{5-3}{5} = 2/5$$

so BEP in (Rs) = $\frac{1000}{2/5}$
~~25000~~ Rs. -

iii) Determination of margin of safety:-

$$DMS. = [actual - BEP] \\ (\text{or})$$

$$[\text{No.of units sold} - \text{BEP units}]$$

$$\text{so, } = 8000 - 5000$$

$$MS. = 3000 \text{ units.}$$

2. A firm has a fixed cost of rupee's 50,000 selling price per unit is rupee's 50 variable cost per unit is 25. present level of production is 3500 units. calculate

i, Determine Break even point in term of volume and also sales value.

ii, calculate the margin safety.

iii, what is change in BEP and margin of safety if fixed costs increase from Rs. 50000 to Rs. 60000?

If fixed costs increase from Rs. 50000 to Rs. 60000?

Sol:- ii, Determination of BEP:-

$$\text{BEP in units} = \frac{\text{fixed cost}}{\text{contribution margin per unit}}$$

where contribution margin per unit

$$= \frac{\text{selling price per unit}}{\text{variable price per unit}}$$

$$= 50 - 25$$

$$= 25 \text{ Rs/-}$$

So, BEP in units = fixed cost of given

$$= \frac{50000}{25}$$

$$= 2000 \text{ units}$$

fixed cost

BEP in value (Rs) = $\frac{\text{fixed cost}}{\text{contribution margin ratio}}$

where contribution margin ratio = $\frac{\text{selling price per unit} - \text{variable price per unit}}{\text{selling price per unit}}$

$$\text{so, } \text{contribution margin ratio} = \frac{50 - 25}{50} = \frac{1}{2}$$

$$\text{so, BEP in (Rs)} = \frac{50000}{0.5}$$

$$= 100000 \text{ Rs.}$$

(iii) Determination of margin safety:-

MS = actual sales - BEP sales

(or)

No. of units - BEP units

$$= \frac{3500 - 2000}{}$$

$$= 1500 \text{ units.}$$

iii. Determination of BEP with fixed cost Rs 60000

$$\text{BEP in units} = \frac{\text{fixed cost}}{\text{contribution margin per unit}}$$

$$= \frac{\text{selling price} - \text{variable price}}{25} \\ = 50 - 25 \\ = 25/-$$

$$\text{So, BEP in units} = \frac{60000}{25}$$

$$= 2400 \text{ units}$$

$$\text{BEP in (Rs)} = \frac{60000}{0.5}$$

$$= 120000 \text{ rs/-}$$

$$\begin{aligned} \text{(margin of safety)} &= 3500 - 2400 \\ &= 1100 \text{ units.} \end{aligned}$$

- ③ PQR Limited has a fixed cost of rupees 100000 selling price per units 200 variable cost per unit rs. 50. present level of production is 7000 units. calculate
- BEP in units

- BEP in value(Rs)

- margin of safety

- what change in BEP and margin of safety if fixed cost increase from 100000 to 102000?

sol:- ii) $\text{BEP in units} = \frac{\text{fixed cost}}{\text{contribution margin per unit}}$

where contribution = selling price - variable cost

$$= 100 - 50$$

$$= 50 \text{ Rs/ltr}$$

so, BEP in units = fixed cost

$$= \frac{100000}{50}$$

$$= 2000 \text{ units}$$

iii) BEP in value(Rs) = $\frac{\text{fixed cost}}{\text{contribution margin ratio}}$

where contribution margin ratio = $\frac{\text{selling price per unit} + \text{variable price per unit}}{\text{selling price per unit}}$

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

$$= 0.5$$

$$\text{so, BEP in (Rs)} = \frac{100000}{0.5}$$

$$= 200000 / - \text{Rs} 1$$

iv) Margin of safety = actual units - BEP units

$$= 21000 - 200$$

$$= 6800 \text{ units}$$

v) * BEP in units = fixed cost / given

$$= \frac{120000}{50}$$

$$\text{BEP in values (Rs)} = \frac{120000}{0.5} \\ = 24000 \text{ Rs.}$$

$$\text{Margin of safety} = \frac{7000 - 2400}{11} \\ = 4600 \text{ units.}$$

- Q14/12
4. The following information relating to XYZ company limited, you are required to calculate
- PV ratio
 - BEP sales volume
 - Margin of safety
 - Profit, Sales rupees 4000, Variable cost rupees 2000
fixed cost Rs. 1600.

so:- Given that sales (Rs) = 4000
variable cost (Rs) = 2000
fixed cost (Rs) = 1600

a) PV ratio:-

$$\text{PV ratio} = \frac{\text{Sales} - \text{Variable cost}}{\text{Sales}} \times 100$$

$$= \frac{4000 - 2000}{4000} \times 100$$

$$= \frac{2000}{4000} \times 100$$

$$= 50\%$$

b) Break even sales:-

$$\text{BES} = \frac{\text{fixed cost}}{\text{P.V. ratio}}$$

$$= \frac{1600}{50/100}$$

$$= 3200 \text{ R.s.}$$

c) Margin of Safety :-

$$\Rightarrow \text{actual sales} - \text{BEP sales}$$

$$MS = \dots \quad (\text{or})$$

$$\Rightarrow \text{No. of units} - \text{BEP sales units.}$$

$$4000 - 3200$$

$$= 800$$

d) profit :-

$$\text{profit} \Rightarrow \text{Sales} = \frac{\text{fixed cost} + \text{profit}}{\text{P.V. ratio}}$$

$$4000 = \frac{1600 + P}{50/100} \quad (\text{or})$$

$$[\text{P.V. ratio} \times \text{MS}]$$

$$1600 + P = 4000 \times \frac{50}{100}$$

$$P = 400 \text{ R.s.}$$

5) PQR Limited given the following information
to you, you are required to calculate.

a) BEP and fixed cost

b) sales Rs. 110000, yielding a profit of Rs. 4000
in period I, sales of Rs. 150000 with a profit of
Rs. 12000 in period II.

Sol:-

PV ratio = $\frac{\text{change in profit in period II} - \text{change in profit in period I}}{\text{change in sales in two periods}} \times 100$

$$= \frac{8000}{40000} \times 100 \\ = 20\%$$

particular	PI	PII
Sales	110,000	150000
Profit	4000	120000

$$\text{PV ratio} = \frac{\text{fixed cost} + \text{profit}}{\text{sales}}$$

$$20\% = \frac{\text{Fixed} + 4000}{110,000}$$

$$\text{fc} + 4000 = 22000$$

$$\boxed{\text{fixed cost} = 18000 \text{ Rs}}$$

$$\text{BEP} = \frac{\text{fixed cost}}{\text{PV ratio}}$$

$$= \frac{18000}{20\%}$$

$$= 90000 \text{ Rs}$$

6) you are given the following information about two companies in 2000, in rupees.

particular	A	B
Sales	50,00,000	50,00,000
Fixed cost	12,00,000	17,00,000
variable cost	35,00,000	30,00,000

A friend seek your advice on to which company's shares he should purchase assuming the capital invested is equal for the two companies. State the advise that you will give.

Sol:- usually a company's share price is known by its profitability position & the profitability of a company can be known by its P/V ratio.

⇒ Higher the P/V ratio higher are the profits.

Given that company (A), and

company (B) :-

* company (A)

$$\text{Sales} = 50,00,000$$

$$\text{Fixed cost} = 12,00,000$$

$$\text{variable cost} = 35,00,000$$

$$P\&V \text{ ratio} = \frac{\text{contribution}}{\text{sales}} \times 100$$

(on)

$$= \frac{\text{selling price} - \text{variable cost}}{\text{selling price}} \times 100$$

$$= \frac{50,00,000 - 35,00,000}{50,00,000} \times 100 = \frac{15,00,000}{50,00,000} \times 100$$

$$= 30\%$$

company (B) :-

$$= \frac{50,00,000 - 30,00,000}{50,00,000} \times 100$$

$$= \frac{20,00,000}{50,00,000} \times 100$$

$$= 40\%$$

22/4/22

7. A company prepared a budget to produce 3 lakh units with fixed cost Rs. 15 lakhs and average variable cost Rs. 10 each. The selling price is to yield 20% profit on cost. You are required to calculate

a) P&V ratio

b) BEP

CN:

Given that total deserved units = 3,4 lakh units

$$\text{fixed cost (R_f)} = 15,00,000$$

$$\text{variable cost (R_v)} = 10 \text{ (per each)}$$

$$= 3,00,000 \times 10$$

$$\boxed{\text{variable cost} = 30,00,000/-}$$

$$\text{total cost (R_t)} = \text{fixed cost} + \text{variable cost}$$

$$= 15,00,000 + 30,00,000$$

$$\boxed{\text{total cost} = 45,00,000/-}$$

$$\text{profit} = 20\% \text{ (total cost)}$$

$$= 45,00,000 \times \frac{20}{100}$$

$$\boxed{\text{profit} = 9,00,000 \text{ Rs/-}}$$

$$\text{Sales} = \text{total cost} + \text{profit/loss}$$

$$= 45,00,000 + 9,00,000$$

$$\boxed{\text{Sales} = 54,00,000 \text{ Rs/-}}$$

a) p.v. ratios

$$\text{p.v. ratio} = \frac{\text{fixed cost} + \text{profit}}{\text{Sales}} \times 100$$

$$= \frac{4500,000 + 9,00,000}{54,00,000} \times 100$$

$$= \frac{24,00,000}{54,00,000} \times 100$$

$$= 44.44\%$$

5) BEP :-

$$\text{BEP} = \frac{\text{fixed cost}}{\text{pr ratio}}$$

$$= \frac{15,00,000}{44.44}$$

$$= \frac{15,00,000}{44/100}$$

$$= 3375337.534 \text{ Rs.}$$

8. If sales is 10,000 units and it's selling price is Rs. 20 per unit variable cost Rs. 10 per unit and fixed cost is Rs. 180,000 calculate BEP in units & in sales revenue. what is profit earned.

a) what should be the sales for earning a profit of Rs. 60000?

Sol:- Given that sales (in units) = 10,000

selling price (per unit) = 20 Rs.

variable cost (Rs per unit) = 10 Rs.

fixed cost (Rs) = 80000/-

$$\text{BEP in (units)} = \frac{\text{fixed cost}}{\text{selling price} - \text{variable cost}}$$

$$= \frac{80000}{20-10} = \frac{80000}{10}$$

= 8,000 units

$$BEP \text{ in (Rs)} = \frac{\text{fixed cost}}{\text{contribution margin ratio}}$$

$$= \frac{\text{selling cost} - \text{variable cost}}{\text{selling price}}$$

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

$$\text{So, } BEP \text{ (in Rs)} = \frac{80000}{0.5}$$

$$= 160000$$

Profit = $BEP \text{ units} \times SP$

$$= 80000 \times 20$$

$$= 16,0000$$

$$\text{Profit} = \text{contribution} - \text{fixed cost}$$

(or)

$$\text{Sales} \times (\text{Selling price} - \text{variable cost}) - \text{fixed cost}$$

$$= 10000 \times (20 - 10) - 80000$$

$$\text{Profit} = 20,000$$

sales for earning a desired profit of

$$(\text{Rs}) = 60,000$$

$$\text{desired sales} = \frac{\text{Fixed cost} + \text{desired profit}}{\text{Selling - variable cost}}$$

$$= \frac{80,000 + 60,000}{20 - 10} \times 20$$

$$= 280,000 \text{ units.}$$

9. A company reported the following results for two periods

period	sales	profit
I	20,00,000	2,00,000
II	25,00,000	3,00,000

calculate BEP, PV ratio, fixed cost and margin of safety.

so:- period - I

company (I) :-

$$\text{Sales (Rs)} = 20,00,000$$

company (II) :-

$$\text{Sales} = 25,00,000$$

$$\text{Profit (Rs)} = 2,00,000, \text{Profit} = 3,00,000$$

change in profit into period $\times 100$

PV ratio = change in sales in two periods.

$$= \frac{10,000}{5,00,000} \times 100$$

$$P.V. \text{ ratio} = \frac{\text{fixed cost} + \text{profit}}{\text{sales}}$$

$$20\% = \frac{\text{fixed cost} + 300,000}{25,00,000}$$

$$\text{fixed cost} + 300,000 = 5,00,000$$

$$= 2,00,000$$

$$\text{BEP} = \frac{\text{fixed cost}}{\text{P.V. ratio}}$$

$$= \frac{2,00,000}{20\%}$$

$$= 10,00,000$$

$$\text{Margin of safety} = \text{No. of sales} - \text{BEP units}$$

$$= 20,00,000 - 10,00,000$$

$$= 10,00,000$$

23 Jul 22

10. Sale of a product amounts to 20 units per month at Rs 10/- per unit. Fixed overhead is Rs. 400 per month and variable cost is Rs. 6 per unit. There is a proposal to reduce price by 10%. calculate present and future P.V. ratio? How many units

must be solded to earn a target profit of or present level?

So:- Given that sales (Rs) = 200 units / month
selling price (Rs) = 10 / unit.

fixed overhead cost = 400. R₁ -
variable cost (Rs) = 6 / unit

present pr ratio = $\frac{\text{selling price} - \text{variable}}{\text{selling price}} \times 100$

$$= \frac{10 - 6}{10} \times 100$$

$$= 40\%$$

Selling price reduced by 10%.

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

$$= 1$$

$$\text{selling price} = 10 - 1$$

$$= 9\%$$

$$\text{future pr ratio} = \frac{9 - 6}{9} \times 100$$

$$= \frac{3}{9} \times 100$$

$$= 33.333$$

$$\text{present profit} = (\text{sales} \times \text{pr ratio}) - \text{fixed cost}$$

$$= 10 \times 20 \times \left(\frac{40}{100}\right) - \text{fixed cost}$$

$$= \left(200 \times \frac{40}{100} \right) - 400$$

$$\begin{aligned} \text{loss per unit} &= +10 \text{ (loss)} \\ &= 80 - 400 \\ &= -320 \text{ loss!} \end{aligned}$$

Q1. If selling price per unit Rs. 12, variable cost per unit Rs. 8, fixed cost Rs. 40,000, find out

a) BE sales units and value.

b) profit when sales are Rs. 3,00,000

c) margin of safety when sales are Rs. 3,50,000

so:- Given that selling price = 12

variable cost = 8

fixed cost = 40,000

$$\begin{aligned} \text{a) PV ratio} &= \frac{\text{selling} - \text{variable}}{\text{selling}} \times 100 \\ &= \frac{12 - 8}{12} \times 100 \\ &= 33\% \end{aligned}$$

$$\begin{aligned} \text{b) BE } \$ &= \frac{\text{fixed cost}}{\text{PV ratio}} \\ &= \frac{40,000}{33\%} \end{aligned}$$

$$\begin{aligned} \text{BE } \$ &= \frac{40,000}{33/100} \\ &= 120,000 \end{aligned}$$

$$\text{Net Profit} = 120,000 - 40,000 = 80,000$$

a) BEP in units = $\frac{\text{fixed cost}}{\text{CH/unit}}$

$$\begin{aligned}\text{CH/unit} &= \text{S.P} - \text{VC} \\ &= 12 - 8 \\ &= 4\end{aligned}$$

$$\text{BEP in units} = \frac{40000}{4}$$

$$= 10000 \text{ units}$$

b) BEP in value (R) = $\frac{\text{fc}}{\text{C.M.R}}$

$$\text{CMR} = \frac{\text{CH/unit}}{\text{S.P/unit}} = \frac{4}{12}$$

$$= 0.333.$$

$$\text{BEP value (₹ R)} = \frac{40000}{0.333}$$

$$= 12,000/-$$

b) PV ratio = $\frac{\text{fixed cost + profit}}{\text{Sales}} \times 100$

$$33.333y. = \frac{40000 + \text{profit}}{12} \times 100$$

$$p + 40000 = 12 \times \frac{33.33}{100}$$

b) profit when sales are ₹ 3,00,000/-

$$\text{Sales} = \frac{\text{fixed cost} + \text{profit}}{\text{PV ratio}}$$

$$300,000 = \frac{40,000 + P}{33.33\%}$$

$$P + 40,000 = 99,990.$$

$$= 59,999$$

$$\left(\text{Margin of safety} = \frac{\text{Profit}}{\text{PV ratio}} \times 100 \right)$$

$$= \frac{59,999}{33.33\%} \times 100$$

$$= 179,987.99$$

$$\text{Margin of safety} = \text{BEP in units} - \text{No. of sales}$$

$$= 350,000 - 120,000$$

$$= 230,000$$

12. A company makes a single product with a sales price Rs. 10 and variable cost of Rs. 6 per unit. Fixed cost are Rs. 60,000 calculate

a) No. of unit to BEP

b) BEP sales

c) Sales to get a profit of Rs. 60,000

d) profit-volume ratio.

sol:- Given sales price (A) = 10.

variable cost = 6

$$\text{fixed cost (R)} = 60,000 = \frac{10 - 6}{4}$$

(i) BEP in units = $\frac{\text{fixed cost}}{\text{sales price} - \text{variable cost}}$

$$= \frac{60,000}{10 - 6}$$

$$= \frac{60,000}{4}$$

$$= 15000$$

(ii) BEP sales (R₁) = $\frac{\text{fixed cost}}{\text{contribution margin ratio}}$

$$= \frac{\text{Sales} - \text{variable}}{\text{Sales}}$$

$$\frac{10 - 6}{10}$$

$$= 0.4$$

so, BEP in (R₁) = $\frac{60,000}{0.4}$

$$= 150000.$$

(iii) sales to get profit

$$\text{sales} = \frac{\text{fixed} + \text{profit}}{\text{pr ratio}}$$

$$\text{PV ratio} = \frac{\text{Sales price} - \text{variable}}{\text{Sales}} \times 100$$

$$= \frac{10 - 6}{10} \times 100$$

$$= \frac{4}{10} \times 100,$$

$$= 40\%.$$

(iv) profit volume ratio = $\frac{\text{fixed cost + profit}}{\text{pr ratio}}$

$$= \frac{60,000 + 101000}{40\%}$$
$$= 175060$$

13. ABC limited given the following information selling price Rs. 10 per unit, variable cost Rs. 6 per unit, fixed cost Rs. 10,000 predict production & sales 5000 units.

The director of the company propose to reduce the selling price by 20%. find out BEP & pr ratio before and after change in selling price

Sol:-