cvp-analysis:-

c → cost (product and period)

V → volume (Quantity of production)

P → profit

Profit: profit is the difference between sales and cost. Here cost means both variable and Fixed cost.

If variable cost V, Fixed cost F and sales S then profit,

$$P = S - (V + F)$$

P/V ratio: The profit/volume ratio, which popularly known as P/V ratio is the ratio of profit to volume of production.

$$P/V \text{ ratio} = \frac{\text{Contribution}}{\text{sales}} = \frac{C}{S}$$

but, $C = S - V$

$$P/V \text{ ratio}, = \frac{S - V}{S}$$

Contribution: contribution is the difference between sales and variable cost. If P denotes the profit, S denotes the sales, V denotes variable cost, F denotes fixed cost, and C denotes contribution,

$$C = S - V \quad \text{- - (i)}$$

we know. $S = P + V + F$ - (ii)

(i) and (ii) $C + V = P + V + F$

$$\therefore C = P + F$$

Contribution may also defined as the sum of profit and fixed cost.

Break evenPoint:- Break even point the sales volume where total sales revenue are equal to the total cost and thus there is no profit, no less.

Mathematically BEP in unit, $= \dfrac{\text{Fixed cost}}{\text{Contribution margin(per unit)}}$

$$= \frac{F\ (\text{total})}{(S-V)\ \text{per unit}}$$

BEP in sales volume, $= \dfrac{F \times S}{C}$

$$= \frac{F}{C/S}$$

$$= \frac{F}{P/V\ \text{ratio}}$$

$$= \frac{F}{\frac{S-V}{S}} = \frac{FS}{S-V}$$

Margin of safety:- An area which indicates "Access sales over the break even point" it called the area of marginal safety. After the break even point the more sales, the more the marginal safety.

M/S = Actual sales − BEP sales

perchange:- $\dfrac{M/S}{\text{Sales}} \times 100\%$

Target profit:- Target profit $= \dfrac{\text{Fixed cost} + \text{Target profit}}{\text{Contribution margin (PU)}}$

Degree of operating leverage (DOL): It is a measure of how sensitive it is net operating income is to the perchantage change in sales.

$$DOL = \frac{\text{Contribution Margin}}{\text{Net operating income}}$$

✱ How do the following reflects in BEP?

(i) Increase in selling price.

(ii) Increase in total physical sales.

(iii) Decrease in variable cost.

✱ CM ratio $= \frac{CM}{Sales} \times 100\%$

✱ procedure:

sales → xx

(−) variable expense → xx

contribution margin → xx

(−) Fixed expense → xx

Net operating income → xx

✱ There are five points for analysing cvp analysis:

(i) sales per unit

(ii) variable expense per unit

(iii) Total fixed expense

(iv) volume of production

(v) sales mix.

③ The sales increase by $ 400000. next year, if the cost behaviour patterns remain unchanged, by how will the company's net operating income increase? Use the CM ratio to comput with your answer?

The sales increase by $400000

CM ratio × 25%

Net operating income → $100000

(4) If the target profit of at least $90000. How many units will have to be sold to meet this target profit?

$$\text{Target profit} = \frac{\text{Fixed Cost} + \text{target profit}}{\text{CM (per unit)}}$$

$$= \frac{\$240000 + \$90000}{\$15}$$

$$= 22000 \text{ units}$$

⑤ Refer to the original data, compute the margin of safety and it's perchange?

M/S = Actual sales − BEP sales

= $1200000 − $ 960000

= $ 240000

$$\text{perchantage} = \frac{\$240000}{\$1200000} \times 100\% = 20\%$$

* Math:-

	Total	per unit	percent of sales
Sales (20000 units) →	\$1200000	\$60	100%
Variable expenses →	900000	\$45	75%
Contribution Margin →	300000	\$15	25%
Fixed expenses →	240000		
Net operating income →	\$60000		

Solⁿ:- (1) Compute the CM's ratio and the VE ratio?

$$\text{CM ratio} = \frac{300000}{\$1200000} \times 100\% = 25\%$$

$$\text{VE ratio} = \frac{900000}{\$1200000} \times 100\% = 75\%$$

(2) BEP in both units and sales dollars?

$$\$60Q = \$45Q + \$240000 + 0$$

$$\Rightarrow \$15Q = \$240000$$

$$\therefore Q = 160000 \text{ units}$$

in dollars, $1Q = 0.75Q + \$240000 + 0$

$$\Rightarrow 0.25Q = \$240000$$

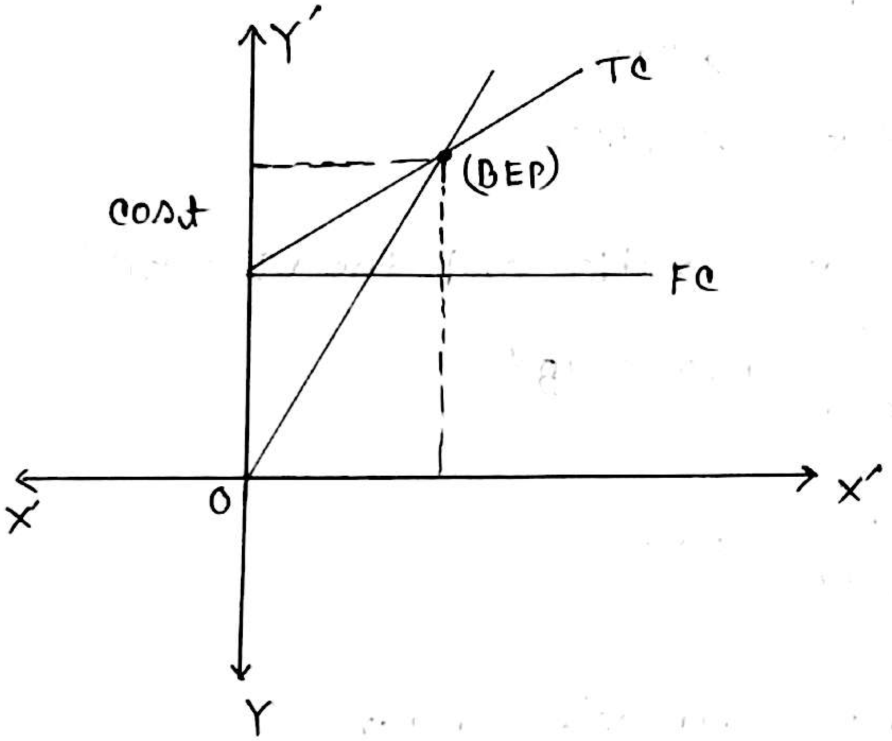
$$\therefore Q = \$960000 \text{ dollars}$$

Alternative:- $BEP = \frac{\$240000}{\$15}$ 160000 units $= \frac{\$2400000}{0.25}$

$= \$960000$ (Ans:)

※ VE (variable expense ratio) $= \frac{VE}{sales} \times 100\%$

※ Break even point:- zero profit area,



※ sales = VE + FE + profit(0)

※ Assumptions of CVP analysis:-

(i) selling price is constant. The price of a product or service will not change as volume changes.

(ii) In multiproduct companies, the sales mix is constant.

(iii) In manufacturing companies. inventories are not change. The number of units produced equals the number of units sold.

6. (a) Calculate the company's degree of operating leverage at present level at states?

$$DOL = \frac{CM}{NOI} = \frac{\$300000}{\$60000} = 5$$

(b) The compan'ys sales increase by 8% next year. By what perchantage would you expect on net operating income? Use the DOL to compute answer?

expected sales increase ⟶ 8%

DOL ⟶ ×5

expeceted NOI ⟶ 40%

(c) Verify your answer by preparing a new Contribution format income statement showing an 8% increase in sales?

sales unit = 20000 + 20000 of 8%

= 21600 units

	Total	per unit	perecent of sale
sales (21,600 units)	→ $12960000	$60	100%
VE	→ $972000	$45	75%
CM Margin,	→ $324000	$15	25%
Fexpenses	→ $240000		
NOI	→ $84000		

$$\therefore \frac{\$84000 - \$60000}{\$60000} \times 100\% = 40\% \text{ increase.}$$

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Standard costing

Standard costing: Standard cost is a predetermined cost which are used in productions as a basis of comparison with actual cost. Standard costing ascertainment, uses and compare with actual cost after making actual cost.

Variances:- Variance is the deviation of standard and actual cost. There are two type of variance (i) Favourable (ii) Unfavourable variance.

* Direct material variances:

(AQ × AP) (AQ × SP) (SQ × SP)

$\therefore \underbrace{AQ(AP - SP)}_{\text{price}}$ and $\underbrace{(AQ - SQ)\,SP}_{\text{Quantity}}$

Direct labour variances:

(AH × AR) (AH × SR) (SH × SR)

$\therefore \underbrace{AH(AR - SR)}_{\text{rate}}$ and $\underbrace{SR(AH - SH)}_{\text{efficiency}}$

Manufacturing overhead variances:

(AH × AR) (AH × SR) (SH × SR)

$\therefore \underbrace{AH(AR - SR)}_{\text{spending}}$ and $\underbrace{SR(AH - SH)}_{\text{efficiency}}$

Avoidable cost:- An avoidable cost that can be eliminated in whole or in a part by choosing one alternative over another.

Sunk cost:- A sunk cost is a cost that has already been incurred and can not be avoided regardless of what a managers decides to do.

selling costs:- selling costs include all costs that are incurred to secure customer order and get the finished product to the customer.

Administrative cost:- Administrative costs include all executive, organizational, and electrical cost associated with the general management of an orgnanization rather than with manufacturing or selling.

Direct materials:- The materials that go into the final product are called direct materials..

Direct labour: Direct labor consists of labor costs that can easily be traced to individuals units of product.

prime cost: prime cost is the sum of direct labor cost and direct material cost.

Direct cost:- A direct cost is a cost that can be easily and conveniently traced to a specified cost object.

Differential cost:- A difference in costs between any two alternatives is known as differential cost.

Differential revenue: A difference in revenues between any two alternatives is known as differential revenue.

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