

Unit 4 : Cost Analysis and Decision Making

Chapter 12

Cost Volume Profit and Break Even Analysis

COST VOLUME PROFIT ANALYSIS

Cost Volume Profit Analysis explains the behavior of profits in response to a change in cost and volume. In other words, it is an analysis presenting the impact of cost and volume on profits. Commonly called as CVP Analysis, a manager can find out the level of sales where the company will be in a no-profit-no-loss situation with this analysis. This situation is called break-even point. In a similar fashion, CVP analysis can also explain the no. of units of sales required to achieve a particular targeted operating income.

CVP analysis requires that all the company's costs, including manufacturing, selling, and administrative costs, be identified as variable or fixed. The aim of a company is to earn profit and profit depends upon a large number of factors, most notable among them are the cost of manufacturing and the volume of sales. These factors are largely interdependent.

The volume of sales is dependent upon production volume which in turn is related to costs which are affected by Volume of production, product mix; internal efficiency of the business, production method used etc.CVP analysis helps management in finding out the relationship between cost and revenue to generate profit.

ASSUMPTIONS OF CVP ANALYSIS

- Costs can be categorized as fixed, variable, or semi-variable. Total fixed costs remain constant as activity changes.
- Variable costs per unit do not change over the relevant range.
- In manufacturing firms, inventories do not change (units produced = units sold).
- The behavior of total revenue is linear (straight line). This implies that the price of the product or service will not change as sales volume varies within the relevant range.
- The behavior of costs is linear (straight line) over the relevant range.
- Selling price is constant throughout the entire relevant range.
- Volume is the only cost driver. The relevant range of volume is specified.
- In multi-product organizations, the sales mix remains constant over the relevant range.

USES OF CVP ANALYSIS

CVP analysis helps in determining the level at which all relevant cost is recovered and there is no profit or loss which is also called the breakeven point. It is that point at which volume of sales equals total expenses (both fixed and variable). Thus CVP analysis helps decision-makers understand the effect of a change in sales volume, price and variable cost on the profit of an entity while taking fixed cost as unchangeable.

CVP Analysis helps in understanding the relationship between profits and costs on the one hand and volume on the other. CVP Analysis useful for setting up flexible budgets which indicate costs at various levels of activity. CVP Analysis also helpful when a business is trying to determine the level of sales to reach a targeted income.

CONTRIBUTION MARGIN AND CONTRIBUTION MARGIN RATIO

Key calculations when using CVP analysis are the **contribution margin** and the **contribution margin ratio**. The contribution margin represents the amount of income or profit the company made before deducting its fixed costs. Said another way, it is the amount of sales dollars available to cover (or contribute to) fixed costs. When calculated as a ratio, it is the percent of sales dollars available to cover fixed costs. Once fixed costs are covered, the next dollar of sales results in the company having income. portance of Cost Volume Profit Analysis

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ADVANTAGES OF CVP ANALYSIS

- Assists in establishing pricing policies.
- Assists in analyzing the impact that volume has on short-term profits.
- Assists in focusing on the impact that changes in costs (variable and fixed) have on profits.
- Assists in analyzing how the mix of products affects profits.
- Useful in setting up of flexible budget which indicate cost at various levels of activities.
- Helps in taking number of managerial decisions.
- Helps to attain the targeted profit.

DISADVANTAGES OF CVP ANALYSIS

- In a current dynamic business environment, the costs and prices can't remain constant throughout the year. A manager is forced to react and make necessary changes in prices and costs due to change in economic conditions, customer bargaining powers, competitors etc.
- All costs cannot be classified as fixed or variable. There is a significant list of costs which are neither fixed nor variable but are semi-variable or semi-fixed. Say, for example, a utility or electricity invoice contains rent as a component which remains constant irrespective of the change in usage of no. of electricity units.
- No. of units cannot be the only driver of total costs and revenues. There are other factors also that impact the prices as well as costs. The raw material price reduction can reduce the variable cost and therefore the customers with knowledge of this change will demand a reduction in prices as well. Similarly, the entrance of a new big player in the market

forces all the firms in the market to reduce their cost or compromise or bear loss of customers.

BREAK EVEN ANALYSIS

A break-even analysis is a financial tool which helps you to determine at what stage your company, or a new service or a product, will be profitable. In other words, it's a financial calculation for determining the number of products or services a company should sell to cover its costs (particularly fixed costs). Break-even is a situation where one is neither making money nor losing money, but all the costs have been covered.

Break-even analysis is useful in studying the relation between the variable cost, fixed cost and revenue. Generally, a company with low fixed costs will have a low break-even point of sale. For an example, a company has a fixed cost of Rs.0 (zero) will automatically have broken even upon the first sale of its product.

Break-Even Point = Fixed Costs/(Selling Price — Variable Costs)

ASSUMPTION OF BREAK EVEN ANALYSIS

- Total fixed costs remain constant at all the output levels.
- All the costs can be considered as either fixed or variable costs.
- Straight-line cost and revenue behaviour.
- Throughout the output level, sales price per unit is constant.
- The business has a constant product mix and produces only one kind of product.
- The inventory remains constant at the start and the end of the accounting period.
- Costs and sales revenue is affected only by the sales volume.
- The unit variable cost remains constant since the change in total variable cost is considered to be proportionate to the output level.
- The other factors such as efficiency, production and technology do not change.

Components of Break Even Analysis

Fixed costs:

Fixed costs are also called as the overhead cost. These overhead costs occur after the decision to start an economic activity is taken and these costs are directly related to the level of production, but not the quantity of production. Fixed costs include (but are not limited to) interest, taxes, salaries, rent, depreciation costs, labour costs, energy costs etc. These costs are fixed no matter how much you sell.

Variable costs:

Variable costs are costs that will increase or decrease in direct relation to the production volume. These cost include cost of raw material, packaging cost, fuel and other costs that are directly related to the production.

Contribution Margin

Break-even analysis also deals with the contribution margin of a product. The excess between the selling price and total variable costs is known as contribution margin. For an example, if the price of a product is Rs.100, total variable costs are Rs. 60 per product and fixed cost is Rs. 25 per product, the contribution margin of the product is Rs. 40 (Rs. 100 – Rs. 60). This Rs. 40 represents the revenue collected to cover the fixed costs. In the calculation of the contribution margin, fixed costs are not considered.

Breakeven analysis is useful for the following reasons:

- It helps to determine remaining/unused capacity of the concern once the breakeven is reached. This will help to show the maximum profit on a particular product/service that can be generated.
- It helps to determine the impact on profit on changing to automation from manual (a fixed cost replaces a variable cost).
- It helps to determine the change in profits if the price of a product is altered.
- It helps to determine the amount of losses that could be sustained if there is a sales downturn.

Additionally, break-even analysis is very useful for knowing the overall ability of a business to generate a profit. In the case of a company whose breakeven point is near to the maximum sales level, this signifies that it is nearly impractical for the business to earn a profit even under the best of circumstances.

Therefore, it's the management responsibility to monitor the breakeven point constantly. This monitoring certainly reduces the breakeven point whenever possible.

ADVANTAGES OF BREAK EVEN ANALYSIS

Break-even analysis enables a business organization to:

1. Measure profit and losses at different levels of production and sales.
2. Predict the effect of changes in sales prices.
3. Analyze the relationship between fixed and variable costs.
4. Predict the effect of cost and efficiency changes on profitability.

DISADVANTAGES OF BREAK EVEN ANALYSIS

Even with its advantages and uses, there are also several demerits of break-even analysis.

1. Assumes that sales prices are constant at all levels of output.
2. Assumes production and sales are the same.
3. Break even charts may be time consuming to prepare.
4. It can only apply to a single product or single mix of products.

MARGIN OF SAFETY:

Margin of safety means the difference between the total sales and the sales at the BEP. It is also known as the amount of the sales above the Break Even Sales. Margin of safety can be expressed in absolute terms and also in terms of percentage. The higher the margin of safety, the better the

situation for an organization. A high margin of safety provides strength and stability to a concern.

To increase the margin of safety, the company should endeavour to keep its BEP at its lowest level and should try to maintain actual sales at the highest level. This may be possible either by controlling fixed costs; by resorting to a dynamic sales policy, or by reducing variable costs. Reproducing the profitable products after discontinuing the unprofitable ones, can also help increase the margin of safety.

Margin of Safety in terms of units as well as Rupees will be found as under; M.O.S. (Units) =	Sales (Units) –B.E.P. (Units)
M.O.S. (Rs.) =	Sales (Rs.) –B.E.P. (Rs.)

PROFIT-VOLUME RATIO:

Profit Volume Ratio means contribution for every Rs. 100 Sales Value. It is always calculated on the percentage basis or at times it is compared with the Sales Value.

When the contribution from sales is expressed as a sales value percentage, it is known as profit-volume ratio (or P/V ratio). The relationship between the contribution and the sales is expressed by it. Sound 'financial health' of a company's product is indicated by better P/V ratio. The change in the profit due to the change in volume is reflected by this ratio. If expressed on equal footing with the sales, it will show how large the contribution will appear. If size of the sales is Rs.100, then the P/V Ratio of 60% will mean that the contribution is Rs. 60.

One important characteristic of P/V ratio is that at all levels of output it remains constant because at various levels the variable cost as a proportion of the sales remains constant. When P/V ratio is considered in conjunction with the margin of safety, it becomes particularly useful. P/V ratio can be referred to by other terms such as: (a) marginal income ratio, (b) contribution to sales ratio, and (c) variable profit ratio.

P/V ratio may be expressed as: $P/V \text{ ratio} =$	$\frac{\text{Contribution}}{\text{Sales}}$
	$\frac{\text{Sales} - \text{Variable cost}}{\text{Sales}}$
	$1 - \frac{\text{Variable cost}}{\text{Sales}}$
Or, P/V ratio =	$\frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}}$
Or, P/V Ratio =	$\frac{\text{Difference in Profits}}{\text{Difference in Sales}} \times 100$

Questions:

1. From the following particulars, calculate:

- (i) Break-even point in terms of sales value and in units.
- (ii) Number of units that must be sold to earn a profit of Rs.90,000.

Solution:

Fixed Factory Overheads Cost	60,000
Fixed Selling Overheads Cost	12,000
Variable Manufacturing Cost per unit	12
Variable Selling Cost per unit	3
Selling Price per unit	24

$$(i) \text{ Break-even point} = \frac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$\text{Variable Cost per unit} = ₹ 12 + 3 = ₹ 15$$

$$\text{Total Fixed Cost} = ₹ 60,000 + 12,000 = ₹ 72,000$$

$$\text{B.E.P.} = \frac{72,000}{24 - 15} = 8,000 \text{ units}$$

$$\text{B.E.P. (in sales values)} = 8,000 \times 24 = ₹ 1,92,000$$

$$(ii) \text{ Number of units that must be sold to earn profit of ₹ 90,000}$$

$$= \frac{\text{Fixed Cost} + \text{Profit}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$= \frac{72,000 + 90,000}{24 - 15} = \frac{1,62,000}{9} = 18,000 \text{ units.}$$

2. Find Break-Even Point:

Variable Cost per unit	₹ 15
Fixed Expenses	54,000
Selling Price per unit	20

What should be the selling price per unit, if the break-even point should be brought down to 6,000 units?

$$\text{Contribution per unit} = \text{Selling Price} - \text{Variable cost per unit}$$

$$= ₹ 20 - 15 = ₹ 5$$

$$(a) \text{ B.E.P.} = \frac{\text{Fixed Expenses}}{\text{Contribution per unit}}$$

$$= \frac{54,000}{5} = 10,800 \text{ units}$$

$$(b) \text{ What should be the selling price per unit, if the break-even-point should be brought down to 6000 units:}$$

$$\text{B.E.P.} = \frac{\text{Fixed Expenses}}{\text{Contribution per unit}}$$

$$\text{Or, } 6,000 = \frac{54,000}{\text{Contribution per unit}}$$

$$\text{Or, Contribution per unit} = \frac{54,000}{6,000} = \text{Rs. } 9$$

$$\text{Contribution} = \text{S.P.} - \text{V.C.}$$

$$\text{Or, } 9 = \text{SP} - 15$$

$$\text{Or, Selling Price} = ₹ 24.$$

3. The fixed costs amount to Rs. 50,000 and the percentage of variable costs to sales is given to be $66\frac{2}{3}\%$. If 100% capacity sales are Rs. 3,00,000, find out break-even point and the percentage sales when it occurred. Determine profit at 80% capacity.

Percentage of Variable Cost to Sales is $66\frac{2}{3}\%$ i.e., $\frac{200}{3}$

\therefore Percentage of Contribution to Sales is $100 - \frac{200}{3} = \frac{100}{3}$

$$\begin{aligned} \text{P/V ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\ &= \frac{100}{3} \times \frac{1}{100} \times 100 = \frac{100}{3} = 33\frac{1}{3}\% \end{aligned}$$

$$\begin{aligned} \text{Break-even Sales} &= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} \\ &= \frac{50,000}{33\frac{1}{3}\%} = \frac{50,000}{100} \times 300 = \text{Rs. } 1,50,000. \end{aligned}$$

100% Capacity Sales = ₹ 3,00,000

Hence, B.E.P. occurs at $\frac{1,50,000}{3,00,000} \times 100 = 50\%$ capacity.

Profit at 80% Capacity

At 100% Capacity Sales are ₹ 3,00,000

\therefore 80% Capacity Sales $3,00,000 \times \frac{80}{100} = \text{Rs. } 2,40,000$

Total Contribution at 80% capacity	$= 2,40,000 \times \frac{100}{3} \times \frac{1}{100}$
	<u>$= ₹ 80,000$</u>
Fixed Expenses	<u>$= ₹ 50,000$</u>
Profit at 80% capacity	$= ₹ 30,000$

4. Calculate:

- (i) The amount of fixed expenses.
- (ii) The number of units to break-even.
- (iii) The number of units to earn a profit of Rs. 40,000.

The selling price per unit can be assumed at Rs. 100. The company sold in two successive periods 7,000 units and 9,000 units and has incurred a loss of Rs. 10,000 and earned Rs. 10,000 as profit

respectively.

	<i>Period I</i>	<i>Period II</i>
Sales	₹ 7,00,000	₹ 9,00,000
Profit/Loss (—)	(—) ₹ 10,000	₹ 10,000

Thus for an additional sales of ₹ 2,00,000 there is an additional contribution of ₹ 20,000 which has wiped off the loss or ₹ 10,000 of period I and earned a profit of ₹ 10,000 in period II.

$$\text{P/V Ratio} = \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100$$

$$= \frac{20,000}{2,00,000} \times 100 = 10\%$$

Contribution of Period I = $7,00,000 \times \frac{10}{100} = \text{Rs. } 70,000$

Loss of period I (given) = ₹ 10,000

(i) **Fixed Cost** = ₹ 80,000

Contribution = Fixed Cost ± Profit/Loss

Fixed Cost = Contribution ± Loss/Profit

(ii) **Break-Even Point** = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$$= \frac{80,000}{10} = \frac{80,000 \times 100}{100} = \text{Rs. } 8,00,000$$

Number of units to break-even = $\frac{\text{Break-Even Sales}}{\text{Selling Price per unit}}$

$$= \frac{8,00,000}{100} = 8,000 \text{ units.}$$

(iii) **Number of units required to earn a profit of ₹ 40,000.**

$$= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V Ratio}}$$

$$= \frac{80,000 + 40,000}{10\%}$$

$$= \frac{1,20,000 \times 100}{10} = \text{Rs. } 12,00,000$$

5. Pepsi Company produces a single article. Following cost data is given about its product:-
 Selling price per unit Rs.40 Marginal cost per unit Rs.24 Fixed cost per annum Rs. 16000
 Calculate: (a) P/V ratio
 (b) Break even sales
 (c) Sales to earn a profit of Rs. 2,000
 (d) Profit at sales of Rs. 60,000
 (e) New break even sales, if price is reduced by 10%.

Solution:

$$(S-v) / S = F + P$$

OR

$$s \times \text{P/V Ratio} = \text{Contribution}$$

So, (A) P/V Ratio = Contribution/sales x 100
 = $(40-24)/40 \times 100 = 16/40 \times 100$ OR 40%

(B) Break even sales

$$S \times \text{P/V Ratio} = \text{Fixed Cost}$$

(At break even sales, contribution is equal to fixed cost)

Putting this values: $s \times 40/100 = 16,000$

$$S = 16,000 \times 100 / 40 = 40,000 \text{ OR } 1000 \text{ units}$$

(C) The sales to earn a profit of Rs. 2,000 $S \times P/V \text{ Ratio} = F + P$

Putting this values: $s \times 40/100 = 16000 + 2000$ $S = 18,000 \times 100/40$ $S = \text{Rs. } 45,000 \text{ OR } 1125$ units

(D) Profit at sales of 60,000 $S \times P/V \text{ Ratio} = F + P$

Putting this values: $\text{Rs. } 60,000 \times 40/100 = 16000 + P$ $24,000 = 16000 + P$ $24,000 - 16,000 = P$ 8,000

(E) New break even sales, if sale price is reduced by 10%

New sales price = $40 - 10\% = 40 - 4 = 36$

Marginal cost = Rs. 24 Contribution = Rs. 12

$P/V \text{ Ratio} = \text{Contribution}/\text{Sales} = 12/36 \times 100$ OR 33.33%

Now, $s \times P/V \text{ Ratio} = F$ (at B.E.P. contribution is equal to fixed cost) $S \times 100/300 = \text{Rs. } 16000$

$$S = 16000 \times 300/100 \quad S = \text{Rs. } 48,000.$$

6. From the following information's find out:

a. P/V Ratio

b. Sales &

c. Margin of Safety

Fixed Cost = Rs. 40,000

Profit = Rs. 20,000

B.E.P. = Rs. 80,000

Solution: a. P/V Ratio.

$$S - V = F + P$$

OR $S(S - V)/S = F + P$ B.E.S. $\times P/V \text{ Ratio} = F$ (Value of P is zero at BE Sales)

OR

$P/V \text{ Ratio} = F/\text{BES}$ Putting the value, $P/V \text{ Ratio} = 40,000/80,000 = 50/100$ OR 50%.

b. Sales. $\text{Sales} \times P/V \text{ Ratio} = F + P$ OR $\text{Sales} \times P/V \text{ Ratio} = \text{Contribution}$ OR $\text{Sales} = \text{Contribution}/P/V \text{ Ratio}$ So, $= (40,000 + 20,000)/50/100 = (60,000 \times 100)/50 = \text{Rs. } 1,20,000$

c. Margin of Safety. $\text{Margin of Safety} = \text{Sales} - \text{B.E.P Sales}$ So, $\text{MOS} = 1,20,000 - 80,000$ MOS = Rs. 40,000.

Questions

1. Bring out clearly the significance of each of cost classifications and explain the meaning of the terms used therein.

2. State the concept of Marginal costing. What management decisions can be made on the basis of marginal costing?

3. Explain with illustration the total Cost Approach and Marginal Cost Approach of profit computation.

4. What do you mean by marginal costing? Explain its assumptions?
5. Discuss marginal costing. Explain its uses?
6. Write short notes on the following:
 - (a) P/V Ratio
 - (b) BEP
 - (c) MOS
7. What is CVP analysis? Explain its uses?
8. What is BEP analysis? Explain its assumptions. How is it determined?

Numerical Questions

NQ. In two periods, total costs amount to Rs.40,000 and Rs.50,000 against production of 15,000 units and 20,000 units respectively. How much is marginal cost per unit and how much is fixed cost?

NQ AMAR SHOE PVT. Ltd. is manufacturing two lines- A and B. The costs of manufacture are as under:

	A	B		
Rs.	Rs.			
Direct Materials per unit		6	8	
Direct Labour per unit		4	6	
Selling Price per unit		20	30	
Output	2,000 units	2,000 units		

Total overheads are Rs.16,000 out of which Rs.12,000 are fixed and the rest are variable. These overheads are to be apportioned in the ratio of output. There is no opening or closing stocks for either of the product. Find profit (i) Absorption and (ii) Marginal approach.

NQ BATA SHOE PVT. Ltd. manufactures one product. Cost information in respect of this product are:

Total Fixed Costs Rs.1,50,000
 Variable Cost per unit Re.1
 Selling Price per unit Rs.4.80
 Normal Capacity 100,000 units per annum.

Production and Sales data for three years are given:

Year	Production (units)	Sales (units)	Sales (in Rs.)
2011	80,000	50,000	2,40,000
2012	40,000	50,000	2,40,000
2013	1,20,000	50,000	2,40,000

The manufacturing costs for each year were the same as indicated above. Finished goods at the start of 2011 were 10,000 units values at Rs.25,000 (Rs.10,000 variable + Rs.15,000 fixed).

You are required to:

- (i) Prepare income statement under Total cost Approach.
- (ii) Prepare Income statement under Marginal Approach.

NQ There are three lines of production and their production cost per unit and selling price per unit are given below:

	Kids cloths	Male cloths	Female cloths
	Rs.	Rs.	Rs.
Materials	18	26	30
Wages	7	9	10
Variable Overheads	2	3	3
Fixed	5	8	9
	-----	-----	-----
	32	46	52
Selling price	40	64	61
	-----	-----	-----
Net Profit	8	18	9
	-----	-----	-----
Production in units	4,000	2,000	5,000
	-----	-----	-----

The production Manager wants to discontinue one line and guarantees that production of other two lines shall rise by 50%. He wants to discontinue line kids cloth, as it is least profitable.

Do you think that line of kids cloth should be discontinued?

NQ Tej shoes pvt.ltd.is manufacturing 5,000 units of shoes, 4,000 units of purses and 3,000 units of belts. The details per unit are:

Rs.	Products		
	Shoes	Purses	Belts
	Rs.	Rs.	
Selling price	80	50	40
Costs:			
Material	30	25	20
Labour	10	8	6
Variable Overheads	4	3	2
Fixed overheads	10	8	7
Scarce Material Consumed (Per unit)	10kg.	6kg.	4kg.

Sales is not limiting factor with respect to any of the products. It is decided to close one of the lines. Will it be advisable? If yes, which line should be closed?

NQ JINDAL Ltd. has two factories: main factory and feeder factory main factory is run at 70% capacity (installed capacity is 1,20,000 units) and feeder factory supplier its requirements by working at 80% capacity. The cost structure of Feeder factory is given below:

Rs.

Materials	1,68,000
Wages (50 paise per unit piece rate plus fixed DA)	60,000
Overhead: Fixed	75,000
Variable	<u>42,000</u>
	<u>3,45,000</u>

The production of the main factory is to be increased to 80% capacity. The component can be bought from the market at Rs.3.50 per unit. As cost of feeder factory exceeds Rs.4 per unit it is proposed to procure the additional requirements from the market instead of having them from the feeder factory. Advise the management.

NQ RELIANCE Industries Ltd. purchases 12,000 units per annum of spare part from another manufacturer @Rs.4 per unit. The production manager has put forward a proposal that the production of this part may be undertaken by the company in order to have full control over the supply of the spare part. He has submitted the following information along with his proposal:

- (i) Material and labour would cost Rs.0.60 and Re.0.50 per unit, respectively.
- (ii) Variable overhead will be 100% of labour.
- (iii) A foreman will be employed at Rs.1,000 p.m.
- (iv) Machine needed would cost Rs.50,000. It will have a production capacity of 15,000 units and its economic life will be five years.
- (v) Funds needed for the above (iv) can be obtained at interest rate of 10% p.a.
- (vi) Fixed expenses (other than mentioned above) are recovered @200% of wages.

You are requested to advise the management about of production manager.

NQ The directors of SHRI RAM Ltd. are considering the sales budget for the next budget period. You are required to present to the Board a statement showing the marginal cost of each product and also to recommend which of the following sales mixes should be adopted:

- (a) 900 units of A and 600 units of B
- (b) 1,800 units of A only
- (c) 1,200 units of B only
- (d) 1,200 units of A and 400 units of B

You are given the following information:

	Product A	Product B
Direct labour @50 paise per hour	20 hours	30 hours
Direct materials	Rs.20	Rs.25
Selling price	Rs.60	Rs.100
Overheads:		
	Fixed Rs.10,000 per annum.	
	Variable 100% of labour.	

NQ From the following particulars, calculate P/V Ratio and with the help of that ratio find out the following: -

- (a) Fixed Costs
- (b) Contribution for both the period
- (c) Variable costs for 2000 and 2001
- (d) Profit when sales are Rs.2,20,000
- (e) Sales required to earn a profit of Rs.40,000

(f)	Sales to have a contribution of Rs.80,000		
(g)	MOS for both the period.		
	Year	Sales	Profit
	Rs.	Rs.	
	2000	2,40,000	18,000
	2001	2,80,000	26,000

NQ. You are given the following data:-

Sales	5,00,000
Less Variable Costs	3,75,000
Contribution	1,25,000
Less Fixed Costs	<u>37,500</u>
Profit	<u>87,500</u>

Calculate the following:-

- PIV Ratio.
- Break-even-point
- Net Profit from the sales of Rs.7,00,000
- Margin of safety when profit is Rs.1,12,500
- Required sales to earn a profit of Rs.1,00,000.
- Profit when margin of safety is Rs.4,00,000.
- Additional sales required to cover an increase of Rs.4,000 p.a. the sales manager's salary.]

NQ The following information is obtained from record of GIDANI POWER Ltd. Sales Rs.2,00,000, variable cost Rs.1,00,000 Fixed Cost's Rs.60,000.

- Find out P/V Ratio, BEP and Margin of Safety.
- Calculate the effect on the above of the following:-
 - 20% decrease in fixed costs
 - 10% increase in fixed costs.
 - 10% decrease invariable costs
 - 10% increase in variable costs
 - 10% decrease in fixed costs and 10% increase invariable costs.
 - 20% increase in fixed costs and 20% decrease in variable costs.

NQ Make an estimate of profit under each of the following conditions: -

- PV Ratio 25%, Sales Rs.1,20,000 and Fixed Costs Rs.17,500
- PV Ratio 25%, and Margin of Safety Rs.50,000.
- PV Ratio 25%, Margin of Safety Ratio 40% and sales Rs.1,25,000.

NQ From the following particulars, find Break-even point in units:

Variable Cost per unit Rs.15, Fixed overheads Rs.1,08,000
Selling price per unit Rs.20.

What should be selling price per unit, if Break-even point is brought down to 12,000 units.