MARGINAL COSTING

Question 1Arnav Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

| Elements of Cost | Variable Cost portion | Fixed Cost |
|-----------------------------------|---------------------------|------------|
| Direct Material | 30% of Cost of Goods Sold | |
| Direct Labour | 15% of Cost of Goods Sold | |
| Factory Overhead | 10% of Cost of Goods Sold | ₹2,30,000 |
| General & Administration Overhead | 2% of Cost of Goods Sold | ₹71,000 |
| Selling & Distribution Overhead | 4% of Cost of Sales | ₹68,000 |
| | | |

Last Year 5,000 units were sold at ₹185 per unit. From the given data find the followings:

- (a) Break-even Sales(in rupees)
- (b) Profit earned during last year
- (c) Margin of safety (in %)
- (d) Profit if the sales were 10% less than the actual sales.

Question 2 Followinginformation are available for the year 2013 and 2014 of PIX Limited:

| Year | 2013 | 2014 | | |
|----------------------|---------------------|---------------------------|-----|-------|
| Sales | ₹32, 00,000 | ₹57, 00,000 | | |
| Profit/ (Loss) | (₹ 3,00,000) | ₹7, 00,000 | | |
| Calculate – (a) | P/V ratio, | (b) Total fixed cost, and | (c) | Sales |
| required to earn a F | Profit of₹12,00,000 |). | | |

COST & MANAGEMENT ACCOUNTING

Question 3 The ratio of variable cost to sales is 70%. The break-even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are ₹ 90,000. Also compute profit at 75% of the capacity sales.

Question 4 Maximum Production capacity of KM (P) Ltd. is 28000 units per month. Output at different levels along with cost data is furnished below:

| | | Activity Level | |
|-------------------------|--------------|----------------|--------------|
| Particulars of Costs | | | |
| | 16,000 units | 18,000 units | 20,000 units |
| Direct Material | ₹12,80,000 | ₹14,40,000 | ₹16,00,000 |
| Direct labour | ₹17,60,000 | ₹19,80,000 | ₹22,00,000 |
| Total factory overheads | ₹22,00,000 | ₹23,70,000 | ₹25,40,000 |
| | | | |

You are required to work out the selling price per unit a an activity level of 24,000 units by considering profit at the rate of 25% on sales.

Question 5 XYZ Ltd. has a production capacity of 2,00,000 units per year. Normal capacity utilisation is as 90%. Standard variable production costs are ₹11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are₹3 per unit and fixed selling costs are₹2,70,000per year. The unit selling price is ₹20.

In the year just ended on 30th June, 2014, the production was 1,60,000 units and sales were 1,50,000 units. The closing inventory on 30th June was 20,000 units. The actual variable production costs for the year were ₹ 35,000 higher than the standard.

1. Calculate the profit for the year

- a. by absorption costing method and
- b. by marginal costing method.
- 2. Explain the difference in the profits.

Question 6 A company sells its product at \gtrless 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of \gtrless 5 per unit. If the volume is raised to 20,000 units, it earns a profit of \gtrless 4 per unit. Calculate break-even point both in terms of rupees as well as in units.

Question 7 NOV. 2007 A company produces single product which sells for \gtrless 20 per unit. Variable cost is \gtrless 15 per unit and Fixed overhead for the year is \gtrless 6,30,000.

Required:

- (a) Calculate sales value needed to earn a profit of 10% on sales.
- (b) Calculate sales price per unit to bring BEP down to 1,20,000 units.
- (c) Calculate margin of safety sales if profit is \gtrless 60,000.

Question 8

- If margin of safety is ₹ 2,40,000 (40% of sales) and P/V ratio is 30% of AB Ltd, calculate its (1) Break even sales, and (2) Amount of profit on sales of ₹9,00,000.
- X Ltd. has earned a contribution of ₹2,00,000 and net profit of ₹1,50,000 of sales of ₹8,00,000. What is its margin of safety?

Question 9A B and C are three similar plants under the same management who want them to be merged for better operation. The details are as under:

| Particulars | Plant A at 100% | Plant B at 70% | Plant C at 50% |
|-------------|-----------------|----------------|----------------|
|-------------|-----------------|----------------|----------------|

| | (₹ in Lakhs) | (₹ in Lakhs) | (₹ in Lakhs) |
|---------------|--------------|--------------|--------------|
| Turnover | 300 | 280 | 150 |
| Variable Cost | 200 | 210 | 75 |
| Fixed Cost | 70 | 50 | 62 |

Required:-

- a) Compute the capacity of the merged plant for break-even
- b) Compute the profit of the merged plant at 75% capacity
- c) Compute the capacity utilisation of the merged plant to earn a profit of Rs.
 28 lakhs

Question 10 A company earned a profit of \gtrless 30,000 during the year 2014. If the marginal cost and selling price of the product are \gtrless 8 and \gtrless 10 per unit respectively, find out the amount of margin of safety.

Question 11 NOV. 2008 ABC Ltd. can produce 4,00,000 units of a product per annum at 100% capacity. The variable production costs are \gtrless 40 per unit and the variable selling expenses are \gtrless 12 per sold unit. The budgeted fixed production expenses were \gtrless 24,00,000 per annum and the fixed selling expenses were \gtrless 16,00,000. During the year ended 31st March, 2014, the company worked at 80% of its capacity. The operating data for the year are as follows:

| Production | 3,20,000 units |
|---------------------------------|----------------|
| Sales @ ₹ 80 per unit | 3,10,000 units |
| Opening stock of finished goods | 40,000 units |

Fixed production expenses are absorbed on the basis of capacity and fixed selling expenses are recovered on the basis of period.

You are required to prepare Statements of Cost and Profit for the year ending 31st March, 2014:

- (i) On the basis of marginal costing
- (ii) On the basis of absorption costing

Question 12 An automobile manufacturing company produces different models of Cars. The budget in respect of model 007 for the month of March, 2015 is as under:

| Budgeted Output | | | 40,000 Units |
|-----------------------|-------------|---------------|---------------|
| | | ₹In lakhs | ₹In lakhs |
| Net Realisation | | | 700 |
| Variable Costs: | | | |
| Materials | | 264 | |
| Labour | | 52 | |
| Direct expenses | | <u>124</u> | 440 |
| Specific Fixed Costs | | 90 | |
| Allocated Fixed Costs | | <u>112.50</u> | <u>202.50</u> |
| | Total Costs | | 642.50 |
| | Profit | | <u>57.50</u> |
| | Sales | | <u>700.00</u> |

Calculate:

- (i) Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.
- (ii) Volume to be achieved to maintain the original profit after a 10 percent rise in material costs, at the originally budgeted selling price per unit.

Question 13 NOV. 2008 PQR Ltd. reports the following cost structure at two capacity levels:

| | (100% capacity) | (75% capacity) |
|------------------------|-----------------|----------------|
| | 2,000 units | 1,500 units |
| Production overhead I | ₹3 per unit | ₹4 per unit |
| Production overhead II | ₹2 per unit | ₹2 per unit |

If the selling price, reduced by direct material and labour is ₹ 8 per unit, what would be its break-even point?

Question 14 NOV. 2012 The following figures are related to LM Limited for the year ending 31st March, 2014 : Sales - 24,000 units @ ₹ 200 per unit; P/V Ratio 25% and Break-even Point 50% of

sales. You are required to calculate:

- (i) Fixed cost for the year
- (ii) Profit earned for the year
- (iii) Units to be sold to earn a target net profit of ₹ 11,00,000 for a year.
- (iv) Number of units to be sold to earn a net income of 25% on cost.
- (v) Selling price per unit if Break-even Point is to be brought down by 4,000 units.

Question 15 The following information is given by Star Ltd.:

| Margin of Safety | ₹1,87,500 |
|------------------|-------------|
| Total Cost | ₹1,93,750 |
| Margin of Safety | 3,750 units |

Break-even Sales 1,250 units

Required:

Calculate Selling Price Per unit, Profit, P/V Ratio, BEP Sales (in₹) and Fixed Cost.

Question 16 A Chinese soft drink company is planning to establish a subsidiary company in India to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the Indian subsidiary:

| | Total annual costs | Percent of Total Annual Cost which is variable |
|----------------------------|-----------------------|---|
| Material | 2,10,000 | 100% |
| Labour | 1,50,000 | 80% |
| Factory Overheads | 92,000 | 60% |
| Administration Expenses | 40,000 | 35% |

The Indian production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Chinese office expenses is to be allocated to the Indian subsidiary. You are required to

- (i) Compute the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in India.
- (ii) Calculate the break-even point in Rupee sales as also in number of bottles for the Indian subsidiary on the assumption that the sale price is ₹ 14 per bottle.

Question 17 MAY 2014 You are given the following data :

| | Sales | Profit |
|-----------|-----------|--------|
| Year 2013 | ₹1,20,000 | 8,000 |
| Year 2014 | ₹1,40,000 | 13,000 |

Find out -

- (i) P/V ratio,
- (ii) B.E. Point,
- (iii) Profit when sales are ₹1,80,000,
- (iv) Sales required earn a profit of ₹12,000,
- (v) Margin of safety in year 2014.

Question 18

| | | | (マ) |
|------|----------------------------------|---|----------|
| (i) | Ascertain profit, when sales | = | 2,00,000 |
| | Fixed Cost | = | 40,000 |
| | BEP | = | 1,60,000 |
| (ii) | Ascertain sales, when fixed cost | = | 20,000 |
| | Profit | = | 10,000 |
| | BEP | = | 40,000 |

Question 19 There are two similar plants under the same management. The management desires to merge these plants.

/~

The following particulars are available:-

| Particulars | Factory 1 | Factory 2 |
|-------------|-----------|-----------|
| | | |

COST & MANAGEMENT ACCOUNTING

| Capacity operation | 100% | 60% |
|--------------------|-------------|-------------|
| Sales | ₹ 300 Lakhs | ₹ 120 Lakhs |
| Variable Costs | ₹ 220 Lakhs | ₹ 90 Lakhs |
| Fixed Costs | ₹ 40 Lakhs | ₹ 20 Lakhs |

You are required to calculate:-

- i. What would be capacity of the merged plant to be operated for the purpose of break-even and
- ii. What would be the profitability on working at 75% of the merged capacity ?

Question 20 X Co Ltd. Manufactures and sells four products A,B,C and D. The total budgeted sales (100%) are Rs. 6,00,000 per month. The Fixed Costs are Rs. 1,59,000 per month.

Sales mix in value comprises of :-

| Product | Present % | Proposed % |
|---------|-----------|------------|
| Α | 33.33% | 25% |
| В | 41.67% | 40% |
| C | 16.67% | 30% |
| D | 8.33% | 5% |

The operating cost as a % of selling prices are:-

A-60%, B-68%, C-80% and D -40%

Calculate break even sales for the company for both these periods.

Question 21 M ltd. Manufactures three products P, Q and R. The unit selling prices of these products are Rs. 100, Rs. 80 and Rs. 50 respectively. The corresponding unit variable cost are Rs. 50, Rs. 40 and Rs. 20/ the proportions (quantity-wise) in which these products are manufactured and sold are 20%, 30% and 50% respectively. Total fixed cost are Rs. 14,80,000.

Given the above information, you are required to work out the over all break-even quantity and the product-wise break-up of such quantity.

Question 22MAY 2008 A company has fixed cost of ₹ 90,000, Sales ₹ 3,00,000 and Profit of ₹ 60,000. Required:

- (i) Sales volume if in the next period, the company suffered a loss of ₹ 30,000.
- (ii) What is the margin of safety for a profit of ₹ 90,000?

Question 23 You are given the following data for the year 2007 of Rio Co. Ltd:

| Variable cost | 60,000 | 60% |
|---------------|----------|------|
| Fixed cost | 30,000 | 30% |
| Net profit | 10,000 | 10% |
| Sales | 1,00,000 | 100% |

Find out (a) Break-even point, (b) P/V ratio, and (c) Margin of safety.

Question 24 MNP Ltd sold 2,75,000 units of its product at ₹ 37.50 per unit. Variable costs are ₹ 17.50 per unit (manufacturing costs of ₹ 14 and selling cost ₹ 3.50 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹ 35,00,000 (including depreciation of ₹15,00,000). there are no beginning or ending inventories.

Required:

- a) Estimate breakeven sales level quantity and cash breakeven sales level quantity.
- b) Estimate the P/V ratio.

- c) Estimate the number of units that must be sold to earn an income (EBIT) of
 ₹ 2,50,000.
- d) Estimate the sales level achieve an after-tax income (PAT) of ₹ 2,50,000.
 Assume 40% corporate Income Tax rate.

Question 25 You are given the following particulars calculate:

- (a) Break-even point
- (b) Sales to earn a profit of ₹ 20,000
 - i. Fixed cost ₹ 1,50,000
 - ii. Variable cost ₹ 15 per unit
 - iii. Selling price is ₹ 30 per unit

| QUESTION ZO THE PRODUCT THIS OF a Gaina LLU. IS as under | Question 26 T | he product i | mix of a Gan | na Ltd. is as | under: |
|--|---------------|--------------|--------------|---------------|--------|
|--|---------------|--------------|--------------|---------------|--------|

| | Products | |
|---------------|----------|--------|
| | М | N |
| Units | 54,000 | 18,000 |
| Selling price | ₹7.50 | ₹15.00 |
| Variable cost | ₹6.00 | ₹4.50 |

Find the break-even points in units, if the company discontinues product \mathbf{R} and replace with product \mathbf{R} . The quantity of product \mathbf{R} is 9,000 units and its selling price and variable costs respectively are \mathbf{R} 18 and \mathbf{R} 9. Fixed Cost is \mathbf{R} 15,000.

Question 27 NOV 2014 Zed Limited sells its product at ₹ 30 per unit. During the quarter ending on 31st March, 2014, it produced and sold 16,000 units and'

suffered a loss of ₹ 10 per unit. If the volume of sales is raised to 40,000 units; it can earn a profit of ₹ 8 per unit.

You are required to calculate:

- (i) Break Even Point in Rupees.
- (ii) Profit if the sale volume is 50,000 units.
- (iii) Minimum level of production where the company needs not to close the production if unavoidable fixed cost is ₹ 1,50,000.

Question 28 A Ltd. maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹ 5 lakhs.

Calculate the following:

- i. Break-even sales
- ii. Total sales
- iii. Total variable cost
- iv. Current profit
- v. New ₹margin of safety' if the sales volume is increased by 7 ½ %.

Question 29 A Company sells two products, J and K. The sales mix is 4 units of J and 3 units of K. The contribution margins per unit are ₹ 40 for J and ₹ 20 for K. Fixed costs are ₹ 6,16,000 per month. Compute the break-even point.

Question 30 NOV 2009 Mega Company has just completed its first year of operations. The unit costs on a normal costing basis are as under:

| | | (₹) |
|-------------------------------|---|--------------|
| Direct material 4 kg @ ₹ 4 | = | 16.00 |
| Direct labour 3 hrs @ ₹ 18 | = | 54.00 |
| Variable overhead 3 hrs @ ₹ 4 | = | 12.00 |
| Fixed overhead 3 hrs @ ₹ 6 | = | <u>18.00</u> |
| | | 100.00 |

Selling and administrative costs:

| Variable | ₹20 per unit |
|----------|--------------|
| Fixed | ₹7,60,000 |

During the year the company has the following activity:

| Units produced | = | 24, | 000 |
|----------------------------|---|-----|--------|
| Units sold | = | 21, | 500 |
| Unit selling price | = | ₹1 | 68 |
| Direct labour hours worked | | = | 72,000 |

Actual fixed overhead was ₹ 48,000 less than the budgeted fixed overhead. Budgeted variable overhead was ₹ 20,000 less than the actual variable overhead. The company used an expected actual activity level of 72,000 direct labour hours to compute the predetermine overhead rates.

Required:

- (a) Compute the unit cost and total income under:
 - i. Absorption costing
 - ii. Marginal costing

- (b) Under or over absorption of overhead.
- (c) Reconcile the difference between the total income under absorption and marginal costing.

Question 31 A Ltd is having a proposal to purchase two machines X and Y. the cost structure for the products with these two machines is as follows:-

| Particular | Machine X | Machine Y |
|------------------------|--------------|--------------|
| Variable Cost per unit | Rs. 6.00 | Rs. 4.00 |
| Fixed Cost | Rs. 2,00,000 | Rs. 3,00,000 |
| Selling Price per unit | Rs. 10 | Rs. 10 |

What is cost indifference point? Which machine should be preferred and when ?

Question 32 A company had incurred fixed expenses of ₹ 4,50,000, with sales of ₹ 15,00,000 and earned a profit of ₹ 3,00,000 during the first half year. In the second half, it suffered a loss of Rs. 150000.

Calculate:

- (i) The profit-volume ratio, break-even point and margin of safety for the first half year.
- (ii) Expected sales volume for the second half year assuming that selling price and fixed expenses remained unchanged during the second half year.
- (iii) The break-even point and margin of safety for the whole year.

Question 33 A company has a P/V ratio of 40%. By what percentage must sales be increased to offset: 20% reduction in selling price?

Question 34 Two firms A & Co. and B & Co. sell the same product in the same market. Their budgeted profit and loss account for the year ending 31st march, 2016 are as follows:-

| Particulars | A & Co. (Rs.) | B & Co. (Rs.) |
|----------------|---------------|---------------|
| Sales | 5,00,000 | 6,00,000 |
| Variable Costs | 4,00,000 | 4,00,000 |
| Fixed Costs | 30,000 | 70,000 |
| Net Profit | 70,000 | 1,30,000 |

Required:

- 1. Calculate at which sales volume both the firms will earn equal profit.
- 2. State which firm is likely to earn greater profits in condition of:
 - a. Heavy demand for the product
 - b. Low demand for the product. Give reasons.

Question 35 By noting "P/V will increase or P/V will decrease or P/V will not change", as the case may be, state how the following independent situations will affect the P/V ratio:

- (i) An increase in the physical sales volume;
- (ii) An increase in the fixed cost;
- (iii) A decrease in the variable cost per unit;
- (iv) A decrease in the contribution margin;
- (v) An increase in selling price per unit;
- (vi) A decrease in the fixed cost;
- (vii) A 10% increase in both selling price and variable cost per unit;
- (viii)A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;

(ix) A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.

Question 36 The P/V Ratio of Delta Ltd. is 50% and margin of safety is 40%. The company sold 500 units for ₹ 5,00,000. You are required to calculate:

- (i) Break- even point, and
- (ii) Sales in units to earn a profit of 10% on sales

Question 37 MAY 2013 ABC Limited started its operation in the year 2013 with a total production capacity of 2,00,000 units. The following information, for two years, are made available to you:

| | Year | Year |
|----------------|-----------|-----------|
| | 2013 | 2014 |
| Sales (units) | 80,000 | 1,20,000 |
| Total Cost (₹) | 34,40,000 | 45,60,000 |

There has been no change in the cost structure and selling price and it is anticipated that it will remain unchanged in the year 2015 also.

Selling price is ₹ 40 per unit.

Calculate :

- i. Variable cost per unit.
- ii. Profit Volume Ratio.
- iii. Break-Even Point (in units)
- iv. Profit if the firm operates at 75% of the capacity.

Question 38 Maxim Ltd. manufactures a product "N-joy". In the month of August 2014, 14,000 units of the product "N-joy" were sold, the details are as under:

| | (₹) |
|--------------------|----------|
| Sale Revenue | 2,52,000 |
| Direct Material | 1,12,000 |
| Direct Labour | 49,000 |
| Variable Overheads | 35,000 |
| Fixed Overheads | 28,000 |

A forecast for the month of September 2014 has been carried out by the General manger of Maxim Ltd. As per the forecast, price of direct material and variable overhead will be increased by 10% and 5% respectively.

Required to calculate:

(a) Number of units to be sold to maintain the same quantum of profit that made in August 2014.

(b) Margin of safety in the month of August 2014 and September 2014.

Question 39The Laila shoe company sells five different styles of ladies chappals with identical purchase costs and selling price. The company is trying to find out the profitability of opening another store, which will have the following expenses and revenues :-

| | Per Pair (Rs.) |
|-----------------------|----------------|
| Selling Price | 30.00 |
| Variable Costs | 19.50 |
| Salesmen's commission | <u>1.50</u> |
| Total variable costs | 21.00 |

Annual Fixed expenses are:-

| Total | 3,60,000 |
|----------------------|---------------|
| Other Fixed Expenses | <u>20,000</u> |
| Advertising | 80,000 |
| Salaries | 2,00,000 |
| Rent | 60,000 |

Required:

a) Calculate the annual break even points in units and in value. Also determine the profit or loss if 35,000 pairs of chappals are sold.

b) The sales commissions are proposed to be discontinued but instead a fixed amount of Rs. 90,000 is to be incurred in fixed salaries. A reduction in selling price of 5% is also proposed. What will be the break even points in units.

c) It is proposed to pay manager 50 paise per pair as further commission. The selling price is also proposed to be increased by 5%. What would be the break even point in units.

d) Refer to the original data, if the store manager were to be paid 30 paise commission on each pair of chappal sold in excess of the break even point, What would be the store's net profit if 50,000 pair of chappals were sold?

Note :- Consider each part of question separately

Question 40 If P/V ratio is 60% and the Marginal cost of the product is ₹ 20. What will be the selling price?

Question 41 SK Lit. is engaged in the manufacture of tyres. Analysis of income statement indicated a profit of ₹ 150 lakhs on a sales volume of 50,000 units. The fixed costs are ₹ 850 lakhs which appears to be high. Existing selling price is

₹3,400 per unit. The company is considering to revise the profit target to ₹ 350 lakhs. You are required to compute –

- (i) Break- even point at existing levels in units and in rupees.
- (ii) The number of units required to be sold to earn the target profit.
- (iii) Profit with 15% increase in selling price and drop in sales volume by 10%.
- (iv) Volume to be achieved to earn target profit at the revised selling price as calculated in (iii) above, if a reduction of 8% in the variable costs and ₹ 85 lakhs in the fixed cost is envisaged.

Question 42 Mr. X has ₹ 2,00,000 investments in his business firm. He wants a 15 per cent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 per cent of sales, his fixed costs are ₹ 80,000 per year. Show computations to answer the following questions:

- (i) What sales volume must be obtained to break even?
- (ii) What sales volume must be obtained to get 15 per cent return on investment?
- (iii) Mr. X estimates that even if he closed the doors of his business, he would incur ₹ 25,000 as expenses per year. At what sales would he be better off by locking his business up?

Question 43 A company has three factories situated in north, east and south with its Head Office in Mumbai. The management has received the following summary report on the operations of each factory for a period:

(₹ in ₹000)

| Sales | | Profit | |
|--------|-------------|--------|--------------|
| Actual | Over/(Under | Actual | Over/(Under) |

| | |) Budget | | Budget |
|-------|-------|-------------|-----|--------|
| North | 1,100 | (400) | 135 | (180) |
| East | 1,450 | 150 | 210 | 90 |
| South | 1,200 | (200) | 330 | (110) |

Calculate for each factory and for the company as a whole for the period :

- a) The Actual fixed costs.
- b) Break-even sales.

Question 44 WONDER LTD. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

| Activity Level | 50% | 100% | |
|-----------------------------------|--------|--------|-------|
| Sales and production (units) | 400 | 800 | |
| | ₹lakhs | ₹lakhs | |
| Sales | 8.00 | | 16.00 |
| Production costs: | | | |
| Variable | 3.20 | | 6.40 |
| Fixed | 1.60 | | 1.60 |
| Selling and administration costs: | | | |
| Variable | 1.60 | | 3.20 |
| Fixed | 2.40 | | 2.40 |

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold.

Required

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?

- (b) What would be the under/over-recovery of overheads during the period?
- (c) What would be the profit using absorption costing?
- (d) What would be the profit using marginal costing?

Question 45 ABC Ltd. is operating at 80 % capacity and presents the following information:

| Break-even Sales | ₹400 crores |
|------------------|-------------|
| P/V Ratio | 30 % |
| Margin of Safety | ₹120 crores |

Management has decided to increase production to 95 % capacity level with the following modifications:

- (i) The selling price will be reduced by 10%.
- (ii) The variable cost will be increased by 2% on sales
- (iii) The fixed costs will increase by ₹ 50 crores, including depreciation on additions, but excluding interest on additional capital.

Additional capital of ₹ 100 crores will be needed for capital expenditure and working capital.

Required:

(i) Indicate the sales figure, with the working, that will be needed to earn ₹ 20 crores over and above the present profit and also meet 15% interest on the additional capital. (ii) What will be the revised Break-even Sales, P/V Ratio and Margin of Safety

Question 46 A single product company sells its product at ₹ 60 per unit. In 2013, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹ 3,60,000 and the variable cost ratio to sales was 80%.

In 2014, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

- (i) Find the selling price required to be fixed in 2014 to earn the same P/V ratio as in 2013.
- (ii) Assuming the same selling price of ₹ 60 per unit in 2014, find the number of units required to be produced and sold to earn the same profit as in 2013.

Question 47 PQR Ltd. has furnished the following data for the two years :

| | 2013 | 2014 |
|--|------------------|------------|
| Sales Profit/Volume Ratio (P/V ratio) Margin of Safety sales as a % of total | ₹8,00,000 50% | ? 37.5% |
| sales | 40% | 21.875% |

There has been substantial savings in the fixed cost in the year 2014 due to the restructuring process. The company could maintain its sales quantity level of 2013 in 2014 by reducing selling price.

You are required to calculate the following:

- (i) Sales for 2014 in Rupees,
- (ii) Fixed cost for 2014,

(iii) Break-even sales for 2014 in Rupees.

Question 48 The overhead expenses of a factory producing a single article at different operating levels are as follows:

| Works | 80% | 100% | 60% | 120% |
|----------|------------|------------|------------|--------------|
| Overhead | | | | |
| Works | Rs. 72,000 | Rs. 80,000 | Rs. 66,000 | Rs. 1,00,000 |
| Overhead | | | | |

At Present the factory is working at 60% operating level and its annual sales amount to Rs. 2,88,000. Selling prices have been based on 100% capacity and have the following relationship with costs at this level:

Factory Cost 66.67% of sales value

Prime Cost 75% of the factory cost.

Administrative and selling expenses (of which 75% is variable) 20% of sales value

The management receives an offer for carrying out some work for another company valued at Rs. 66,000 per annum which will take 40% of the capacity. The prime cost for the work is estimated at Rs. 40,000. There will be an addition of Rs. 3,000 per annum to administrative expenses.

The sale manager estimates that the sales of the company's own product will increase to 80% of capacity by the time new order materialises. Calculate the profits on current production. Give your views, supported by figures, on the advisability of accepting the new work.

Question 49 A company currently operating at 80% capacity has the following particulars :

| Sales | Rs. 32,00,000 |
|--------------------|---------------|
| Direct materials | Rs. 10,00,000 |
| Direct labour | Rs. 4,00,000 |
| Variable overheads | Rs. 2,00,000 |
| Fixed overheads | Rs. 13,00,000 |

An export order has been received that would utilise half the capacity of factory. The order cannot be split i.e. it has either to be taken in full and executed at 10% below the normal domestic prices or rejected totally. The alternatives available to the Management are :

- Reject the order and continue with the domestic sales only (as at present) OR
- 2. Accept the order, split capacity between overseas and domestic sales and turn away excess domestic demand OR
- 3. Increase capacity so as to accept the export order and maintain the present domestic sales by:
 - a. Buying an equipment that will increase capacity by 10%. This will result in an increase of Rs. 1,00,000 in fixed costs and
 - b. Work overtime to meet balance of required capacity. In that case, labour will be paid at one and half times the normal wage rate.

Prepare a comparative statement of profitability and suggest the best alternatives.

Question 50 The budgeted income statement by product lines of multi-products ltd. For year 2016 is as follows:-

| | Product A (₹) | Product B (₹) | Product C (₹) |
|----------|---------------|---------------|---------------|
| Sales | 2,00,000 | 5,00,000 | 3,00,000 |
| Variable | | | |

| Expenses: | | | |
|--------------------|--------|----------|----------|
| Cost of goods sold | 90,000 | 2,70,000 | 1,50,000 |
| Selling Expenses | 30,000 | 90,000 | 45,000 |
| Fixed Expenses: | | | |
| Overhead | 36,000 | 90,000 | 54,000 |
| Administrative | 16,000 | 40,000 | 24,000 |
| Income before tax | 28,000 | 10,000 | 27,000 |
| Income tax @ | 11,200 | 4,000 | 10,800 |
| 40% | | | |
| Net Income | 16,800 | 6,000 | 16,200 |

All products are manufactured in same facilities under common administrative control. Fixed expenses are allocated among the products in proportion to their budgeted sales value.

- 1. Compute the budgeted break-even point of the company as a whole from the data provided.
- What would be the effect on budgeted income if half of budgeted sales volume of product B were shifted to product A & C in equal rupee amounts so that the total budgeted sales in rupees remain the same.
- 3. What would be the effect of the shift in the product-mix suggested in (2) above on the budgeted break-even point of the whole company ?

Question 51 From the following particulars, find the most profitable product mix and prepare a statement of profitability of that product mix:-

| | Product A | Product B | Product C |
|-------------------------------|-----------|-----------|-----------|
| Units budgeted to be produced | 1,800 | 3,000 | 1,200 |
| and sold | | | |
| Selling price per unit (₹) | 60 | 55 | 50 |
| Requirement per unit: | | | |

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| Direct Materials | 5 kg | 3 kg | 4 kg |
|------------------------------------|---------|---------|---------|
| Direct labour | 4 hours | 3 hours | 2 hours |
| Variable overheads (₹) | 7 | 13 | 8 |
| Fixed overheads (₹) | 10 | 12 | 5 |
| Cost of direct material per kg (₹) | 4 | 4 | 4 |
| Direct labour hour rate (₹) | 2 | 2 | 2 |
| Maximum possible units of sales | 4,000 | 5,000 | 1,500 |

All the three products are produced from the same direct material using same type of machines and labours. Direct labour, which is the key factor, is limited to 18,600 hours.

Question 52 A manufacturer with an overall capacity (inter-changeable among the products) of 1,00,000 machine hours has been so far producing a standard mix of A, B and C as 15,000 units, 10,000 units and 10,000 units respectively. On experience, the total expenditure exclusive of his fixed charges found to be Rs. 2,09,000 and the variable costs ratio among the products is 1 : 1.5 : 1.75 respectively per unit. The fixed charges comes to Rs. 2.00 per unit. When the unit selling prices are Rs. 6.25 for A, Rs. 7.50 for B and Rs. 10.50 for C, he incurs loss.

He desires to change the product mix as under:-

| | <u>MIX 1</u> | <u>MIX 2</u> | <u>MIX 3</u> |
|---|--------------|--------------|--------------|
| Α | 18,000 | 15,000 | 22,000 |
| В | 12,000 | 6,000 | 8,000 |
| С | 7,000 | 13,000 | 8,000 |

As an accountant, which mix would you recommend?

Question 53 A firm can produce three different products from the same raw material using the same production facilities. The requisite labour is available in

plenty at Rs. 8 per hour for all products. The supply of raw material, which is imported at Rs. 8 per kg., is limited to 10,400 kgs for the budget period. The variable overheads are Rs. 5.60 per hour. The fixed overheads are Rs. 50,000. The selling commission is 10% on sales.

a) From the following information, you are required to suggest the most suitable sales mix, which will maximize the firm's profits. Also determine the profit that will be earned at that level:-

| Product | market | Selling price | Labour hours | Raw material |
|---------|---------|---------------|--------------|--------------|
| | demand | per unit (₹) | required per | required per |
| | (units) | | unit (₹) | unit (Kg.) |
| X | 8,000 | 30 | 1 | 0.7 |
| Y | 6,000 | 40 | 2 | 0.4 |
| Z | 5,000 | 50 | 1.5 | 1.5 |

b) Assume, in above situation, if additional 4,500 kgs of raw material is made available for production. Should the firm go in further production, if it will result in additional fixed overheads of Rs. 20,000 and 25% increase in the rates per hour for labour and variable overhaeds.

Question 54 A company produces three products. The general manager has prepared the following draft budget for the next year.

| | Product A | Product B | Product C |
|------------------------|-----------|-----------|-----------|
| No. of units | 30,000 | 20,000 | 40,000 |
| Selling price per unit | 40 | 80 | 20 |
| (₹) | | | |
| P/V Ratio | 20% | 40% | 10% |
| Raw material cost as | 40% | 35% | 45% |
| a % of sales value | | | |
| Maximum Sales | 40,000 | 30,000 | 50,000 |
| potential in Units | | | |

The company incurs Rs. 1,00,000 per annum towards fixed cost. The company uses the same raw material in all the three products and the price of raw material is Rs. 2 per kg.

The draft budget makes full utilization of the available raw material which is in short supply. The managing director is not satisfied with the budgeted profitability and hence he has passed on the aforesaid draft budget to you for review. **Required:**

- 1) Set an optimal product mix for the next year and finds its profit.
- 2) The company has been able to locate a source for purchase of additional material 20,000 kgs at an enhanced price. The transport cost for the additional raw material is Rs. 10,000. What is the maximum price per kg.which can offered by the company for additional supply of raw material.

Question 55 ABC Ltd. Produces three products A, B and C from the same manufacturing facilities. The cost and other details of the three products are as follows:-

| | Product A | Product B | Product C |
|------------------------------|-----------|-----------|-----------|
| Selling price per unit (Rs.) | 200 | 160 | 100 |
| Variable cost per unit (Rs.) | 120 | 120 | 40 |
| Maximum production per | 5,000 | 8,000 | 6,000 |
| months in units | | | |
| Maximum demand per | 2,000 | 4,000 | 2,400 |
| month in units | | | |

Fixed expenses for the month is Rs. 2,76,000. The total processing hours available for the month cannot be increased beyond 200 hours. With these available 200 hours, only one of these three products can be produced at maximum level.

You are required to:-

a) Compute the most profitable product-mix;

b) Compute the overall break-even sales of the company for the month based on the mix calculated in (a) above.

Question 56 Kalyan university conducts a special course on "Computer Applications" for a month during summer. For this purpose, it invites applications from graduates. An entrance test is given to the candidates and based on the same, a final selection of a 100 candidates is made. The entrance test consists of four objective type of examinations and is spread over four days, one examination per day. Each candidate is charged a fee of Rs. 50 for taking up the entrance test. The following data was gathered for the past 2 years:-

Kalyan University

Statement of net revenue from the entrance test for the course on "Computer Application"

| | 2015 | 2016 |
|--|----------|----------|
| Gross Revenue (Fees Collected) (A) | 1,00,000 | 1,50,000 |
| Costs:- | | |
| Valuation | 40,000 | 60,000 |
| Question Booklets | 20,000 | 30,000 |
| Hall Rent at Rs. 2,000 per day | 8,000 | 8,000 |
| Honorarium to chief administrative | 6,000 | 6,000 |
| Supervision charges (One supervisor | 4,000 | 6,000 |
| every | | |
| 100 candidates at the rate of Rs. 50 per c | | |
| General administrative expenses | 6,000 | 6,000 |
| Total Cost (B) | 84,000 | 1,16,000 |
| Net Revenue (A – B) | 16,000 | 34,000 |

You are required to compute :-

a) The budgeted net revenue if 4,000 candidates take up the entrance test in 2017.

- b) The break-even number of candidates.
- c) The number of candidates to be enrolled if the net income desired to be Rs. 20,000.

Solution to Question 1:

Working Note 1:- Calculation of COGS COGS= DM + DL+ Fixed O/H + General & Administrative O/H x= 0.3x + 0.15x + 0.10x + 2,30,000 + 0.02x + 71,000 x= 7,00,000Working Note 2:- Calculation of COS COS = COGS + Selling & Distribution O/H x = 7,00,000 + 0.04x + 68,000x= 8,00,000

Working Note 3:- Calculation of Variable & Fixed Cost

| Elements of Cost | Variable Cost | Fixed Cost |
|---------------------------------|---------------|------------|
| Direct Material | 2,10,000 | - |
| Direct Labour | 1,05,000 | - |
| Fixed O/H | 70,000 | 2,30,000 |
| General & Administrative O/H | 14,000 | 71,000 |
| Selling & Distribution O/H | 32,000 | 68,000 |
| Total | 4,31,000 | 3,69,000 |

Working Note 4:- Marginal Cost Equation & PV Ratio

| Sales | 9,25,000 |
|-----------------|------------|
| - Variable cost | (4,31,000) |
| Contribution | 4,94,000 |
| - Fixed Cost | (3,69,000) |
| Profit | 1,25,000 |

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}} \times 100$ = $\frac{4,94,000}{9,25,000} \times 100 = 53.41\%$ (a) BEP Sales = $\frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{3,69,000}{53.41\%} = 6,90,882$ (b) Profit = Rs. 1,25,000 (as per Working Note 4) (c) MOS (%) = $\frac{\text{MOS}}{\text{Sales}} \times 100$ $=\frac{9,25,000-6,90,882}{9,25,000} X 100$ = 25.31%

(d) Profit at less than 10% sales = Contribution – Fixed cost = Sales x P/v Ratio - Fixed cost = 9,25,000 X $\frac{90}{100}$ X $\frac{53.41}{100}$ – 3,69,000 = 75,638

Solution to Question 4:

Working Note 1:- Calculation of Variable O/h per unit & Fixed O/H

Variable O/H per unit = $\frac{\Delta \text{ in total Fixed O/H}}{\Delta \text{ in units}}$ $= \frac{23,70,000-22,00,000}{18,000 \text{ units}-16,000 \text{ units}} = 85 \text{ per unit}$

Fixed O/H = Total Fixed O/H – Total Variable Factory O/H

= 22,00,000 - 16,000 X 85

= 8,40,000

Statement Showing total cost at 24,000 units

| Particulars | Amount (Rs) |
|--|-------------|
| Direct Material (24,000 units X | 19,20,000 |
| $\frac{\text{Rs.12,80,000}}{16,000 \text{ units}}$ | |
| Direct Labour (24,000 units X | 26,40,000 |
| $\frac{\text{Rs.17,60,000}}{16,000 \text{ units}}$ | |
| Variable factor O/ H (24,000 X Rs. 85) | 20,40,000 |
| Fixed Factory O/H | 8,40,000 |
| Total Cost | 74,40,000 |
| + Profit (¹ / ₄ of Sales = 1/3 of cost) | 28,80,000 |
| Total Sales | 99,20,000 |

Selling Price per unit = $\frac{\text{Total Sales}}{\text{Total units}} = \frac{99,20,000}{24000 \text{ units}} = \text{Rs. 413.34 per unit}$

Solution to Question 6:

Working Note 1 :- Calculation of Sales, Profit/ loss & P/V ratio

| | 8,000 units | 20,000 units |
|--------|-----------------------------------|----------------------------------|
| Sales | Rs. 1,20,000 (8000 units X Rs. 15 | Rs. 3,00,000 (20,000 units X Rs. |
| | per unit) | 15 per unit) |
| Profit | (40,000) (8000 units X Rs.5 per | Rs. 80,000 (20000 units X Rs.4 |
| | unit) | per unit) |

P/V Ratio =
$$\frac{\Delta PFT}{\Delta Sales} X 100 = \frac{80,000 - (40,000)}{3,00,000 - 1,20,000} X 100 = 66.66 \%$$

Working Note 2 :- Marginal Cost equation at 8,000 units

| | Amount (Rs) |
|-----------------|-------------------------------|
| Sales | 1,20,000 |
| - Variable Cost | (40,000) (balancing figure) |
| Contribution | 80,000 (66.66%) |
| - Fixed Cost | (1,20,000) (balancing figure) |
| Profit | (40,000) |

Contribution per unit =
$$\frac{\text{Rs.80,000}}{8,000 \text{ units}}$$
 = Rs.10 per unit
BEP Sales = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$ = $\frac{1,20,000}{66.66\%}$ = Rs. 1,80,000
BEP Units = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$ = $\frac{1,20,000}{10}$ = 12,000 units

SOLUTION TO QUESTION 8:-

(1) Given :- MOS = Rs. 2,40,000 (40 % of Sales)

Hence, total sales = $\frac{\text{Rs.2,40,000}}{40\%}$ = Rs. 6,00,000

- (a) BEP Sales = Rs. 6,00,000 Rs. 2,40,000 = = Rs. 3,60,000
- (b) Profit = $\frac{\text{Contribution}}{\text{Sales X PV Ratio}}$ Fixed Cost = Rs. 9,00,000 X 30% - Rs. 1,08,000 = Rs. 1,62,000

Fixed Cost = BEP Sales X P/V Ratio

= 3,60,000 X 30%

= Rs. 1,08,000

(2) Calculation of P/V Ratio & Marginal Cost Equation

| | Amount (Rs) |
|-----------------|-------------|
| Sales | 8,00,000 |
| - Variable Cost | (6,00,000) |
| Contribution | 2,00,000 |
| - Fixed Cost | (50,000) |
| Profit | 1,50,000 |

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$ X 100 = $\frac{\text{Rs.2,00,000}}{\text{Rs.8,00,000}}$ X 100 = 25% MOS = $\frac{\text{PFT}}{\text{PV Ratio}}$ = $\frac{\text{Rs.1,50,000}}{25\%}$ = Rs. 6,00,00

SOLUTION TO QUESTION 10

 $MOS = \frac{PFT}{PV \text{ Ratio}} = \frac{Rs.30,000}{20\%} = Rs. 1,50,000$ $P/V \text{ Ratio} = \frac{Sales - Variable Cost}{Sales} X 100 = \frac{10-8}{10} X 100 = 20\%$

Solution to Q 11:-

Income statement under Marginal costing approach

| Particulars | Amount |
|---------------------------------|--------|
| | (Rs.) |
| Variable (Direct Material Cost) | |

| Variable (Direct Labour Cost) | |
|--|-------------|
| Variable (Direct Expenses) | |
| Variable Factory OH | |
| Variable manufacturing cost of Quantity | 1,28,00,000 |
| Produced 320000 units x Rs. 40 | |
| Add:- Opening FG 40000 units x Rs.40 | 16,00,000 |
| Less:- Closing FG 50000 units x Rs. 40 | (20,00,000) |
| Variable manufacturing cost of Quantity | 1,24,00,000 |
| Sold | |
| Add:- Variable Selling OH 310000 units x Rs.12 | 37,20,000 |
| Variable Cost of Sales (A) | 1,61,20,000 |
| Sales (B) | 2,48,00,000 |
| Contribution (B – A) | 86,80,000 |
| Less:- Fixed Factory OH | 24,00,000 |
| Fixed Office and Admin OH | NIL |
| Fixed Selling & Distribution OH | 16,00,000 |
| Profit | 46,80,000 |

Income statement under Absorption costing approach

| Particulars | Amount |
|--|-------------|
| | (Rs.) |
| Variable (Direct Material Cost) | |
| Variable (Direct Labour Cost) | |
| Variable (Direct Expenses) | |
| Variable Factory OH | |
| Total 320000 units x Rs. 40 | 1,28,00,000 |
| Fixed Factory OH <u>absorbed</u> 320000 units x Rs.6 | 19,20,000 |
| Total manufacturing cost of Quantity Produced | 1,47,20,000 |

| Add:- Opening FG 40000 u | nits x Rs.46 | 18,40,000 |
|------------------------------|-----------------------|-------------|
| Less:- Closing FG 50000 u | nits x Rs. 46 | (23,00,000) |
| Total manufacturing cost | of Quantity Sold | 1,42,60,000 |
| Add:- Variable Selling & Dis | st. OH 310000 units x | 37,20,000 |
| Rs.12 | | 16,00,000 |
| Fixed Selling and Dist. OH | | |
| Add:- Under absorbed OH | Actual OH incurred – | 4,80,000 |
| OH absorbed) | | |
| 24,00,000 - 19,20,000 | | |
| Less:- Over absorbed OH (| OH absorbed – Actual | |
| OH incurred) | | |
| Total Cost of Sales | (A) | 2,00,60,000 |
| Sales | (B) | 2,48,00,000 |
| Profit | (B – A) | 47,40,000 |

Solution to Question 12:

(i) Statement of Calculation of Profit

| | Amount (Rs) (in lacs) |
|--|-----------------------|
| Sales (36,000 units X Rs. 1925 per unit) | 693.00 |
| Variable Cost (36,000 units X Rs. 1100 per unit) | (396.00) |
| Contribution | 297.00 |
| - Fixed Cost | (202.50) |
| Profit | 94.50 |

Old Sales Volume = 40,000 units New Sales Volume = 40,000 units X 90% = 36,000 units Old Selling Price per unit = $\frac{\text{Rs.700 lacs}}{40,000 \text{ units}}$ = Rs. 1750 per unit New Selling Price per unit = Rs. 1750 per unit X 1.10 = Rs. 1925 per unit Variable Cost per unit = $\frac{\text{Rs.440 lacs}}{40,000 \text{ units}}$ = Rs. 1,100 per unit (ii) Desired Sales (units) = $\frac{\text{Fixed Cost+PFT}}{\text{Contribution per unit}}$

 $= \frac{\text{Rs.202.50 lacs} + \text{Rs.57.50 lacs}}{\text{Rs.584 per unit}} = 44,521 \text{ units}$

New Contribution per unit = Selling Price – New Variable Cost per unit = Rs. 1750 – (Rs. 1,100 per unit + $\frac{\text{Rs.264 lacs}}{40,000 \text{ units}} \times 10\%$)

= Rs. 584 per unit

Solution to Question 17 :-

(i) P/V Ratio =
$$\frac{\Delta PFT}{\Delta Sales} X 100 = \frac{Rs.13,000 - Rs.8,000}{Rs.1,40,000 - Rs.1,20,000} X 100 = 25\%$$

Working Note 1:- Marginal Cost Equation (2014)

| | Amount (Rs) |
|-----------------|-----------------------------|
| Sales | 1,40,000 |
| - Variable Cost | (1,05,000) |
| Contribution | 35,000 (25% PV Ratio) |
| - Fixed Cost | (22,000) (balancing figure) |
| Profit | 13,000 |

(ii)
$$BEP = \frac{Fixed Cost}{PV Ratio} = \frac{Rs.22,000}{25\%} = Rs. 88,000$$

(iv) Desired Sales = $\frac{\text{Fixed Cost+PFT}}{\text{PV Ratio}} = \frac{\text{Rs.22,000+Rs.12,000}}{25\%} = \text{Rs. 1,36,000}$

MOS (2014) = $\frac{PFT}{PV \text{ Ratio}} = \frac{13,000}{25\%}$ = Rs. 52,000

Solution to Question 18 :

= Rs. 2,00,000 X 25% - Rs.40,000 = Rs. 10,000

P/V ratio = ?

Fixed Cost = BEP X P/V ratio 40,000 = 1,60,000 X P/V ratio P/V Ratio = 25%

(ii) Profit = Sales X P/V Ratio – Fixed Cost
 10,000 = sales X 50% - 20,000
 Sales = Rs. 60,000

P/ V ratio = ? Fixed Cost = = BEP X P/V ratio 20,000 = 40,000 X P/V ratio P/V Ratio = 50%

Solution to Question 19:

Working note 1:- Calculation of sales, variable cost , contribution & fixed cost of at 100%.

| Particulars | Factory 1 (in Rs. lacs) | Factory 2 (in Rs. lacs) | Merged Plant at 100% (in Rs. lacs) |
|-------------------|----------------------------|----------------------------|--|
| Sales | 300 | 200 | 500 |
| (-) Variable Cost | (220) | (150) | (370) |
| Contribution | 80 | 50 | 130 |
| (-) Fixed Cost | (40) | (20) | (60) |
| Profit | 40 | 30 | 70 |

(i) Capacity at Break- Even Point = $\frac{\text{Required Sales}}{\text{Total sales}} \times 100$

 $=\frac{230.69 \ lacs}{500 \ lacs} \times 100 = 46.15\%$

Required sales (BEP) = $\frac{\text{Fixed Cost}}{\text{PV ratio}}$ = $\frac{60 \text{ lacs}}{26\%}$ = 230.69 lacs P/V Ratio = $\frac{Contribution}{selling \text{ price}}$ x 100 = $\frac{130 \text{ lacs}}{500 \text{ lacs}}$ x 100 = 26% (ii) Profit at 75% Capacity :- Total Sales at 75% X P/V Ratio – Fixed Cost

i al 75% Capacity - Total Sales al 75% × P/V Ratio – Fixed

= 1000 lacs X 75% X 26% - 60 lacs

= 37.50 lacs

Solution to Question 21:

| Working note | 1:- Calculation | of overall | Contribution | per unit |
|--------------|-----------------|------------|--------------|----------|
|--------------|-----------------|------------|--------------|----------|

| Product | Selling | Variable | Contribution | Qty | Overall contribution |
|---------|---------|----------|--------------|-----|----------------------|
| | price | cost | | Mix | per unit |
| Р | 100 | 50 | 50 | 20% | 10 |
| Q | 80 | 40 | 40 | 30% | 12 |
| R | 50 | 20 | 30 | 50% | 15 |
| Total | | | | | Rs. 37 per unit |

(i) Overall BEP (units) = $\frac{\text{Fixed Cost}}{\text{Overall Contribution per unit}} = \frac{14,80,000}{37} = 40,000 \text{ units}$

(ii) Break up of Composite BEP Units

P :- 20% of 40,000 units = 8,000 units Q:- 30% of 40,000 units = 12,000 units Q:- 50% of 40,000 units = 20,000 units Total = 40,000 units

Solution to Question 22:

Working Note 1:- Marginal Cost Equation

| | Amount (Rs) |
|-----------------|-----------------------------|
| Sales | 3,00,000 |
| - Variable Cost | (1,50,000) |
| Contribution | 1,50,000 (balancing figure) |

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| - Fixed Cost | (90,000) |
|--------------|----------|
| Profit | 60,000 |

P/V ratio = $\frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{1,50,000}{3,00,000} \times 100 = 50\%$

(i) Sales Volume =
$$\frac{\text{Fixed Cost}-\text{Loss}}{\text{PV Ratio}} = \frac{90,000-30,000}{50\%} = \text{Rs. } 1,20,000$$

(ii) MOS Sales = $\frac{PFT}{PV ratio} = \frac{90,000}{50\%} = Rs. 1,80,000$

Solution to Question 23:

Working Note 1:- Variable cost to Sales ratio = 60%

So, P/V Ratio = 100% - 60% = 40%

(a) BEP =
$$\frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{30,000}{40\%}$$
 = Rs. 75,000

(c) MOS =
$$\frac{PFT}{PV ratio} = \frac{10,000}{40\%} = Rs. 25,000$$

Solution to Question 25:

(a) BEP= $\frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{1,50,000}{30-15} = 10,000 \text{ units}$

(b) Desired Sales Value =
$$\frac{\text{Fixed Cost+PFT}}{\text{PV ratio}}$$

 $= \frac{1,50,000+20,000}{50\%} = \text{Rs. } 3,40,000$ P/V Ratio = $\frac{\text{Contribution per unit}}{\text{Sales per unit}} \times 100 = \frac{15}{30} \times 100 = 50\%$

Solution to Question 26:

N = 18000 units and O = 9000 units

Ratio of N:O = 2:1

Calculation of contribution per unit

| Particulars | Ν | 0 |
|-----------------------------|-----------|-------|
| Selling price per unit | 15 | 18 |
| Less variable cost per unit | (4.50) | (9) |
| Contribution per unit | Rs. 10.50 | Rs. 9 |

Assume x units of "O" is produced then 2x units of "N" shall be produced.

At BEP, Contribution = Fixed cost

2x units x Rs. 10.50 + x units x Rs. 9 = Rs. 15000

X = 500

Hence N = 1000 units and O = 500 units

Solution to Question 29:

Let 4x be no. of units of J

Then 3x shall be no. of units of K

BEP Units $x = \frac{Fixed Cost}{Contribution} = \frac{3,08,000}{4X40+3X20} = 1400 units$ BEP (Units) for Product J is $4x = 4 \times 1400 = 5600$ units BEP (Units) for Product K is 3x = 3 X 1400 = 4200 units

Solution to Question 30 :-

| income statement under Marginal costing approach | | |
|--|---------|--|
| Particulars | Amount | |
| | (Rs.) | |
| Variable (Direct Material Cost) 24000 units x | 384000 | |
| Rs.16 | | |
| Variable (Direct Labour Cost) 24000 units x | 1296000 | |
| Rs.54 | | |
| Variable (Direct Expenses) | NIL | |
| | | |

In a sure statement we den Menninel sosting som see

| Variable Factory OH 24000 units x Rs.12 + Rs. 20000 | 308000 |
|---|------------|
| Variable manufacturing cost of Quantity | 19,88,000 |
| Produced | |
| Add:- Opening FG | NIL |
| Less:- Closing FG 2500 units | (2,07,083) |
| Variable manufacturing cost of Quantity | 17,80,917 |
| Sold | |
| Add:- Variable Selling & Admin OH 21500 units | 4,30,000 |
| x Rs.20 | |
| Variable Cost of Sales (A) | 22,10,917 |
| Sales (B) | 36,12,000 |
| Contribution (B – A) | 14,01,083 |
| Less:- Fixed Factory OH 432000 - 48000 | 384000 |
| Fixed Office and Admin OH | 760000 |
| Fixed Selling & Distribution OH | |
| Profit | 257083 |

Income statement under Absorption costing approach

| Particulars | | Amount |
|---|---------------|-----------|
| | | (Rs.) |
| Variable (Direct Material Cost) | | 384000 |
| Variable (Direct Labour Cost) | | 1296000 |
| Variable (Direct Expenses) | | NIL |
| Variable Factory OH | | 308000 |
| Fixed Factory OH absorbed 24000 ι | inits x Rs.18 | 432000 |
| Total manufacturing cost of Quant | ity Produced | 2420000 |
| Add:- Opening FG | | NIL |
| Less:- Closing FG 2500 units | | (252083) |
| Total manufacturing cost of Quantity Sold | | 21,67,917 |
| Add:- Variable Selling & Admin OH 2 | 1500 units x | 430000 |
| Rs.20 | | 760000 |
| Fixed Selling and Admin OH | | |
| Add:- Under absorbed OH (Actual OH incurred – | | (48000) |
| OH absorbed) | | |
| Less:- Over absorbed OH (OH absor | bed – Actual | |
| OH incurred) | | |
| Total Cost of Sales (A) | | 33,09,917 |
| Sales (B) | | 36,12,000 |
| Profit (B – A |) | 302083 |

Reason for difference in profit

| Particulars | Amount (Rs.) |
|---|--------------|
| Profit under marginal costing | 2,57,083 |
| Add:- Opening stock Over-valued in marginal costing | |
| Closing stock under valued in marginal costing | 45000 |
| Less:- Opening stock Under-valued in marginal costing | NIL |
| Closing stock over valued in marginal costing | |
| Profit under absorption costing | 3,02,083 |

W.Note 1:- closing stock = 24000 units - 21500 units = 2500 units

Solution to Question 32:

| Working Note 1: | - Marginal Cost Equation |
|-----------------|--------------------------|
|-----------------|--------------------------|

| | Amount (Rs) (1 st half) | Amount (Rs) (2 nd half) |
|--------------------|---------------------------------------|-------------------------------------|
| Sales | 15,00,000 | 6,00,000 |
| - Variable Cost | (7,50,000) | (3,00,000) |
| Contribution | 7,50,000 | 3,00,000 |
| - Fixed Cost | (4,50,000) | (4,50,000) |
| Profit | 3,00,000 | (1,50,000) |

(i) P/V ratio
$$(1^{st} half) = \frac{Contribution}{Sales} X 100 = \frac{7,50,000}{15,00,000} X 100 = 50\%$$

BEP $(1^{st} half) = \frac{Fixed Cost}{PV Ratio} = \frac{4,50,000}{50\%} = Rs. 9,00,000$
MOS $(1^{st} half) = \frac{PFT}{PV Ratio} = \frac{3,00,000}{50\%} = Rs. 6,00,000$
(ii) Sales volume $(2^{nd} half) = \frac{Fixed Cost-Loss}{PV Ratio} = \frac{4,50,000-1,50,000}{50\%} = Rs. 6,00,000$
(iii) BEP (Whole year) = $\frac{Fixed Cost}{PV Ratio} = \frac{4,50,000 X 2}{50\%} = Rs. 18,00,000$
MOS (Whole year) = $\frac{PFT}{PV Ratio} = \frac{3,00,000-1,50,000}{50\%} = Rs. 3,00,000$

Solution to Question 34:

Working note 1:- Calculation of P/V ratio

| | A S Co. | B.S Co |
|-----------|--|--|
| P/V Ratio | $\frac{5,00,000-4,00,000}{5,00,000} \times 100 = 20\%$ | $\frac{\frac{6,00,000-4,00,000}{6,00,000}}{6,00,000} \times 100 = 33.33\%$ |

(i) Profit of AS Co. = Sales X P/V ratio - Fixed cost

= sales X 20% - 30,000

Profit of BS Co. = Sales X P/V ratio - Fixed cost

= sales X 33.33% - 70,000

If profit of both company are to be same then:-

sales X 20% - 30,000 = sales X 33.33% - 70,000

40,000 = 0.1333 sales

Sales = Rs. 3,00,000

2-

| Situation | Greater profit earning co. |
|-----------|---|
| Low dd. | AS Co. (low fixed cost) |
| | |
| High dd. | BS Co. (high P/V ratio i.;e low variable cost to sales ratio) |
| | |

Solution to Question 36:

(i) MOS = 40%

BEP = (100% - 40%) of total sales = 60% of total sales = 60% X 5,00,000

= Rs. 3,00, 000

Working Note 1:- Marginal Cost Equation

| | Amount (Rs) |
|-------|-------------|
| Sales | 5,00,000 |

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| - Variable Cost | (2,50,000) |
|-----------------|----------------|
| Contribution | 2,50,000 (50%) |
| - Fixed Cost | (1,50,000) |
| Profit | 1,00,000 |

(MOS X P/V ratio) = 5,00,000 X 40% X 50%

(ii) Desired Sales Value = $\frac{\text{Fixed Cost+PFT}}{\text{PV ratio}}$ $x = \frac{1,50,000+0.10 \text{ x}}{50\%}$ x = Rs. 3,75,000Or, Selling Price per unit = Rs. 1,000

Units assumed = x

 $1000 \text{ x} = \frac{1,50,000 + 1,000 \text{ x} \text{ x} 0.10}{50\%}$

x = 375 units

Solution to Question 37:

(i) Variable Cost per unit = $\frac{\Delta \text{ Total cost}}{\Delta \text{ Units}} = \frac{45,60,000-34,40,000}{1,20,000 \text{ Units}-80,000 \text{ units}} = \text{Rs. 28 per unit}$

Working Note 1:- Marginal Cost Equation

| | Amount (Rs) (|
|---|---------------|
| Sales (80,000 units X Rs 40 per unit) | 32,00,000 |
| - Variable Cost (80,000 units X Rs 28 per unit) | (22,40,000) |
| Contribution | 9,60,000 |
| - Fixed Cost | (12,00,000) * |
| Loss | (2,40,000) |

Fixed Cost = Total Cost – Variable cost

= Rs. 34,40,000 - (80,000 units X Rs 28 per unit)

= Rs. 12,00, 000

(ii) P/V ratio =
$$\frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{9,60,000}{32,00,000} \times 100 = 30\%$$

(iii) BEP (Rs)= $\frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{12,00,000}{30\%} = \text{Rs. 40,00,000}$

BEP (units) = $\frac{40,00,000}{40}$ = 1,00,000 units

Solution to Question 39:

(a) (i) BEP Units = $\frac{Fixed \ cost}{Contribution \ per \ unit} = \frac{3,60,000}{30-21 \ per \ unit} = 40,000 \ units$

BEP (in value) = 40,000 units X Selling price per unit (Rs. 30)

= Rs. 12,00,000

(ii) Profit at 35,000 pairs sale

| Particulars | Amount (rs) |
|-------------------------------------|-------------|
| Sales (35,000 X Rs. 30) | 10,50,000 |
| (-) Variable Cost (35,000 X Rs. 21) | (7,35,000) |
| Contribution (35,000 X Rs.9) | 3,15,000 |
| (-) Fixed Cost | (3,60,000) |
| Profit | (45,000) |

Hence, loss of Rs. 45,000

(b)

| Particulars | Amount (rs) |
|---|-------------|
| Revised selling price per unit Sales (Rs. 30 X 95%) | 28.50 |
| (-) Revised Variable Cost per unit (excluding commission) | (19.50) |

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| Revised Contribution | per unit | |
|----------------------|----------|--|

BEP Units = $\frac{Fixed \ cost}{Contribution \ per \ unit}$ = $\frac{3,60,000+90,000}{9 \ per \ unit}$ = 50,000 units

| Particulars | Amount (rs) |
|--|-------------|
| Revised selling price per unit Sales (Rs. 30 X 105%) | 31.50 |
| (-) Revised Variable Cost per unit (21+0.50) | (21.50) |
| Revised Contribution per unit | 10.00 |

BEP Units = $\frac{Fixed \ cost}{Contribution \ per \ unit}$ = $\frac{3,60,000}{10 \ per \ unit}$ = 36,000 units

Original data means, BEP = 40,000 units

Contribution per unit = Rs. 9

Contribution per unit = Rs. 9 upto 40,000 units

= Rs. 8.70 (0.30 commission) above 40,000 units

Profit = Contribution – fixed cost

= 40,000 X 9 + 10,000 X 8.70 - 3,60,000

= Rs. 87,000

Solution to Question 40:

If P/V Ratio = 60%

Variable cost per unit of sales price per unit ratio = 100% - 60% = 40%

 $\frac{Variable\ cost\ per\ unit}{Sales\ price\ per\ unit} = 0.40$ $\frac{20}{Sales\ price\ per\ unit} = 0.40$

Selling price per unit = Rs. 50

Solution to Question 43:

Working note 1:-Calculation of Budgeted Profit, Budgeted Sales (in rs'000) and P/V

Ratio

| | Actual | Budgeted | Actual | Budgeted | P/V Ratio* |
|-------|--------|---------------------|--------|-------------------|---|
| | sales | Sales | Profit | Profit | |
| North | 1100 | 1500 (1100+ 400) | 135 | 315 (135+ 180) | ^{315−135} / _{1,500−1100} X 100 = 45% |
| East | 1450 | 1300 (1450- 150) | 210 | 120 (210-90) | ^{210−120} / _{1,450−1300} X 100 = 60% |
| South | 1200 | 1400 (1200+ 200) | 330 | 440 (330 +110) | ^{440−330} / _{1,400−1200} X 100 = 55% |

* P/V Ratio = $\frac{\text{Difference between budgeted profit & actual profit}}{\text{Difference between budgeted sales & actual sales}} X 100$

(i) Calculation of Fixed Cost in (Rs. '000)

Fixed Cost = Actual Sales X P/V Ratio - Actual Profit

North = 1100 X 45% - 135 = 360

East = 1450 X 60% - 210 = 660

South = 1200 X 55% - 330 = 330

Total Fixed Cost = 1350

(ii) Calculation of BEP Sales (in Rs. '000)

 $BEP (Rs) = \frac{Fixed Cost}{PV Ratio}$ North = 360 ÷ 45% = 800 East = 660 ÷ 60% = 1100 South = 330 ÷ 55% = 600 Total = 2500

Solution to Q.44:-

Working Note 1:- Calculation to closing stock units

| Particulars | Units |
|---------------|-------------|
| Opening stock | NIL |
| Add Produced | 220 units |
| Less Sold | (160 units) |
| Closing Stock | 60 units |

Working Note 2:-

| Variable production cost per unit | $\frac{Rs.3,20,000}{400 \text{ units}}$ = Rs. 800 per unit |
|---------------------------------------|---|
| Variable selling & Dist cost per unit | $\frac{Rs.160,000}{400 \text{ units}}$ = Rs. 400 per unit |
| Selling price per unit | $\frac{Rs.1600,000}{800 \text{ units}}$ = Rs. 2000 per unit |
| Fixed production cost per quarter | $\frac{Rs.160,000}{4 \ Qtr}$ = Rs. 40,000 |
| Fixed Selling & Dist OH per quarter | $\frac{Rs.240,000}{4 \ Qtr}$ = Rs. 60,000 |
| Fixed production OH per unit | $\frac{Rs.160,000}{800 \text{ units}}$ = Rs. 200 per unit |

(d) Income statement under Marginal costing approach

Particulars

Amount

| | (Rs.) |
|---|--|
| Variable (Direct Material Cost) | |
| Variable (Direct Labour Cost) | |
| Variable (Direct Expenses) | |
| Variable Factory OH | |
| Variable manufacturing cost of Quantity | 176000 |
| Produced | |
| 220 units x Rs.800 | |
| Add:- Opening FG | NIL |
| Less:- Closing FG 60 units x Rs.800 | (48,000) |
| | |
| Variable manufacturing cost of Quantity | 1,28,000 |
| Variable manufacturing cost of Quantity Sold | 1,28,000 |
| Variable manufacturing cost of QuantitySoldAdd:- Variable Selling OH 160 units x Rs.400 | 1,28,000 64,000 |
| Variable manufacturing cost of QuantitySoldAdd:- Variable Selling OH 160 units x Rs.400Variable Cost of Sales (A) | 1,28,000 64,000 1,92,000 |
| Variable manufacturing cost of QuantitySoldAdd:- Variable Selling OH 160 units x Rs.400Variable Cost of Sales(A)Sales(B) | 1,28,000 64,000 1,92,000 3,20,000 |
| Variable manufacturing cost of Quantity Sold Add:- Variable Selling OH 160 units x Rs.400 Variable Cost of Sales (A) Sales (B) Contribution (B – A) | 1,28,000 64,000 1,92,000 3,20,000 1,28,000 |
| Variable manufacturing cost of Quantity Sold Add:- Variable Selling OH 160 units x Rs.400 Variable Cost of Sales (A) Sales (B) Contribution (B – A) Ess:- Fixed Factory OH | 1,28,000 64,000 1,92,000 3,20,000 1,28,000 40000 |
| Variable manufacturing cost of Quantity Sold Add:- Variable Selling OH 160 units x Rs.400 Variable Cost of Sales (A) Sales (B) Contribution (B – A) Less:- Fixed Factory OH Fixed Office and Admin OH | 1,28,000 64,000 1,92,000 3,20,000 1,28,000 40000 |
| Variable manufacturing cost of Quantity Sold Add:- Variable Selling OH 160 units x Rs.400 Variable Cost of Sales (A) Sales (B) Contribution (B – A) Less:- Fixed Factory OH Fixed Office and Admin OH Fixed Selling & Distribution OH | 1,28,000 64,000 1,92,000 3,20,000 1,28,000 40000 60000 |

(c) Income statement under Absorption costing approach

| Particulars | Amount |
|---------------------------------|--------|
| | (Rs.) |
| Variable (Direct Material Cost) | |
| Variable (Direct Labour Cost) | |
| Variable (Direct Expenses) | |
| Variable Factory OH | |

| Total 220 units x Rs.800 | 176000 | |
|---------------------------------|---------------------|----------|
| Fixed Factory OH absorbed | 44,000 | |
| Total manufacturing cost o | f Quantity Produced | 2,20,000 |
| Add:- Opening FG | | NIL |
| Less:- Closing FG 60 units | | (60000) |
| Total manufacturing cost o | f Quantity Sold | 160000 |
| Add:- Variable Selling & Dist. | OH 160 units x | 64,000 |
| Rs.400 | | 60000 |
| Fixed Selling and Dist. OH | | |
| Add:- Under absorbed OH (A | ctual OH incurred – | |
| OH absorbed) | | (4000) |
| Less:- Over absorbed OH (O | H absorbed – Actual | |
| OH incurred) | | |
| (40000 – 44000) | | |
| Total Cost of Sales | (A) | 2,80,000 |
| Sales | (B) | 3,20,000 |
| Profit | (B – A) | 40,000 |

(a) Fixed production cost absorbed

- = Actual production in units x Fixed production overhead per unit
- = 220 units x Rs. 200 per unit = Rs. 44,000
- (b) Fixed Production Overheads absorbed = Rs. 44,000
 - Actual Fixed production overheads = Rs. 40,000
 - Over absorbed Overheads = Rs. 44,000 40,000 = Rs. 4,000

Solution to Question 45:

Working Note 1:- Marginal Cost Equation

Amount (Rs)

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| Sales | 520 crs (BEP + MOS) | | |
|-------------------|--|--|--|
| Less - Variable | (364 crs) (70% of P/V Ratio) | | |
| Cost | | | |
| Contribution | 156 crs (30% P/v ratio) | | |
| Less - Fixed Cost | (120 crs) (BEP X P/V Ratio) (balancing figure) | | |
| Profit | 36 crs (MOS X P/V Ratio) | | |

Assume Sales Price per unit is Rs. 100

| Existing Selling | Rs. 100 | Revised Selling Price per | Rs. 90 (10% |
|-------------------|------------|---------------------------|-------------------|
| Price per unit | (assume) | unit | reduced) |
| Existing Variable | Rs.70 | Revised Variable Cost per | 72% of sales = Rs |
| Cost per unit | (balancing | unit | 64.80 (2 % |
| | figure) | | increase but 2% |
| | | | on sales) |
| Existing | Rs. 30 | Revised contribution per | Rs. 25.20 |
| contribution per | (30% P/V | unit | |
| unit | Ratio) | | |
| | | Revised P/V ratio | 28% |

(i) Required Sales figure =
$$\frac{\text{Revised Fixed Cost+Revised PFT}}{\text{Revised PV Ratio}}$$

$$=\frac{185 \text{ crs}+56 \text{ crs}}{28\%}$$
 = Rs. 860.71 crs

Revised Fixed Cost = Existing fixed cost + additional cost + interest on additional

capital

= 120 crs +50 crs +100 crs X 15%

= 185 crs

Revised profit = existing profit + incremental profit

= 36 crs +20 crs = 56 crs

(ii) (a) Revised BEP Sales = $\frac{\text{Revised Fixed Cost}}{\text{Revised PV Ratio}} = \frac{\text{Rs.185 crs}}{28\%} = \text{Rs660.71 crs}$

(b) Revised P/V Ratio = 28% (Working note 1)

(c) Revised MOS = Revised Total Sales – revised BEP Sales

= 860.71 crs - 660.71 crs

= Rs. 200 crs

Or, $\frac{\text{Revised PFT}}{\text{Revised PV Ratio}} = \frac{56 \text{ crs}}{28\%} = \text{Rs. 200 crs}$

Solution to Question 46:

Working Note 1:- Marginal Cost Equation

| Particulars | Unit | Rate per unit | Amount (Rs) |
|----------------|-------------------------|---------------|-------------|
| Sales | 50,000 (working Note 2) | 60 | 30,00,000 |
| (-) Variable | 50,000 (working Note 2) | 48 | (24,00,000) |
| Cost | | | |
| Contribution | 50,000 (working Note 2) | 12(20% P/V | 6,00,000 |
| | | Ratio) | |
| (-) Fixed Cost | | | (3,60,000) |
| Profit | | | 2,40,000 |

Variable cost to sales ratio = 80%.

Hence, P/V ratio = 100% -80% = 20%

Working note 2:- Calculation of Units sold in 2013:-

 $\mathsf{BEP} = \frac{\mathsf{Fixed Cost}}{\mathsf{Contribution per unit}} = \frac{3,60,000}{12} = 30,000 \text{ units}$

MOS = 40% Hence, BEP (units) = 100% - 40% = 60% of total sales 60% X Total Sales = 30,000 units Total sales = 50,000 units

(i) P/V Ratio = $\frac{Contribution \ per \ unit}{Selling \ price \ per \ unit}$

Assume selling price per unit = Rs. x

$$0.20 = \frac{x - 48 (1 + 10\%)}{x}$$

0.20 x = x- 52.8
x = Rs. 66

(ii) Desired Sales (units) = $\frac{\text{Fixed Cost+PFT}}{\text{Contribution per unit}} = \frac{3,60,000 (1.05)+2,40,000}{\text{Rs.60-Rs.48 (1.10)}}$ = $\frac{\text{Rs. 6,18,000}}{\text{Rs7.20}}$ = 85,834 units

Solution to Question 47:

Working Note 1:- Marginal Cost Equation

| | 2013 | 2014 |
|--------------|-----------------------------|-----------------------------------|
| MOS Sales | 3,20,000 (40% of sales) | 1,40,000 (21.875%) |
| + BEP Sales | 4,80,000 (balancing figure) | 5,00,000 (balancing figure) |
| Total Sales | 8,00,000 | 6,40,000 (Note 2)(|
| (-) Variable | (4,00,000) (balancing | (4,00,000) (same as 2013- Note 1) |
| cost | figure) | |
| Total | 4,00,000 (50% P/V Ratio) | 2,40,000 (balancing figure) |
| contribution | | |

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| (-) Fixed Cost | (2,40,000) (BEP X P/V | (1,87,500) (BEP X P/V Ratio) |
|----------------|-----------------------|--------------------------------|
| | Ratio) | |
| Profit | 1,60,000 (MOS Sales X | 52,500 (MOS Sales X P/V Ratio) |
| | P/V Ratio) | |

Note 1:- In 2014, total variable cost will be same since sales quantity level of 2013 & 2014 is same.

Note 2:- If in 2014, P/V Ratio = 37.5%Hence, Variable cost to sales = 100% = 37.5% = 62.5% $\frac{4,00,000}{\text{Total sales}} = 62.5\%$

Total sales = Rs. 6,40,000

(i) Sales (2014) = Rs. 6,40,000 (working note 1)
(ii) Fixed Cost (2014) = Rs. 1,87,500 (working note 1)
(iii) BEP (2014) = Rs. 5,00,000 (working note 1)

Solution to Question 48:

Working Note 1:- Calculation of all cost on the basis of 100% sales Current sales at 60% capacity = Rs. 2,88,000 Sales at 100% capacity = Rs. 4,80,000 Factory Cost at 100% = 66.67% of sales at 100% level = 2/3 of Rs. 4,80,000 = Rs. 3,20,000 (at 100%) Prime cost at 100% = 75% of factory cost = 75% of Rs. 3,20,000 = Rs. 2,40,000 Alternatively prime cost calculation: -Prime cost + factory O.H (100% capacity)= factory cost Prime cost + rs. 80,000 = Rs. 3,20,000 Prime cost = Rs. 2,40,000 Admin O/H = 20% of sales

= 20% of Rs. 4,80,000

= Rs. 96,000 Variable Admin O/H = 96,000 X 75% = Rs. 72,000 (at 100%) Fixed Admin O/H = 96,000 X 25% = Rs. 24,000

(i) Profit statement at Current Production (60%)

| Particulars | Amount (Rs) |
|-----------------------------|-------------|
| (a) Sales | 2,88,000 |
| (b) Cost of Sales:- | |
| Prime Cost (2,40,000 X 60%) | 1,44,000 |
| + Factory O/H (60%) (given) | 66,000 |
| Factory Cost | 2,10,000 |
| + Admin O/H :- | |
| Fixed | 24,000 |
| Variable (72,000 X 60%) | 43,200 |
| Total cost of sales | 2,77,200 |
| (c) Profit (a-b) | 10,800 |

(ii) Now existing capacity will increase to 80% as given in question. At the same time, under is received for 40% capacity. Hence, total capacity shall be 80% + 40% = 120%.

So, company has to decide whether to work for 80% or 120%.

| | Alternative 1 (80% | Alternative 2 (120% |
|-----------------------|--------------------------|--------------------------|
| | capacity) | capacity with new order) |
| (a) Sales - existing | 3,84,000 (4,80,000 X80%) | 3,84,000 (4,80,000 X80%) |
| + Special order | - | 66,000 |
| Total sales | 3,84,000 | 4,50,000 |
| (b) Cost of Sales:- | | |
| Prime Cost - Existing | 1,92,000 (2,40,000 X | 1,92,000 (2,40,000 X |
| | 80%) | 80%) |
| Prime Cost – Special | - | 40,000 |

| order | | |
|------------------|-----------------------|------------------------|
| + Factory O/H | 72,000 (given) | 1,00,000 (given) |
| + Admin O/H :- | | |
| Fixed | 24,000 | 24,000 |
| Variable | 57,600 (72,000 X 80%) | 86,400 (72,000 X 120%) |
| Other fixed cost | - | 3,000 |
| Total cost | 3,45,600 | 4,45,400 |
| (c) Profit (a-b) | 38,400 | 4,600 |

Advice:- Order should not be accepted since profit will come down to Rs.4,600 from Rs.38,400.

Solution to Q.49:- At Present, Company is operating at 80% capacity hence 20% surplus capacity is available. Company have 3 alternatives as below:-

Alternative 1:- Reject order and operate at 80% capacity.

<u>Alternative 2</u>:- Accept export order for 50% capacity and use balance 50% for domestic sales.

<u>Alternative 3</u>:- Enhance capacity by 50% for capacity export order and operate at 130% capacity (80% capacity plus 50% capacity)

10% capacity will be increased by buying equipment

20% capacity will be increased by working overtime

Converting all cost and sales figure at 100% capacity = $\frac{\text{Figures to 80\% capacity}}{80\% \text{ capacity}}$

| Particulars | At 80% capacity | At 100% capacity |
|--------------------|-----------------|--|
| Sales | 32,00,000 | $40,00,000 \ \left(\frac{Rs.32,00,000}{80\%}\right)$ |
| Direct materials | 10,00,000 | 12,50,000 |
| Direct Labour | 4,00,000 | 5,00,000 |
| Variable Overheads | 2,00,000 | 2,50,000 |

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| Fixed Overheads 13,00,000 13,00,000 (Will remained) | ain same) |
|---|-----------|
|---|-----------|

Profit Statement

| Particulars | Alternative 1 | Alternative 2 | Alternative 3 |
|------------------------|---------------|-------------------|-------------------|
| Domestic Sales | 32,00,000 | 20,00,000 | 32,00,000 |
| | | (40,00,000 x 50%) | |
| Export Sales | | 18,00,000 | 18,00,000 |
| | | (40,00,000 x 50% | |
| | | x 90% (Reduction | |
| | | in price) | |
| Total Sales | 32,00,000 | 38,00,000 | 50,00,000 |
| <u>Costs</u> | | | |
| Direct Materials | 10,00,000 | 12,50,000 | 16,25,000 |
| | | | (12,50,000 x |
| | | | 130%) |
| Direct Labour | 4,00,000 | 5,00,000 | 7,00,000 (W. Note |
| | | | 1) |
| Variable | 2,00,000 | 2,50,000 | 3,25,000 |
| Overheads | | | (2,50,000 x 130%) |
| Fixed Overheads | 13,00,000 | 13,00,000 | 13,00,000 + |
| | | | 1,00,000 |
| Total Cost | 29,00,000 | 33,00,000 | 40,50,000 |
| <u>Profit</u> (Sales – | 3,00,000 | 5,00,000 | 9,50,000 |
| Costs) | | | |

Working Note 1 :- Labour cost at 130% working

| Particulars | Amount (Rs.) |
|--------------------------------|--------------|
| Labour cost upto 100% capacity | 5,00,000 |

| Add:- Labour cost for next 10% capacity | 50,000 (5,00,000 x 10%) |
|---|--|
| (New machine will be used) | |
| Add:- Labour cost for next 20% capacity | 1,50,000 (5,00,000 x 20% x 1.5 times) |
| (Labour cost 1.5 times) | |
| Total Labour Cost | 7,00,000 |

Advice:- Work at 130% capacity level hence accept work order and use new machine.

Solution to Question 50 :

(a) Total Sales = 200000 + 500000 + 300000 = 1000000 Cost of goods sold = 90000 + 270000 + 150000 = 510000 Variable selling expenses = 30000 + 90000 + 45000 = 165000 Contribution = 1000000 - 510000 - 165000 = 325000

P/V Ratio = $\frac{325000}{1000000}$ x 100 = 32.5%

Fixed cost = Fixed mfd. OH + Fixed Adm. OH = 36000 + 90000 + 54000 + 16000 + 40000 + 24000 = 260000

BEP Sales = $\frac{260000}{32.5\%}$ = Rs. 8,00,000

| W.Note 1:- Calculation of % of different cost w.r.t. to sales val |
|---|
|---|

| Product | Sales | COGS | COGS as % of Sales | Selling Cost | Selling cost as % of Sales |
|---------|--------|--------|-----------------------|-----------------|----------------------------------|
| A | 200000 | 90000 | 45% | 30000 | 15% |
| В | 500000 | 270000 | 54% | 90000 | 18% |
| С | 300000 | 150000 | 50% | 45000 | 15% |

W.Note 2:- Calculation of % of Fixed mfd OH and Fixed Adm. OH to Total Sales

Fixed Mfd OH (in % of Sales) = $\frac{36000+90000+54000}{200000+500000+300000}$ x 100 = 18%

Fixed Adm. OH (In % of Sales) = $\frac{16000+40000+24000}{1000000}$ x 100 = 8%

(b) Statement showing impact on budgeted income if 50% of sales of product B is shifted to product A and C equally.

| Particulars | Product A | Product B | Product C | Total |
|-----------------------------------|-----------|-----------|-----------|----------|
| Sales | 200000 | 500000 | 300000 | 1000000 |
| Adjustment of Sales Transfer | 125000 | -250000 | 125000 | |
| Total Sales | 325000 | 250000 | 425000 | 1000000 |
| Less V. Cost | | | | |
| COGS (45%, 54%, 50%) | (146250) | (135000) | (212500) | (493750) |
| Selling Exp.(15%, 18%, 15%) | (48750) | (45000) | (63750) | (157500) |
| Contribution | 130000 | 70000 | 148750 | 348750 |
| Less Fixed Mfd OH (18%) | (58500) | (45000) | (76500) | (180000) |
| Less Fixed Adm (8%) | (26000) | (20000) | (34000) | (80000) |
| Profit | 45500 | 5000 | 38250 | 88750 |
| Less Tax 40% | (18200) | (2000) | (15300) | (35500) |
| PAT | 27300 | 3000 | 22950 | 53250 |

(c) Revised P/V Ratio = $\frac{348750}{1000000}$ x 100 = 34.875% Revised BEP Sales = $\frac{260000}{34.875\%}$ = Rs. 7,45,520 BEP Reduced

Solution to Q.51:-

Working Note 1:- Available Labour hours for budgeted production

|--|

| | Production (Units) | unit (hours) | hours |
|-------|--------------------|--------------|--------------|
| A | 1800 units | 4 | 7,200 hours |
| В | 3000 units | 3 | 9,000 hours |
| С | 1200 units | 2 | 2,400 hours |
| Total | | | 18,600 hours |

Note:- Even if total labour hours are not given in questions still we can find it as above.

Working Note 2:- Calculation of Fixed Overheads

| Particulars | Production (Units) | Fixed Overhead | Total Fixed |
|-------------|--------------------|----------------|-----------------|
| | | per unit (Rs.) | Overheads (Rs.) |
| A | 1800 units | 10 | 18,000 |
| В | 3000 units | 12 | 36,000 |
| С | 1200 units | 5 | 6,000 |
| Total | | | 60,000 |

The amount of fixed overheads will remain same even if company charges the product mix.

Statement showing Rank

| Particulars | А | В | С |
|---|-----------|-----------|-----------|
| Selling price per unit (Rs.) | 60 | 55 | 50 |
| Less:- Variable cost per unit | | | |
| Direct material @ Rs. 4 per kg | (20) | (12) | (16) |
| Direct labour @ Rs. 2 per labour hour | (8) | (6) | (4) |
| Variable overheads | (7) | (13) | (8) |
| Contribution (Selling Price – Variable Cost per unit) | <u>25</u> | <u>24</u> | <u>22</u> |
| Labour hours per unit (Hours) | 4 | 3 | 2 |

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| Contribution per labour hour (Rs.) | 6.25 | 8 | 11 |
|------------------------------------|------|---|----|
| Rank | | | |

Allocation of available 18,600 labour hours

| Rank | Product | Max. | Hour per | Required | Allotment |
|-------|---------|---------|----------|----------|------------|
| | | demand | unit | Labour | of labour |
| | | (Units) | | hours | hours |
| 1 | С | 1500 | 2 hour | 3,000 | 3000 hour |
| | | | | hours | |
| II | В | 5000 | 3 hour | 15,000 | 15000 hour |
| | | | | hours | |
| III | A | 4000 | 4 hour | 16,000 | 600 hour |
| | | | | hors | (Balance |
| | | | | | Fig) |
| Total | | | | 34,000 | 18,600 |
| | | | | hours | hours |

Maximum possible production of A = $\frac{600 \text{ hours}}{4 \text{ hour per unit}}$ = 150 units

Product Mix = A = 150 units

B = 5000 units

C = 1500 units

Statement of profitability

| Particulars | Units | Contribution per | Total Contribution | |
|-------------|-----------|------------------|--------------------|--|
| | | unit (Rs.) | (Rs.) | |
| А | 150 units | 25 | 3,750 | |

| В | 5000 units | 24 | 1,20,000 |
|-----------------|------------|----|----------|
| С | 1500 units | 22 | 33,000 |
| Total | | | 1,56,750 |
| Less Fixed Cost | | | (60,000) |
| Profit | | | 96,750 |

Solution to Question 54:

(1) Calculation of available quantity of raw material (Based on budget)

| Product | Selling price per unit (Rs.) | Material cost (%) | Material cost (Rs.) | Mat. Requirement per unit@Rs. 2 per kg | Sales budget | Raw material (Qty) |
|---------|---------------------------------------|----------------------|---------------------------|--|-----------------|--------------------------|
| A | 40 | 40% | 16 | 8 kg | 30000 units | 240000 kg |
| В | 80 | 35% | 28 | 14 kg | 20000 units | 280000 kg |
| С | 20 | 45% | 9 | 4.50 kg | 40000 units | 180000 kg |
| Total | | | | | | 700000 kg |

Total available raw material = 700000 kg

(2) Statement showing Rank

| Particulars | A | В | С |
|---------------------------------|-------|----------|----------|
| Selling price per unit | 40 | 80 | 20 |
| P/V Ratio | 20% | 40% | 10% |
| Contribution per unit | 8 | 32 | 2 |
| Material required per unit (Kg) | 8 kg | 14 kg | 4.50 kg |
| Contribution per kg | Rs. 1 | Rs. 2.29 | Rs. 0.44 |

| Rank | I | 1 | |
|------|---|---|--|
| | | | |

(3) Allocation of available 700000 kg material

| Product | Rank | Demand | Material required per unit | Required material | Allotted material |
|---------|------|--------|----------------------------------|-------------------|----------------------|
| A | II | 40000 | 8 kg | 320000 kg | 280000 kg (bal.) |
| В | I | 30000 | 14 kg | 420000 kg | 420000 kg |
| С | | 50000 | 4.50 kg | 225000 kg | |
| Total | | | | | 700000 Kg |

possible production of A = $\frac{280000 \ kg}{kg}$ = 35000 units

Best production mix

A = 35000 units B = 30000 units Profit = Contribution – Fixed Cost = (35000 units x Rs.8 + 30000 units x Rs.2) – 100000 = 11,40,000

(2a) Total demand of product A = 40000 units Less existing supply of A = (35000 units) Balance demand = 5000 units
Possible production with additional 20000 kg = ^{20000 kg}/_{8 kg} = 2500 units
Selling price of A = Rs. 40 Less Contribution = (Rs.8)
Variable Cost per unit = Rs. 32 Less Material cost (8 kg x Rs. 2) = (Rs. 16)
Other variable cost per unit = <u>Rs. 16u</u>
Sale value of 2500 units of A= Max cost of material + freight + other variable cost +

Sale value of 2500 units of A= Max cost of material + freight + other variable cost + additional fixed cost + profit
2500 units x Rs. 40 = Max. Material cost + 10000 + (2500 units x Rs. 16)
Max. material cost = Rs. 50000

Max offer price per kg = $\frac{Rs.50000}{20000 \ kg}$ = Rs. 2.50 per kg

Solution to Question 55:

Limited available processing hours = 200 hours

With these available hours, only one product can be produced for maximum production quantity.

(1)

| Product | Production | Hours | Hour per unit |
|---------|------------|-----------|--|
| A | 5000 kg | 200 hours | 1/25 hour per unit $\left(\frac{200 \text{ hours}}{5000 \text{ units}}\right)$ |
| Or B | 8000 kg | 200 hours | 1/40 hour per unit |
| Or C | 6000 kg | 200 hours | 1/30 hour per unit |

Statement showing rank

| Particulars | A | В | С |
|-----------------------------|-----------|--------------------|--------------------|
| Selling price per unit | 200 | 160 | 100 |
| Less variable cost per unit | (120) | (120) | (40) |
| Contribution per unit | 80 | 40 | 60 |
| Hour per unit | 1/25 hour | 1/40 hour per unit | 1/30 hour per unit |
| Hourly contribution Rs. | 2000 | 1600 | 1800 |
| Rank | I | III | II |

Allocation of available 200 hours

| Product | Rank | Max. demand | HR Per unit | Required | Allotted |
|---------|------|-------------|-----------------------|-----------|--------------------|
| | | units | | hours | hours |
| A | I | 2000 units | 1/25 hour per unit | 80 hours | 80 hours |
| В | | 4000 units | 1/40 hour per unit | 100 hours | 40 hours (Bal.) |
| С | II | 2400 units | 1/30 hour per unit | 80 hours | 80 hours |
| | | | | 260 hours | 200 hours |

Possible production of B = $\frac{40 \text{ hours}}{1/40 \text{ hour per unit}}$ = 1600 units

Best MIX

A = 2000 units

- B = 1600 units
- C = 2400 units

(2) calculation of sales and contribution

| Product | Qty | Selling | Contribution | Total Sales | Total |
|---------|------------|-------------|--------------|-------------|--------------|
| | | price (Rs.) | per unit | (Rs.) | Contribution |
| | | | (Rs.) | | (Rs.) |
| A | 2000 units | 200 | 80 | 400000 | 160000 |
| В | 1600 units | 160 | 40 | 256000 | 64000 |
| С | 2400 units | 100 | 60 | 240000 | 144000 |
| Total | | | | 896000 | 368000 |

P/V Ratio = $\frac{368000}{896000}$ x 100 = 41.07% BEP Sales = $\frac{276000}{41.07\%}$ = Rs. 6,72,000