**Paper- 15: MANAGEMENT ACCOUNTING – ENTERPRISE PERFORMANCE MANAGEMENT**

**Time Allowed: 3 Hours** **Full Marks: 100**

**The figures in the margin on the right side indicate full marks.**
**Attempt Question No. 1 (carrying 25 marks), which is compulsory and any five more questions (each carrying 15 marks) from the rest.**

**Please: (i) Answer all part of a question at one place only.**
**(ii) Open a new page for answer to a new question.**
**Working Notes should form part of the answer.**
**Whenever necessary, suitable assumptions should be made and indicated in answer by the candidates.**

**1 (a). State whether the following statements given below are 'True' or 'False'. If True, simply rewrite the given statement (1 mark). If False, state it as False (½ mark) and rewrite the correct statement (½ mark): [1x5]**

**(i) Shared belief does not ensure greater commitment of the employee to the organization.**
**(ii) Break Even Chart is dynamic.**
**(iii) Quality Circle is a group of employees who formally meet together.**
**(iv) Variable Cost is also known as Indirect Cost.**
**(v) Balanced Score card is a new approach to Strategic Management and was developed by Joseph Maciariello and Calvin Kirby.**

**(b) Match Column I with Column II: [½x10=5]**

| Column I | | Column II | |
|---|---|---|---|
| (i) | A Chase Strategy | A. | is price led |
| (ii) | Value Analysis | B. | most significant development in Business Management |
| (iii) | Life Cycle Costing | C. | Critical part in HR Plg. process |
| (iv) | Supply Chain's emergence | D. | Process of analyzing empirical data |
| (v) | Decision Tree | E. | Vogel's Approximation Method |
| (vi) | Succession Planning | F. | Technique of last resort |
| (vii) | Transportation Model | G. | implies matching demand and capacity period by period |
| (viii) | Target Costing | H. | Rolling-Back Technique |
| (ix) | Simulation Model | I. | assists mgmt. in decision-making |
| (x) | Data Mining | J. | Cost Reduction |

**(c) Expand the following abbreviation:** **[1×5]**

**(i) FAST**
**(ii) FMECA**
**(iii) CER**
**(iv) EMS**
**(v) CPOF**

**(d) Define the following terms:** **[1×5]**

**(i) Generic Benchmarking**
**(ii) Six Sigma**
**(iii) Sensitivity Analysis**
**(iv) Seiso**
**(v) Cybernetics**

**(e) Fill in the blanks with the most appropriate words out of the options indicated in the bracket against each statement:** **[1×5]**

**(i) Management Control System (MCS) is a set of _____ (inter/intra) related communication.**
**(ii) The idea behind Lean/JIT is a concept called_____ (idle/ideal) production.**
**(iii) The Master Production Schedule is divided into units of time called _____ (Drums/Buckets).**
**(iv) A Customer FAST diagram is usually applied to_____ (average/total) product.**
**(v) Business Process Perspective refers to_____(internal/external) business processes.**

**Answer to 1 (a):**

**(i) False**: Shared belief ensures greater commitment of the employee to the organization

**(ii) False:** Break Even Chart is Static.

**(iii) False:** Quality Circle is a group of employees, who voluntarily and informally meet together.

**(iv) False:** Variable Cost is also known as Direct Cost.

**(v) False:** Balanced Scorecard is a new approach to Strategic Management and was developed by Robert Kaplan and David Norton.

**Answer to 1 (b):**

| Column-1 | | Column-II | |
|---|---|---|---|
| (i) | A Chase Strategy | G | implies matching demand & capacity period by period. |
| (ii) | Value Analysis | J | Cost Reduction |
| (iii) | Life Cycle Costing | I | assists mgmt. in decision making. |
| (iv) | Supply Chain's emergence | B | Most significant development in Business |

| | | | |
|---|---|---|---|
| | | | Management. |
| (v) | Decision Tree | H | Rolling -Back Technique. |
| (vi) | Succession Planning | C | critical part of HR Plg., process |
| (vii) | Transportation Model | E | Vogel's Approximation Method. |
| (viii) | Target Costing | A | is price-led |
| (ix) | Simulation Model | F | Technique of last resort |
| (x) | Data Mining | D | Process of analyzing empirical data |

**Answer to 1 (c):**

**(i) FAST:** Functional Analysis System Techniques.

**(ii) FMECA:** Failure Mode, Effects, Criticality Analysis

**(iii) CER:** Cost Estimating Relationships

**(iv) EMS:** Environmental Management System.

**(v) CPOF:** Capacity Planning using Overall Factors.

**Answer to 1 (d):**

**(i) Generic Benchmarking:** is an application of functional benchmarking that compares a particular business function at two or more organizations, selected without regard to their industry.

**(ii) Six Sigma:** is a set of practices to systematically improve processes by eliminating defects.

**(iii) Sensitivity Analysis:** is to ascertain the impact on final profitability by taking specific changes in each critical factor. Thus, if the company is to operate in a highly competitive market, with many rivals, sales volume and price will be critically important.

**(iv) Seiso:** means 'clean-up'. It means undertaking up the job of cleaning. Such cleaning is not restricted merely to the machines, table, kitchen, cabinet, etc., It should be extended to the entire surroundings.

**(v) Cybernetics:** is a term derived from the Greek letter "Kybernetes" which means 'Steersman'. A Steersman is a person, who directs a ship and corrects deviations from planned course of action, as they occur.

**Answer to 1 (e):**

**(i)** Management Control System (MCS) is a set of inter related communication.

**(ii)** The idea behind Lean/JIT is a concept called ideal production.

**(iii)** The Master Production Schedule is divided into units of time called Buckets.

**(iv)** A Customer FAST diagram is usually applied to total product.

**(v)** Business Process Perspective refers to internal business processes.

**2. (a) A factory engaged in manufacturing plastic buckets is working at 40% capacity and produces 10,000 buckets per month. The present cost break-up for one bucket is as under :**

| | |
|---|---|
| **Materials** | **₹20** |
| **Labour** | **₹6** |
| **Overheads** | **₹10 (60% fixed)** |

**The selling price is ₹ 40 per bucket. If it is decided to work the factory at 50% capacity, the selling price falls by 3%. At 90% capacity, the selling price falls by 5% accompanied by a similar fall in the price of materials.**

**You are required to prepare a statement showing the profits at 50% and 90% capacities and also determine the break-even points at each of these production levels. [5]**

**(b) A book store wishes to carry 'Ramayana' in stock. Demand is probabilistic and replenishment of stock takes 2 days (i.e. if an order is placed on March 1, it will be delivered at the end of the day on March 3). [10]**

**The probabilities of demand are given below**

| Demand (daily) | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Probability | 0.05 | 0.10 | 0.30 | 0.45 | 0.10 |

**Each time an order is placed, the store incurs an ordering cost of ₹ 10 per order. The store also incurs a carrying cost of ₹ 0.50 per book per day. The inventory carrying cost in calculated on the basis of stock at the end of each day.**
**The manager of the bookstore wishes to compare two options for his inventory decision.**
**Order 5 books when the inventory at the beginning of the day plus order outstanding is less than 8 books.**
**Order 8 books when the inventory at the beginning of the day plus order outstanding is less than 8.**
**Currently (beginning 1st day) the store has a stock of 8 books plus 6 books ordered two days ago and expected to arrive next day.**
**Using Monte-Carlo Simulation for 10 cycles, recommend, which option the manager, should choose.**
**The two digits random numbers are given below:**
**89 34 70 63 61 81 39 16 13 73**

**Answer to 2 (a):**

**Flexible budget**

| Capacity level | 40% Present | 50% | 90% |
|---|---|---|---|
| Production and sales (units) | 10,000 | 12,500 | 22,500 |
| Selling price (₹) | 40.00 | 38.80 | 38.00 |
| Sales (a) | 4,00,000 | 4,85,000 | 8,55,000 |
| Variable cost | | | |
| Materials @ ₹20 | 2,00,000 | 2,50,000 | 4,27,500 |
| Labour @ ₹6 | | 75,000 | 1,35,000 |

| | | | |
|---|---|---|---|
| | 60,000 | | |
| Variable overheads (₹10 x 40/100) | 40,000 | 50,000 | 90,000 |
| Total (b) | 3,00,000 | 3,75,000 | 6,52,500 |
| Contribution (a) – (b) | 1,00,000 | 1,10,000 | 2,02,500 |
| **Less:** Fixed overheads (₹ 10 x 60/100 x 10,000 units | 60,000 | 60,000 | 60,000 |
| Profit | 40,000 | 50,000 | 1,42,500 |
| Contribution per unit | 10.00 | 8.80 | 9.00 |
| Breakeven point (units) = Fixed Overhead / Contribution per unit | 6,000 | 6,818 | 6,677 |

**Answer 2 (b):**

| Random No. Range Table | | | |
|---|---|---|---|
| **Demand** | **Probability** | **Cumulative Probability** | **Range** |
| 0 | 0.05 | 0.05 | 0-4 |
| 1 | 0.10 | 0.15 | 5-14 |
| 2 | 0.30 | 0.45 | 15-44 |
| 3 | 0.45 | 0.90 | 45-89 |
| 4 | 0.10 | 1.00 | 90-99 |

**Option - A**

| Day | R No. | Demand | Option | Stock order | Closing Stock | Order Place |
|---|---|---|---|---|---|---|
| 1 | 89 | 3 | 8 | - | 5 | - |
| 2 | 34 | 2 | 5 | 6 | 9 | - |
| 3 | 70 | 3 | 9 | - | 6 | 0 |
| 4 | 63 | 3 | 6 | - | 3 | 5 |
| 5 | 61 | 3 | 3 | 0 | 0 | - |
| 6 | 81 | 3 | 0 | 5 | 2 | 5 |
| 7 | 39 | 2 | 2 | - | 0 | 5 |
| 8 | 16 | 2 | 0 | 5 | 3 | - |
| 9 | 13 | 1 | 3 | 5 | 7 | - |
| 10 | 73 | 3 | 7 | - | 4 | 5 |
| | | | | | 39+5=44 | |

| | |
|---|---|
| Ordering Cost 4 × 10 | 40 |
| Ordering cost 0.5 × 44 | 22 |
| **Total Cost** | **62** |

**Option – B**

| Day | R No. | Demand | Option | Stock order | Closing Stock | Order Place |
|---|---|---|---|---|---|---|
| 1 | 89 | 3 | 8 | - | 5 | - |
| 2 | 34 | 2 | 5 | 6 | 9 | - |
| 3 | 70 | 3 | 9 | - | 6 | - |
| 4 | 63 | 3 | 6 | - | 3 | 8 |
| 5 | 61 | 3 | 3 | 0 | 0 | - |
| 6 | 81 | 3 | 0 | 8 | 5 | - |
| 7 | 39 | 2 | 5 | - | 3 | 8 |
| 8 | 16 | 2 | 3 | - | 1 | - |
| 9 | 13 | 1 | 1 | 8 | 8 | - |
| 10 | 73 | 3 | 8 | - | 5 | - |
| | | | | | 45 | |

| | |
|---|---|
| Ordering Cost 2 × 10 | 20 |
| Ordering cost 0.5 × 45 | 22.50 |
| **Total Cost** | **42.50** |

Option 'B' is better because it has low Inventory costs.

**3. The marketing Director of a company engaged in the manufacture and sale of a range of products wants to increase the market share and for that purpose proposes to spend ₹ 5,00,000 on advertisement campaign. Two alternative sales budgets have been put forward as under:**

| Products | A | B | C | D |
|---|---|---|---|---|
| **Budget: (Units '000)** | | | | |
| **A: Before advertisement** | **360** | **560** | **520** | **300** |
| **B: After advertisement** | **380** | **590** | **545** | **315** |
| **The selling price on variable cost data are as under:** | | | | |
| **Selling price / unit (₹)** | **20** | **24** | **50** | **42** |
| **Direct materials / unit (₹)** | **8** | **11** | **25** | **21** |
| **Direct labour / unit (₹)** | **3** | **3** | **6** | **5** |
| **Variable overheads / unit (₹)** | **2** | **2** | **4** | **3** |

**Direct labour hour rate is ₹ 5 per hour. Fixed overheads amount to ₹ 51,40,000 per annum. The production capacity is limited to 15,00,000 direct labour hours for the ensuing year. A and C however, could be bought on subcontract basis at ₹ 17 and ₹ 40 per unit respectively for sale.**

**Required:**

**Present a statement showing profitability of the proposed scheme and state whether the investment in the advertisement campaign is worthwhile. [15]**

**Answer to 3.**

**Calculation of contribution P.U.**

| Particulars | A | B | C | D |
|---|---|---|---|---|
| Selling price (i) | 20 | 24 | 50 | 42 |
| Variable cost: | | | | |
| Direct material | 8 | 11 | 25 | 21 |
| Direct Labour | 3 | 3 | 6 | 5 |
| Variable overhead | 2 | 2 | 4 | 3 |
| (ii) | 13 | 16 | 35 | 29 |
| Contribution (i) – (ii) | 7 | 8 | 15 | 13 |
| Direct Labour hours P.U. | 0.6 | 0.6 | 1.2 | 1.0 |
| Contribution per Direct Labour hour | 11.67 | 13.33 | 12.50 | 13.0 |
| **Rank** | **IV** | **I** | **III** | **II** |

**Calculation of Direct labour hours required:**

As per Budget A (Before advertisement)

| | | (Hours) |
|---|---|---|
| A | 3,60,000 units × 0.6 hr. | 2,16,000 |
| B | 5,60,000 units × 0.6 hr. | 3,36,000 |
| C | 5,20,000 units × 1.2 hr. | 6,24,000 |
| D | 3,00,000 units × 1.0 hr. | 3,00,000 |
| | **Total** | **14,76,000** |

As per Budget B (After advertisement)

| | | (Hours) |
|---|---|---|
| A | 3,80,000 units × 0.6 hr. | 2,28,000 |
| B | 5,90,000 units × 0.6 hr. | 3,54,000 |
| C | 5,45,000 units × 1.2 hr. | 6,54,000 |
| D | 3,15,000 units × 1.0 hr. | 3,15,000 |
| | **Total** | **15,21,000** |

Budget B required 51,000 Direct labour hours in excess of 100% capacity of 15,00,000 Direct Labour hours. Therefore, product A or C can be purchased from outside to meet the excess demand.

**Profitability statement (Before advertisement)**

| Particulars | A | B | C | D | Total |
|---|---|---|---|---|---|
| Units | 3,60,000 | 5,60,000 | 5,20,000 | 3,00,000 | |
| Contribution P.U. | 7 | 8 | 15 | 13 | |
| Total contribution | 25,20,000 | 44,80,000 | 78,00,000 | 39,00,000 | 1,87,00,000 |
| Less: Fixed cost profit | | | | | 51,40,000 |
| | | | | | **1,35,60,000** |

**Profitability statement if product C is bought on sub-contract basis for balance hours**

| Particulars | A | B | D | C | C (bought out) | Total |
|---|---|---|---|---|---|---|
| Units | 3,80,000 | 5,90,000 | 3,15,000 | 5,02,500 | 42,500 | --- |
| Direct Labour hrs. P.U. | 0.6 | 0.6 | 1.0 | 1.2 | --- | --- |
| Total D.L. Hours | 2,28,000 | 3,54,000 | 3,15,000 | 6,03,000 | --- | 15,00,000 |
| Contribution P.U. | 7 | 8 | 13 | 15 | 10 | --- |
| Total Contribution | 26,60,000 | 47,20,000 | 40,95,000 | 75,37,500 | 4,25,000 | 1,94,37,500 |
| Less: Fixed Cost | | | | | | 51,40,000 |
| **Profit** | | | | | | **1,42,97,500** |

**Profitability Statement if product B is bought on sub-contract basis for balance hours**

| Particulars | B | C | D | A | A (bought out) | Total |
|---|---|---|---|---|---|---|
| Units | 5,90,000 | 5,45,000 | 3,15,000 | 2,95,000 | 85,000 | --- |
| Direct Labour hrs. P.U. | 0.6 | 1.2 | 1.0 | 0.6 | --- | --- |
| Total D.L. Hours | 3,54,000 | 6,54,000 | 3,15,000 | 17,70,000 | --- | 15,00,000 |
| Contribution P.U. | 8 | 15 | 13 | 7 | 3 | --- |
| Total Contribution | 47,20,000 | 81,75,000 | 40,95,000 | 20,65,000 | 2,55,000 | 1,93,10,000 |
| Less: Fixed Cost | | | | | | 51,40,000 |
| **Profit** | | | | | | **1,41,70,000** |

| | | |
|---|---|---|
| Incremental profit if product C is bought out for balance hours | 1,42,97,500 – 1,41,70,000 | ₹ 1,27,500 |
| Therefore, product A can be procured | | |
| Profit, if advertisement campaign is taken up | 1,42,97,500 – 5,00,000 | ₹1,42,97,500 |
| Profit, if no advertisement campaign is taken up | ₹ 1,35,60,000 | |
| Incremental profit if advertisement campaign is taken up | 1,42,97,500 – 1,35,60,000 | ₹ 7,37,500 |

**Suggestion:** Hence it is suggested to take up advertisement campaign and procure product A from outside for excess direct labour hours over the normal capacity.

**4. (a) Distinguish between Standard Costs and Estimated Cost. [5]**

**(b) A single product company recovers its fixed factory overheads of ₹ 80,000 on the basis of normal output of 1,60,000 units. The actual fixed overheads are same as budgeted fixed overheads. The management account presented the following statement of profit for 3 years on absorption costing basis:**

| Particulars | 2012 | 2013 | 2014 |
|---|---|---|---|
| **Production (Units)** | **176000** | **192000** | **128000** |
| **Sales (Units)** | **160000** | **128000** | **160000** |
| | **₹** | **₹** | **₹** |
| **Cost of sales at standard** | **3,84,000** | **3,07,200** | **3,84,000** |

| | | | |
|---|---|---|---|
| **Production cost variance** | **1,760 A** | **1,920 A** | **1,280 A** |
| **Volume variance** | **8,000 F** | **16,000 F** | **16,000 A** |
| **Sales** | **4,80,000** | **3,84,000** | **4,80,000** |
| **S/Adm. Costs (fixed)** | **48,000** | **48,000** | **48,000** |
| **Closing stock** | **38,400** | **1,92,000** | **1,15,200** |
| **Profit** | **54,240** | **42,880** | **30,720** |

**A means adverse and F means favourable.**

**Required:**

**(i) Redraft the statement on marginal costing basis to show the closing stocks, contribution and profit.**

**(ii) Prepare a statement reconciling the profits arrived at by you with the profits given above. [8+2]**

**Answer to 4 (a):**

**Standard Costs and Estimated Costs**: The distinction between standard costs and estimated costs should be clearly understood. While both standard costs and estimated costs are predetermined costs, their objectives are different. The main differences between the two types of costs are:

**(i)** Estimated costs are intended to determine what the costs 'will' be. Standard costs aim at what costs 'should' be.

**(ii)** Estimated costs are based on average of past actual figures adjusted for anticipated changes in future. Anticipated wastes, spoilage and inefficiencies, all of which tend to increase costs are included in estimated costs. Standard Costs are planned costs determined on a scientific basic and they are based upon certain assumed conditions of efficiency and other factors.

**(iii)** In estimated costing systems, stress is not so much on cost control, but costs are used for other purposes such as fixation of prices to be quoted in advance. Standard costs serve as effective tools for cost control.

**Answer to 4 (b).**

Factory fixed overhead rate = 80,000 / 1,60,000 = ₹ 0.50 per unit.

| Particulars | | 2012 | 2013 | 2014 |
|---|---|---|---|---|
| Std. cost of Sales | (₹) | 3,84,000 | 3,07,200 | 3,84,000 |
| Sales quantity | (Units) | 1,60,000 | 1,28,000 | 1,60,000 |
| Std. Cost per unit | (₹) | 2.40 | 2.40 | 2.40 |
| Variance | (₹) | 1,760 | 1,920 | 1,280 |
| Production | (Units) | 1,76,000 | 1,92,000 | 1,28,000 |
| Variance/unit | (₹) | 0.01 | 0.01 | 0.01 |
| Total cost | (₹) | 2.41 | 2.41 | 2.41 |
| Fixed costs | (₹) | 0.50 | 0.50 | 0.50 |
| **Variable cost / unit** | **(₹)** | **1.91** | **1.91** | **1.91** |

**(i) Statement showing the value of Closing Stock, Contribution and Profit (Marginal costing basis)**

(₹)

| Particulars | 2012 | 2013 | 2014 |
|---|---|---|---|
| Production (units) | 1,76,000 | 1,92,000 | 1,28,000 |
| Sales (units) | 1,60,000 | 1,28,000 | 1,60,000 |
| Sales | 4,80,000 | 3,84,000 | 4,80,000 |
| Production V.C. @ 1.91) | 3,36,160 | 3,66,720 | 2,44,480 |
| Less: Closing stock @ 1.91) (16,000; 80,000; 48,000) | 30,560 | 1,52,800 | 91,680 |
| | 3,05,600 | 2,13,920 | 1,52,800 |
| Add: Opening Stock (@ 1.91) (Nil; 16,000; 80,000) | --- | 30,560 | 1,52,800 |
| Total variable cost | 3,05,600 | 2,44,480 | 3,05,600 |
| Contribution | 1,74,400 | 1,39,520 | 1,74,400 |
| Fixed Costs - | | | |
| Production 80,000 | | | |
| Selling & Admn. 48,000 | 1,28,000 | 1,28,000 | 1,28,000 |
| **Profit** | **46,400** | **11,520** | **46,400** |

**(ii) Statement of Reconciliation of Profits under Marginal Costing and Absorption Costing Basis**

(₹)

| Particulars | 2012 | 2013 | 2014 |
|---|---|---|---|
| Profit as per Adsorption Costing | 54,240 | 42,880 | 30,720 |
| Less: Cl. Stock overvalued | 7,840 | 39,200 | 23,520 |
| | 46,400 | 3,680 | 7,200 |
| Add: Op. stock overvalued | --- | 7,840 | 39,200 |
| **Profit as per marginal Costing** | **46,400** | **11,520** | **46,400** |

**5. (a) A machine used on a production line must be replaced at least every four years. The costs incurred in running the machine according to its age are:**

**(₹)**

| Particulars | Age of machine (years) | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| **Purchase price** | **3,000** | | | | |
| **Maintenance** | | **800** | **900** | **1,000** | **1,000** |
| **Repairs** | | | **200** | **400** | **800** |
| **Net realizable value** | | **1,600** | **1,200** | **800** | **400** |

**Further replacement will be identical machines with the same costs. Revenue is unaffected by the age of the machine. Assume there is no inflation and ignore tax. The cost of capital is 15%. Determine the optimum replacement cycle.**

**Present value factors at 15% for years 1, 2, 3 and 4 are 0.8696, 0.6575 and 0.5718 respectively. Present valu7e of annuity at 15% for years 1, 2, 3, and 4 are 0.8696, 1.6257, 2.2832 and 2.8550 respectively. [10]**

**(b) Explain the impact of budgetary control system on human behavior [5]**

**Answer to 5 (a):**

The possible replacement options of the machine are very one, two, three & four years.

The annual equivalent cost of each of these replacement policies are as follows:

**Replacement every year**

(₹)

| Particulars | Year | |
|---|---|---|
| Cost | (3000) | --- |
| Maintenance | --- | (800) |
| Resale value | --- | 1600 |
| Total | (3000) | 800 |
| DCF @ 15% | 1.0 | 0.8696 |
| Present value of cash flows | (3000) | 696 |

Total PV of Costs = ₹ 2304

Annual equivalent cost = $\frac{2304}{0.8696}$ = ₹ 2649.

**Replacement every two years**

(₹)

| Particulars | Years | | |
|---|---|---|---|
| | 0 | 1 | 2 |
| Cost | (3000) | --- | --- |
| Maintenance | --- | (800) | (900) |
| Repairs | --- | --- | (200) |
| Resale value | --- | --- | 1200 |
| Total | (3000) | (800) | 100 |
| DCF @ 15% | 1.0 | 0.8696 | 0.7561 |
| **Present value of cash flows** | **(3000)** | **(696)** | **76** |

Total PV of Costs = ₹ 3620

Annual equivalent cost = $\frac{3620}{1.6257}$ = ₹ 2227

**Replacement every three years**

(₹)

| Particulars | Years | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| Cost | (3000) | --- | --- | --- |
| Maintenance | --- | (800) | (900) | (1,000) |
| Repairs | --- | --- | (200) | (400) |
| Net realizable value | --- | --- | --- | 800 |
| Total | (3000) | (800) | (1100) | (600) |
| DCF @ 15% | 1.000 | 0.8696 | 0.7561 | 0.6575 |
| **Present value of cash flows** | **(3000)** | **(696)** | **(832)** | **(395)** |

Total PV of Costs = ₹ 4923

Annual equivalent cost = $\frac{4923}{2.2832}$ = ₹ 2,156

**Replacement every four years**

(₹)

| Particulars | Years | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| Cost | (3000) | --- | --- | --- | --- |
| Maintenance | --- | (800) | (900) | (1,000) | (1,000) |
| Repairs | --- | --- | (200) | (400) | (800) |
| Net realizable value | --- | --- | --- | --- | 400 |
| Total | (3000) | (800) | (1100) | (1,400) | (1,400) |
| DCF @ 15% | 1.000 | 0.8696 | 0.7561 | 0.6575 | 0.5718 |
| **Present value of cash flows** | **(3000)** | **(696)** | **(832)** | **(921)** | **(800)** |

Total PV of Costs = ₹ 6,249

Annual equivalent cost = $\frac{6,249}{2.8550}$ = ₹ 2189

**Answer to 5 (b)**:

The budget process affects behavior in three aspects

**(i) Formulation of budgets -** The budgeting process may be top – down, determined wholly by top management. This may engender a feeling of budgets being thrust upon employees who perceive them as pressure devices; as a result their full enthusiasm may not be forthcoming in implementing it. In case the budget is formulated with a bottom-up approach, involving employees, commitment for meeting the budget can be assured.

**(ii) Fixing targets -** Sales production and other targets that are fixed should be challenging but attainable so as to bring out the best efforts of individuals. If targets are so high, as to be unattainable, it may de motivate employees: in some cases it may also lead to manipulation of data to ensure conformity with budget. However such manipulations will have adverse effects in the long run. A common practice is far sales manager to dump stocks on their dealers at the year end to meet sales targets, perhaps giving unduly long credit.

**(iii) Evaluation of performance -** The evaluation of performance should be done in a constructive manner and not in vindictive style. While variances may be thrown up by the system, the causative factors may not be known readily. Hence it is necessary to analyze the reasons for variance and ensure proper accountability.

**6. (a) Industrial Metal Works Ltd., have received an enquiry from Calcutta Enterprises for the manufacture and supply of 200 units of a product. The offer if finalized would be a repeat order. The first 100 units at the selling price of ₹ 300 each was completed last month but IMWL did not make any profit or loss on the order. Analysis of the completed order shows the following:**

**(1) Tooling cost to the extent of ₹ 1,000 was charged totally to the order since the tools would not benefit the production of any subsequent order.**

**(2) Raw material cost per unit was ₹ 80. An increase of 10% is estimated for the new order.**

**(3) Finishing cost of the product was ₹ 6 per unit. The operation is highly mechanical and no learning function is applicable.**

**(4) The cost of inspection was ₹ 2 per unit. This is manual work to which learning function would apply.**

**(5) Direct labour cost was ₹ 202 per unit. Negotiations with the worker's union is almost complete and as a result of which labour costs are likely to go up by 10% by the time the order materialize.**

**IMWL expects profit of 10% on the cost of the proposed contract but insists on retaining for itself the benefit of learning function. On the other hand, Calcutta Enterprises is prepared to allow for all cost increase and higher profit margin of 15% on cost but wants to have the advantage of cost saving taking into account 80% learning effect.**

**You are required to determine the manufacturer's price and determine the buyer's price. [4+4]**

**(b) Ever Forward Ltd., is manufacturing and selling two products: Splash and Flash at selling prices of ₹ 3 and ₹ 4 respectively. The following sales strategy has been outlined for the year 2014.**

**(i) Sales planned for year will be ₹ 7.20 lakhs in the case of Splash and ₹ 3.50 lakhs in the case of Flash.**

**(ii) To meet competition, the selling price of Splash will be reduced by 20% and that of Flash by 12½%.**

**(iii) Break-even is planned at 60% of the total sales of each product.**

**(iv) Profit for the year to be achieved is planned as ₹ 69,120 in the case of Splash and ₹ 17,500 in the case of Flash. This would be possible by launching a cost reduction programme and reducing the present annual fixed expenses of ₹ 1,35,000 allocated as ₹ 1,08,000 to Splash and ₹ 27,000 to Flash.**

**You are required to present the proposal in financial terms given clearly the following information:**

**(a) Number of units to be sold of Splash and Flash to break-even as well as the total number of units of Splash and Flash to be sold during the year.**

**(b) Reduction in fixed expenses product-wise that is envisaged by the Cost Reduction Programme. [2+5]**

**Answer to 6 (a):**

**(1) Labour Cost**

For 300 units – 70.21% of ₹ 222.20 (only labour cost) = ₹ 156 (approx.) per unit

(₹)

| | |
|---|---|
| For 300 units | 46,800 |
| Less: 100 units | 22,220 |
| For 200 units | 24,580 |

**(2) Inspection cost**

(₹)

| For units | Average per 100 | |
|---|---|---|
| 100 | 200 | 200 |
| 300 (70.21%) | 140.42 | 421 |
| 200 | | 221 |

Tooling cost for 200 units has been taken as double the tooling cost of 100 units.

| | **For 1st order of 100 units** | **For 2nd order (without learning) Manufacturer's price** | **200 units (With 80% learning) Buyer's price** |
|---|---|---|---|
| Raw materials | 8,000 | 17,600 | 17,600 |
| Direct wages | 20,200 | 44.440 | 24,580 |
| Finishing cost (₹ 6/unit) | 600 | 1,200 | 1,200 |
| Inspection cost | 200 | 400 | 223 |
| Tooling cost | 1,000 | 2,000 | 2,000 |
| | 30,000 | 65,640 | 45,603 |
| Profit | --- | (10%) 6,564 | (15%) 6,840 |
| Selling price | | 72,204 | 52,443 |

**Answer to 6 (b).**

**(a) Statement showing number of units to be sold of Splash and Flash to break-even and their total units to be sold during the year 2014.**

| **Particulars** | **Products** | | **Total** |
|---|---|---|---|
| | **Splash** | **Flash** | |
| 1. Planned sales for the year (₹) | 7,20,000 | 3,50,000 | 10,70,000 |
| 2. Selling price per unit (after price reduction) (₹) | 2.40 | 3.50 | |
| 3. Total units to be sold during the year [(1)/(2)] | 3,00,000 | 1,00,000 | 4,00,000 |
| 4. Break-even sales in units (60% of total sales in units) | 1,80,000 | 60,000 | 2,40,000 |

**(b) Reduction in fixed expenses product – wise envisaged by Cost Reduction Programme**

| **Particulars** | **Products** | | **Total** |
|---|---|---|---|
| | **Splash** | **Flash** | |
| 1. Budgeted Sales (₹) | 7,20,000 | 3,50,000 | 10,70,000 |
| 2. Break-even Sales (60% of total Sales) (₹) | 4,32,000 | 2,10,000 | 6,42,000 |
| 3. Sales above break-even [(1)/(2)] | 2,88,000 | 1,40,000 | 4,28,000 |
| 4. Planned profit for the year | 69,120 | 17,500 | 86,620 |
| 5. Planned profit as percentage of Sales above break-even or P.V. ratio | 24% | 12.5% | |
| 6. Contribution at break-even sales i.e., fixed costs (Break-even Sales × P.V. ratio) | 1,03,680 | 26,250 | 1,29,930 |
| 7. Existing fixed expenses | 1,08,000 | 27,000 | 1,35,000 |
| 8. Reduction in Fixed expenses envisaged | 4,320 | 750 | 5,070 |

**7. (a) A manufacturing company purchase one of the components required for the manufacture of product from two sources, viz, Supplier A and Suppler B. The price quoted by Supplier A is ₹ 15.00 per hundred numbers of the component and it is found that on the average 3% of the total receipt from this source is defective. The corresponding quotation from Supplier B is ₹ 14.50 but the defectives would go up to 5% for the total supply. If the defectives are not detected, they are utilized in production causing a damage of ₹ 15.00 per hundred components.**

**The company intends to introduce a system of inspection for the components on receipt which would cost ₹ 2.00 per hundred components. Such an inspection will, however, be able to detect only 90% of the defective components received. No payment will be made for components found to be defective in inspection.**

**Offer your opinion, (a) whether inspection at the point of receipt is justified, and (b) which of the two suppliers should be asked to supply. Assume total requirements, of components to be 10,000 numbers. [(3½+3½)+1]**

**(b) Ravi, Richard, Rahim and Roop Singh are regional salesman distributing the product of Super Perfumes Ltd. The selling price of the product is ₹ 400 per unit. The sales quota and the standard selling expenses for the year are:**

| Salesman | Sales quota | Standard selling expenses |
|---|---|---|
| Ravi | 7,50,000 | 2,25,000 |
| Richard | 9,00,000 | 2,47,500 |
| Rahim | 11,50,000 | 2,87,500 |
| Roop Singh | 6,00,000 | 2,25,000 |

**Actual data for the year were as follows:**

| Particulars | Ravi | Richard | Rahim | Roop Singh |
|---|---|---|---|---|
| Days on field work | 200 | 175 | 225 | 250 |
| Kilometers covered | 20,000 | 18,000 | 18,000 | 30,000 |
| | ₹ | ₹ | ₹ | ₹ |
| Sales | 8,00,000 | 10,00,000 | 10,50,000 | 5,20,000 |
| Salary | 80,000 | 80,000 | 80,000 | 80,000 |
| Free Samples | 9,000 | 7,500 | 5,375 | 8,000 |
| Postage and Stationery | 8,000 | 9,000 | 10,000 | 6,000 |
| Other Expenses | 9,000 | 5,000 | 4,000 | 10,000 |

**The salesmen are allowed conveyance allowance of ₹ 1.50 per kilometer and a daily allowance of ₹ 80 per day for the days spent on field work. Ravi gets a commission of 6 per cent of sales and others are given a commission of 5 per cent on sales. Corporate sales office expenses are chargeable at the rate of ₹ 30 per unit sold in the case of Ravi and Richard and ₹ 40 per unit in the case of Rahim and Roop Singh. Prepare a schedule showing the selling cost variances by salesmen. [7]**

**Answer to 7 (a):**

**(i) If not inspected**

| Supplier | A | B |
|---|---|---|
| Units supplies (Nos.) | 10,000 | 10,000 |
| Defectives expected (Nos.) | 300 | 500 |
| Costs | ₹ | ₹ |
| Purchase cost of components | 1,500.00 | 1,450.00 |
| Production damage on defective components (@ ₹ 15 per 100 components) | 45.00 | 75.00 |
| Total | 1,545.00 | 1,525.00 |
| Good Components (Nos.) | 9,700 | 9,500 |
| Cost per 100 good components | ₹ 15.93 | ₹ 16.05 |

**(ii) If inspected**

| Supplier | A | B |
|---|---|---|
| Defectives not expected (Nos.) | 30 | 50 |
| Defectives expected (Nos.) | 270 | 450 |
| Components paid for | 9,730 | 9,550 |
| Costs | ₹ | ₹ |
| Purchase cost | 1,459.50 | 1,384.75 |
| Inspection Cost | 200.00 | 200.00 |
| Production damage (@ ₹ 15 per 100 components) | 4.50 | 4.50 |
| Total | 1,664.00 | 1,589.25 |
| Good Components (Nos.) | 9,700 | 9,500 |
| Cost per 100 good components | ₹ 17.15 | ₹ 16.73 |

On comparing the cost under I and II above, we find that it will not be economical to install a system of inspection. Further, it will be advantageous to purchase the components from Supplier A.

**Answer to 7 (b):**

| Particulars | Ravi | Richard | Rahim | Roop Singh |
|---|---|---|---|---|
| Std. Sales (Units) (Sales quota/₹ 400) | 1,875 | 2,250 | 2,875 | 1,500 |
| Std. Selling expenses per unit (₹) | 120 | 110 | 100 | 150 |
| Actual Sales (Actual sales/₹ 400) (Units) | 2,000 | 2,500 | 2,625 | 1,300 |

**Statement of Actual selling expenses of 4 salesmen**

| Particulars | Ravi | Richard | Rahim | Roop Singh |
|---|---|---|---|---|
| Conveyance allowance | 30,000 | 27,000 | 27,000 | 45,000 |
| Dayly allowance | 16,000 | 14,000 | 18,000 | 20,000 |
| Sales commission | 48,000 | 50,000 | 52,500 | 26,000 |
| Salaries | 80,000 | 80,000 | 80,000 | 80,000 |
| Free samples | 9,000 | 7,500 | 5,375 | 8,000 |
| Postage & Stationery | 8,000 | 9,000 | 10,000 | 6,000 |
| Other Expenses | 9,000 | 5,000 | 4,000 | 10,000 |
| Corporate Sales office Expenses | 60,000 | 75,000 | 1,05,000 | 52,000 |
| (a) Total actual selling expenses | 2,60,000 | 2,67,500 | 3,01,875 | 2,47,000 |

| | | | | |
|---|---|---|---|---|
| (b) Standard Selling Cost | 2,40,000 | 2,75,000 | 2,62,500 | 1,95,000 |
| (Actual selling expenses/Std. selling expenses per unit) | | | | |
| Selling Cost Variance (b) – (a) | (20,000) | 7,500 | (39,375) | (52,000) |
| | Adverse | Favourable | Adverse | Adverse |

The total selling cost variance (Adverse) = ₹ 1,03,875.

**8. Write Short Notes on any three out of the following: [3x5]**

**(i) Backflush accounting**

**(ii) Kaizen Costing**

**(iii) Value Chain Management**

**(iv) Margin of Safety**

**Answer 8.**

**(i) Backflush accounting:**

Backflush accounting is defined as 'a cost accounting system which focuses on the output of the organization and then work backwards to allocate costs between cost of goods sold and inventory'. In essence, backflush accounting is a simpler bookkeeping system designed to reflect key aspects of JIT system i.e. little or no work-in-progress and demand pull.

There are several variants of backflush accounting (BFA), a popular one being the replacement of separate raw material and WIP accounts with a single account; Raw and In Process (RIP) account. When items are sold the standard cost for the materials in the finished goods would be credited (or back flushed) to the RIP account. All conversion costs (labour and materials) would be applied to the cost of finished goods production, none would be applied to WIP.

**(ii) Kaizen Costing**

Kaizen costing is a modification of standard costing which is essential to realize the planned cost reductions in continuous time. Kaizen costing is a Japanese contribution to cost accounting. Kaizen costing is continuous improvement applied to cost reduction in the manufacturing stage of a product's life. Like that of standard costing programme, the aim of Kaizen costing is to remove inefficiencies from production processes.

Kaizen costing tracks the cost reduction plans on a monthly basis. The Kaizen costing targets are expressed in the physical resources terms. If the head of a group fails to achieve the Kaizen costing target by 1 percent, review by senior will start. Resource consumption is so tightly controlled in many Japanese firms. Thus the planned cost reductions are planned and monitored through Kaizen cost targets in terms of physical resources.

While implementing the concept of Kaizen, following few rules are to be remembered:

**I.** List down your own problems.
**II.** Grade your problems as to minor, difficult and major.
**III.** Select the smallest minor problem and start with it. After tackling this, move on to next graded problem and so on.
**IV.** Know and always remember, improvement is a part of daily routine.
**V.** Never accept status quo.
**VI.** Never reject any idea before trying it.

**VII.** Share the experiments with colleagues.
**VIII.** Eliminate already tried but failed experiments, while sharing the problems with your colleagues.
**IX.** Never hide problems, always highlight them.

**(iii) Value Chain Management:**

Value chain management (VCM) is a solution for smoothening the interaction between all partners of an enterprise, suppliers, dealers, bankers etc. VCM goes beyond supply chain management to bring synergy between business partner by way of providing business and knowledge information in the effective manner to help achieve business targets. There are three kinds of partners among whom a company try to build synergy.

**I.** One if the normal supply chain management partners – suppliers, suppliers to suppliers, dealers, customers etc.
**II.** The second important partner category is the transporter who transports raw material and finished goods. The transporters play an important role in value chain.
**III.** The third important category of partners are service providers and banks.

**(iv) Margin of Safety**

The margin of safety refers to sales in excess of the break-even volume. It represents the difference between sales at a given activity level and sales at break-even point. It is important that three should be a reasonable margin of safety to run the operations of the company in profitable position. A low margin of safety usually indicates high fixed overheads so that profits are not made until there is a high level of activity to absorb the fixed costs. A margin of safety provides strengths and stability to a concern.

The margin of safety is an important measure, especially in times of receding sales, to know the real position to operate without incurring losses and to take steps to increase the margin of safety to improve the profitability.

Margin of safety is calculated by using the following formulae:

Margin of safety = Actual sales – Break-even sales

$$= \frac{\text{Profit}}{\text{P/V Ratio}}$$

$$= \frac{\text{Profit x Selling Price p.u.}}{\text{Selling Price p.u. – Variable cost p.u.}}$$

The higher the margin of safety, the better profitability of the product/ product line. The margin of safety can be improved by adopting any of the following steps :

**(i)** Keeping the break-even point at lowest level and try to maintain actual sales at highest level.
**(ii)** Increase in sales volume.
**(iii)** Increase in selling price.
**(iv)** Change in product mix increasing contribution.
**(v)** Lowering fixed cost.
**(vi)** Lowering variable cost.
**(vii)** Discontinuance of unprofitable products in sales mix.