**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 questions (each carrying 15 marks) from the rest.**

**1. (a) Expand the following abbreviations:**                                              **[1×5=5]**
   i.   **CBS**
  ii.   **LCC**
 iii.   **WAITRO**
  iv.   **QFD**
   v.   **MPS**

**Answer 1 (a).**

   i.    Cost Breakdown Structure
  ii.    Life Cycle Costing
 iii.    World Association of Industrial and Technological Research Organisation
  iv.    Quality Function Deployment
   v.    Master Production Schedule

 **1. (b) Define the following terms in not more than two or three lines.**              **[1×5=5]**

**(i) Data Mining**
**(ii) Matrix Organizational Structure**
**(iii) Bench Marking**
**(iv) Contribution Approach**
**(v) Talent Drain**

**Answer 1 (b).**

**(i) Data Mining:** is the process of analyzing empirical data. It also enables the extrapolation of information. Such extrapolated results are then used in forecasting and defining trends.

**(ii) Matrix Organization Structure** combines the coordination and control of the decentralized structure with the technical excellence of economies of scale of the functional structures to reap the benefits of both.

**(iii) Benchmarking** is a process of continuously comparing and measuring an organizations business process against business leader anywhere in the world to gain information that will help the organization take action to improve performance.

**(iv) Contribution Approach** is a method of preparing income statement that separates variable cost from fixed cost to emphasize cost behaviour pattern for the purpose of planning and control.

**(v) Talent Drain is** the second potential problem in succession planning. Because upper management must identify a small group of managers to receive training and development for promotion, those managers who are not assigned to development activities may feel overlooked leave the organizations. This turnover may reduce the number of talented managers of lower and middle levels of the organization.

1. **(c)** Choose the most appropriate one from the stated options and write it down. **[5×2=10]**

**(i)  The budgeted fixed overheads for a budgeted production of 40,000 units is ₹80,000. For a certain period the actual production was 44,000 units and actual expenditure came to ₹96,000. Then the volume variance is**

    A. ₹16,000(A)
    B. ₹8,000 (F)
    C. ₹ 8,000 (A)
    D. None of these.

**Answer:—** B :₹8,000 (F)
Volume Variance = (Budgeted Production. – Actual Production.) × Standard. Rate
     = (40,000 - 44,000)× 80,000/40,000= ₹8,000 (F)

**(ii) The current price of a product is ₹8,000 per unit and it has been estimated that for every ₹200 per unit reduction in price, the current level of sale, which is 10 units, can be increased by 1 unit. The existing capacity of the company allows a production of 15 units of the product. The variable cost is ₹4,000 per unit for the first 10 units; thereafter each unit will cost ₹400 more than the preceding one. The most profitable level of output for the company for the product will be**
A. 11 units
B. 12 units
C. 13 units
D. 14 units

**Answer:— B : 12 units.**

| Units | Total Variable Cost | Selling Price Per unit | Total Revenue | Total Contribution |
|---|---|---|---|---|
|  | ₹ | ₹ | ₹ | ₹ |
| 10 | 40,000 | 8,000 | 80,000 | 40,000 |
| 11 | 40000+4400=44,400 | 7,800 | 85,800 | 41,400 |
| 12 | 44400+4800=49,200 | 7,600 | 91,200 | 42,000 |
| 13 | 49200+5200=54,400 | 7,400 | 96,200 | 41,800 |
| 14 | 54400+5600=60,000 | 7,200 | 1,00,800 | 40,800 |

**(iii) A particular job requires 800 kgs of material-G.**
**500 kgs. of the particular material is currently in stock.**
**The original price of the material-G was ₹ 300 but current resale value of the same has been determined as ₹ 200. If the current replacement price of the material-P is ₹ 0.80 per kg., the relevant cost of the material-P required for the job would be :**
A. ₹ 640
B. ₹ 440
C. ₹ 300
D. None of these.

**Answer:—B: ₹ 440.**

500 kgs. of material in stock at resale value = ₹ 200
Balance 300 kgs. of material at current price of ₹ 0.80 = ₹ 240
Relevant Cost of the material = ₹ 440

**(iv) The Selling price of the single product manufactured by a company is fixed at ₹ 4,500 per unit. In the coming year, 500 units of the product are likely to be sold. If the total value of investments of the company is ₹45 lakhs and it has a target ROI of 15%, the target cost would be :**
A. ₹ 2,790
B. ₹2,850
C. ₹ 3,150
D. None of these.

**Answer: — C: ₹ 3,150.**

|  | ₹ |
|---|---|
| Sales Revenue = 500 × ₹ 4,500 = | 22,50,000 |
| *Less* : ROI 15% on ₹ 45 Lakhs = | 6,75,000 |
| Target Cost = | 15,75,000 |

Target Cost per unit = Target Cost/500= 15,75,000/500 = ₹3,150.

**(v)   A company using a detailed system of standard costing finds that the cost of investigation of variances is ₹ 30,000 and if after investigation, it is found that the situation is out of control, the cost of correction is ₹ 50,000. If no investigation is made, the present value extra cost involved is ₹ 2,00,000. The probability of process, being out of control, is 20%. The cost of investigation would be :**
A. ₹ 6,000
B. ₹ 10,000
C. ₹ 40,000
D. None of these.

**Answer:— C: ₹ 40,000.**

Cost of Investigation = ₹ 30,000 + (0.20 × 50,000) = ₹ 40,000.

1.  (d) Fill in the blanks with appropriate word(s) :                          [1×5=5]
    (i)   VAR stands for _____ _____ _____.
    (ii)  _____ has become a standard practice among many organizations as a way to add flexibility to chain.
    (iii) Balanced Score Card is a performance management and _____ _____ methodology that helps executives translate an organization's mission statement and overall business strategy with specific quantifiable goals.
    (iv)  Balanced Score Card is a way to translate _____ into _____.
    (v)   Kaizen is a Japanese term comprising KAI = _____ and ZEN = _____.

**Answer:**

    **(i)**   VAR is **Value Added Resellers**.
    **(ii)**  **Outsourcing** has become a standard practice among many organizations as a way to add flexibility to chain.

**(iii)** Balanced Score Card is a performance management and **strategy deployment** methodology that helps executives translate an organization's mission statement and overall business strategy with specific quantifiable goals.

**(iv)** Balanced Score Card is a way to translate **strategy** into **action**.

**(v)** Kaizen is a Japanese term comprising KAI =**change** and ZEN = **better**.

**2. (a) List the aims / objectives of Material Requirement Planning.** [5]

**Answer:**

Following are the aims/objectives of Material Requirement Planning:

(i) To determine quantity and timing of Finished Goods Production as per the Master Production Schedule.
(ii) To ascertain quantity of Raw Materials, Sub-Assemblies and Components required for budgeted production, based on Bill of Materials.
(iii) To compute the Inventories, Work-In-Progress, Batch Sizes and manufacturing & packaging Lead Times.
(iv) To control inventory by ordering bought-in Components and Raw materials in relation to the orders received or forecast.
(v) To forecast the inventory position period – by – period for a future time period of a manufacturing operation.
(vi) To serve as an inventory information system helpful in planning for Raw materials and Component Parts.
(vii) To generate Purchase Requisition Notes and Purchase orders through computer system automatically.

**2. (b) A manufacturing Company has an installed capacity of 1,50,000 units p.a. Its cost structure is given below –**

| Variable Costs | ₹10 per unit |
| --- | --- |
| Labour (Minimum ₹1,00,000 per month) | ₹ 10 per unit |
| Overheads | ₹ 4 per unit |
| Fixed Overheads | ₹1,92,300 per annum. |

**Semi-Variable overheads ₹ 60,000 per annum at 75% capacity, which increases by ₹ 4,000 per annum for every 5% increase in capacity utilization for the year as a whole.**
**The capacity utilization for the next year is estimated at 75% for three months, 80% for six months and 90% for the remaining part of the year. If the company is planning to have a profit of 20% on the selling price, calculate the selling price per unit.** [8]

**Answer:**

**I. Production per month** = 1,50,000 ÷ 12 = 12500 units

**II. Statement of Costs and Revenues for the year**

| Particulars | First 3 months | Next 6 months | Last 3 months | Total (₹) |
| --- | --- | --- | --- | --- |

| a. Capacity | 75% | 80% | 90% | |
|---|---|---|---|---|
| b. Production | 12500 × 75% × 3 = 28,125 | 12500 × 80% × 6 = 60,000 | 12500 × 90% ×3 = 33,750 | 1,21,875 |
| c. Variable Costs at ₹ 10 p.u. | 2,81,250 | 6,00,000 | 3,37,500 | 12,18,750 |
| d. Labour at ₹ 10 p.u. (min. ₹ 1 Lakh per month) | 3,00,000 | 6,00,000 | 3,37,500 | 12,37,500 |
| e. Variable OH at ₹ 4 pu | 1,12,500 | 2,40,000 | 1,35,000 | 4,87,500 |
| f. Fixed Overheads (given) | | | | 1,92,300 |
| g. Semi-Variable OH (Note 3) | 15,000 | 32,000 | | 65,000 |
| | 1/4 on Revenue | = ¼ on Cost | 18,000 | |
| h. **Total Costs** | | | | **32,01,050** |
| i. Add: Profit | | | | 8,00,263 |
| j. **Desired Revenue (h + i)** | | | | **40,01,313** |
| k. **Selling Price unit (j ÷ b)** | | | | **32.83** |

**III. Computation of Semi-variable OH :**

First 3 months : 75%    ₹ 60,000 × 3/12                = 15,000

Next 6 months : 80%    [₹ 60,000 + ₹4,000] × 6/12    = 32,000

Last 3 months : 90%    [₹ 60,000 + ₹ 4,000 × 3] × 3/12  = 18,000

**Note :** In the above calculation, it is presumed that Semi-Variable OH arise uniformly during the year. Alternatively, the following treatment is also permissible -

• Since 90% is reached at some time during the year (i.e.during the last three months), the average SVOH for the entire year = 90% Capacity = ₹ 60,000 + ₹ 4,000 × 3 = ₹ 72,000.

• Average Capacity Utilisation during the entire year = 1,21,875 ÷ 1,50,000 units = 81.25%. Hence, SVOH for the entire year = ₹ 60,000 + ₹ 4,000 × 2 = ₹ 68,000.

**2.(c)  What is Decision Tree ?**                                                                    **[2]**

**Answer:**

Decision Tree is a tool which helps to choose between several courses of action. It provides a highly effective structure within which options can be laid out and the possible outcomes of choosing those options can be investigated. It also helps to form a balanced picture of the risks and rewards associated with each possible course of action.

**3.  (a) Write a note on Quality Function Deployment .**                                    **[5]**

**Answer :**

**Quality Function Deployment-** Quality Function Deployment (QFD) is a structured approach to defining customer needs or requirements and translating them into specific plans to produce products to meet those needs. The "voice of the customer" is the term to describe these stated and unstated customer needs or requirements. The voice of the customer is captured in a variety of ways : direct discussion or interviews, surveys, focus groups, customer specifications, observation, warranty data, field reports, etc. This understanding of the customer needs is then summarized in a product planning matrix or "house of quality". These matrices are used to translate higher level "what's" or needs into lower level "how's" — product requirements or technical characteristics to satisfy these needs. While the Quality Function Deployment matrices are a good communication tool at each step in the process, the matrices are the means and not the end. The real value is in the process of communicating and decision-making with QFD. QFD is oriented toward involving a team of people representing the various functional departments that have involvement in product development: Marketing, Design Engineering, Quality Assurance, Manufacturing/ Manufacturing Engineering, Test Engineering, Finance, Product Support, etc.

The active involvement of these departments can lead to balanced consideration of the requirements or "what's" at each stage of this translation process and provide a mechanism to communicate hidden knowledge - knowledge that is known by one individual or department but may not otherwise be communicated through the organization. The structure of this methodology helps development personnel understand essential requirements, internal capabilities, and constraints and design the product so that everything is in place to achieve the desired outcome - a satisfied customer. Quality Function Deployment helps development personnel maintain a correct focus on true requirements and minimizes misinterpreting customer needs. As a result, QFD is an effective communications and a quality planning tool.

**3. (b) State the areas in which the application of learning curve theory can help a manufacturing organization? [6]**

**Answer:**

The applicability of learning curve is more important in cases where the labour input in an activity is large and the activity is complex. The following are the areas where the effects of learning curve would be useful to decision making in a manufacturing organization :

- **Pricing decision –** Since learning curve permit better cost prediction, it seems that they should be employed in pricing decision.

- **Work scheduling –** Learning curve increases a firm's ability to predict their required labour input and make it possible to forecast labour needs.

- **Capital budgeting –** One of the most important aspects in capital budgeting problems is the amount of cash flows. The learning curve suggests that unit costs are likely to begin high and reducing afterwards.

- **Overtime decisions –** Hiring more workers is not likely to be an easily reversible decision. Hence, if an organization is near the beginning its learning curve, it prefers to work overtime rather than hire additional workers who will not be needed later.

- **Fixation of pay scales –** In fixing pay scales and production bonus, the time needed to learn production process should be allowed for in calculating the wages and bonus for a period. The wage incentive schemes must recognize the learning curve i.e., the employees will need to be compensated during the early stages of learning for the lower than normal level of performance. This is due to lack of familiarity in the early stages of production rather than any lack of motivation or ability.

- **Cash budgets –** Since learning effect reduces unit variable costs as more units are produced, it should be allowed for in cash flow projections.

- **Direct costs –** The learning curve applies to an industry where there is a high labour turnover or when products and process are subject to frequent changes. As the labour hours or cost is reduced for repeat orders, a knowledge of learning curve helps in direct labour budget.

- **Setting of standard costs –** If the learning phase is not recognized an incorrect standard may be established. When cumulative output is low the standard cost is high, resulting in favourable variances. The converse of this applies when cumulative output is high.

### 3. (c) Write Short Notes on Optimized Production Technology (OPT). [4]

**Answer:**

i.   Goldratt and Core advocated a new approach to production management called "Optimised Production Technology" (OPT)
ii.  OPT is based on the principle that profits are expanded by increasing the throughput of the plant i.e., rate at which raw material are turned into sales.
iii. The OPT approach determines what prevents throughput being higher by distinguishing between – a) Bottleneck and b) Non-Bottleneck Resources.
iv.  This approach advocates that bottleneck resources/activities should be fully utilized while non-bottleneck resources/activities should not be utilized to 100% of their capacity since it would result in increase in inventory.
v.   The most widely recognized management accounting system developed for this purpose is known as Throughput Accounting (TA).

**4. (a)** A company is organized into two large Divisions. Division 'A' produces a component which is used by Division 'B' in making a final product. The final product is sold for ₹ 400 each. Division A has a capacity to produce 2,000 units and the entire quantity can be purchased by Division B.

Division A informed that due to installation of new machines, its depreciation cost had gone up and hence wanted to increase the price of the component to be supplied to Division B to ₹220. Division B, however can buy the component from the outside market at ₹ 200 each. The variable costs of Division A are ₹190 and fixed costs ₹20 per component. The variable costs of Division B in manufacturing the final product by using the component is ₹ 150 (excluding the component cost).

Present statement indicating the position of each Division and the company as a whole taking each of the following situations separately.

**(i)**   If there are no alternative use for the production facilities of A, will the company benefit if Division B buys from outside suppliers at ₹ 200 per component?
**(ii)**  If internal facilities of A are not otherwise idle and the alternative use of the facilities will give an annual cash operating saving of ₹30,000 to Division A, should Division B purchase the component from outside suppliers?
**(iii)** If there are no alternative used for the production facilities of Division A and the selling price for the component in the outside market drops by ₹15, should Division B purchase from outside suppliers?
**(iv)**  What transfer price would you fix for the component in each of the above circumstances?

[10]

**Answer :**

**(i) Statement of contribution**
**(a) When component is purchased by Division B from outside**

(₹)

| Division A | | | Nil |
|---|---|---|---|
| Division B sales (2,000 x 400) | | 8,00,000 | |
| Less : Cost of purchase  (2,000 x 200) | 4,00,000 | | |
| Variable Cost    (2,000 x 150) | 3,00,000 | 7,00,000 | 1,00,000 |
| Company's total contribution | | | 1,00,000 |

**(b) When component is purchased from Division A by Division B**

| Division A | | | |
|---|---|---|---|
| Sales    (2,000 x 220) | | 4,40,000 | |
| Less : Variable cost  (2,000 x 190) | | 3,80,000 | 60,000 |
| Division B | | | |
| Sales    (2,000 x 400) | | 8,00,000 | |
| Less : Variable cost | | | |
| Purchase cost from Division A (2,000 x 220) | 4,40,000 | | |
| Variable cost in Division B  (2,000 x 150) | 3,00,000 | 7,40,000 | 60,000 |
| Company's total contribution | | | 1,20,000 |

Thus, it will be beneficial for the company as a whole to ask Division B to buy the component from Division A.

**(ii) Statement of total contribution if Division A could be put to alternative use :**

| Division A | | | |
|---|---|---|---|
| Contribution from alternative use of facilities | | | 30,000 |
| Division B | | | |
| Sales     (2,000 x 400) | | 8,00,000 | |
| Less : Variable cost | | | |
| Cost of purchase       (2,000 x 400) | 4,00,000 | | |
| Division B            (2,000 x 150) | 3,00,000 | 7,00,000 | 1,00,000 |
| Company's total contribution | | | 1,30,000 |

The company's contribution when component is purchased from outside, shows an increase of ₹ 30,000 as compared to when there is inter departmental transfer. Hence, it will be beneficial to purchase the component from outside.

**(iii) Statement of total contribution when component is available from outside at ₹185**

| Division A | | | Nil |
|---|---|---|---|
| Division B | | | |
| Sales   (2,000 x 400) | | 8,00,000 | |
| Less : variable cost | | | |
| Cost of purchase   (2,000 x 185) | 3,70,000 | | |
| Division B | 3,00,000 | 6,70,000 | 1,30,000 |
| Company's total contribution | | | 1,30,000 |

If the component is purchased by Division B from Division A, the contribution is only ₹ 1,20,000 as calculated under (i) above. Hence it will be beneficial to buy the component from outside.

**(iv) Fixation of transfer price**

(a) When there are no alternative uses of production facilities of Division A
In such a case the variable cost i.e. ₹ 190 per component will be charged

(b) If facilities of Division A can be put to alternative uses :

| | |
|---|---|
| Variable cost | ₹ 190 |
| Opportunity cost | ₹ 15 |
| Transfer price | ₹ 205 |

(c) If market price gets reduced to ₹ 185 and there is no alternative use of facilities of Division A
The variable cost of ₹ 190 per component should be charged.

**4. (b) The sales Manager of the Electronic Toy Company is considering two toys: a doll and a game. The toys have discrete probability distribution of cash inflows in each of the next three years.**

| Event | Doll (₹) | Probability | Game |
|---|---|---|---|
| Prosperity | 20,000 | 0.2 | 42,000 |
| Normal | 15,000 | 0.5 | 20,000 |
| Recession | 9,000 | 0.3 | (5,000) |

**(i) For each toy item, compute**
- **The expected value of the cash inflow in each of the next three years.**
- **The standard deviation**

**(ii) Which toy would you select and why?** [5]

**Answer:**

For the doll:
Expected Value= ₹20,000 x 0.2 + ₹15,000 x 0.5 + ₹9,000 x 0.3= ₹14,200

For the game:
Expected Value=₹42,000 x 0.2 + ₹20,000 x 0.5 - ₹5,000 x 0.3=₹16,900

For the doll:
$\sigma = [0.2(20,000-14,200)^2 + 0.5(15,000-14,200)^2 + 0.3(9,000-14,200)^2]^{1/2}$
= ₹3,893.58
For the game:
$\sigma = [0.2(42,000-16,900)^2 + 0.5(20,000+16,900)^2 + 0.3\{(5000)-16,900\}^2]^{1/2}$
=₹16,573.77

Coefficient of variation: doll $\frac{3893.85}{14,200} \times 100 = 27.4\%$

Game $\frac{16,573.77}{16,900} \times 100 = 98.1\%$

CV is lower in Doll-Therefore Doll should be chosen-Risk is lower

5. **(a) State the differences between Strategic Planning and Management Control.** [6]

**Answer:**

**Differences between Strategic Planning and Management Control**:

| Characteristic | Strategic Planning | Management Control |
|---|---|---|
| Focus of plans | On one aspect at a time | On whole organization |
| Complexities | Many variables | Less complex |
| Degree of structure | Unstructured and irregular: each problem | Rhythmic: prescribed |
| Nature of information | Tailor-made for the problem; more external and predictive; less | Integrated; more internal and historical; more accurate |
| Communication of information | Relatively simple | Relatively difficult |
| Purpose of estimates | Show expected results | Lead to desired results |
| Persons primarily involved | Staff and top management | Line and top |
| Number of persons involved | Small | Large |
| Mental activity | Creative; analytical | Administrative: persuasive |
| Source discipline | Economics | Social psychology |
| Planning and control | Planning dominant, but some control | Emphasis on both planning and control |
| Time horizon | Tends to be long | Tends to be short |
| End result | Policies and precedents | Action within policies and Precedents |
| Appraisal of the job done | Extremely difficult | Much less difficult |

5. **(b) Five Swimmers are eligible to compete in a relay team that should have four swimmers swimming different styles- backstroke, breaststroke, free style and butterfly. The time taken for the five swimmers - Anand, Balu, Chandru, Deepak and Eswar – to cover a distance of 100 metres in various swimming styles are given below in minutes: seconds. Anand swims backstroke in 1:09, breaststroke in 1:15 and has never competed in free style or butterfly. Balu is a free style specialist averaging 1:01 for 100 metres but can also swim breaststroke in 1:16 and butterfly in 1:20. Chandru swims all styles, backstroke 1:10, breaststroke 1:12, free style 1:05 and butterfly 1:20. Deepak swims only butterfly at 1:11 while Eswar swims backstroke 1:20, breaststroke 1:16, free style 1:06 and butterfly 1:10. Which swimmers should be assigned to which swimming style? Who will not be in the team?** [9]

**Answer:**

### I. The Time taken matrix is first derived (in seconds)

| Swimmers | Backstroke | Breaststroke | Freestyle | Butterfly |
|---|---|---|---|---|
| Anand | 69 | 75 | - | - |
| Balu | - | 76 | 61 | 80 |
| Chandru | 70 | 72 | 65 | 80 |
| Deepak | - | - | - | 71 |
| Eswar | 80 | 76 | 66 | 70 |

The objective is minimization of time taken. The combinations not available for assignment are indicate by M where M = infinity. A dummy column is introduced in the above matrix.

**II. Inserting Dummy Column**

| | | | | |
|---|---|---|---|---|
| 69 | 75 | M | M | 0 |
| M | 76 | 61 | 80 | 0 |
| 70 | 72 | 65 | 80 | 0 |
| M | M | M | 71 | 0 |
| 80 | 76 | 66 | 70 | 0 |

**III. Row and Column Operations**

| | | | | |
|---|---|---|---|---|
| 0 | 3 | M | M | 0 |
| M | 4 | 0 | 10 | 0 |
| 1 | 0 | 4 | 10 | 0 |
| M | M | M | 1 | 0 |
| 11 | 4 | 5 | 0 | 0 |

**IV. Inserting Dummy Column**

| | | | | |
|---|---|---|---|---|
| **0** | 3 | M | M | 0 |
| M | 4 | **0** | 10 | 0 |
| 1 | **0** | 4 | 10 | 0 |
| M | M | M | 1 | **0** |
| 11 | 4 | 5 | **0** | 0 |

Total Time taken will be 272 seconds or 4 min and 32 seconds.

| Swimmer | Anand | Balu | Chandru | Deepak | Eswar |
|---|---|---|---|---|---|
| Style | Backstroke | Freestyle | Breaststroke | Dummy - will not be in the race. | Butterfly |
| Time Taken | 69 | 61 | 72 | | 70 |

6. (a) The Himalaya Snow Co. Ltd. manufactures and sells direct to consumers 10,000 jars of "Himalaya Snow" per month at ₹ 1.25 per jar. The company's normal production capacity is 20,000 jars of snow per month. An analysis of costs for 10,000 jars show :

|  | ₹ |
|---|---|
| Direct material | 1,000 |
| Direct labour | 2,475 |
| Power | 140 |
| Miscellaneous supplies | 430 |
| Jars | 600 |
| Fixed expenses for manufacturing, selling & admin. | 7,955 |
| Total | 12,600 |

The company has received an offer for the export under a different brand name of 20,000 jars per month at ₹0.75 a jar.

Write a short report on the advisability of accepting the offer. [7]

**Answer :**

**Statement showing profit and loss position with export order**

|  | Present Position (Capacity 50%) | For Export Offer (Capacity 50%) | Total (Capacity 100%) |
|---|---|---|---|
| Sale units | 10,000 | 10,000 | 20,000 |
| Selling price | 1.25 | 0.75 | |

|  |  | ₹ |  | ₹ | ₹ |
|---|---|---|---|---|---|
| Sales value | | 12,500 | | 7,500 | 20,000 |
| Less : Marginal Cost : | | | | | |
| Direct material | 1,000 | | 1,000 | | |
| Direct labour | 2,475 | | 2,475 | | |
| Power | 140 | | 140 | | |
| Misc. supplies | 430 | | 430 | | |
| Jars | 600 | | 600 | | |
| | | 4,645 | | 4,645 | 9,290 |
| Contribution | | 7,855 | | 2,855 | 10,710 |
| Less : Fixed Costs | | | | | |
| Prof it/( Loss) | | 7,955 | | — | 7,955 |
| | | (-100) | | ( + 2,855) | ( + 2,755) |

As, the profit is increased by ₹ 2,855 on accepting the proposed offer, the proposal should be accepted. Before taking a final decision the following point, however, should be considered :

(i)     The increase in cost on export order due to special packing, freight etc., and whether the Government will grant subsidy and provide for importation on raw materials on the basis of export,

(ii)    Whether cost will increase if the export orders are not received in future,

(iii)   Whether there will be any effect in home market in the long run for reduction in export price,

(iv)    As the present position is not prospecive, the surplus capacity should be utilized for production of more profitable products.

**6.(b) Patients arriving at a village dispensary are traded by a doctor on a first-come-first serve basis. The inter arrival time of the patients is known to be uniformly distributed between 0 and 80 minutes, while their service time is known to be uniformly distributed between 15 and 40 minutes. It is desired to simulate the system and determine the average time a**

patient has to be in the queue for getting service and the proportion of time the doctor would be idle.

Carry out the simulation using the following sequences of random numbers. The numbers have been selected between 00 and 80 to estimate inter-arrival times and between 15 and 40 to estimate the service times required by the patients.

| Series I | 07 | 21 | 12 | 80 | 08 | 03 | 32 | 65 | 43 | 74 |
|----------|----|----|----|----|----|----|----|----|----|----|
| Series II | 23 | 37 | 16 | 28 | 30 | 18 | 25 | 34 | 19 | 21 |

The dispensary starts serving patients at 8.00 a.m. [8]

Answer:

### Simulation of data at a village dispensary

| No. of Patients | Inter arrival time Random No. (Minutes | Entry Time in to queue (hrs) | Service Time Random No. (minutes) | Service Start time (hrs) | End time (hrs) | Waiting time of patient (minutes) | Idle time of doctor (minutes) |
|-----------------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 07 | 8.07 | 23 | 8.07 | 8.30 | - | 07 |
| 2 | 21 | 8.28 | 37 | 8.30 | 9.07 | 2 | - |
| 3 | 12 | 8.40 | 16 | 9.07 | 9.23 | 27 | - |
| 4 | 80 | 10.00 | 28 | 10.00 | 10.28 | - | 37 |
| 5 | 08 | 10.08 | 30 | 10.28 | 10.58 | 20 | - |
| 6 | 03 | 10.11 | 18 | 10.58 | 11.16 | 47 | - |
| 7 | 32 | 10.43 | 25 | 11.16 | 11.41 | 33 | - |
| 8 | 65 | 11.48 | 34 | 11.48 | 12.22 | - | 07 |
| 9 | 43 | 12.31 | 19 | 12.31 | 12.50 | - | 09 |
| 10 | 74 | 01.45 | 21 | 01.45 | 2.06 | - | 55 |
| Total (in minutes) | | | | | | 129 | 115 |

Thus, Average waiting time of patient = 129 /10 =12.9 minutes and
Average waiting time of doctor = 115/10 = 11.5 minutes .

7. (a) Technotik Ltd., specializes in the manufacture of Computers. It is planning to introduce a new computer specially designed for children. Development of the New Computer is to begin shortly and Technotik Ltd., is in the process of preparing a Product Life-Cycle Budget. It expects the new product to have a life-cycle of 3 years from the time of its introduction in the market before the computer becomes obsolete due to technological advancement of other competitive products.

The following information is available :

| Particulars | Year-1 | Year-2 | Year-3 |
|---|---|---|---|
| Units manufactured & sold | 25,000 | 1,00,000 | 75,000 |
| Computers per batch | 40 | 50 | 50 |
| Price per Computer (₹) | 4,500 | 4,000 | 3,500 |
| R&D and Design Cost (₹) | 450 Lakh | 50 Lakh | - |
| Production Cost: | | | |
| Variable Cost per unit (₹) | 1,600 | 1,500 | 1,500 |
| Variable Cost per batch (₹) | 7,000 | 6,000 | 6,000 |
| Fixed Cost (₹) | 300 Lakh | 300 Lakh | 300 Lakh |
| Marketing Cost: | | | |
| Variable Cost per unit (₹) | 360 | 320 | 280 |
| Fixed Cost (₹) | 200 Lakh | 150 Lakh | 150 Lakh |
| Distribution Cost: | | | |
| Units produced per batch | 20 | 16 | 12 |
| Variable Cost per unit (₹) | 100 | 100 | 100 |
| Variable Cost per batch (₹) | 1,200 | 1,200 | 1,000 |
| Fixed Cost (₹) | 120 Lakh | 120 Lakh | 120 Lakh |
| Customer Service Cost per unit (₹) | 200 | 150 | 150 |

**You are required to prepare budgeted life-cycle operating profit for the new computer.**

**[2+2+2+2]**

**Answer:**

### Technotik Ltd. Preparation of Budgeted Life Cycle Operating Profit

| Particulars | | | (Amount in ₹ Lakhs) | |
|---|---|---|---|---|
| | Year-1 | Year-2 | Year-3 | Total |
| Sales Revenue (A) [(25,000×4,500)÷1,00,000] | 1,125 | 4,000 | 2,625 | 7,750 |
| R&D and Design Cost | 450 | 50 | - | 500 |
| **Production Cost:** | | | | |
| Variable Cost | 400 | 1,500 | 1,125 | 3,025 |
| Variable Cost per batch | | | | |
| [(Unit manufactured **x** Variable Cost per batch)÷No. of computers in a batch] | 43.75 | 120 | 90 | 253.75 |
| Fixed Cost | 300 | 300 | 300 | 900 |
| **Marketing Cost:** | | | | |
| Variable Cost | 90 | 320 | 210 | 620 |
| Fixed Cost | 200 | 150 | 150 | 500 |
| **Distribution Cost:** | | | | |
| Variable Cost | 25 | 100 | 75 | 200 |
| Variable Cost for batch [(Unit manufactured **x** Variable Cost per batch)÷No. of computers in a batch] | 15 | 75 | 62.50 | 152.50 |
| Fixed Cost | 120 | 120 | 120 | 360 |

| | | | | |
|---|---|---|---|---|
| Customer Service Cost | 50 | 150 | 112.50 | 312.50 |
| Total Cost | 1,693.75 | 2,885 | 2,245 | 6,823.75 |
| OPERATING PROFIT | (568.75) | 1,115.00 | 380.00 | 926.25 |

**7.(b) What are the various stages/steps to be taken in the implementation of Total Quality Management?** **[7]**

**Answer:**

The following are the various stages/steps to be taken in the implementation of TQM process:
(i) Stage 1: Identification of customers/customer groups: Through a team approach, the firm should identify major customer groups. This helps in generating priorities in the identification of customers and critical issues in the provision of decision-support information.
(ii) Stage 2: Identifying customer expectations: Once the major customer groups are identified, their expectations are then listed.
(iii) Stage 3: Identifying customer decision-making requirements and product utilities: BY identifying the need to stay close to the customers and follow their suggestions, a decision-support system can be developed, incorporating both financial as well as non-financial information.

(iv) Stage 4: Identifying perceived problems in decision-making process and product utilities: Using participative processes such as brain-storming, the firm seeks to list out its perception of problem areas and the shortcomings in meeting customer requirements.

(v) Stage 5: Comparison with other firms and benchmarking: Detailed and systematic internal deliberations allow the firm to develop a clear idea of their own strengths and weaknesses and of the areas of most significant deficiency.

(vi) Stage 6: Customer feedback: Interaction with the customers and obtaining their views helps the firm in correcting its own perceptions and refining its process.

(vii) Stage 7: Identification of improvement opportunities and implementation of Quality improvement Process: The outcomes of the customer survey, benchmarking and internal analysis.

**8. Write short notes on any three:** **[5×3=15]**
 **(a) Enterprises Risk Management (ERM)**
 **(b) Backflush accounting**
 **(c) Limitations Of Standard Costing**
 **(d) Extended Supply Chain**

**Answer:**

**8. (a) Enterprises Risk Management (ERM)**

Enterprise Risk Management (ERM) deals with risks and opportunities affecting value creation or preservation. ERM is a process, affected by an entity's Board of Directors, Management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity and manage risk to be within its risk appetite and to provide reasonable assurance regarding the achievement of entity objectives.

The underlying premise of ERM is that every entity exists to provide value for its stakeholders. All entities face uncertainty and the challenge for the management is to determine how much, uncertainty to accept as it strives to grow stakeholder value. Uncertainty presents both risk and opportunity, with the potential to erode or enhance value. ERM enables management to effectively deal with uncertainty and the associated risk and opportunity, enhancing the capacity to build value.

**ERM encompasses :**

• Aligning risk appetite and strategy
• Enhancing risk response decisions
• Reducing operational surprises and losses
• Identifying and managing multiple and cross-enterprise risks
• Seizing opportunities and
• Improving deployment of capital.

### 8. (b) 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.

### 8. (c)Limitations Of Standard Costing

The following are some of the limitations of Standard Costing:
i. Establishment of standard costs is difficult in practice.
ii. The standards tend to become rigid, in course of time.
iii. Inaccurate, unreliable and out of date standards do more harm than good.
iv. Sometimes, standards create adverse psychological effects. If the standard set is too high, its non achievement would result in frustration .
v. Standard costing may not sometimes be suitable in the case of industries dealing with non-standardized products and for repair jobs, which will keep on changing, in accordance with the customer's specifications.
vi. Lack of interest in standard costing on the part of the management makes the system practically ineffective. Management must accept the concept whole-heartedly.

**8. (d)** The **Extended Supply Chain** is a clever way of describing everyone who contributes to a product. So if you make text books, then your extended supply chain would include the factories where the books are printed and bound, but also the company that sells you the paper, the mill where that supplier buys their stock, and so on. It is important to keep track of what is happening in your extended supply chain because with a supplier or a supplier's supplier could end up having an impact on you (as the old saying goes, a chain is only a strong as its weakest link). For example, a fire in a paper mill might cause the text book manufacturer's paper supplier to run out of inventory. If the text book company knows what is happening in its extended supply chain it can find another paper vendor.