

# FINAL EXAMINATION

## GROUP IV

(SYLLABUS 2008)

### SUGGESTED ANSWERS TO QUESTIONS

DECEMBER 2012

#### 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.*

*Answer Question No. 1 (carrying 25 marks), which is compulsory and any five more questions (each carrying 15 marks) from the rest.*

*Please : (1) Answer all part of a question at one place only.  
(2) Open a new page for answer to a new question.*

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

- (i) Value Chain Concept and Value Added Concepts are fundamentally same.
- (ii) Decisions under uncertainty are not always obvious.
- (iii) Life Costing is a technique to establish the total cost of ownership.
- (iv) Drum is the constraint and therefore sets the pace for the entire system.
- (v) Theory Y style of Management is a highly autocratic style. [1×5]

**(b)** In each of the cases given below, only one is the most appropriate option. Indicate the correct answer (=1 mark) and show workings/reasons briefly in support of your answer (=1 mark):

- (i) SUVAM LTD., has the capacity of production of 80,000 units and presently sells 20,000 units at ₹ 100 each. The demand is sensitive to selling price and it has been observed that with every reduction of ₹ 10 in selling price, the demand is doubled. What should be the target cost at full capacity if profit margin on sale is taken as 25%?
  - A. ₹ 67.50
  - B. ₹ 60.00
  - C. ₹ 45.00
  - D. None of the above

2 ♦ Suggested Answers to Question — EPM

- (ii) ASHLIN LTD., has developed a new product and just completed the manufacture of first four units of the product. The first unit took 2 hours to manufacture and the first four units together took 5.12 hours to produce. The Learning Curve rate is

A. 83.50%  
B. 80.00%  
C. 75.50%  
D. None of (A), (B) or (C)

- (iii) ANKIT LTD., operates Throughput Accounting System. The details of Product A per unit are as under:

|                              |            |
|------------------------------|------------|
| Selling Price                | ₹ 75       |
| Material Cost                | ₹ 30       |
| Conversion Cost              | ₹ 20       |
| Time to bottleneck resources | 10 minutes |

The return per hour for Product A is

A. ₹ 270  
B. ₹ 150  
C. ₹ 120  
D. ₹ 90

- (iv) A company makes and sells a single product. The selling price and marginal revenue equations are :

$$\text{Selling Price} = ₹ 50 - ₹ 0.001X$$

$$\text{Marginal Revenue} = ₹ 50 - ₹ 0.002X$$

Where X is the product the company makes. The variable costs amount to ₹ 20 per unit and the fixed costs are ₹ 1,00,000.

In order to maximize the profit, the selling price should be

A. ₹ 25  
B. ₹ 30  
C. ₹ 35  
D. ₹ 40

- (v) A company has budgeted break-even sales revenue of ₹ 8,00,000 and fixed costs of ₹ 3,20,000 for the next period. The sales revenue needed to achieve a profit of ₹ 50,000 in the period will be

A. ₹ 8,50,000  
B. ₹ 9,25,000  
C. ₹ 11,20,000  
D. ₹ 12,00,000

[1×5]

**(c)** Fill in the blanks with the appropriate word out of the options indicated in the bracket against each statement :

- (i) Instead of \_\_\_\_\_ (accepting / not accepting) the current practice, Zero Base Budgeting creates a challenging and questioning attitude.
- (ii) Finite Capacity Scheduling (FCS) is an extension of \_\_\_\_\_ [Capacity Requirement Planning (CRP)/ Manufacturing Resource Planning (MRP)].
- (iii) Marginal Cost is a \_\_\_\_\_ (constant/ variable) ratio which may be expressed in terms of an amount per unit of output.
- (iv) In a Transportation Problem, when the quantities are allocated to cost cells within the matrix and if such allocations are less than the number of rows plus number of columns plus one, such situation is known as \_\_\_\_\_ (unbalanced/ degeneracy).
- (v) A relative measure of \_\_\_\_\_ (standard deviation/dispersion) is the coefficient of variation. [1×5]

**(d)** Define the following terms in just one/two sentences :

- (i) Effectors;
- (ii) Quality Function Deployment;
- (iii) Intranet;
- (iv) Cost Breakdown Structure;
- (v) Quality Circle. [1×5]

**Answer 1. (a)**

(i) **False.**

The value-chain concept is fundamentally different from the value-added concept.

(ii) **True.**

Decisions under uncertainty are not always obvious.

(iii) **True.**

Life Costing is a technique to establish the total cost of ownership.

(iv) **True.**

Drum is the constraint and therefore sets the pace for the entire system.

(v) **False.**

Theory X is a highly autocratic style of management.

4 ♦ Suggested Answers to Question — EPM

**Answer 1. (b)**

(i) B: ₹ 60.

| Demand | Price (₹) |
|--------|-----------|
| 20,000 | 100       |
| 40,000 | 90        |
| 80,000 | 80        |

$$\text{Target Cost} = ₹ 80 - (80 \times 0.25) = ₹ 60$$

(ii) B = 80%

Let the learning rate be X.

Since the first unit took 2 hours, average time for the first two units = 2X and

The average time for the first 4 units =  $2X \times X = 2X^2$

$$\therefore 2x^2 = 5.12 \div 4 = 1.28$$

$$\text{Or, } x = \sqrt{1.28 \div 2} = \sqrt{0.64}$$

$$= 0.80 \text{ i.e. } 80\%$$

(iii) A: ₹ 270

(Selling Price – Material Cost) / Time on bottleneck resources.

$$= [(\text{₹ } 75 - \text{₹ } 30) / 10 \text{ minutes}] \times 60 = ₹ 270$$

(iv) C = ₹ 35

$$\text{Selling price} = ₹ 50 - ₹ 0.001X$$

$$\text{Marginal Revenue} = ₹ 50 - ₹ 0.002X$$

$$\text{Variable Cost per unit} = \text{Marginal Cost per unit} = ₹ 20$$

$$\text{Optimal output for maximum profit: } 20 = 50 - 0.002X,$$

$$\text{Hence, } X = 30 / 0.002 = 15,000 \text{ units}$$

$$\text{SP} = 50 - 0.001X = 50 - 0.001(15000) = 50 - 15 = ₹ 35.$$

(v) B = ₹ 9,25,000.

$$\text{P/V Ratio} = \text{Fixed cost} / \text{BE Sales} = 3,20,000 / 80,000 \times 100 = 40\%$$

$$\text{Contribution required} = \text{FC} + \text{Profit} = ₹ (3,20,000 + 50,000) = ₹ 3,70,000.$$

$$\text{Sales} = 3,70,000 / 40\% = ₹ 9,25,000$$

**Answer 1. (c)**

- (i) accepting
- (ii) Capacity Requirement Planning
- (iii) constant
- (iv) degeneracy
- (v) dispersion

**Answer 1. (d)**

- (i) **Effectors** : Is a true decision maker. It evaluates alternative course of corrective action in the light of the significance of the deviations transmitted by the Comparator.
- (ii) **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.
- (iii) **Intranet** : is a private computer network that uses internet protocols and network connectivity to securely share part of an organization's information or operations with its employees.
- (iv) **Cost Breakdown Structure (CBS)** : is central to life cycle costing. Its aim is to identify all the relevant cost elements and it must have well defined boundaries to avoid omission or duplication.
- (v) **Quality Circle** : is a small group of 6 to 12 employees doing similar work and who voluntarily meet together on a regular basis to identify improvements in their respective work areas.

**Q. 2.** Modern Electronics Ltd., manufactures Electronic Regulators. It is proposing to introduce a new advanced version of the Electronic Regulator with digital display. Development of the new Regulator will begin shortly and it is expected that the new product will have a life cycle of 3 years because of continuous development in the field of Electronics.

The company has prepared the following estimates for 3 years :

|                                                             | Year I   | Year II  | Year III |
|-------------------------------------------------------------|----------|----------|----------|
| Advanced Regulator – units to be manufactured & sold (nos.) | 50,000   | 2,00,000 | 1,50,000 |
| Advanced Regulator per batch (nos.)                         | 400      | 500      | 500      |
| Price per Regulator (₹)                                     | 45       | 40       | 32       |
| <u>Development Cost (₹)</u>                                 | 8,50,000 | 1,50,000 | —        |
| <u>Production Costs</u>                                     |          |          |          |
| Variable Cost/unit (₹)                                      | 16       | 15       | 15       |
| Variable Cost/batch (₹)                                     | 700      | 600      | 600      |
| Fixed Costs (₹)                                             | 5,50,000 | 5,50,000 | 5,50,000 |
| <u>Marketing Costs</u>                                      |          |          |          |
| Variable Cost/unit (₹)                                      | 3.60     | 3.20     | 2.80     |
| Fixed Costs (₹)                                             | 4,00,000 | 3,00,000 | 3,00,000 |
| <u>Distribution Costs</u>                                   |          |          |          |
| Regulators/batch (nos.)                                     | 200      | 160      | 120      |
| Variable Cost/unit (₹)                                      | 1        | 1        | 1        |
| Other variable Cost/batch (₹)                               | 120      | 120      | 100      |
| Fixed Costs (₹)                                             | 2,30,000 | 2,30,000 | 2,30,000 |
| Sales Promotion expenses/unit (₹)                           | 2        | 1.50     | 1.50     |

6 ♦ Suggested Answers to Question — EPM

You are requested to calculate :

- (i) Life Cycle Operating Profit and
- (ii) Comment/evaluate on a proposal to decrease selling price by ₹ 3, which will increase sales volume by 10%. In such a case, production and distribution batch size will increase by 10%.

[5+10]

**Answer 2.**

**(i) Life Cycle Operating Profit:**

(₹ in '000)

|                                                                            | Year I          | Year II      | Year III     | Life Cycle       |
|----------------------------------------------------------------------------|-----------------|--------------|--------------|------------------|
| Sales                                                                      | 2,250           | 8,000        | 5,250        | 15,500           |
| Development Cost                                                           | 850             | 150          | —            | 1,000            |
| <b>Production Costs :</b>                                                  |                 |              |              |                  |
| Variable Cost/unit (Total)                                                 | 800             | 3,000        | 2250         | 6,050            |
| Variable Cost/batch (Total)<br>(50000/400 × 700)                           | 87.5            | 240          | 180          | 5,07.5           |
| Fixed Costs                                                                | 550             | 550          | 550          | 1,650            |
| <b>Marketing Costs :</b>                                                   |                 |              |              |                  |
| Variable Cost (per unit) – Total                                           | 180             | 640          | 420          | 1,240            |
| Fixed Costs                                                                | 400             | 300          | 300          | 1,000            |
| <b>Distribution Costs :</b>                                                |                 |              |              |                  |
| Variable Cost (per unit) –Total                                            | 50              | 200          | 150          | 400              |
| Variable Cost/ batch – (Total) $\left(\frac{50000}{200} \times 120\right)$ | 30              | 150          | 125          | 305              |
| Fixed Costs                                                                | 230             | 230          | 230          | 690              |
| Sales Promotion expenses (/unit)<br>(Total)                                | 100             | 300          | 225          | 625              |
| <b>Total Costs</b>                                                         | <b>3,277.50</b> | <b>5,760</b> | <b>4,430</b> | <b>13,467.50</b> |
| Operative Profit/ Loss                                                     | (1,027.50)      | 2,240        | 820          | 2,032.50         |

**(ii) Effect of reduction in price on Life Cycle operating profit:**

|                             | Year I | Year II | Year III |
|-----------------------------|--------|---------|----------|
| New Selling Price/ unit (₹) | 42     | 37      | 32       |
| Sales volume                | 55000  | 220000  | 165000   |
| Production Batch size       | 440    | 550     | 550      |
| Distribution Batch size     | 220    | 176     | 132      |

**Operating Profit :**

(₹ in '000)

|                                                                            | Year I    | Year II | Year III | Life Cycle |
|----------------------------------------------------------------------------|-----------|---------|----------|------------|
| Sales                                                                      | 2310      | 8140    | 5280     | 15730      |
| Development Cost                                                           | 850       | 150     | —        | 1000       |
| <b>Production Costs :</b>                                                  |           |         |          |            |
| Variable Cost/unit – (Total)(55000×16)                                     | 880       | 3300    | 2475     | 6655       |
| Variable Cost/batch – (Total) $\left(\frac{55000}{4400} \times 700\right)$ | 87.5      | 240     | 180      | 507.5      |
| Fixed Cost                                                                 | 550       | 550     | 550      | 1650       |
| <b>Marketing Costs :</b>                                                   |           |         |          |            |
| Variable Cost (per unit)- Total (55000 × 3.6)                              | 198       | 704     | 462      | 1364       |
| Fixed costs                                                                | 400       | 300     | 300      | 1000       |
| <b>Distribution Costs :</b>                                                |           |         |          |            |
| Variable Cost (per unit) –Total (55000 × 1)                                | 55        | 220     | 165      | 440        |
| Variable Cost/ batch – (Total) $\left(\frac{50000}{200} \times 120\right)$ | 30        | 150     | 125      | 305        |
| Fixed Costs                                                                | 230       | 230     | 230      | 690        |
| Sales Promotion expenses (/unit)                                           |           |         |          |            |
| - (Total)                                                                  | 110       | 330     | 247.5    | 687.5      |
| Total Costs                                                                | 3390.50   | 6174    | 4734.5   | 14299      |
| Operative Profit/ Loss                                                     | (1080.50) | 1966    | 545.5    | 1431       |

**Comment:** When the price is reduced, there is a reduction in profit by over ₹ 6 lakhs.

**Q. 3. (a)** What is a control system? What are the types of control systems?

[1+4]

**(b)** ALEENA LTD., manufactures two sub-assemblies M and P. One unit of each is assembled to produce the final product BS.

The following information is available :

|                                      | Sub-assembly - M | Sub-assembly - P | Final Product - BS |
|--------------------------------------|------------------|------------------|--------------------|
| Material Used – Special Steel Plates | 20 kg            | 20 kg            | —                  |
| Other direct manufacturing cost (₹)  | 500              | 500              | —                  |
| Final assembly Cost (₹)              | —                | —                | 1,000              |

ALEENA LTD., has procured an order for supply of 40,000 units of the final product BS on an urgent basis at a price of ₹ 3,000 per unit. However ALEENA LTD., can arrange for only 800 MT of Special Steel Plate required for production. On enquiry in the market, a supplier has been located, who has got ready stock of 40,000 units of Sub-assembly P and is willing to sell the entire quantity to ALEENA LTD.

8 ♦ *Suggested Answers to Question — EPM*

The company has decided to procure sub-assembly P from the said supplier and the company has to incur an additional cost of ₹100 per unit for the same.

*Required :*

What is the maximum price that ALEENA LTD. can pay to the supplier for procuring sub-assembly P? What are your conclusions and decisions? [8+2]

**Answer 3. (a)**

A Control System consists of a set of formal and informal systems that are designed to assist management in steering the organization towards achievement of its goals. These two systems are distinct but closely inter-related, sometimes undistinguishable sub-divisions of control systems.

**Types of control systems:**

The control systems are of two types:

- (i) Formal Control Systems and
- (ii) Informal Control Systems.

The Formal and Informal Control Systems, along with five components of each are enumerated as below:

**Formal Control Systems:**

**i. Infrastructure:**

- Organization Structure
- Patterns of Autonomy
- Measurement Methods

**ii. Management Style and culture:**

- Prevailing Style
- Principle Values

**iii. Formal Control Process:**

- Strategic Planning
- Operational Planning
- Report Systems

**iv. Rewards:**

- Individual and Group
- Short term and Long term

**v. Coordination:**

- Standing Committees
- Formal Conferences
- Involvement Techniques.

**Informal Control Systems:**

**i. Infrastructure:**

- Personal Contracts
- Networks
- Expertise Oriented

**ii. Management Style and culture:**

- Prevailing Style
- External/ Internal/ Mixed

**iii. Informal Control Process:**

- Search/ alternative generations
- Rationalisation / dialogue

**iv. Rewards:**

- Recognition
- Status Oriented

**v. Coordination & Integration:**

- Based upon trust
- Simple/ direct/ personal
- Telephone conversation.



**Answer 3. (b)****ALEENA LTD.**

The limiting factor is the availability of Special Steel. Only 800 MT of Special Steel is available.

To produce 40000 units, the requirement of Special Steel will be:

Sub-assembly M: 20kg x 40000 units = 800 MT

P: 20 kg x 40000 units = 800 MT

Therefore the available alternatives are:

- (i) To restrict production of BS to 20000 units, fully utilizing the available 800 MT of Special Steel Plates.
- (ii) To produce 40000 units of BS using 800 MT of Special Steel Plates for the required sub-assembly-M and procuring 40000 units of Sub-assembly P from the outside supplier.

**COMPARATIVE ECONOMIES STATEMENT OF THE TWO ALTERNATIVES**

|                                                         | <b>Alternative- I</b>                                        | <b>Alternative- II</b>                                                                      | <b>Incremental</b> |
|---------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------|
|                                                         | M and P (each 20000 units made per availability constraints) | Only M is made 40000 units with the availability constraints and 40000 units of P purchased |                    |
| Production of final Product BS (units)                  | 20000                                                        | 40000                                                                                       | 20000              |
| Revenue @ ₹ 3000 per unit                               | ₹ 600 Lakhs                                                  | ₹ 1200 Lakhs                                                                                | ₹ 600 Lakhs        |
| Less: Direct Material Cost (Other than Spl. St. plates) |                                                              |                                                                                             |                    |
| For M @ ₹ 500/unit                                      | ₹ (100) Lakhs                                                | ₹ (200) Lakhs                                                                               | —                  |
| For P @ ₹ 500/unit                                      | ₹ (100) Lakhs                                                | —                                                                                           |                    |
| Less : Handling Cost @ ₹ 100 per unit                   | —                                                            | ₹ (40) Lakhs                                                                                | ₹ (40) Lakhs       |
| Less: Final Assembling cost @ ₹ 1000/unit               | ₹ (200) Lakhs                                                | ₹ (400) Lakhs                                                                               | ₹ (200) Lakhs      |
| Margin                                                  | ₹ 200 Lakhs                                                  | ₹ 560 Lakhs                                                                                 | ₹ 360 Lakhs        |

**Decision:**

Buying Price for Sub-assembly – P could be ₹ 900 ( ₹ 360 Lakh ÷ 40000) as maximum. But, then the company (Aleena Ltd.,) will not make any financial gain at this price, though it may benefit the company indirectly.

Therefore, any price below ₹ 900 for P will add to the profit and help in maintaining a good customer-relationship with the company.

**Q. 4. (a)** What is 'Decision Tree Analysis'? Write a brief note on this. [5]

**(b)** RAHUL TEXTILES LTD., is considering whether to enter a new market. In case the company decides to enter this market, it must increase its production. To achieve higher production, it must either install a new plant with a cash outlay of ₹ 3,00,000 or pay overtime wages to its workers, which are expected to amount to ₹ 1,00,000. If the company decides to enter the market, there is a 60% chance of its shareholders, approving the installation of the new plant. A random sample of current market structure reveals that there are 40% chances for achieving a high level of sales by the company, 30% chances of achieving a medium level sales, 20% chances of low sales and 10% chances of achieving no sales. Further, high level of sales will yield a profit of ₹ 10,00,000, a medium level of sales will yield a profit of ₹ 6,00,000 and a low level of sales a profit of ₹ 2,00,000. If there are no sales, the company will lose ₹ 5,00,000, apart from the cost of the equipment.

*Required :*

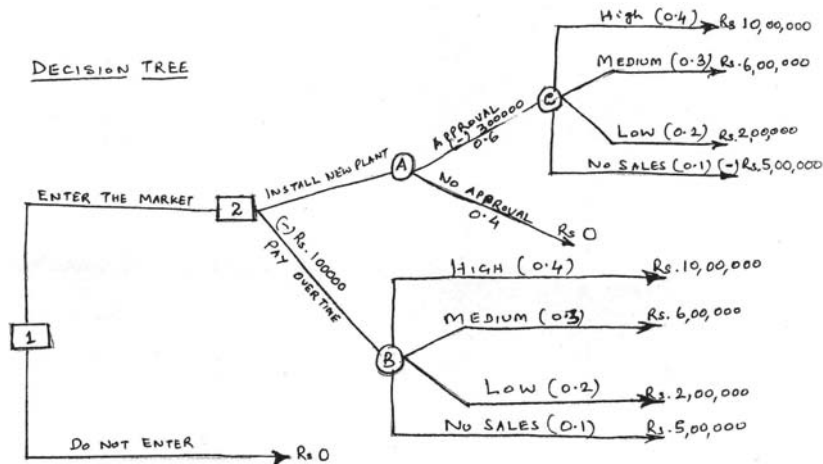
Represent the above problem in the form of a DECISION TREE and suggest the option that should be selected by the company (RAHUL TEXTILES LTD.). [4+6]

**Answer 4. (a)**

**Decision Tree Analysis:**

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.

Decision Tree is a graphic representation of the sequence of action-event combinations available to the decision-maker. It depicts in a systematic manner all possible sequences of decisions and consequences. Each alternative course of action is represented by a branch, which leads to subsidiary branches for further courses of action or possible events. Decision Trees are designed to illustrate the full range of alternatives and events that can occur under all envisaged conditions. Decision Tree brings out logical analysis of a problem and enables a complete strategy to be drawn up to cover all eventualities before a firm becomes committed to a scheme.

**Answer 4. (b)****Evaluation of Decision Points :**

Expected Monetary Value (EMU) of chance node at C

$$= 0.4 \times 10,00,000 + 0.3 \times 6,00,000 + 0.2 \times 2,00,000 + 0.1 \times (-) 5,00,000 = ₹ 5,70,000.$$

$$\text{EMV of Node at B} = 0.4 \times 10,00,000 + 0.3 \times 6,00,000 + 0.2 \times 2,00,000 + 0.1 \times (-) 5,00,000 \\ = ₹ 5,70,000.$$

$$\text{EMV of Node at A} = 0.6 \times (5,70,000 - 3,00,000) + 0.4 \times 0 \\ = ₹ 1,62,000$$

$$\begin{aligned} \text{EMV of decision node at 2 : New Plant} &= ₹ 1,62,000 \\ \text{Overtime} &= ₹ (5,70,000 - 1,00,000) \\ &= ₹ 4,70,000 \end{aligned}$$

$$\begin{aligned} \text{EMV of decision node at 1 : Enter Market} &= ₹ 4,70,000 \text{ (Max.)} \\ &\text{\& Pay overtime} \end{aligned}$$

$$\text{Do not enter market} = ₹ 00$$

∴ The company should enter market by paying overtime wages to the workers.

**Q. 5. (a)** What are the reasons for implementation of an ERP (Enterprise Resource Planning) package by the companies? [5]

**(b)** The top management of ZASLEEN LTD., is considering the problem of marketing a new product. The fixed cost required in the project is ₹ 1,50,000. The three factors that are uncertain are Selling Price, Variable Cost and the annual Sales Volume. The product has a Life of only one year.

The management has collected the following data regarding the possible levels of these three factors:

| Selling Price/unit (₹)<br>(Series 1) | Probability | Variable Cost/unit (₹)<br>(Series 2) | Probability | Sales volume (units)<br>(Series 3) | Probability |
|--------------------------------------|-------------|--------------------------------------|-------------|------------------------------------|-------------|
| 14                                   | 0.35        | 2                                    | 0.30        | 30,000                             | 0.25        |
| 15                                   | 0.50        | 3                                    | 0.50        | 40,000                             | 0.40        |
| 16                                   | 0.15        | 4                                    | 0.50        | 50,000                             | 0.35        |

Consider the following three series of random numbers:

Series 1 : 82 84 28 82 36 92 73 91 63 29 (to be used for Selling Price)

Series 2 : 27 26 92 63 83 03 10 39 10 10 (to be used for Variable Cost)

Series 3 : 23 57 99 84 51 29 41 11 66 30 (to be used for Sales Volume)

*Required:*

Using Monte Carlo Simulation Technique, determine the expected profit for the above project on the basis of 10 trials. [10]

**Answer 5. (a)**

The reasons for implementation of ERP by the companies are enumerated below:

(i) **Complete Automation and Faster Service:**

ERP automates the tasks involved in performing a business process faster and with fewer errors than before. Major business processes like handling customer orders, Employee Payroll or Financial Reporting can be speeded up.

(ii) **Standardised Process:**

Manufacturing companies find that multiple business units across the company adopt different methods and computer systems, for the same product. Standardising these, using a single integrated computer system can save time and increase productivity.

(iii) **Integrated Financial Data:**

ERP creates a single version of the financial position and performance, which is very useful in analyzing the performance of different business units.

(iv) **Standardised HR Information:**

HR may not have a unified, simple method for tracking employee time and communicating with them about benefits and services.

(v) **Tailor-made:**

ERP Systems are designed as per the requirements of individual companies, based on the methods of their operations.

(vi) **Information Management:**

ERP helps at getting proper information, since all data are made available at one place and are accessible to different users based on their requirements.

**Answer 5. (a)**

| Selling Price<br>(₹)    | Probability | Cumulative<br>Probability | Random Numbers<br>assigned |
|-------------------------|-------------|---------------------------|----------------------------|
| 14                      | 0.35        | 0.35                      | 00 - 34                    |
| 15                      | 0.50        | 0.85                      | 35 - 84                    |
| 16                      | 0.15        | 1.00                      | 85 - 99                    |
| Variable Cost<br>(₹)    |             |                           |                            |
| 2                       | 0.30        | 0.30                      | 00 - 29                    |
| 3                       | 0.50        | 0.80                      | 30 - 79                    |
| 4                       | 0.20        | 1.00                      | 80 - 99                    |
| Sales Volume<br>(units) |             |                           |                            |
| 30000                   | 0.25        | 0.25                      | 00 - 34                    |
| 40000                   | 0.40        | 0.65                      | 35 - 84                    |
| 50000                   | 0.35        | 1.00                      | 85 - 99                    |

**SIMULATION USING 3 SERIES OF 10 RANDOM NUMBERS EACH**

| Run | Random<br>Number<br>Series 1 | Price<br>(₹) | Random<br>Number<br>Series 2 | Variable<br>Cost<br>(₹) | Random<br>Number<br>Series 3 | Sales<br>Unit | Fixed<br>Cost<br>(₹) | Profit<br>(₹) |
|-----|------------------------------|--------------|------------------------------|-------------------------|------------------------------|---------------|----------------------|---------------|
|     | 1                            | 2            | 3                            | 4                       | 5                            | 6             | 7                    | (2-4)×6-7     |
| 1   | 82                           | 15           | 27                           | 2                       | 23                           | 30000         | 150000               | 240000        |
| 2   | 84                           | 15           | 26                           | 2                       | 57                           | 40000         | 150000               | 370000        |
| 3   | 28                           | 14           | 92                           | 4                       | 99                           | 50000         | 150000               | 350000        |
| 4   | 82                           | 15           | 63                           | 3                       | 84                           | 40000         | 150000               | 330000        |
| 5   | 36                           | 15           | 83                           | 4                       | 51                           | 40000         | 150000               | 290000        |
| 6   | 92                           | 16           | 03                           | 2                       | 29                           | 40000         | 150000               | 410000        |
| 7   | 73                           | 15           | 10                           | 2                       | 41                           | 40000         | 150000               | 370000        |
| 8   | 91                           | 16           | 39                           | 3                       | 11                           | 30000         | 150000               | 240000        |
| 9   | 63                           | 15           | 10                           | 2                       | 66                           | 40000         | 150000               | 370000        |
| 10  | 29                           | 14           | 10                           | 2                       | 30                           | 40000         | <u>150000</u>        | <u>330000</u> |
|     |                              |              |                              |                         |                              |               | Total                | 3300000       |

Therefore, the expected Profit (Average):  $3300000/10 = ₹ 3,30,000$ .

**Working Notes:**

Profit = (Selling Price-Variable Cost) × Sales Volume - Fixed Cost.

₹

$$\begin{aligned}\text{Trial-1} &= (15-2) \times 30000 - 150000 = 240000 \\ 2 &= (15-2) \times 40000 - 150000 = 370000 \\ 3 &= (14-4) \times 50000 - 150000 = 350000 \\ 4 &= (15-3) \times 40000 - 150000 = 330000 \\ 5 &= (15-4) \times 40000 - 150000 = 290000 \\ 6 &= (16-2) \times 40000 - 150000 = 410000 \\ 7 &= (15-2) \times 40000 - 150000 = 370000 \\ 8 &= (16-3) \times 30000 - 150000 = 240000 \\ 9 &= (15-2) \times 40000 - 150000 = 370000 \\ 10 &= (14-2) \times 40000 - 150000 = 330000\end{aligned}$$

**Q. 6. (a)** Explain briefly the major components of a Balanced Score Card.

[5]

**(b)** NAVAYOGANA LTD., has adopted a Standard Costing System. The Standard output for a period is 20,000 units. The Standard Cost and Profit per unit is given below :

|                                     | ₹            |
|-------------------------------------|--------------|
| Direct Materials (6 units @ ₹ 1.50) | 9.00         |
| Direct Labour (6 units @ Re. 1.00)  | 6.00         |
| Direct Expenses                     | 1.00         |
| Factory Overheads :                 |              |
| Variable                            | 0.50         |
| Fixed                               | 0.60         |
| Administrative Overheads            | 0.60         |
|                                     | <u>17.70</u> |
| Profit per unit                     | 2.30         |
| Selling Price (Fixed by Government) | <u>20.00</u> |

Actual production and sales for a period was 14,400 units.

The following are the variance worked out at the end of the period :

|                               | Favourable<br>(₹) | Adverse<br>(₹) |
|-------------------------------|-------------------|----------------|
| Direct Materials:             |                   |                |
| Price Variance                | —                 | 8,500          |
| Usage Variance                | 2,100             | —              |
| Direct labour:                |                   |                |
| Rate Variance                 | —                 | 8,000          |
| Efficiency Variance           | 6,400             | —              |
| Factory Overheads:            |                   |                |
| Variable Expenditure Variance | 800               | —              |
| Fixed Expenditure Variance    | 800               | —              |
| Fixed Volume Variance         | —                 | 3,360          |
| Administrative Overheads:     |                   |                |
| Expenditure Variance          | —                 | 800            |
| Volume Variance               | —                 | 3,360          |

You are required to :

- (i) Ascertain the details of cost and prepare the Profit and Loss Account in the statement for the period, showing actual profit. [5+3]
- (ii) Reconcile the actual profit with the standard profit. [2]

#### Answer 6. (a)

The component of Balanced Score Card (BSC) varies from business to business. A well designed BSC combines financial measures of past performance with measures of firm's drivers of future performance. The specific objectives and measures of an organization's BSC are derived from the firm's vision and strategy. Generally the BSC has the following perspective form which a company's activity can be evaluated:

- (i) **Customer Perspective:** i.e., How customer see us? The Customer Perspective considers the business through the eyes of the customers, measuring and reflecting upon customer satisfaction.
- (ii) **Internal Business Perspective:** i.e., In what processes must the firm excel? The Internal Business Perspective focuses attention on the performance of the key internal processes of the business.
- (iii) **Learning and Growth Perspective:** i.e., Can we continue to improve and create value? This perspective is a measure of potential future performance. It drives attention to the basis of all future success—the organization's people and its infrastructure.
- (iv) **Financial Perspective:** i.e., How we look to our shareholders? The Financial Perspective measures the results that the organization delivers to its stockholders.

**Answer 6. (b)****NAVAYOGANA LTD.****ASCERTAINMENT OF DETAILS OF COSTS :**

| (14400 units)                | Variance<br>(₹) | Standard Cost<br>(₹) | Actual Cost<br>(₹) |
|------------------------------|-----------------|----------------------|--------------------|
| Directs Materials (14400×9)  |                 | 1,29,600             |                    |
| Price Variance (Adverse)     | 8,500           |                      |                    |
| Usage Variance (Favourable)  | <u>(2,100)</u>  | <u>6,400</u>         | 1,36,000           |
| Direct Labour (14400×6)      |                 | 86,400               |                    |
| Rate Variance (Adverse)      | 8,000           |                      |                    |
| Efficiency Variance (Fav)    | <u>(6,400)</u>  | <u>1,600</u>         | 88,000             |
| Direct Expenses: (14400 × 1) |                 | 14,400               | 14,400             |
| Factory Overheads:           |                 |                      |                    |
| Variable (14400 × 0.50)      |                 | 7,200                |                    |
| Fixed (14400 × 0.60)         |                 | 8,640                |                    |
| Variable Expenditure (Fav)   | (800)           |                      |                    |
| Fixed Expenditure (Fav)      | (800)           |                      |                    |
| Fixed Volume (Adv)           | <u>3,360</u>    | <u>1,760</u>         | 17,600             |
| Administrative Overheads:    |                 |                      |                    |
| (14400 × 0.60)               |                 | 8,640                |                    |
| Expenditure (Adv)            | 800             |                      |                    |
| Volume Variance (Adv)        | <u>3,360</u>    | <u>4,160</u>         | <u>12,800</u>      |
| Total Cost (14400 × 17.70)   |                 | 2,54,880             | 2,68,800           |

**PROFIT AND LOSS ACCOUNT OF NAVAYOGANA LTD.***for the year ending.....*

|                                |               |                 |
|--------------------------------|---------------|-----------------|
|                                |               | ₹               |
| Sales Rev-enue (14400 × 20)    |               | 2,88,000        |
| Less: Costs:                   | ₹             |                 |
| Direct Materials               | 1,36,000      |                 |
| Direct Labour                  | 88,000        |                 |
| Direct Expenses                | 14,400        |                 |
| Factory Overhead               |               |                 |
| Variable                       | 6,400         |                 |
| Fixed                          | 11,200        |                 |
| Administrative Overhead        | <u>12,800</u> | <u>2,68,800</u> |
| Profit (Actual)                |               | 19,200          |
| Standard Profit (14400 × 2.30) |               | 33,120          |



**STATEMENT OF RECONCILIATION OF ACTUAL PROFIT  
WITH STANDARD PROFIT**

|                            |                 |                                               |
|----------------------------|-----------------|-----------------------------------------------|
| Standard Profit            |                 | ₹<br>33,120                                   |
| Add: Favourable Variance : | ₹               |                                               |
| Direct Materials Usage     | 2,100           |                                               |
| Direct Labour Efficiency   | 6,400           |                                               |
| Variable OH Expenditure    | 800             |                                               |
| Fixed OH Expenditure       | 800             |                                               |
|                            | <u>10,100</u>   |                                               |
| Less : Adverse Variance :  |                 |                                               |
| Direct Material Price      | (8,500)         |                                               |
| Direct Labour Rate         | (8,000)         |                                               |
| Fixed OH Volume            | (3,360)         |                                               |
| Admn. OH Expenditure       | (800)           |                                               |
| Admn. OH Volume            | (3,360)         |                                               |
|                            | <u>(24,020)</u> |                                               |
| Profit (Actual)            |                 | <u>(13,920)</u><br><u>19,200</u> (Reconciled) |

**Q. 7. (a)** What is 'Supply Chain Management'?

**(b)** What do you mean by 'Linear Programming'?

**(c)** What is 'Quality'? What is its relevance to Cost Management?

**(d)** What is 'Total Quality Management'?

**(e)** Write a brief note on 'Kaizen Costing Approach'.

[3+3+3+3+3]

**Answer 7. (a)**

**Supply Chain Management :**

Supply Chain Management encompasses the planning and management of all the activities involved in sourcing, procurement, conversion and logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers and customers. In essence, Supply Chain Management integrates supply and demand management within and across the companies.

The concept of Supply Chain Management emphasizes on linkages among all of the value-adding activities in the chain. This concept has virtually displaced the term "business logistics". In fact Supply Chain Management's emergence is perhaps the most significant development in business management since the early 1980s. Savvy business executives firmly believe that effective management of the Supply Chain can help boost a firm's performance. They recognize that Supply Chain Management can provide a distinctive and sustainable competitive advantage and improved profitability.

**Answer 7. (b)**

**Linear Programming :**

Linear Programming is an optimization technique. It is a technique for specifying how to use limited resources or capacities of a business to obtain a particular objective, such as least cost, highest margin or least time, when those resources have alternate uses.

A Linear Programming Problem has two basic parts. The first part is the 'Objective function', which describes the primary purpose of the formulation to maximize profit/minimize losses.

The second part is the constraint set. It is the system of equalities and /or inequalities, which describes the restrictions (conditions or constraints) under which optimization is to be accomplished.

**Answer 7. (c)**

**The concept of 'Quality' and its relevance to Cost Management:**

The concept of 'Quality' means conformance to requirements. 'Quality' is unobtrusively meeting the needs of the customers. A Product or process that is reliable and that performs its intended function is said to be a quality product. Quality is the extent to which products are free from defects, constraints and items which do not add any value for the customers. Quality is a fulfillment of expectation. Quality is the ability of a product or service to meet a customer's expectations from that product/service. It is consistent conformance to customer expectations. Quality is doing right things right. It is related to customer orientation, innovation, teamwork and everyone's responsibility.

**Relevance of Quality in Cost Management :**

Cost Management is the management of cost related activities(including Quality conformance) achieved by collecting, analysis, evaluating and reporting cost informations. Cost Management is the process by which the companies control and plan the costs of doing business. Cost Management is the process of planning and controlling the budgets of a business. It is a form of Management Accounting that allows a business to predict impending expenditures to help reduce the chance of going over budget. Quality has become such an important strategic variable that Cost Management can no longer ignore it. Building up quality means adding up cost. Quality thus is cost and Quality Control and Cost Control are in fact the obverse and reverse of the same coin. The emphasis should be on prevention of errors and failures through Quality Planning. Investment in Quality Control will yield rich returns to the manufacturer through savings in material and man-hours lost, improving productivity and above all profitability through customer satisfaction.

**Answer 7. (d)**

**Total Quality Management :** Quality is considered a by-product of the manufacturing system i.e., each individual process has some variation that will lead to the production of some defective units. If the resulting defective rate is too high, compared to the established quality standards, quality inspectors will identify and send them for rework. The approach is expensive and does not guarantee the desired quality because quality maintaining and ensuring itself cannot be inspected into a product. This approach assigns the responsibility for quality to Quality Control Managers.

A more enlightened approach to quality emphasizes building quality into the product by studying and improving activities that affect quality, from marketing through design to manufacturing. This new approach is referred to as **Total Quality Management (TQM)**. TQM is an active approach encompassing a company-wide operating philosophy and system for continuous improvement of quality. TQM demands cooperation from everyone in the company, from the top management down to workers.

The principles of TQM are:

- Customer Focus and customer-orientation approach
- Managerial Leadership and
- Belief in continuous improvement

**Answer 7. (e)**

**Kaizen Costing Approach :**

Kaizen Costing Approach is a Japanese strategy for continuous improvement. This approach focuses its attention on the reduction of waste in the production process. Kaizen Costing Approach stands for a number of cost reduction steps that can be used subsequent to issuing a new product design to the factory floor. This approach assumes continuous improvement.

The activities in Kaizen Costing Approach include elimination of waste in production, assembly and distribution processes, as well as the elimination of unnecessary work steps in any of these areas. Cost Reductions resulting from Kaizen Costing Approach are much smaller than those achieved with value engineering. But these are still significant since competitive pressures are likely to force down the price of a product over time and any possible cost savings allow a company to still attain its targeted profit margins.

Toyota aggressively and successfully pursued Kaizen Costing to reduce costs in the manufacturing phase.

**Q. 8. Write Short Notes on :**

- (a) Matrix Organization;
- (b) Aggregate Planning;
- (c) Enterprises Risk Management.

[5×3]

**Answer 8. (a)**

**Matrix Organization :**

Matrix Organization was used in USA to solve management problems in the Aerospace Industry.

Matrix Organization is a combination of two/more Organization Structures. For example- Functional Organization and Project Organization. The Organization is divided into different functions. Example - Purchase, Production, R&D etc., Each function has a Functional (departmental) Manager- Example. Purchase Manager, Production Manager, etc.,

The Organization is also divided on the basis of Projects. Example-Project- A, Project-B, etc., Each Project has a Project Manager. Example-Project Manager-A, Project Manager-B, etc., The employee has to work under two authorities (bosses).

The authority of the functional manager flows downwards while the authority of the project manager flows across (sideways). Thus the authority flows both downwards as well as across. That is why such an Organization is called 'Matrix Organization'.

An example of Matrix Organization:

| Function<br>Projects  | Purchase<br>Manager | Production<br>Manager | R&D<br>Manager | Marketing<br>Manager | Finance<br>Manager |
|-----------------------|---------------------|-----------------------|----------------|----------------------|--------------------|
| Project —A<br>Manager |                     |                       |                |                      |                    |
| Project —B<br>Manager |                     |                       |                |                      |                    |
| Project —C<br>Manager |                     |                       |                |                      |                    |

The peculiarities or characteristics or features of a Matrix organization are :

- (i) **Hybrid Structure** : Matrix Organization is a hybrid structure. This is so, because, it is a combination of two or more Organizational & Structures. It combines Functional Organization with a Project Organization. Therefore it has the merits and demerits of both these Organization Structures.
- (ii) **Functional Manager** : The functional manager has authority over the technical (functional) aspects of the project. The responsibilities of functional managers are:
  - He decides how to do the work
  - He distributes the project work among his sub-ordinates
  - He looks after the operational aspects.
- (iii) **Project Manager** : The Project Manager has authority over administration aspects of the project. He has full authority over the financial and physical resources, which he can use for completing the project.
- (iv) **Problem of unity of command** : In a Matrix Organization, there is a problem of unity of command. This is so, because, the sub-ordinates receive orders from 2 bosses, viz., the Project Manager and the Functional Manager. This will result in confusion, disorder, indiscipline, inefficiency, etc., All these will reduce the productivity and profitability of the project.
- (v) **Specialization** : In a Matrix Organization, there is a specialization. The Project Manager concentrates on the administrative aspects of the project while the Functional Manager concentrates on the technical aspects of the project.
- (vi) **Suitability**: Matrix Organization is suitable for Multi-projects Organizations. It is mainly used by large construction companies that construct huge residential and commercial projects in different places at the same time.

#### Answer 8. (b)

##### Aggregate Planning :

Aggregate Planning is a process of developing, analyzing and maintaining a preliminary approximate schedule of the overall operations of an organisation. It generally contains targeted sales forecasts,

production levels and customer backlogs. It is an attempt to balance capacity and demand in such a way that costs are minimized. The term “Aggregate” is used because planning at this level includes all resources ‘in the aggregate’.

Aggregate Planning starts with the determination of demand and current capacity and proceeds to decide whether to increase or decrease capacity to meet the demand. Aggregate planning is considered to be intermediate-term (as opposed to long or short term) in nature. Most Aggregate plans cover a period of three to 18 months. It serves as a foundation for future short — range type planning, like production scheduling, sequencing, loading etc.

There are two pure planning strategies available to the aggregate planner. They are —

- (i) Level Strategy and
- (ii) Chase Strategy

Firms may choose to utilize one of the pure strategies in isolation or they opt for a strategy that combines the two.

Techniques for Aggregate Planning range from informal trial and error approaches to more formalized and advanced mathematical techniques.

#### **Answer 8. (c)**

##### **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.

ERM approach seeks to implement risk awareness and prevention programs throughout a company, thus creating a corporate culture able to handle the risks associated with a rapidly changing business environment. Practitioners of ERM incorporate risk management into the basic goals and values of the company and support those values with action. They conduct risk analysis, devise specific strategies to reduce risk, develop monitoring systems to warn about potential risks and perform regular reviews of the program.

Summing up, ERM helps an entity get to where it wants to go and avoid pitfalls and surprises along the way.