Paper- 15: MANAGEMENT ACCOUNTING – ENTERPRISE PERFORMANCE MANAGEMENT

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

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

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

1. (a) In each of the cases given below, only one is the most appropriate option. Indicate the correct answer (=1 mark) and show your workings/reasons briefly in support of your answer (=1 mark): [2×5=10]

(i) A company proposes to undertake a capital project. The life of the project is 4 years and the annual cash inflows are estimated at ₹40,000. The internal rate of return of the project is 15% and the cumulative present value factor for 15% for 4 years is 2.855. The profitability index is 1.064.
The net present value of the project is
(A) ₹ 6,870
(B) ₹ 10,000
(C) ₹ 12,670
(D) ₹ 14,200

(ii) A company is preparing a quotation for a new product. The time taken for the first unit is 30 hours. The company expects 85% learning curve (index is –0.2345). The company desires that the quotation should be based on the time taken for the final output within the learning period which is expected to end after the company has produced 200 units.
The time per unit of product to be used for the quotation is:

(A) 13.34 hours
(B) 25.50 hours
(C) 30.00 hours
(D) 6.67 hours

(iii) 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

(iv) Nova Manufacturing Company manufactures two products using common material handling facility. The total budgeted material handling cost is ₹ 60,000. The other details are:

	Product X	Product Y
Number of units produced	30	30
Material moves per product line	5	15
Direct labour hour per unit	20	20

Under Activity Based Costing system the material handling cost to be allocated to product X (per unit) would be:

(A) ₹1,000
(B) ₹500
(C) ₹1,500
(D) ₹2,500

(v) A company makes and sells a single product. The selling price and marginal revenue equations are: Selling price = ₹ 50 – ₹ 0.001X

Marginal revenue = ₹50 –₹0.002 X

Where X is the no. of 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) ₹ 32
(B) ₹ 25
(C) ₹ 35
(D) ₹ 40

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

(i) AQL
(ii) PIS
(iii) CIM
(iv) OPT
(v) TOC

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

(i) Succession Planning
(ii) Linear Programming
(iii) Master Production Schedule (MPS)
(iv) Bill-of-Materials (BOM)
(v) Functional Structure

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

(i) 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) Bench marking is a process of continuously comparing an organization's business process against the business leader anywhere in the world to gain information that will help the organization to take action to improve performance.

(iii) A Chase Strategy implies matching demand and capacity period by period. This could result in a considerable amount of hiring, firing or laying off of employees; insecure and unhappy employees; increased inventory carrying cost; problems with labour unions and erratic utilization of plant and equipment.

(iv) Rope is the constraint and therefore sets the pace for the entire system. In simpler terms, the rope is the rate or pace of production set by the system's constraints.

(v) In VAT Analysis, a T-logical structure (many-to-many flow) starts with one or a few raw materials, and the product expands into a number of different products as it flows through its routings.

Q2. (a) After observing heavy congestion of customers over a period of time in a petrol station, Mr. Khan has decided to set up a petrol pump facility on his own in a nearby site. He has compiled statistics relating to the potential customers arrival pattern and service pattern as given below. He has also decided to evaluate the operations by using the simulation technique.

Arrivals		**Services**	
Inter-arrival time (minutes)	Probability	Inter-arrival time (minutes)	Probability
2	0.22	4	0.28
4	0.30	6	0.40
6	0.24	8	0.22
8	0.14	10	0.10
10	0.10		

Assume:

(1) The clock starts at 8.00 hours

(2) Only one pump is set up

(3) The following 12 Random Numbers are to be used to depict the customer arrival pattern.
78, 26, 94, 08, 46, 63, 18, 35, 59, 12, 97 and 82.

(4) The following 12 Random Numbers are to be used to depict the customer service pattern.
44, 21, 73, 96, 63, 35, 57, 31, 84, 24, 05 and 37.

Your are required to find out the

(i) Probability of the pump being idle and

(ii) Average time spent by a customer waiting in queue **[10+2]**

(b) What is the 5-S Concept? **[3]**

Q3. (a) X uses traditional standard costing system. The inspection and setup costs are actually ₹ 1,760 against a budget of ₹ 2,000.

ABC system is being implemented and accordingly, the number of batches is identified as the cost driver for inspection and setup costs. The budgeted production is 10,000 units in batches of 1,000 units, whereas actually, 8,800 units were produced in 11 batches.

(i) Find the volume and total fixed overhead variance under the traditional standard costing system.

(ii) Find total fixed overhead cost variance under the ABC system. **[4+6]**

(b) Write down the quality management principle for improved organization performance. **[5]**

Q4. (a) An oil Refinery can blend 3 grades of crude oil to produces Quality A & Quality B Petrol. Two possible blending processes are available. For each production run, the older process uses 5 units of Crude Q, 7 units of Crude P and 2 Units of Crude R and produces 9 Units of A and 7 Units of B. The newer process uses 3 units of Crude Q, 9 units of Crude P & 4 units of Crude R to produces 5 units of A & 9 units of B.

Because of prior contract commitments, the refinery must produce at least 500 units of A and at least 300 units of B for the next month. It has 1,500 units of Crude Q, 1900 units of Crude P and 1,000 units of Crude R. For each unit of A, refinery receives ₹60 while for each unit of B, it receives ₹90. **[7]**

(b) ITC Ltd., supports the concept of the Life Cycle Costing for new investment decisions, covering its engineering activities, ITC LTD., is to replace a number of its machines and the Chief Engineer is to decide between the 'AB' machine, a more expensive machine, with a life of 10 years and the 'CD' machine with an estimated life of 5 years. If the 'CD' machine is chosen, it is likely that it would be replaced at the end of 5 years. If the 'CD' machine is chosen, it is likely that it would be replaced at the end of 5 years by another 'CD' machine.

The pattern of maintenance and running costs differs between two types of machine and the relevant data are as given below:

	Machine-AB (₹)	**Machine-CD (₹)**
Purchase price	19,000	13,000
Trade-in-value	3,000	3,000
Annual repair cost	2,000	2,600
Overhaul cost (p.a.)	4,000 (at year 8)	2,000 (at year 4)
Estimated financing cost averaged over machine life (p.a.)	10%	10%

Required: Recommend, with supporting figures, which machine to be purchased, stating any assumptions made.

[Given PVIF (10,10) = 0.39
PVIF (10,5) = 0.62
PVIFA (10,10) = 6.15
PVIFA (10,5) = 3.80
PV factor @ 10% for 4 years = 0.68
PV factor @10% for 8 years = 0.47]

PVIF means present value interest factor.
PVIFA means present value interest factor for an Annuity. **[4+4]**

Q5. (a) F Manufacturing Ltd., uses the three variances method to analyze the manufacturing overhead variances. Manufacturing overhead variances for the fiscal year just ended were computed as follows:

Spending - ₹ 86,000 Adverse
Efficiency- ₹ 36,000 Favorable
Volume - ₹ 80,000 Favorable

The manufacturing overhead application rate for the year was ₹ 160 per machine hour of which ₹ 60 per machine hour was the variable component. The year-end balance in the Manufacturing Overhead Control Account was ₹ 16,50,000 and the standard machine hours for the year were 11,300.

From the above data compute: (i) Budgeted machine hours, (ii) Actual machine hours, (iii) Applied manufacturing overhead, (iv) Total amount of fixed overhead cost. **[2.5 × 4]**

(b) What are the benefits of Kaizen Procedure? **[5]**

Q6. (a) Shoaib Ltd. makes tow products – X and Y, with the following cost patterns.

	Product X	**Product Y**
Direct materials	27	24
Direct Labour at ₹ 5 per hour	20	25
Variable production overheads at ₹ 6 per hour	3	6
	50	55

Production fixed overheads total ₹3,00,000 per month and these are absorbed on the basis of direct labour hours. Budgeted direct labour hours are 25,000 per month. However, the company has carried out an analysis of its production support activities and found that its 'fixed cost' actually vary in accordance with non-volume-related factors.

Activity	**Cost-driver**	**Product X**	**Product X**	**Total cost (₹)**
Set-ups	Production runs	30	20	40,000
Materials handing	Production runs	30	20	1,50,000
Inspection	Inspections	880	3,520	1,10,000
				3,00,000

Budget Production is 1,250 units of product X and 4,000 units of product Y.

Required:

Given that the company wishes to make a profit of 20% on full production costs calculate the prices that should be charged for products X and Y using the following.

(i) Full cost pricing

(ii) Activity based cost pricing

(iii) Offer your comments on the figures arrived at (i) and (ii). **[3+5+2]**

(b) A Company produces three products A, B and C. The following information is available for a period:

Product	A	B	C	Throughout Accounting Ratio
Contribution (₹ per unit) (Sales – Direct Materials)	30	25	15	
Machine hours required per unit of production:				
Machine 1	10 hours	2 hours	4 hours	133.33%
Machine 2	15 hours	3 hours	6 hours	200.00%
Machine 3	5 hours	1 hour	2 hours	66.67%

Estimated Sales Demand for A, B and C are 500 units each and machine capacity is limited to 6,000 hours for each machine. You are required to analyze the above information and apply Theory of Constraints process to remove the constraints. How many units of each product will be made? **[5]**

Q7.(a) A Company has sales of 1,00,000 units at a price of ₹200.00 per unit and profit of ₹40.00 Lakhs in the current year. Due to stiff competition, the Company has to reduce its price of product next year 5% to achieve same volume target of sales. The cost structure and profit for the current year is given as below:

Particulars	(₹ Lakhs)
Direct Materials	60.00
Direct Wages	45.00
Variable Factory Overheads	20.00
Fixed Overheads including Sales & Admin Expenses	35.00
Total Cost	**160.00**

To achieve the Target Cost to maintain the same profit, the Company is evaluating the proposal to reduce Labour Cost and Fixed Factory Overheads. A Vendor supplying the Machine suitable for the Company's operations has offered an advanced technology Semi-Automatic Machine of ₹20 Lakhs as replacement of Old Machine worth ₹5.0 Lakhs. The Vendor is agreeable to take back the Old Machine at ₹2.70 Lakhs only. The Company's policy is to charge depreciation at 10% on WDV. The Maintenance Charge of the Existing Machine is ₹1.20 Lakhs per annum whereas there will be warranty of services free of cost for the New Machine first two years. There are ten (10) Supervisors whose Salary is ₹1.50 Lakhs per annum. The New Machine having Conveyor Belt is expected to help in cost cutting measures in the following ways –

(1) Improve productivity of workers by 20%
(2) Cut-down Material Wastage by 1%
(3) Elimination of services of Supervisors because of automatic facilities of the machine
(4) Saving in Packaging Cost by 1.5 Lakhs

Assuming Cost of Capital to be 15%, calculate how many supervisors should be removed from the production activities to achieve the Target Cost. **[9]**

(b) S Ltd engaged in manufacturing activities. It has received a request from one of its important customers to supply a product which will require conversion of Material M, which is a non moving item. The following details are available

Book Value of Material M	₹60
Realizable value of Material M	₹80
Replacement Cost of Material M	₹100

It is estimated that conversion of one unit of M into one unit of finished product will require one unit of labour hour. At present labour is paid @ ₹20 per hour. Other costs are as follows:

Out of Pocket Expenses	₹30 per unit
Allocated Overheads	₹10 per unit

The labour will be re-deployed from other activities. It is estimated that the temporary redeployment will not result in loss of contribution. The employees to be redeployed are permanent employees of the Co.

Estimate the minimum price to be charged from the customer so that the company is not worse off by executing the order. **[6]**

Q8. Write short notes on any three: **[5×3=15]**

(a) Uses of the learning curve.
(b) DRUM-BUFFER-ROPE.
(c) Step in strategies bench trending
(d) PDCA