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Costing – Final – Nov 2008

Total No. of Questions—6]

[Total No. of Printed Pages—8

Time Allowed—3 Hours

Maximum Marks—100

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Answers to questions are to be given only in English except in the case of candidates who have opted for Hindi medium. If a candidate who has not opted for Hindi medium, answers in Hindi, his answers in Hindi will not be valued.

Question No. 1 is compulsory. Answer any **four** questions from the rest.

Working notes should form part of the answer.

- | | Marks |
|--|-------|
| 1. (a) State the general guidelines to be used in adopting a pricing policy in a manufacturing organization. | 3 |
| (b) A company which has developed a new machine has observed that the time taken to manufacture the first machine is 600 hours. Calculate the time which the company will take to manufacture the second machine if the actual learning curve rate is (i) 80% and (ii) 90%. Explain which of the two learning rates will show faster learning. | 3 |
| (c) A company manufactures three types of products namely P, Q and R. The data relating to a period are as under : | 7 |

	P	Q	R
Machine hours per unit	10	18	14
Direct labour hours per unit @ Rs. 20	4	12	8
Direct Material per unit Rs.	90	80	120
Production (units)	3,000	5,000	20,000

Currently the company uses traditional costing method and absorbs all production overheads on the basis of machine hours. The machine hour rate of overheads is Rs. 6 per hour.

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The company proposes to use activity based costing system and the activity analysis is as under :

	P	Q	R
Batch size (units)	150	500	1,000
Number of purchase orders per batch	3	10	8
Number of inspections per batch	5	4	3

The total production overheads are analysed as under :

Machine set up costs	20%
Machine operation costs	30%
Inspection costs	40%
Material procurement related costs	10%

Required :

- Calculate the cost per unit of each product using traditional method of absorbing all production overheads on the basis of machine hours.
- Calculate the cost per unit of each product using activity based costing principles.

- A single product manufacturing company has an installed capacity of 3,00,000 units per annum. The normal capacity utilization of the company is 90%. The company has prepared the following budget for a year : 11

Variable costs :

Factory costs	Rs. 33 per unit
Selling and Administration costs	Rs. 9 per unit

Fixed costs :

Factory costs	Rs. 21,60,000
Selling and Administration costs	Rs. 7,56,000

Selling Price

Selling price per unit	Rs. 60
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The actual production, sales, price and cost data relating to the year under review are as given below :

Production	2,40,000 units	✓
Sales	2,25,000 units	✓
Finished goods stock in the beginning of the year :	15,000 units	
Actual factory variable costs exceeded the budget by	Rs. 1,20,000	4

Required :

- (i) Calculate the budgeted profit and break-even point in units. ✓
 - (ii) What increase in selling price was necessary during the year under review to maintain the budgeted profit ?
 - (iii) Prepare statements showing the actual profit during the year under review by using (1) absorption costing method and (2) marginal costing method.
2. (a) ✓ Discuss the benefits accruing from the implementation of a Total Quality Management programme in an organisation. 4 2
- (b) ✓ Explain the concept of relevancy of cost by citing three examples each of relevant costs and non-relevant costs. 4 3
- (c) ✓ A manufacturing company has furnished the following financial data relating to the actual output of 9,600 units produced in the last quarter : 11

	Rs.	
	4,45,500	✓
Sales		
Costs :		
Direct Materials	59,400	✓
Direct Wages	89,400	✓
Variable Overheads	1,45,500	✓
Fixed Overheads	78,000	✓
	3,72,300	✓
Profit	73,200	✓

The standard wage rate is Rs. 4.50 per hour and the standard variable overhead rate is Rs. 7.50 per hour. The company uses a JIT system and the budgeted production and sales quantity is 10,000 units.

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The following are the variances from standard costs recorded during the last quarter :

		Rs.	
Direct materials	Price V	600 A	✓
	Usage V	1,200 A	✓
Direct Wages	Rate V	1,500 F	✓
	Efficiency V	4,500 A	✓
Variable overheads	Expense V	6,000 F	✓
	Efficiency V	7,500 A	✓
Fixed overheads	Expense V	3,000 A	✓
Sales	Price V	13,500 F	✓

You are required to :

- (i) Prepare the Original budget and Standard cost sheet per unit of output;
 - (ii) Produce a statement reconciling the budgeted profit with actual profit.
- 3/ (a) Describe the four types of bench marking of critical success factors. 4
- (b) Explain, how the implementation of JIT approach to manufacturing can be a major source of competitive advantage. 4
- (c) A project consists of seven activities and the time estimates of the activities are furnished as under : 11

Activity	Optimistic Days	Most likely Days	Pessimistic Days
1-2	4	10	16
1-3	3	6	9
1-4	4	7	16
2-5	5	5	5
3-5	8	11	32
4-6	4	10	16
5-6	2	5	8

Required :

- (i) Draw the network diagram.

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- (ii) Identify the critical path and its duration.
 (iii) What is the probability that the project will be completed in 5 days earlier than the critical path duration ?
 (iv) What project duration will provide 95% confidence level of completion ($Z_{0.95} = 1.65$) ?

Given

Z	1.00	1.09	1.18	1.25	1.33
Probability	0.1587	0.1379	0.1190	0.1056	0.0918

4. (a) State the methods in which initial feasible solution can be arrived at in a transportation problem. 3 2

- (b) State the advantages and limitations of Zero Based Budgeting. 5 3

- (c) A large business consultancy firm is organized in to several divisions. One of the divisions is the Information Technology (IT) division which provides consultancy services to its clients as well as to the other divisions of the firm. The consultants in the IT divisions always work in a team of three professional consultants on each day of consulting assignment. The external clients are charged a fee at the rate of Rs. 4,500 for each consulting day. The fee represents the cost plus 150% profit mark up. The break up of cost involved in the consultancy fee is estimated at 80% as being variable and the balance is fixed. 11 5

The textiles division of the consultancy firm which has undertaken a big assignment requires the services of two teams of IT consultants to work five days in a week for a period of 48 weeks. While the director of the textiles division intends to negotiate the transfer price for the consultancy work, the director of IT division proposes to charge the textiles division at Rs. 4,500 per consulting day.)

In respect of the consulting work of the textiles division, IT division will be able to reduce the variable costs by Rs. 200 per consulting day. This is possible in all cases of internal consultations because of the use of specialized equipment.

You are required to explain the implications and set transfer prices per consulting day at which the IT division can provide consultancy services to the textiles division such that the profit of the business consultancy firm as a whole is maximized in each of the following scenarios :

- (i) Every team of the IT division is fully engaged during the 48 week period in providing consultancy services to external clients and that the IT division has no spare capacity of consultancy teams to take up the textiles division assignment.

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- (ii) IT division will be able to spare only one team of consultants to provide services to the textiles division during the 48 week period and all other teams are fully engaged in providing services to external clients.
- (iii) A new external client has come forward to pay IT division a total fee of Rs. 15,84,000 for engaging the services of two teams of consultants during the aforesaid period of 48 weeks.
5. (a) State the characteristic features of a database created for operational control and decision making. 4 1
- (b) Discuss, how target costing may assist a company in controlling costs and pricing of products. 4 2
- (c) The costs and selling prices per unit of two products manufacturing by a company are as under : 11

Product	A (Rs.)	B (Rs.)
Selling Price	500	450
Variable costs :		
Direct Materials @ Rs. 25 per kg.	100	100
Direct Materials @ Rs. 20 per kg.	80	40
Painting @ Rs. 30 per hour	30	60
Variable overheads	190	175
Fixed costs @ Rs. 17.50/D.L.Hr.	70	35
Total costs	470	410
Profit	30	40

In any month the maximum availability of inputs is limited to the following :

Direct Materials	480 kg
Direct Labour hours	400 hours
Painting hours	200 hours

Required :

- (i) Formulate a linear programme to determine the production plan which maximizes the profits by using graphical approach.
- (ii) State the optimal product mix and the monthly profit derived from your solution in (i) above.

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(iii) If the company can sell the painting time at Rs. 40 per hour as a separate service, show what modification will be required in the formulation of the linear programming problem. You are required to re-formulate the problem but not to solve.

6. (a) Enumerate the uses of Pareto Analysis. 3
- (b) A single counter ticket booking centre employs one booking clerk. A passenger on arrival immediately goes to the booking counter for being served if the counter is free. If, on the other hand, the counter is engaged, the passenger will have to wait. The passengers are served on first come first served basis. The time of arrival and the time of service varies from one minute to six minutes. The distribution of arrival and service time is as under : 8

Arrival/Service Time (Minutes)	Arrival (Probability)	Service (Probability)
1	0.05	0.10
2	0.20	0.20
3	0.35	0.40
4	0.25	0.20
5	0.10	0.10
6	0.05	—

Required :

- (i) Simulate the arrival and service of 10 passengers starting from 9 A.M. by using the following random numbers in pairs respectively for arrival and service. Random numbers 60 09 16 12 08 18 36 65 38 25 07 11 08 79 59 61 53 77 03 10.
- (ii) Determine the total duration of
- (1) Idle time of booking clerk and
 - (2) Waiting time of passengers.
- (c) A city health centre provides health and other related services to the citizens who are covered under insurance plan. The health centre receives a payment from the insurance company each time any patient attends the centre for consultation as under : 8

Consultations involving	Payment from Insurance company
	Rs.
No treatment	60
Minor treatment	250
Major treatment	500

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In addition, the adult patients will have to make a co-payment which is equivalent to the amount of payment for the respective category of treatment made by the insurance company. However, children and senior citizens are not required to make any such co-payment.

The health centre will remain open for 6 day in a week for 52 weeks in a year. Each physician treated 20 patients per day although the maximum number of patients that could have been treated by a physician on any working day is 24 patients.

The health centre received a fixed income of Rs. 2,25,280 per annum for promotion of health products from the manufacturers.

The annual expenditure of the health centre is estimated as under :

Materials and consumable (100% variable)	Rs. 22,32,000
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Staff salaries per annum per employee (fixed) :

Physician	Rs. 4,50,000
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Assistants	Rs. 1,50,000
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Administrative staff	Rs. 90,000
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Establishment and other operating costs (fixed)	Rs. 16,00,000
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The non-financial information is as under :

(i) Staff :

Number of physicians employed	6
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Assistants	7
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Administrative staff	2
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(ii) Patient Mix :

Adults	50%
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Children	40%
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Senior Citizens	10%
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(iii) Mix of patient appointments (%)

Consultation requiring no treatment	70%
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Minor treatment	20%
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Major treatment	10%
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Required :

(i) Calculate the Net income of the city health centre for the next year;

(ii) Determine the percentage of maximum capacity required to be utilized next year in order to break even.

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