Roll No.....

Total No. of Questions—6] [Total No. of Printed Pages—7

Time Allowed—3 Hours Maximum Marks—100

ZRF

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.

Answer **all** questions.

Working notes should form part of the answer.

Marks

1. (a) Lee Electronics manufactures four types of electronic products, A, B, C and D. All these products have a good demand in the market. The following figures are given to you : 18

	A	B	C	D
Material cost (Rs/u)	64	72	45	56
Machining Cost (Rs/u) (@ Rs. 8 per hour)	48	32	64	24
Other variable costs (Rs/u)	32	36	44	20
Selling Price (Rs/u)	162	156	173	118
Market Demand (Units)	52,000	48,500	26,500	30,000

Fixed overheads at different levels of operation are :

Level of operation (in production hours)	Total fixed Cost (Rs.)
upto 1,50,000	10,00,000
1,50,001—3,00,000	10,50,000
3,00,001—4,50,000	11,00,000
4,50,001—6,00,000	11,50,000

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At present, the available production capacity in the company is 4,98,000 machine hours. This capacity is not enough to meet the entire market demand and hence the production manager wants to increase the capacity. The company wants to retain the customers by meeting their demands through alternative ways. One alternative is to sub-contract a part of its production. The sub-contract offer received is as under :

	A	B	C	D
Sub-contract Price (Rs/u)	146	126	155	108

The company seeks your advice in terms of products and quantities to be produced and/or sub-contracted, so as to achieve the maximum possible profit. You are required to also compute the profit expected from your suggestion.

(b) Explain briefly the concept of skimming pricing policy. 2

2. (a) A bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods. 12

The bank wants to know the productwise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget :

Activity	Present cost (Rs.)	Estimation for the budget period
(i) ATM Services :		
(a) Machine maintenance	4,00,000	(all fixed; no change)
(b) Rents	2,00,000	(fully fixed; no change)
(c) Currency Replenishment Cost	1,00,000	(expected to double during budget period)
	7,00,000	(This activity is driven by no. of ATM transactions)
(ii) Computer Processing	5,00,000	(Half this amount is fixed and no change is expected) (The variable portion is expected to increase to three times the current level). This activity is driven by the number of computer transactions.

Marks

Activity	Present cost (Rs.)	Estimation for the budget period
(iii) Issuing Statements	18,00,000	Presently, 3 lac statements are made. In the budget period, 5 lac statements are expected; For every increase of one lac statements, one lac rupees is the budgeted increase (this activity is driven by the number of Statements)
(iv) Customer Inquiries	2,00,000	Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes.)

The activity drivers and their budgeted quantities are given below :

	Deposits	Loans	Credit Cards
No. of ATM Transactions	1,50,000	—	50,000
No of Computer Processing Transactions	15,00,000	2,00,000	3,00,000
No. of Statements to be issued	3,50,000	50,000	1,00,000
Telephone Minutes	3,60,000	1,80,000	1,80,000

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card accounts.

You are required to :

(i) Calculate the budgeted rate for each activity.

(ii) Prepare the budgeted cost statement activity wise.

(iii) Find the budgeted product cost per account for each product using (i) and (ii) above.

(b) How do you know whether an alternative solution exists for a transportation problem ? 4

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3. (a) Hind Metals Manufactures an alloy product 'Incop' by using iron and Copper. The metals pass through two plants, X and Y. The company gives you the following details for the manufacture of one unit of Incop : 6

Materials	:	Iron 10 kgs @ Rs. 5 per kg.
		Copper : 5 kg @ Rs. 8 per kg.
Wages	:	3 hours @ Rs. 15 per hour in Plant X.
		5 hours @ Rs. 12 per hour in Plant Y.
Overhead recovery	:	On the basis of direct labour hours.
Fixed overhead	:	Rs. 8 per hour in Plant X.
		Rs. 5 per hour in Plant Y.
Variable overhead	:	Rs. 8 per hour in Plant X.
		Rs. 5 per hour in Plant Y.
Selling overhead	:	(fully variable)—Rs. 20 per unit.

(i) Find out the minimum price to be fixed for the alloy, when the alloy is new to the market. Briefly explain this pricing strategy.

(ii) After the alloy is well established in the market. What should be the minimum selling price ? Why ?

(b) What are the critical success factors for the implementation of a 'Total Quality Management' programme ? 5

(c) How can value analysis achieve cost reduction ? 5

4. (a) Opticals Ltd. makes two kinds of products, P (lenses) and Q (swimming goggles) in divisions P and Q respectively. P is an input for Q and two units of P are needed to make one unit of Q. 12

The following data is given to you for a period :

	P Rs./u of P	Q Rs./u of Q
Direct Materials	20	25 (excluding P)
Direct Labour	30	35
Variable Overhead	10	20

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External Demand (units)	3,000	3,000
Capacity (units)	7,000	2,500
Selling Price Rs./u (outside market)	100	410

If Q buys P from outside, it has the following costs :

for order quantity 2,499 or less	Rs. 90 per unit for the entire quantity ordered.
for order quantity 2,500—5,000	Rs. 80 per unit for the entire quantity ordered.
for order quantity more than 5,000	Rs. 70 per unit for the entire quantity ordered.

You are required to :

(i) Evaluate the best strategies for Divisions P and Q.

(ii) Briefly explain the concept of goal congruence.

(b) In an assignment problem to assign jobs to men to minimise the time taken, suppose that one man does not know how to do a particular job, how will you eliminate this allocation from the solution ? 4

5. (a) The following information relates to labour of X Ltd. : 10

Type of Labour	Skilled	Semi-Skilled	Unskilled	Total
No. of workers in standard gang	4	3	2	9
Standard rate per hour (Rs.)	6	3	1	
Number of workers in actual gang				9
Actual rate per hour (Rs.)	7	2	2	

In a 40 hour week, the gang produced 270 standard hours.

The actual number of semi-skilled workers is two times the actual number of unskilled workers. The rate variance of semi-skilled workers is Rs. 160 (F).

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Find the following :

(i) The number of workers in each category

(ii) Total gang variance

(iii) Total Sub-efficiency variance

(iv) Total labour rate variance

(v) Total labour cost variance

(b) The following is a linear programming problem. You are required to set up the initial simplex tableau. (Please do not attempt further iterations or solution) : 6

Maximise

$$100x_1 = 80x_2$$

Subject to

$$3x_1 + 5x_2 \leq 150$$

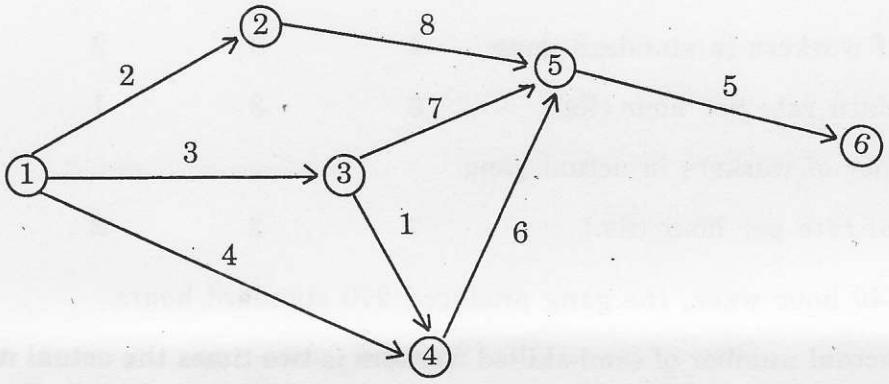
$$x_2 \leq 20$$

$$8x_1 + 5x_2 \leq 300$$

$$x_1 + x_2 \geq 25$$

$$x_1,\ x_2 \geq 0.$$

6. (a) The following network gives the duration in days for each activity : 6



Marks

(i) You are required to list the critical paths.

(ii) Given that each activity can be crashed by a maximum of one day, choose to crash any four activities so that the project duration is reduced by 2 days.

(b) In the past, a machine has produced pipes of diameter 50 mm. To determine whether the machine is in proper working order, a sample of 10 pipes is chosen, for which mean diameter is 53 mm and the standard deviation is 3 mm. Test the hypothesis that the machine is in proper working order, given that the critical value of the test statistic from the table is 2.26. 4

(c) The Gifts Company makes mementos for offering chief guests and other dignitaries at functions. A customer wants 4 identical pieces of hand-crafted gifts for 4 dignitaries invited to its function. 6

For this product, the Gifts Company estimates the following costs for the 1st unit of the product :

	Rs./unit
Direct variable costs (excluding labour)	2,000
Direct labour (20 hours @ Rs. 50 per hour)	1,000

90% learning curve ratio is applicable and one labourer works for one customer's order.

(i) What is the price per piece to be quoted for this customer if the targeted contribution is Rs. 1,500 per unit ?

(ii) If 4 different labourers made the 4 products simultaneously to ensure faster delivery to the customer, can the price at (i) above be quoted ? Why ?