

Roll No.

Total No. of Questions—74

[Total No. of Printed Pages—9]

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 Nos. 1 is compulsory.

Answer any five questions from the rest.

Working notes should form part of the answer.

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1. (a) XYZ Ltd. has two divisions, A and B. Division A makes and sells product A, which can be sold outside as well as be used by B. A has a limitation on production capacity, that only 1,200 units can pass through its machining operations in one month. On an average, about 10% of the units that A produces are defective. It may be assumed that out of each lot that A supplies, 10% are defectives. 12

When A sells in the outside market, the defectives are not returned, since the transportation costs make it uneconomical for the customer. Instead, A's customers sell the defectives in the outside market at a discount.

But when B buys product A, it has to fix it into its product, which is reputed for its quality. Therefore, B returns all the defective units to A. A can manually rework the defectives, incurring only variable labour cost and sell them outside at Rs. 150 and not having to incur any selling costs on reworked units. If A chooses not to rework, it can only scrap the material at Rs. 30 per unit. B can buy product A from outside at Rs. 200 per unit, but has to incur Rs. 10 per unit as variable transport cost. B can insist to its outside suppliers also that it will accept only good units.

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A incurs a variable selling overhead only on units (other than reworked units) sold outside. The following figures are given for the month :

Variable cost of production—Dept. A (Rs./unit)	120
Variable selling overhead (Rs./u)	20
Selling price per unit in the outside market (Rs./u)	200
Current selling price to B (Rs./u)	190
Additional variable labour cost of reworking defectives (Rs./u)	100
Selling price of reworked defectives (Rs./u)	150
Fixed costs for the month (Rs.)	36,000
Maximum demand from B at present (no. of units)	630

The outside demand can be freely had upto 900 units.

Given the demand and supply conditions, you are required to present appropriate calculations for the following :

- (i) Evaluation of the best strategy for A in the present condition.
 - (ii) If B can buy only upto 540 units and the outside demand is only 600 units, how much should A charge B to maintain the same level of profit as in (i) above ?
- (b) PQ Ltd. makes and sells a labour-intensive product. Its labour force has a learning rate of 80%, applicable only to direct labour and not to variable overhead. 8

The cost per unit of the first product is as follows :

Direct materials	10,000
Direct labour	8,000 (@ Rs. 4 per hour)
Variable overhead	2,000
Total variable cost	20,000

PQ Ltd. has received an order from X Ltd. for 4 units of the product. Another customer, Y Ltd. is also interested in purchasing 4 units of the product. PQ Ltd. has the capacity to fulfil both the orders. Y Ltd. presently purchases this product in the market for Rs. 17,200 and is willing to pay this price per unit of PQ's product. But X Ltd. lets PQ choose one of the following options :

- (i) A price of Rs. 16,500 per unit for the 4 units it proposes to take from PQ.

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Or

- (ii) Supply X Ltd.'s idle labour force to PQ, for only 4 units of production, with PQ having to pay only Re. 1 per labour hour to X Ltd.'s workers. X Ltd.'s workers will be withdrawn after the first 4 units are produced. In this case, PQ need not use its labour for producing X Ltd.'s requirement. X Ltd. assures PQ that its labour force also has a learning rate of 80%. In this option, X Ltd. offers to buy the product from PQ at only Rs. 14,000 per unit.

X and Y shall not know of each other's offer.

If both orders came before any work started, what is the best option that PQ may choose?

Present suitable calculations in favour of your argument.

2. (a) Ret Ltd., a retail store buys computers from Comp Ltd. and sells them in retail. Comp Ltd. pays Ret Ltd. a commission of 10% on the selling price at which Ret sells to the outside market. This commission is paid at the end of the month in which Ret Ltd. submits a bill for the commission. Ret Ltd. sells the computers to its customers at its store at Rs. 30,000 per piece. Comp Ltd. has a policy of not taking back computers once despatched from its factory. Comp Ltd. sells a minimum of 100 computers to its customers. 13

Comp Ltd. charges prices to Ret Ltd. as follows :

Rs. 29,000 per unit, for order quantity 100 units to 140 units:

Rs. 26,000 per unit, for the entire order, if the quantity is 141 to 200 units. Ret Ltd. cannot order less than 100 or more than 200 units from Comp Ltd.

Due to the economic recession, Ret Ltd. will be forced to offer as a free gift, a digital camera costing it Rs. 4,500 per piece, which is compatible with the computer. These cameras are sold by another Co., Photo Ltd. only in boxes, where each box contains 50 units. Ret Ltd. can order the cameras only in boxes and these cameras cannot be sold without the computer.

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In its own store, Ret Ltd. can sell 110 units of the computer. At another far-off location, Ret Ltd. can sell upto 80 units of the computer (along with its free camera), provided it is willing to spend Rs. 5,000 per unit on shipping costs. In this market also, the selling price that each unit will fetch is Rs. 30,000 per unit.

You are required to :

- (i) State what is Ret's best strategy along with supporting calculations.
- (ii) Compute the break-even point in units, considering only the above costs.

- (b) What are the various formulae used in calculating budget ratios ?

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3. (a) The CEO of your company has been given the following statement showing the results for a recent month :

Particulars	Master Budget	Actual
Units produced & sold	10,000	9,000
	Rs.	Rs.
Sales	8,00,000	7,00,000
Direct material	2,00,000	1,84,000
Direct Wages	3,00,000	2,62,000
Variable overhead	1,00,000	94,000
Fixed overhead	1,00,000	98,000
Total Cost	7,00,000	6,38,000
Net Surplus	1,00,000	62,000

The standard cost of the product is as follows :

Direct material (1 kg @ Rs. 20/kg)	Rs. 20.00 per unit
Direct Wages (1 hour @ Rs. 30/hour)	Rs. 30.00 per unit
Variable overhead (1 hour @ Rs. 10/hour)	Rs. 10.00 per unit

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Actual results for the month revealed that 9,800 kg. of material was used and 8,800 labour hours were recorded.

- (i) Prepare a flexible budget for the month and compare with the actual results 6
- (ii) Calculate material volume and variable overhead efficiency variances. 2
- (b) What is disinvestment strategy? Highlight the main reasons for disinvestment. 4
- (c) What is uniform costing? Why is it recommended? 4
4. (a) The cost per unit of transporting goods from the factories X, Y, Z to destinations A, B and C, and the quantities demanded and supplied are tabulated below. As the company is working out the optimum logistics, the Govt. has announced a fall in oil prices. The revised unit costs are exactly half the costs given in the table. You are required to evaluate the minimum transportation cost. 6

Destinations Factories	A	B	C	Supply
X	15	9	6	10
Y	21	12	6	10
Z	6	18	9	10
Demand	10	10	10	30

- (b) Give an appropriate cost unit for each of the following service sectors : 4
- (i) Hotel
- (ii) School
- (iii) Hospital
- (iv) Accounting firm

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(v) Transport

(vi) Staff Canteen

(vii) Machine maintenance

(viii) Computer Department.

- (c) A factory manager contends that the mean operating life of light bulbs of his factory is 4,200 hours. A customer disagrees and says it is less. 6

The mean operating life for a random sample of 9 bulbs is 4,000 hours, with a sample standard deviation of 201 hours.

Test the hypothesis of the factory manager, given that the critical value of the test statistic as per the table is (-) 2.896.

5. (a) Bearings Ltd. makes three products, A, B and C in Divisions A, B and C respectively. The following information is given : 12

	A	B	C	
Direct Materials (excluding material A for Divisions B and C)	4	15	20	Rs./u
Direct labour	2	3	4	Rs./u
Variable overhead	1	1	1	Rs./u
Selling price to outside customers	15	40	50	Rs./u
Existing Capacity	5,000	2,500	2,500	(No. of units)
Maximum External demand	3,750	5,000	4,000	(No. of units)
Additional fixed costs that would be incurred to install additional capacity	24,000	6,000	18,700	Rs.
Maximum Additional units that can be produced by additional capacity	5,000	1,250	2,250	(No. of units)

B and C need material A as their input. Material A is available outside at Rs. 15 per unit. Division A supplies the material free from defects. Each unit of B and C requires one unit of A as the input material.

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If B purchases from outside, it has to pay Rs. 15 per unit. If B purchases from A, it has to incur in addition to the transfer price, Rs. 2 per unit as variable cost to modify it.

B has sufficient idle capacity to inspect its inputs without additional costs.

If C gets material from A, it can use it directly, but if it gets material from outside, which is at Rs. 15, it has to do one of the following :

- (i) Inspect it at its own shop floor at Rs. 3 per unit

Or

- (ii) Get the supplier to supply inspected products and pay the supplier Rs. 2 p.u. as inspection charges.

Or

- (iii) A has enough idle labour, which it can lend to C to inspect at Re. 1 p.u. even though C purchases from outside.

A has to fix a uniform transfer price for both B and C. The transfer price will not be known to outsiders and is at the discretion of the Divisional Managers.

What is the best strategy for each division and the company as a whole ?

- (b) Explain the following in the context of a network :

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(i) Critical path

(ii) Dummy activity.

6. (a) Formulate the dual for the following linear program :

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Maximise : $100x_1 + 90x_2 + 40x_3 + 60x_4$

Subject to

$$6x_1 + 4x_2 + 8x_3 + 4x_4 \leq 140$$

$$10x_1 + 10x_2 + 2x_3 + 6x_4 \leq 120$$

$$10x_1 + 12x_2 + 6x_3 + 2x_4 \leq 50$$

$$x_1, x_2, x_3, x_4 \geq 0$$

(Only formulation is required. Please do not solve.)

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- (b) Name the various methods of fitting a straight line to a time series and briefly explain any two of them. 5
- (c) Traditional Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows : 5

Particulars	Product A	Product B	Product C	
Direct materials	50	40	40	Rs./u
Direct labour @ 10 Rs./hour	30	40	50	Rs./u
Production overheads	30	40	50	Rs./u
Total Cost	110	120	140	Rs./u
Quantity produced	10,000	20,000	30,000	Units

Traditional Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows :

Activity Cost Pool	Cost Driver	Associated Cost
Stores Receiving	Purchase Requisitions	2,96,000
Inspection	Number of Production runs	8,94,000
Despatch	Orders Executed	2,10,000
Machine Setup	Number of setups	12,00,000

The following information is also supplied :

Details	Product A	Product B	Product C
No. of Setups	360	390	450
No. of Orders Executed	180	270	300
No. of Production runs	750	1,050	1,200
No. of Purchase Requisitions	300	450	500

You are required to calculate activity based production cost of all the three products.

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7. (a) Vikram Ltd. produces 4 products using 3 different machines. Machine capacity is limited to 3,000 hours for each machine. The following information is available for February, 2009 : 7

Products	A	B	C	D
Contribution (Sales-direct material) Rs.	1,500	1,200	1,000	600
Machine Hours Required/Unit :				
Machine 1	10	6	2	1
Machine 2	10	9	3	1.5
Machine 3	10	3	1	0.5
Estimated Demand (units)	200	200	200	200

From the above information you are required to identify the bottleneck activity and allocate the machine time.

- (b) Explain the essential features of Life-cycle costing. 5
- (c) Explain briefly the concepts of Opportunity costs and Relevant costs. 4

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