

MAY 2011

**P/ID 77508/PMBH/
PMB1H**

Time : Three hours

Maximum : 100 marks

PART A — (5 × 6 = 30 marks)

Answer any FIVE questions.

All questions carry equal marks.

1. State any two relationship between primal and dual LPP.
2. What is meant by “Degeneracy” in a transportation problem?
3. What do you mean by resource-smoothing?
4. State the relationship between three floats in network.
5. Distinguish between PERT and CPM.
6. What do you mean by ‘Balking’ and ‘Reneging’ in a queue?
7. Distinguish between pure and mixed strategies in Game.
8. What is meant by individual and group replacement?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

All questions carry equal marks.

9. Solve graphically the following L.P.P.

Maximize $z = 3x + 2y$

Subject to

$-2x + 3y \leq 9$

$x - 5y \geq -20$

and $x, y \geq 0$.

10. Solve the following transportation problem.

		To			Availability
		A	B	C	
From	I	50	30	220	1
	II	90	45	170	3
	III	250	200	50	4
Requirements		4	2	2	

11. Solve the assignment problem.

		Job			
		P	Q	R	S
Machine	A	18	26	17	11
	B	13	28	14	26
	C	38	19	18	15
	D	19	26	24	10

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12. A project schedule has the following characteristics.

Activity : 1-2 1-3 2-4 3-4 3-5 4-9

Time (Hrs.) : 4 1 1 1 6 5

Activity : 5-6 5-7 6-8 7-8 8-10 9-10

Time (Hrs.) : 4 8 1 2 5 7

Draw the network find the critical path and also total float.

13. A and B play a game in which each has three coins, a 5P, a 10P and a 20P. Each select a coin without the knowledge of the other's choice. If the sum of the coins is an odd amount, A wins B's coin; if the sum even B wins A's coin. Find the best strategy for each player and the value of the game.
14. A certain item costs Rs. 235 per ton. The monthly requirements are 5 tons and each time the stock is replenished, there is a set up cost of Rs. 1,000. The cost of carrying inventory has been estimated at 10% of the average inventory per year. What is the optimum order quantity?
15. The cost of a machine is Rs. 6,100 and its scrap value is 100. The maintenance cost found from experience are as follows :
- | | | | | | | | | |
|------------------|-----|-----|-----|-----|-----|------|------|------|
| Year : | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| M/C cost (Rs.) : | 100 | 250 | 400 | 600 | 900 | 1200 | 1600 | 2000 |
- When should the machine be replaced?

16. Describe the Kendal's notation for representing queueing models.

PART C — (1 × 20 = 20 marks)

Compulsory.

17. The following failure rates have been observed for certain items :

End of month : 1 2 3 4 5

Probability of failure : 0.10 0.30 0.55 0.85 1.00

The cost of replacing an individual item is Rs. 1.25. The decision is made to replace all item simultaneously at fixed intervals and also replace individual item as they fail. If the cost of group replacement is 50 paise, what is the best interval for group replacement? At what group replacement per item, would a policy strictly individual replacement become preferable to the adopted policy?

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