

FACULTY OF MANAGEMENT
MBA (CBCS) III - Semester Examination, March 2022

Subject: Operations Research
Paper No. MB - 303

Time: 3 Hours

Max. Marks: 80

PART – A

Note: Answer all questions.

(5 x 4 = 20 Marks)

1. Explain Non- linear programming problem
2. What is Duality in LPP
3. Explain Degeneracy in TP
4. Explain Fulkerson's Rule
5. Explain Single Channel queuing model

PART – B

Note: Answer any five questions.

(5 x 12 = 60 Marks)

6. Explain the managerial applications of OR?
7. What is dynamic programming and also explain the characteristics of dynamic Programming?
8. A carpenter makes tables and chairs. Each table can be sold for a profit of Rs 30 and each chair for a profit of Rs 10. The carpenter can afford to spend up to 40 hours per week working and takes six hours to make a table and three hours to make a chair. Customer demand requires that he makes at least three times as many chairs as tables. Tables take up four times as much storage space as chairs and there is room for at most four tables each week.

Formulate this problem as a linear programming problem and solve it graphically.

9. What is Sensitivity analysis and also explain its implications?

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10. A dairy plant has five milk tankers I, II, III, IV & V. These milk tankers are to be used on five delivery routes A, B, C, D, and E. The distances (in kms) between dairy plant and the delivery routes are given in the following distance matrix

	I	II	III	IV	V
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

How the milk tankers should be assigned to the chilling centers so as to minimize the distance travelled?

11. A travelling salesman, named Rolling Stone plans to visit five cities 1, 2, 3, 4 & 5. The travel time (in hours) between these cities is shown below:

		TO				
		1	2	3	4	5
FROM	1	--	5	8	4	5
	2	5	--	7	4	5
	3	8	7	--	8	6
	4	4	4	8	---	8
	5	5	5	6	8	--

How should Mr. Rolling Stone schedule his touring plan in order to **minimize** the total travel **time**, if he visits each city once a week?

12. A Project is composed of seven activities whose time estimates are listed in the following table. Activities are simplified by this beginning (i) ones ending (j) Node member.

<i>Activity</i>		<i>Estimated duration in weeks</i>		
<i>i</i>	<i>j</i>	<i>Optimistic</i>	<i>Most likely</i>	<i>Pessimistic</i>
1	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

Calculate expected project length.

13. A small project consists of seven activities for which the relevant data are given below:

Activity	Preceding Activities	Activity Duration (Days)
A	=	4
B	=	7
C	=	6
D	A, B	5
E	A, B	7
F	C, D, E	6
G	C, D, E	5

- (I) Draw the network and find the project completion time
 (II) Calculate total float for each of the activities.

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14. Two firms are competing for business under the condition, so that one firm's gain is another firm's loss. Firm A's payoff matrix is given below:

		FIRM - B		
		No Advertising	Medium Advertising	Heavy Advertising
FIRM - A	No Advertising	10	5	-2
	Medium Advertising	13	12	15
	Heavy Advertising	16	14	10

Suggest optimum strategies for the two firms and the net outcome thereof.

15. Explain the Applications of simulation to different management Problems.

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