Second Semester MBA Degree Examination, Dec.2024/Jan.2025 **Operations Research**

Max. Marks: 100

22MBA24

Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.

2. Question No. 8 is compulsory.

3. Use of Statistical / normal distribution tables are permitted.

4. M: Marks, L: Bloom's level, C: Course outcomes.

			M	L	C
Q.1	a.	Define Operations Research. Mention different phases of Operation research.	3	L1	CO1
	b.	Explain the steps involved in decision tree analysis.	7	L2	CO2
	c.	Solve the following LP problem by using graphical method : Minimize $z = 20x_1 + 10x_2$ Subject to constraints $x_1 + 2x_2 \le 40$ $3x_1 + x_2 \ge 30$ $4x_1 + 3x_2 \ge 60$ and $x_1, x_2 \ge 0$	10	L4	CO4
Q.2	a.	With respect to Transportation problem, define the following: (i) Non-Degenerate Basic Feasible solution. (ii) Degenerate Basic Feasible solution.	3	L2	CO2
	b.	Explain various steps involved in Hungarian algorithm.	7	L2	CO2
	c.	There are two machines M_1 and M_2 that performs the five jobs. The processing time (in hours) of five jobs are shown below: Job 1 2 3 4 5 M_1 3 8 5 7 4 M_2 4 10 6 5 8 Find the optimal sequence for five jobs so as to minimize elapsed time.	10	L4	CO4
Q.3	a.	Bring out the difference between PERT and CPM.	3	L2	CO2
	b.	Solve the following transportation problem by using Least Cost Method (LCM). Factory Warehouses Supply X 21 16 25 13 21 Y 17 18 14 22 27 Z 32 27 12 41 19 Demand 14 15 18 20 67	7	L3	CO4
	c.	Solve the following assignment problem. Assign 4 tasks to 4 persons so as to minimize the total cost. $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	10	L4	CO4

1 of 3

Q.4	a.	List the assumptions of LPP.	3	Ľ1	CO2
	b.	Explain different phases of Project management.	7	L2	CO
	c.	Solve the following transportation problem and determine optimal distribution for the company so as to minimize the total transportation cost. Use VAM method to find initial basic feasible solution.	10	L4	CO
Q.5	a.	Define the following: (i) MinMax and MaxMin principle. (ii) Pure and Mixed Strategy	3	L2	CO2
	b.	A doctor purchases a particular vaccine each Monday. If the vaccine is not used within the week, it becomes useless. The vaccine costs Rs.30 per dose and the doctor charges Rs.60 for the same. The dose administered per week has the following distribution: Doses per week 20 25 40 60 No. of weeks 5 15 25 5 Obtain Payoff/regret matrix and determine the optimal number of doses the doctor should buy.	7	L4	CO4
	c.	Explain the scope of operation research in different area.	10	L2	CO3
Q.6	a.	What is decision tree? Write advantages.	3	L2	CO2
	b.	Bring out the differences between Transportation problem and Assignment problem.	7	L2	CO3
	c.	Solve the following game using the concept of dominance. Write the strategies adopted by each player and find value of game: Player B I II III IV V Player A I 6 15 30 21 6 3 3 6 6 4 CMRIT LIBRATI 12 12 24 36 3 BANGALORE - 560 037	10	L4	CO4
Q.7	a.	Explain the benefits of operation research.	3	L2	CO2
	b.	Explain the objectives of Network Analysis.	7	L2	CO2
	c.	The twelve jobs and precedence relationship between them for a small maintenance project are given below:	10	L4	CO4
Job	(i, j)	(1, 2) (1, 3) (1, 4) (2, 3) (2, 5) (2, 6) (3, 7) (4, 5) (5, 6) (6, 7)	(6, 8)) (7.	8)
Dura	ation (ys)		4		7
		 (i) Construct network for the project. (ii) Determine critical path with total project duration. (iii) Compute earliest start, earliest finish, latest start, latest finish. 			

Find total float, free float and independent float.

(iv)

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