

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MBA- SEMESTER - III-EXAMINATION- SUMMER-2023**

**Subject Code: 4539271****Date: 19/06/2023****Subject Name: Operations Research****Time: 02:30 PM TO 05:30 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

Q. No.	Question Text and Description	Marks
Q.1	Define the following: (a) Deterministic Model (b) Unbounded LPP (c) Degeneracy in Transportation Model (d) Transition Probabilities (e) Saddle Point (f) Zero Sum game (g) Steady State Equilibrium	14
Q.2	(a) Write a detailed note on 'Significance and scope of Operations Research in Modern Management'. (b) Operation Research prefers a holistic systems approach and optimization. Elaborate	07 07
<b>OR</b>		
	(b) Discuss various classifications of operations research model.	07
Q.3	(a) The dual of the dual is a primal. Explain with the help of an example of your own choice. (b) Explain how simulation can be applied in the case of Queuing problems.	07 07
<b>OR</b>		
Q.3	(a) Elaborate the steps in the process of Simulation along with advantages and disadvantages. (b) Explain how the concept of Game Theory can be used to formulate strategies in competing environment.	07 07
Q.4	(a) What is the general structure of a linear programming model? List out the assumptions and limitations of linear programming. (b) Explain Single Server Queuing Model with all the assumptions.	07 07
<b>OR</b>		
Q.4	(a) Explain the various components of a queuing system and describe each elements briefly.	07

- (b) Explain Markov's Chain along with its characteristics. Mention any four application areas of Markov analysis. **07**

**Q.5**

**CASE STUDY:**

Consider the following matrix

	D1	D2	D3	Supply
O1	8	6	10	2000
O2	10	4	9	2500
Demand	1500	2000	1000	

- (a) Assuming that matrix represents a cost matrix. Find out initial feasible by VAM **07**
- (b) Apply stepping stone optimality test on the initial solution and calculate the cost. **07**

**OR**

- Q.5** (a) Assuming the matrix is a profit matrix, find the initial feasible solution by LCM. **07**
- (b) Apply optimality test on the initial solution obtained by LCM. Comment on the solution obtained. **07**

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