Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA - SEMESTER– III • EXAMINATION – WINTER 2022

Subject Code:4539271 **Date:30/01/2023**

Subject Name: Operations Research

Time:10:30 AM to 01:30 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.1 Answer the following briefly: **14**

a) Saddle point in Game theory
b) Long run probabilities in Markov chain
c) Types of queueing models
d) Infeasibility in LPP
e) Transshipment problem
f) Characteristics features of Operations Research
g) Advantages of simulation

Q.2 **(a)** Describe the methodology of Operations Research. Discuss the use of TORA software for solving operations research problems? **07**

(b) Discuss various applications of Markov chain. **07**

OR

(b) Describe the structure of linear programing problem model. What are the limitations of LPP? **07**

Q.3 **(a)** How maximization of transportation problem is managed with hungarion method? Discuss the process. **07**

(b) Based on Game theory, explain the concept of two-person zero sum game. Also discuss the limitations of game theory. **07**

OR

Q.3 **(a)** What do you understand by Markov analysis? Discuss assumptions underlying Markov analysis. **07**

(b) Discuss the simplex method of solving LPP. Also discuss the concept of redundancy. **07**

Q.4 **(a)** How operations research helps in verifying and refining the business problem? **07**

(b) Discuss guidelines on LPP model formulation. **07**

OR

Q.4 **(a)** In transportation model, three methods are used to get initial solution. Discuss any two methods. **07**

(b) Discuss the types and steps for simulation process. **07**

Q.5 Mahadev Construction co needs 3,3,4 and 5 million cubic feet of fill at four earthen dam sites in Gujarat. It can transfer the fill from three mound A, B and C where 2, 6 and 7 million cubic feet of fill from mound to the four sites in lakhs are given below: **14**

Particulars	I	II	III	IV
A	15	10	17	18
B	16	3	12	13
C	12	17	20	11

Answer the following:

a) Calculate the initial basic feasible solution by North-West corner method.
b) Find the initial solution by VAM.

OR

a) Formulate the problem as Transportation model.
b) Find the optimal solution by MODI method to minimize the cost.

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