Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA – SEMESTER 4 – EXAMINATION – SUMMER 2019

Subject Code:3549271 **Date:04/05 2019**

Subject Name: Operations Research

Time:10.30a.m to 1.30 p.m. **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. No.			Marks
Q.1		Write brief about following terms (a) Monte carlo simulation (b) Unbounded Solutions in LPP (c) Unbalanced transportation problem (d) Big M method (e) Saddle point in game theory (f) Transshipment Problem (g) Queuing System	**14**
Q.2	**(a)**	Write a note on Characteristics of Queuing System	**07**
	(b)	Write a note on duality and its rules	**07**
		OR	
	(b)	Write a note on degeneracy and multiple solutions in LPP	**07**
Q.3	**(a)**	Write a note on Properties of Linear Programming Model	**07**
	(b)	Write a note on Procedure for Numbering the Events Using Fulkerson's Rule	**07**
		OR	
Q.3	**(a)**	What is game in game theory? what are the properties of a game? Explain two-person zero sum game with suitable example.	**07**
	(b)	Discuss continuous in time vs Direct in time models	**07**
Q.4	**(a)**	Explain Single Server Queuing Model in detail with example	**07**
	(b)	Write a note on CPM, float and slack times.	**07**
		OR	
Q.4	**(a)**	A bakery keeps stock of popular brand of cake. Previous experience shows the daily demand pattern for the item with associated probabilities, as given below Daily demand : 0 10 20 30 40 50 Probability 0.01 0.20 0.15 0.50 0.12 0.02 Use the following sequence of random numbers to simulate the demand for next 10 days. Random numbers: 25,39,65,76,12,05,73,89,19,49 Also calculate average demand of cakes.	**07**

	(b)	How to verify and refine a mathematical model?	**07**
Q.5		A frim makes two products X and Y and has a total production capacity of 9 tons per day, Both X and Y require the same production capacity. The firm has a permanent contract to supply at least 2 tons of X and at least 3 tons of Y per day to another company. Each ton of X requires 20 machine hours of production time and each ton of Y requires 50 machine hours of production time. The daily maximum possible number of machine hours is 360. All of the firm's output can be sold. The profit made is rs.80 per ton of X and rs.120 per ton of Y.	
	(a)	Identify decision variables and prepare objective function	**07**
	(b)	Formulate given LPP and suggest suitable method for solution	**07**
		OR	
Q.5	(a)	Write constrains and objective function of given situation	**07**
	(b)	Find solution of given problem	**07**

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