Paper / Subject Code: 53174 / Simulation and Modeling (DLOC - V)

BE / Sem VIII / 'C' scheme / IT

(3 Hours) [Total Marks: 80]

N.B.: (1) Question No.1 is Compulsory.
(2) Attempt any three questions from remaining questions.
(3) Assume suitable data wherever required but justify the same.
(4) Figures to the right indicate full marks.
(5) Answer to each new question to be started on a fresh page.

Question No.		Marks
Q 1	(a) Discuss when simulation is appropriate tool and when it is inappropriate tool.	05
	(b) Explain with diagram Different types of models in Simulation	05
	(c) Explain different random number generation techniques	05
	(d) Define following terms with example: Entity, Attribute, Activity, System, System state	05
Q 2 (a)	Explain Event Scheduling Algorithm with example	10
Q2 (b)	Define Simulation and Explain Steps in simulation with flowchart.	10
Q3 (a)	Derive the Steady state parameter of M/G/1 queue and M/M/1	10
Q3 (b)	Calculate the Statistics for Single channel queue for 10 customers where interarrival time (IAT) and service time (ST) is given by following table. Assume first customer arrives at time t=0	10

IAT	--	08	06	01	08	03	08	07	02	03
ST	04	01	04	03	02	04	05	04	05	03

Q4 (a)	Describe the algorithm for runs above and below the mean random number testing method. Test the following set of random numbers for independence by runs up and down test. Take α =0.05 and critical value $Z\alpha$ =1.96 0.12 0.01 0.23 0.28 0.89 0.31 0.64 0.28 0.33 0.93	10
Q4 (b)	Explain Naylor and finger validation approach	10
Q5(a)	Local train arrives at railway station at every 15 minutes beginning at 5:00 am. A passenger arrives at the station which is uniformly distributed between 10:00 am and 10:30 am. Find probability that passenger has to wait a) less than 6 min b) more than 10 min	10
Q5 (b)	A sequence of three-digit numbers has been generated and an analysis indicate that 560 have three different digits, 380 have one pair of like digit and 60 contain like digits. Based on Poker test check whether they are independent or not α =0.05	10
Q6	Write short note on any two: (a) KS Test (b) Verification and Validation Process (c) Time Advance Algorithm (d) Issue in Manufacturing System (e) Simulation of Computer System.	10

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