Tribhuvan University
Institute of Science and Technology
2081
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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSC317)
(Simulation and Modelling)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any TWO questions. **[2×10 = 20]**

1. Why it is necessary to analyze the simulation output. Explain different estimation methods which are used in simulation output analysis. [3 +7]

2. Consider that a machine tool in a manufacturing shop is turning out parts at the rate of two every 5 minutes. As they are finished, the parts go to an inspector, who takes 5± 2 minutes to examine each one and rejects about 15% of the parts. Now develop a block diagram and write the code for simulating the above problem using GPSS, and also explain the function of each block used in the block diagram in detail. [3+3+4]

3. Explain the independence and uniformity property of random number. For the following sample of random numbers, perform test for independence using K-S test. ($D_{0.05,10}$= **0.41**) [2 +8]
0.35, 0.77, 0.12, 0.33, 0.88, 0.45, 0.19, 0.25, 0.91, 0.54

Section B

Attempt any EIGHT questions. **[8×5 = 40]**

4. Differentiate between static physical and dynamic physical models. [5]

5. Describe different phases of simulation study with the help of flow chart. [5]

6. Explain Markov Chain with suitable example. What are different application areas of markov chain? [2 + 3]

7. Explain iterative process of calibrating a simulation model. [5]

8. Describe the process of model building, verification and validation in detail with example. [5]

9. Define traffic intensity and server utilization. Write down the Kendall's notation for queuing system with example. [2 +3]

10. "In many system of reference there is coupling between input and output of the system". Justify the statement with reference to feedback system. [5]

11. What is analog computer? Explain with suitable example. [2 + 3]

12. Write short notes: [2 × 2.5 =5]
    a) Queueing Discipline
    b) Random Variate