

Tribhuvan University
Institute of Science and Technology
2082
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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSC328)
(Simulation and Modeling)
(NEW COURSE)

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

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

Section A

Attempt any TWO questions.

[2 × 10 = 20]

1. Describe the MARK and TABULATE block in GPSS. A coffee shop has a single barista serving customers. Customers arrive at an average rate of one every 3 minutes and the barista takes an average of 2.5 minutes to serve a customer. Create a simulation model and block diagram representing the coffee shop using GPSS blocks and simulate the system for 8 hours. [4+6]
2. What is simulation? Describe the analogy between a mechanical system and corresponding electrical system with reference to dynamic physical model. [2+8]
3. What are the properties of random number? The sequence of numbers 0.23, 0.45, 0.67, 0.12, 0.89, 0.34, 0.56, 0.78, 0.19, 0.41, 0.63, 0.08, 0.85, 0.29, 0.51, 0.73, 0.16, 0.94, 0.37, 0.59 has been generated. Test for the independence among numbers in the sequence starting with index (i) = 2 and lag (m)=3 using auto-correlation test. ($\alpha = 0.05$, $Z_{\alpha/2} = 1.96$) (3+7)

Section B

Attempt any EIGHT questions.

[8 × 5 = 40]

4. Explain static mathematical model with suitable example. [5]
5. Define Markov Chain. Explain with suitable example. [5]
6. Explain non-stationary Poisson process in brief. [5]
7. Discuss the inverse transform technique and acceptance-rejection technique for random variate generation. [5]
8. Explain the iterative process of calibrating a model. [5]
9. Explain Kendall notation with appropriate example. [5]
10. Explain Hybrid Simulation with example. [5]
11. What is feedback system? Explain with suitable example. [5]
12. Write short note on: [2 X 2.5 = 5]
 - a. Mid Square Method
 - b. Digital Analog Simulation