POKHARA UNIVERSITY

Level: Bachelor Semester: Spring Year : 2019
Programme: BE Full Marks: 100
Course: Simulation and Modeling Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is system environment? Explain with reference to open and close system? 7
   b) Why Monte-Carlo method is best method for computing static model? Use it to solve $\int_2^5 x^2 . dx$ using twenty samples. 8
2. a) What do you understand by time advancement mechanism? Explain its types briefly. 7
   b) What are the steps to be taken in simulation? Explain with neat diagram. 8
3. a) Explain Predator Pray Model with example. 8
   b) When there is no line available or all the links are busy calls get lost. Show all the necessary steps for block and busy condition in telephone call simulation. 7
4. a) What are the various components and organization of a discrete system? Explain them. 7
   b) If same process is repeated for multiple runs, which of the analysis method is used and how? 8
5. a) The following numbers have been generated 0.39, 0.67, 0.78, and 0.55. Use the Lolmogorov-Smirnov Test to check whether given number s are uniformly distributed or not. (Use the critical value of D for $\alpha = 0.05$ and N=5 is 0.565.) 7
   b) The two Digit random numbers generated by a multiplicative congruential method are given below. Test these data for uniform distribution using Chi-square. Is it acceptable at 95% confidence level? (Use x^2 0.05,9=16.9) 8

36, 91, 51, 02, 54, 06, 58,
06, 58, 02, 54, 01, 48, 97, 43, 22,
83, 25, 79, 95, 42, 87, 73, 17, 02,
42, 95, 38, 79, 29, 65, 09, 55, 97,
39, 83, 31, 77, 17, 62, 03, 49, 90,

37, 13, 17, 58, 11, 51, 92, 33, 78,
21, 66, 09, 54, 49, 90, 35, 84, 26,
74, 22, 62, 12, 90, 36, 83, 32, 75,
31, 94, 34 ,87, 40, 07, 58, 05,
56, 22, 58, 77, 71, 10, 73, 23, 57, 13,
36, 89, 22, 68, 02, 44, 99 ,27,
81,26,85,22

6. a) Why is analysis of simulation output necessary? How is it done in replication of run? 7
   b) Write SIMSCRIPT code for arrival routine of telephone call simulation. 8
7. Write short notes on: (**Any two**) 2×5
   a) Feedback System
   b) Differential Equations
   c) Measure of queuing system