POKHARA UNIVERSITY

Level: Bachelor | Semester: Spring | Year: 2020
Programme: BCA | Full Marks: 70
Course: Simulation and Modeling | Pass Marks: 31.5
Time: 2 hrs.

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

Group 'A': Attempt all questions (5×10=50)

1. Discuss about different types of model. Explain the steps involved in the verification and validation of model.
2. Explain the Distributive lag model in detail and Draw and explain a Cobweb model for the following market:

   $D = 12.4 – 1.2\ P$
   $S = 9.0 – 0.6\ P_{-1}$
   $P_0 = 1.0$ (Assume market is clear.)
3. Explain the three general types of statements in CSMP III? Derive a CSMP III program for the automobile suspension problem and also Draw a block diagram using analog method for solving the following model.
   $F(t) = MX'' + DX' + KX.$
4. Describe initial bias. How it affects the output of simulation. Explain in detail various techniques of elimination of initial bias.

OR

Test the auto correlation of random numbers using significance level of 99% on the following sequence of random numbers.

0.13,0.21,0.23,0.32,0.19,0.93,0.89,0.73,0.99,0.33,0.27,0.35,0.28,0.65, 0.56,0.42,0.87,0.69,0.37, 0.18,0.88,0.25,0.05,0.68,0.43,0.75,0.33

5. Consider a telephone system which has 10 telephones lines and 4 maximum number of links out of which 2 are in use. Suppose arrival time of first call is 1045. Now explain the simulation of lost call and delayed call considering this case with suitable diagram.

Group 'B': Problem-solving/case studies (20)

6. *Read the case situation given below and answer the questions that follow:*

   Consider a XYZ bank with 3 service counter where customer arrival time is in average of 5, with a variance of 2 minutes. If any customers

find the first service counter busy, he/she goes to another services counter but it takes 3 extra minutes to move into the another service counter, similar condition for reaching third counter. It takes average of 10 minutes to provide service to any customer with 2, 3, 4 minutes variance respectively for all counters 1, 2 and 3.

Questions:

a) Develop a GPPS model considering 20% customers do not get proper services. [9]

b) Write a SIMSCRIPT program for the above case. [8]

c) Name entities, attributes, activities, events and state variable for the above XYZ banking system. [3]