# POKHARA UNIVERSITY

Level: Bachelor     Semester: Spring     Year    : 2018
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 a model? Explain different types of model in simulation study.    7
   b) Discuss the concept and methodology of Monte Carlo Method.    8

2. a) Draw the cobweb model (in graph) for market economy graph from the given data.    8

$$D = 12.4 - 1.2P$$
$$S = 8.0 - 0.6P_{-1}$$
$$D = S \text{ and } P_o = 1.0$$

   b) What is continuous system? How differential equation can be used to represent continuous system? Explain with example.    7

3.
   a) Write a CSMP-III program for $A=\int_0^4 \sqrt{16 - x^2}\, dx$ where $\theta = \dfrac{Q}{V}$ and assume necessary data.    7

   b) Make the necessary assumptions and model telephone call simulation when call gets listed if the line is busy.    8

4. a) Differentiate between trace driven and Boot strapping method. What are the simulation programming task?    7

   b) For the given sequence of random numbers, can the hypothesis that the numbers are independent be rejected on the basis of length of runs up and down at $\alpha$=0.05?    8

| 0.41 | 0.68 | 0.89 | 0.94 | 0.74 | 0.91 | 0.55 | 0.62 | 0.36 | 0.27 |
|------|------|------|------|------|------|------|------|------|------|
| .19  | 0.72 | 0.75 | 0.08 | 0.54 | 0.02 | 0.01 | 0.36 | 0.16 | 0.28 |
| 0.18 | 0.01 | 0.95 | 0.69 | 0.18 | 0.47 | 0.23 | 0.32 | 0.82 | 0.53 |
| 0.31 | 0.42 | 0.73 | 0.04 | 0.83 | 0.45 | 0.13 | 0.57 | 0.63 | 0.29 |

5. a) Discuss the concept of SIMSCRIPT Program. Explain the organization of SIMSCRIPT Program.    7

   b) There are 48 people in a institute studying programming. They all started writing a program at the same time. It takes each student 15 (+ - ) 3 minutes to write the program. Only 35% of the program will run correctly for first time. When program has a error it takes 4 (+ - ) 2.5 minutes to do the de-bugging. After de-bugging only 35% of the program will run successfully. How long does it take for whole class to finish every ones program correctly? Simulate the given program with block diagram and code of GPSS.    8

6. a) How does initial bias make an adverse effect? Discuss about the process of eliminating initial bias.    7

   b) What is the method used when the simulation is repeated multiple times?    8

7. Write short notes on: (**Any Two**):    2×5
   a) SSQM
   b) Measuring utilization and occupancy
   c) Real time simulation