POKHARA UNIVERSITY

Level: Bachelor Semester: Spring Year : 2016
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) Why simulation is essential in depicting real world problem. Differentiate continuous and discrete system. 7

   b) Solve $I = \int_0^5 \frac{X^3}{X^4+16}$ by Monte Carlo method. Also estimate the error percentage. 8

2. a) What are steps used in simulation study? Explain with neat block diagram. 7

   b) Explain Analog computer. Draw the suitable analog computer model for the following set of differential equations. 8

   $dx_1/dt = - k_{12}x_1 + k_{21}x_2$

   $dx_2/dt = - k_{12}x_1 - (k_{21} + k_{23})x_2$

   $dx_3/dt = k_{23}x_2$

3. a) Why do you think that CSMP III is important in simulation? Explain with reference to CSMP III program of automobile wheel. 7

   b) What are the various types of calls? Simulate telephone system for lost call system. 8

4. a) How time can be represented in discrete system? Explain Counters and summary measures. 7

   b) Use the chi-square test with α=0.05 to test whether the data shown below are uniformly distributed. Critical value for n=10 is 16.9. 8

0.34	0.90	0.25	0.89	0.87	0.44	0.12	0.21	0.46	0.67
0.83	0.76	0.79	0.64	0.70	0.81	0.94	0.74	0.22	0.74
0.96	0.99	0.77	0.67	0.56	0.41	0.52	0.73	0.99	0.02
0.47	0.30	0.17	0.82	0.56	0.05	0.45	0.31	0.78	0.05
0.79	0.71	0.23	0.19	0.82	0.93	0.65	0.37	0.39	0.42
0.99	0.17	0.99	0.46	0.05	0.66	0.10	0.42	0.18	0.49
0.37	0.51	0.54	0.01	0.81	0.28	0.69	0.34	0.75	0.49
0.72	0.43	0.56	0.97	0.30	0.94	0.96	0.58	0.73	0.05
0.06	0.39	0.84	0.24	0.40	0.64	0.40	0.19	0.79	0.62
0.18	0.26	0.97	0.88	0.64	0.47	0.60	0.11	0.29	0.78

5. a) Workers come to a supply store at the rate of one every 5 ± 2 minutes. Their requisitions are processed by one of two clerks who take 8 ± 4 minutes for each requisition. The requisitions are then passed to a single storekeeper who fills them one at a time, taking 4 ± 3 minutes for each request. Write a GPSS block diagram to simulate the problem for 1000 requisitions to be filled. 7

   b) When simulation process is to be repeated, which output analysis method is preferred? 8

6. a) When data gets biased at the beginning of the analysis it needs to be removed, what are the processes to remove it? 5

   b) Explain about the organization of SIMSCRIPT program with suitable example. 5

   c) Explain about independence property of random number. Explain any two methods to test the independence property. 5

7. Write short notes on: **(Any two)** 2×5

   a) Validation and verification

   b) Single server queuing model

   c) Recording Distribution