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Question Paper Code : 45899

5 Year M.Sc. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Seventh Semester

Software Engineering

XCS 472/10677 SW 702 — MODELLING AND SIMULATION

(Common to 5 Year M.Sc. Computer Technology and M.Sc. Information Technology)

(Regulation 2003/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name four areas of application of simulation.
2. Define entity and attribute of a system.
3. Name the distributions used to study reliability of a system.
4. Name the distributions used to study situations with limited data.
5. Define any two properties of random numbers.
6. Give an example each for Poisson random variate and Binomial random variate.
7. State two features of any one simulation language.
8. What is a multivariate? Give an example.
9. Define mean and variance of a continuous random variate.
10. What is a quantite-quantile plot? How does it differ from histogram?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What is meant by model of a system? Explain the various types of models. (8)
- (ii) Discuss the advantages and disadvantages of simulation study. (8)

Or

- (b) Explain the simulation of a situation modelled by single-channel queue.

12. (a) Write notes on :

- (i) Discrete distribution (4)
- (ii) Continuous distribution (4)
- (iii) Empirical distribution (4)
- (iv). Poisson process. (4)

Or

- (b) Explain the characteristics of queuing systems.

13. (a) Explain the techniques for generating random numbers.

Or

- (b) (i) Explain the following tests for random numbers : χ^2 test and Kolmogrov Simrov test. (8)
- (ii) Explain the inverse transform technique to generate a exponential random variate. (8)

14. (a) Explain about selection of simulation languages when a particular environment has to be simulated.

Or

- (b) Write in detail about any one simulation language.

15. (a) (i) Explain Time-Series input model and Multivariate input model. (12)
- (ii) Write notes on face validity of a model. (4)

Or

- (b) Explain with a suitable example the various types of simulation with respect to output analysis of a system. Discuss also the stochastic nature of simulated output data.