

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
(2125)

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**B. Tech 5th Semester Examination**  
**Modelling & Simulation (NS)**  
**CS-312**

**Time : 3 Hours**

**Max. Marks : 100**

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt FIVE questions in all, select ONE question from each section A, B, C and D, section E is compulsory. All question carry equal marks.

**SECTION - A**

1. (a) What is model? List and explain various types of models used in system simulations. Also give the block diagram of each. (10)
- (b) What do you mean by system? Describe its various types and important terms which describe a system. Explain with example. (10)
2. (a) What are the advantages and disadvantages of simulation technique? (10)
- (b) What are the applications of simulation? Explain in detail. (10)

**SECTION - B**

3. (a) For the following probability distribution function calculate the cumulative distribution function.

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$$F(x) = \begin{cases} \frac{1}{4} \exp(4x), & -\infty < x \leq 0 \\ \frac{1}{4}, & 0 \leq x \leq \frac{15}{4} \\ 0, & \frac{15}{4} < x \end{cases} \quad (10)$$

- (b) Explain normal and Poisson distribution pattern in detail. (10)
4. (a) How to generate uniform distributed random number using discrete system simulation? (10)
- (b) Explain various tests for randomness in simulation process. (10)

**SECTION - C**

5. (a) Give the process to simulate single server queue. (10)
- (b) Discuss the rudiments of queuing theory. (10)
6. (a) Explain transient and steady state of queuing system. (10)
- (b) Discuss the infinite delivery rate of simulation of inventory system with no back ordering. (10)

**SECTION - D**

7. (a) Describe the process of design of simulation experiments with example. (10)
- (b) What are the various control statements used in GPSS and what do you mean by transit time in GPSS? (10)
8. (a) What are the various building blocks used in GPSS for carrying out simulation of a system? (10)
- (b) Describe expression based language with suitable example. (10)

**SECTION - E**

9. Answer the following questions briefly:
- (a) List the advantages of verification.
  - (b) What is the objective of queuing system?
  - (c) Explain discrete probability function.
  - (d) What is difference between a facility and storage in GPSS?
  - (e) Write short note on independence test.
  - (f) What are pseudorandom numbers?
  - (g) What are stochastic systems?
  - (h) What is birth and death problem?
  - (i) Explain distribution lag model.
  - (j) What do you mean by real time simulation? (10×2=20)