[Total No. of Questions - 8]   [Total No. of Printed Pages - 2]
(2064)

14757

M. Tech 2nd Semester Examination

Modeling and Simulation of Communication Systems

EC-208

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 : (i)   Attempt any five questions.

(ii) Assume suitable data if necessary.

1. (a)   Explain and discuss rayleigh and normal continuous invariant models.   (10)

(b)   Explain why modeling and simulation is required in communication systems. Explain the need of stochastic processes in the modeling of communication systems.
                                                                (10)

2. (a)   Explain mixed-congruential method for generation of random number. Give algorithm for the same.   (10)

(b)   Explain bounds and approximations used in the modeling of communications system. What is the central limit theorem?   (10)

3. (a)   What are the different consideration to be taken care behind designing a model? Take an example from the wireless communication field.   (10)

(b)   Explain in detail the various sources of errors in simulation of a system.   (10)

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4. (a) Explain the variance reduction method in respect to estimate the expectation function of a random variable "x".   (10)

    (b) Explain LTI system and its properties. Also prove the convolution integral for continuous LTI system.   (10)

5. Explain the simulation & case study of satellite model using p-SPICE.   (20)

6. (a) Discuss the transformation of a random variable as a scalar valued function of one random variable. Take a suitable example for explanation.   (10)

    (b) Explain shadow fading and wide sense stationary uncorelated scattering. Also give the delay-power profile for the same.   (10)

7. (a) Explain the block diagram of a generic communication system. Explain the need and modeling of the blocks.
                                                                  (10)

    (b) Discuss the channel coding models for BCH code. (10)

8. Write short note on the following:

    (a) Monte carlo simulation.

    (b) Quantization.

    (c) Chebyshev bound.

    (d) Pseudo Random Numbers.   (4×5=20)