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305502

December, 2019

B.Tech. (ECE) V SEMESTER

Probability Theory and Stochastic Processes (EC502)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) What do you understand by 'conditional probability'? (1.5)

(b) Mention any 2 set operations. (1.5)

(c) What is probability mass function? (1.5)

(d) What is probability distribution function? (1.5)

(e) Explain the term 'Joint Distribution'. (1.5)

(f) What are Markov bounds? (1.5)

(g) State the Central Limit theorem. (1.5)

(h) Explain the moments of random variables. (1.5)

(i) What are stationary processes? (1.5)

(j) Explain the term 'Ergodicity'. (1.5)

PART - B

2. (a) Find the probability that a leap year selected at random will contain 53 Sundays. (5)

(b) Explain with examples, how the Bayes theorem can be used in solving practical problems. (10)

3. (a) Explain the Chernoff bounds in detail. (5)

(b) Differentiate between discrete random variables and continuous random variables. (10)

4. State the properties of probability density function with examples. (15)

5. (a) Explain random sequences and the modes of convergence. (5)

(b) Describe the strong and weak laws of large numbers. (10)

6. (a) What do you understand by mean and covariance functions? (5)

(b) Explain the joint characteristic functions in detail. (10)

7. Explain the transmission of random process through an LTI system. (15)
