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Total No. of Questions : 18

Total No. of Pages : 02

B.Tech. (ECE)(Sem.-5) RANDOM VARIABLES AND STOCHASTIC PROCESSES Subject Code : BTEC-905B-18 M.Code : 78708

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly:

- 1) Define probability Distribution function
- 2) What are the conditions for a function to be a random variable?
- 3) State the importance of central limit theorem.
- 4) List various levels of stationary random process.
- 5) Derive expression for mean for uniform random variable.
- 6) Explain ergodic random process in short.
- 7) a) Write a short note on ergodicity.
 - b) Write a short note on sampling models
- 8) Define covariance with example.
- 9) Differentiate between Random Processes and Random variables with an example.
- 10) Write a short note on sets operation.

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SECTION-B

- 11) Explain about conditional probability and its properties.
- 12) Define power density spectrum and write down its properties.
- 13) What is random process? Explain Gaussian random process.
- 14) Explain the moments of the random variable in detail.
- 15) Calculate the variance of g(x) = 2x+3 where x is a random variable with probability distribution as :

x	0	1	2	3
f(x)	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{8}$

SECTION-C

- 16) Discuss random sequences and modes of convergence in detail.
- 17) State and prove Chebyshev inequality.
- 18) Describe in detail strong and weak laws of large numbers.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.