Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

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.

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.