R18

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech. I Semester Supplementary Examinations, December – 2024
PROBABILITY THEORY AND STOCHASTIC PROCESSES
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours   **Max. Marks: 75**

Section – A (Short Answer type questions)   (25 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	Write the axioms of Probability.	CO1	L1	2M
2.	Discuss the set, sample space and mutually exclusive events with an example.	CO1	L2	3M
3.	What are the conditions for a function to be random variables?	CO2	L1	2M
4.	Define the variance and skew?	CO2	L1	3M
5.	What is the meaning of statistical independence.	CO3	L1	2M
6.	Define the expected value of a function of random variable/	CO3	L1	3M
7.	Define random process and write example?	CO4	L1	2M
8.	Discuss about the WSS and SSS.	CO4	L2	3M
9.	Write the Statement of wiener-Khinchin relation.	CO5	L1	2M
10.	Define the SNR?	CO5	L1	3M

Section B (Essay Questions)
Answer all questions, each question carries equal marks.   (5 X 10M = 50M)

11. A)	Explain Joint and Conditional Probability.	CO1	L2	10M
	OR			
B)	In a sports event javelin throw distances are well approximated by a Gaussian distribution for which mean is 30 m and standard deviation is 5m. In a qualify in ground, contestants must throw farther than 27m to qualify. In the main event the record throw is 44m. i) What is the probability of being disqualified in the first round? ii) In the main event what is the probability the record will be broken.	CO1	L3	10M
12. A)	Derive the properties of probability density function.	CO2	L3	10M
	OR			
B)	A continuous random variable X has a pdf $f_X(x)= 3x^2$, $0<x<1$. Find a and b such that (i) $P\{X=a\} = P\{X>a\}$ and (ii) $P\{X>b\} = 0.05$.	CO2	L3	10M
13. A)	Distinguish between joint distribution and marginal distribution.	CO3	L3	10M
	OR			
B)	Explain the transformations of multiple random variables.	CO3	L2	10M
14. A)	Explain WSS and SSS for a random process.	CO4	L2	10M
	OR			
B)	Telephone calls are initiated through an exchange mean average rate of 75 per minute and are described by a poisson process. Find the probability that more than 3 calls are initiated in any 5 seconds period.	CO4	L3	10M

15. A) A random process has the power density spectrum $S_{XX}=6\omega^2/(1+\omega^4)$ CO5   L3   10M
Find the average power in the process.

OR

   B) Explain the different types of noises?   CO5   L2   10M