R18

Code No: 153BQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, March - 2022
PROBABILITY THEORY AND STOCHASTIC PROCESSES
(Electronics and Communication Engineering)

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

Answer any five questions
All questions carry equal marks

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1.a) Discuss about the Discrete and Continuous Sample Spaces.
b) Find the probability of the card being either red or a king when one card is drawn from a regular deck of 52 cards.
c) State and prove Bays theorem. [5+5+5]

2.a) Given P(A) =1/3, P(B) =1/2, P(A∩B) = 1/5, then find P(AUB) and $P(A^c \cap B^c)$.
b) Differentiate between the joint probability and conditional probability.
c) Define Gaussian and Rayleigh distribution functions. [5+5+5]

3.a) Show that the mean value of a weighted sum of random variables is equal to the Weighted sum of mean values.
b) Write about Chebychev's inequality and mention about its characteristic function. [8+7]

4.a) Define moment generating function. State and prove the properties of moment generating function.
b) If X and Y are two random variables which are Gaussian. If a random variable Z is defined as Z=X+Y, Find $F_Z(Z)$. [8+7]

5.a) Explain about the Autocorrelation function and mention its properties and use.
b) Differentiate between a Gaussian random process and Poisson random process.
c) Explain the concept of stationary process and write some examples. [7+4+4]

6.a) Show that the auto-correlation function and power density spectrum is Fourier transform pair.
b) What is power spectrum? Explain its significance and relate this to cross power spectrum. [8+7]

7.a) Write about the different types of Noise sources and modeling in brief.
b) Discuss about the quadrature representation of narrow band noise with its properties. [7+8]

8.a) Write a note on Mutual information and channel capacity of discrete channel.
b) Explain about the Huffman coding and procedure for code implementation with example. [8+7]

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