

UNIVERSITY COLLEGE OF ENGINEERING KAKINADA (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Name of the Course: **Random Variables & Stochastic Processes**
Class: **II B.Tech I-Sem**
Academic Year: **2019-20**

Tutorial # 2

1. Write the expression for the mean value of a discrete random variable.
2. Write the expression for the mean value of a continuous random variable.
3. Define the n^{th} moment of a random variable.
4. Define n^{th} central moment of a random variable.
5. A random variable X has a probability density function of the form
 $f_X(x) = \exp(-2|x|) \quad -\infty < x < \infty$. A second random variable Y is related X by
 $Y = X^2$. Find the probability density function of the random variable Y . Find the probability that Y is greater than 2.
6. When three coins are tossed, the random variable is taken to be the number of heads that result. Find
 - a) the mean value of this random variable
 - b) the variance of this random variable
7. A Gaussian random voltage has a mean value of 5 and variance of 16.
 - a) What is the probability that an observed value of the voltage is greater than zero?
 - b) What is the probability that an observed value of the voltage is greater than twice the mean value?
8. A current having a Rayleigh probability density function is passed through a resistor having a resistance of $2\pi \Omega$. The mean value of the current is 2 A.
 - a) Find the mean value of the power dissipated in the resistor.
 - b) Find the probability that the dissipated power is greater than 72 W.
9. Define the characteristic function (CF) of a random variable and show that the moments can be obtained from CF.
10. Define the moment generating function (MGF) of a random variable and show that the moments can be obtained from MGF.