MA-8451 Probability and Random Processes

Important 2Mark Questions

Unit I

1. Find the second moment about the origin of the Geometric distribution with parameter p.
2. The mean and variance of binomial distribution are 5 and 4. Determine the distribution.
3. A random variable X is uniformly distributed between 3 and 15. Find the variance of X.

Unit II

1. Define covariance and coefficient of correlation between two random variables x and y.
2. The joint pdf of a bivariate random variable (X, Y) is given by $f_{xy}(x, y) = \{k, 0<y\leq x<1$

   0, otherwise

   Where k is a constant. Determine the value of k.
3. Can Y = 5 + 2.8x and x = 3-0.5y be the estimated regression equation of y on x respectively explain your answer.

Unit III

1. Define Markov process.
2. Give the example of evolutionary random process.
3. Prove that random telegraph process {Y(t)} is a wide sense stationary process.

Unit IV

1. State fundamental theorem on the power spectrum of the output of a linear system.
2. Show that the power spectrum of a (real) random process {X(E)} is real.
3. State any two properties of cross-power density spectrums.

Unit V

1. Check whether the system y(t) = x^2(t) is linear or not.
2. Define transfer function of a system.
3. If X(t) is a WSS process and if y(t) = $\int_{-\infty}^{\infty} h(u)X(t-u)du$ then power that $R_{xy}(r) = R_{xx}(r) + h(-r)$.