

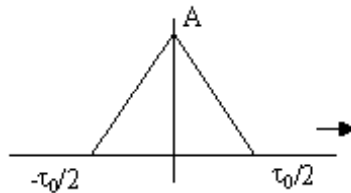
II B.Tech I Semester Supplementary Examinations, May 2005
PROBABILITY & RANDOM VARIABLES
 (Common to Electronics & Communication Engineering and Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. (a) State and prove Bayes theorem of probability.
 (b) In a single throw of two dice, what is the probability of obtaining a sum of at least 10?
2. (a) Explain the Rayleigh probability density function.
 (b) Find the mean value, the mean squared value and the cumulative distribution function for the Rayleigh distribution with parameter $\alpha > 0$, specified by the pdf $f(x) = \frac{x}{\alpha^2} \exp \left\{ -\frac{1}{2} \frac{x^2}{\alpha^2} \right\}$.
3. (a) Prove that $|R_{xy}(\tau)| \leq \sqrt{R_{xx}(0)R_{yy}(0)}$.
 (b) Find the mean and characteristic function of Binomial distribution.
4. (a) State the condition for wide sense stationary Random process.
 (b) Find the Auto Correlation function for white noise shown in the figure below.



5. Find the input auto correlation function, output autocorrelation and o/p spectral density of RC low pass filter, where the filter is subjected to a white noise of spectral density $N_0/2$.
6. (a) What are the characteristics of White noise?
 (b) Discuss the spectral distribution of thermal noise.
7. (a) What are the precautions to be taken in cascading stages of a network in the point of view of noise reduction?
 (b) What is the need for band limiting the signal towards the direction increasing SNR.
8. (a) Compare discrete and continuous channel with respect to information transmission.

- (b) Derive an expression for channel capacity of a continuous channel in the presence of White Gaussian noise.
