INFORMATION THEORY AND CODING

ASSIGNMENT-1

1) Define the following:

a) Event, Event Space, Sample Space

b) Baye's Theorem

c) Poisson's Random Variable

d) Gaussian's Random Variable

e) Poisson Process, Brownian Process, Gaussian Process and Wide Sense Stationary process

2) The number of hits to a popular website during a 1-minute interval is given by a Poisson (λ) random variable. Find the probability that there is at least one hit between 3:00 am and 3:01 am if $\lambda = 2$. Then find the probability that there are at least 2 hits during this time interval.

3) If X is an exponential random variable with parameter $\lambda = 1$, find E[Xn].

4) Find the cdf of a Bernoulli(p) random variable.

5) Let A be a non negative RV, that is independent of any collection of samples of Wide sense stationary random process X(t). Is Y(t) = A + X(t) a wide sense stationary process?