Time: 20 mins

Name: Std. Number:

Quiz 2 (Stationary Stochastic process)

Questions

1. Short Questions

   (a) Suppose $X(t) = A$ where A is a continous random variable with a pdf uniform between $(-1, 1)$. Is $X(t)$ a SSS process?

   (b) Suppose $x(t)$ and $v(t)$ are two independent WSS random processes with autocorrelation functions respectively $R_{xx}(\tau)$ and $R_{vv}(\tau)$. Construct a random process $g(t)$ whose autocorrelation function $R_{gg}(\tau) = R_{xx}(\tau)R_{vv}(\tau)$

2. Given the random process $Y(t) = X(t)cos(w_0 t + \theta)$ where $X(t)$ is WSS, w_0 is constant and θ is uniformly distributed on $(-\pi, \pi)$ independent of $X(t)$. Find the autocorrelation of $Y(t)$ and determine if it's WSS.