Assignment 5

AI1110: Probability and Random Variables

Indian Institute of Technology Hyderabad

MALOTH DAVID
CS21BTECH11035

june 4

paupolis PROBLEM 9.29

(paupolis, Exercise 9.29) (Paupolis chapter 9 ,ex 9.29) find $E\{y^2(t)\}$ a) If $R_{XX}(\tau) = 5\delta(\tau)$ and y'(t)+2y(t) = X(t) all t. b) if i) holds for t >0 only and y(t)= 0 for t $\leq$ 0

I. Solution

Solution

- a) if y'(t)+2y(t) = X(t), then y(t) =x(t)*h(t)
- where h(t) = $e^{-2t}u(t)$ and with q(t)=5, (10-90) yields
- $E\{y^2(t)\}$ = 5*$e^{-4t}U(T)$=5*$\int_0^\infty e^{-4t}d(\tau)$ =$\frac{5}{4}$
- b) as a) with q(t) = 5U(t).hence,for t >0
- $E\{y^2(t)\} = 5U(t) * e^{-4t}U(t)$ =5 * $\int_0^t e^{-4t}d\tau$ =$\frac{5}{4}(1 - e^{-4t})$
- hence proved