ECE 2704: Signals & Systems

Summer-I 2004, 3 credits, CRN: 60318

Test#2

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1. Prove that the derivative of the step response of an LTI system is its impulse response. (10 points)
2. Compute the output of a system that has the following impulse response and the input signal. (10 points)

   $h(t) = e^{-at}u(t), a > 0$

   $x(t) = u(t)$
3. Consider a continuous-time LTI system with a step response

   $$s(t) = [e^{-2t} + 2e^{t}]u(t)$$

   What will be the output of the system when the input to the system is as given below? (10 points)

   $$x(t) = 12.5u(t) - 2u(t+2)$$
4. Find the eigenvalue corresponding to the eigenfunction e^{2t} for the system (10 points)

   $$y(t) = \int_{-\infty}^{t} e^{-(t-\tau)}x(\tau)d\tau$$