Name _____ CM_____

ECE-300, Quiz #3

1) The impulse response of the mathematical model of a system $y(t) = 2x(t-1)$ is

a) $h(t) = \delta(t)$ b) $h(t) = 2\delta(t)$ c) $h(t) = 2\delta(t-1)$ d) $h(t) = 2u(t-1)$

2) The impulse response of the mathematical model of a system $y(t) = \int_{-\infty}^{t-1} x(\lambda)d\lambda$ is

a) $h(t) = u(t)$ b) $h(t) = 1$ c) $h(t) = u(t-1)$ d) $h(t) = t-1$

3) The impulse response of the mathematical model of a system $y(t) = \int_{-\infty}^{t-1} \lambda x(\lambda - 2)d\lambda$ is

a) $h(t) = 2u(t-1)$ b) $h(t) = 2u(t-2)$ c) $h(t) = 2u(t-3)$ d) $h(t) = 2u(t)$

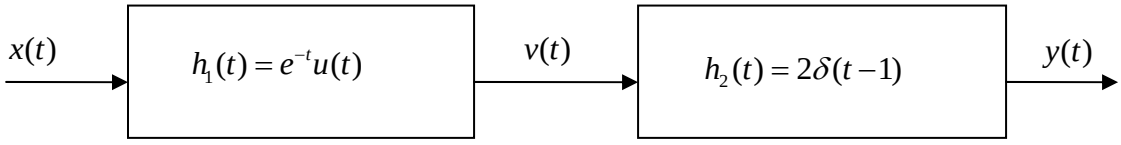
4) The impulse response of the mathematical model of a system $y(t) = \int_{t}^{\infty} \lambda x(\lambda - 2)d\lambda$ is

a) $h(t) = 2u(t)$ b) $h(t) = 2u(2-t)$ c) $h(t) = 2u(t-2)$ d) $h(t) = u(t)$

5) The impulse response of the mathematical model of a system $\dot{y}(t) + 2y(t) = 3x(t)$ is

a) $h(t) = 3e^{-2t}u(t)$ b) $h(t) = 3e^{2t}u(t)$ c) $h(t) = 3u(t)$ d) $h(t) = 6u(t)$

6) The impulse response of the system



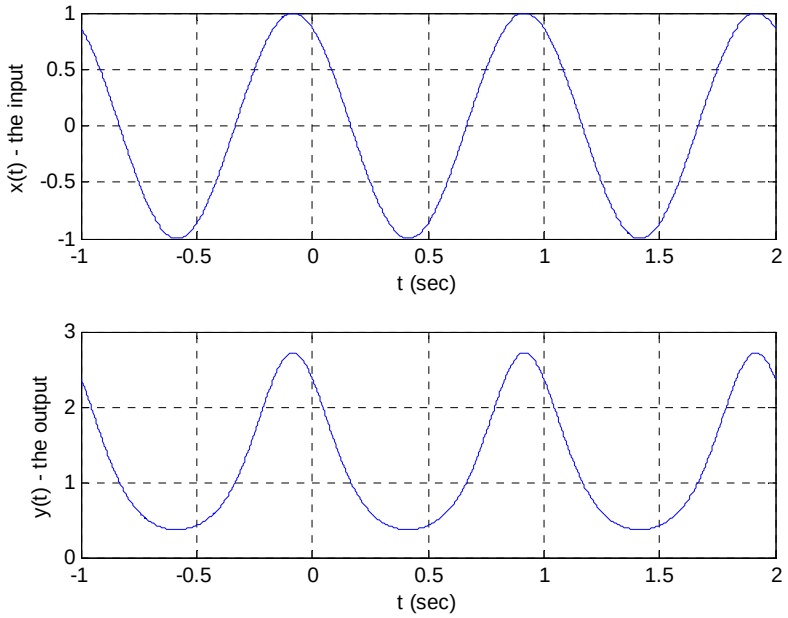
is

a) $h(t) = 2e^{-t}u(t)$ b) $h(t) = 2e^{-t}\delta(t-1)$ c) $h(t) = 2e^{-(t-1)}u(t-1)$ d) $h(t) = 2e^{-(t-1)}u(t)$

7) Consider an unknown system. When the input to the system is $x(t) = 2\cos(2t)$ the output of the system is $y(t) = 2\cos(2t) + \cos(4t)$. Is the system **linear**?

a) Yes b) No c) Can't tell, not enough information

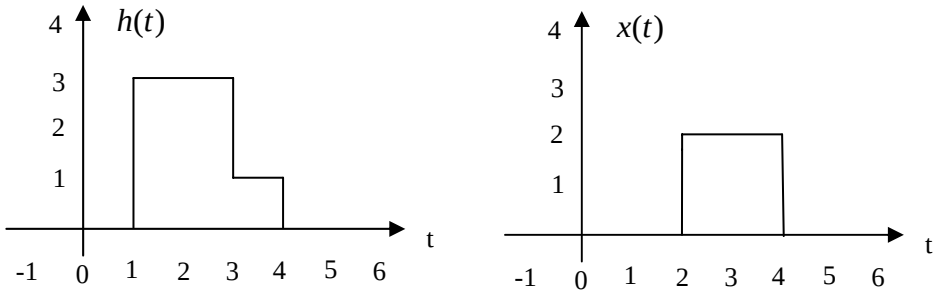
8) Consider the following input/output pair for an unknown system.



Which of the following is true:

a) The system is linear
b) The system is not linear
c) It is not possible to determine if the system is linear based on the information given.

Problems 9 -12 refer to the following linear time invariant (LTI) system, with impulse response $h(t)$ shown below on the left, and input $x(t)$ shown below on the right. The output of the system, $y(t)$, is the convolution of the impulse response with the input, $y(t) = h(t) * x(t)$.



9) Is this LTI system causal? a) Yes b) No

10) The maximum value of $y(t)$ is a) 4 b) 5 c) 6 d) 12 e) 14

11) $y(t)$ is zero until what time? a) 0 b) 1 c) 2 d) 3 e) 4

12) $y(t)$ will return to zero at what time? a) 6 b) 7 c) 8 d) 9 e) 10