

Name \_\_\_\_\_ CM \_\_\_\_\_

## Quiz 4

1) The **impulse response** for the LTI system  $y(t) = \int_{-\infty}^{t+1} e^{-(t-\lambda)} x(\lambda - 3) d\lambda$  is

- a)  $h(t) = e^{-(t-3)} u(t)$
- b)  $h(t) = e^{-(t-3)} u(t+1)$
- c)  $h(t) = e^{-(t-3)} u(t-3)$
- d)  $h(t) = e^{-(t-3)} u(t-2)$
- e)  $h(t) = e^{-(t-3)} u(t-1)$
- f) none of these

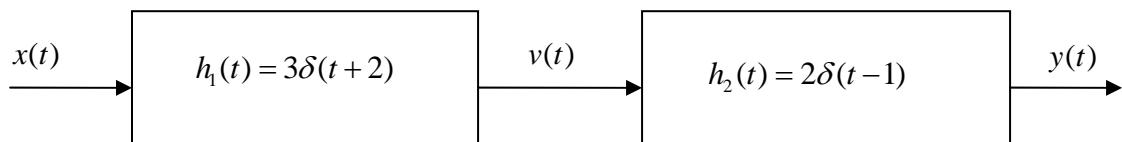
2) The **impulse response** for the LTI system  $y(t) = x(t-1) + \int_{-\infty}^{t-2} e^{-(t-\lambda)} x(\lambda - 3) d\lambda$  is

- a)  $h(t) = \delta(t-1) + e^{-(t-3)} u(t)$
- b)  $h(t) = u(t-1) + e^{-(t-3)} u(t)$
- c)  $h(t) = \delta(t-1) + e^{-(t-3)} u(t-1)$
- d)  $h(t) = u(t-1) + e^{-(t-3)} u(t+1)$
- e)  $h(t) = \delta(t-1) + e^{-(t-3)} u(t-3)$
- f) none of these

3) The **impulse response** for the LTI system  $\dot{y}(t) - y(t) = x(t-1)$  is

- a)  $h(t) = e^{(t-1)} u(t-1)$
- b)  $h(t) = e^{-(t-1)} u(t-1)$
- c)  $h(t) = e^{-(t-1)} u(t)$
- d)  $h(t) = e^{(t-1)} u(t)$
- e) none of these

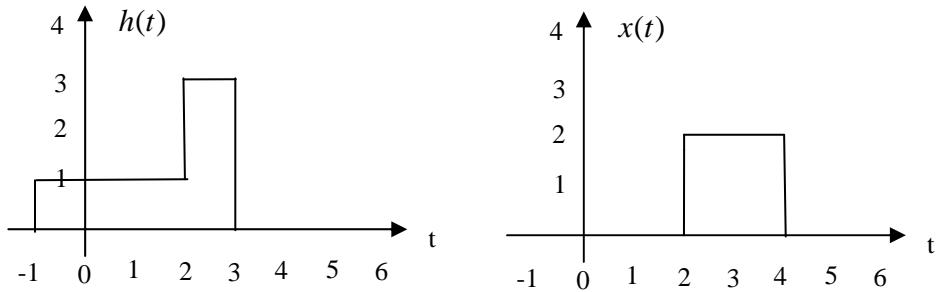
4) The **impulse response** of the system



is

- a)  $h(t) = 6u(t)$
- b)  $h(t) = 6u(t-1)$
- c)  $h(t) = 6u(t+1)$
- d)  $h(t) = 6\delta(t)$
- e) none of these

Problems 5 - 8 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,  $y(t) = h(t) * x(t)$ .



- 5) Is this LTI system causal?  
 a) Yes b) No
- 6) The maximum value of  $y(t)$  is  
 a) 4 b) 5 c) 6 d) 7 e) 8
- 7)  $y(t)$  is zero until what time?  
 a) 0 b) 1 c) 2 d) 3 e) 4
- 8)  $y(t)$  will return to zero at what time?  
 a) 6 b) 7 c) 8 d) 9 e) 10