

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

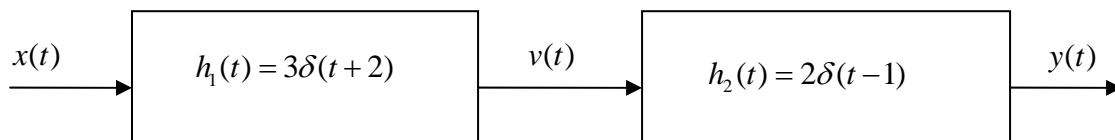
2) The **impulse response** for the LTI system  $y(t) = x(t-1) + \int_{-\infty}^{t-2} e^{-(t-\lambda)} x(\lambda - 3) d\lambda$  is

- 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

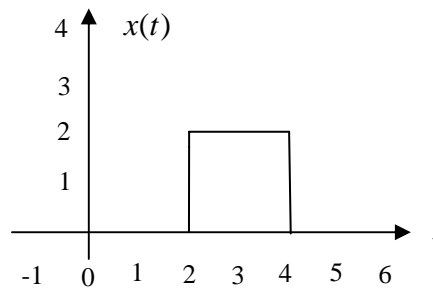
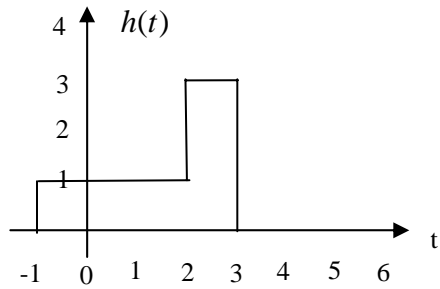
4) The **impulse response** of the system



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