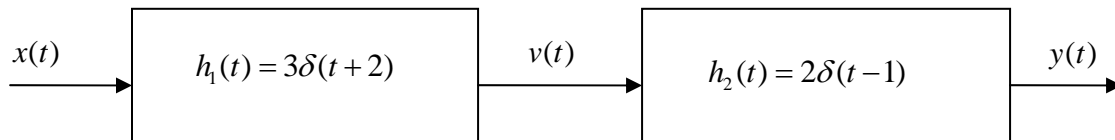


Name \_\_\_\_\_ CM \_\_\_\_\_

### Quiz 6

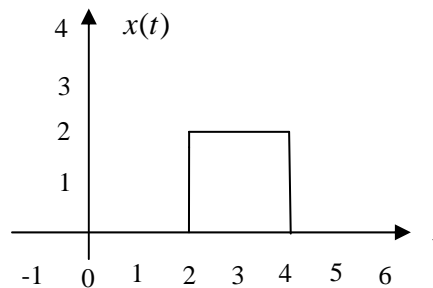
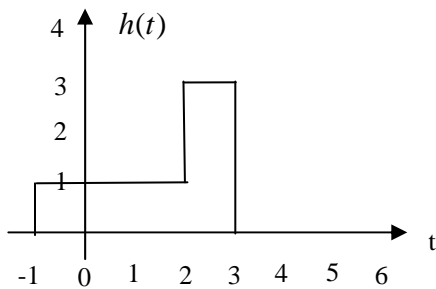
1) The **impulse response** of the system



is

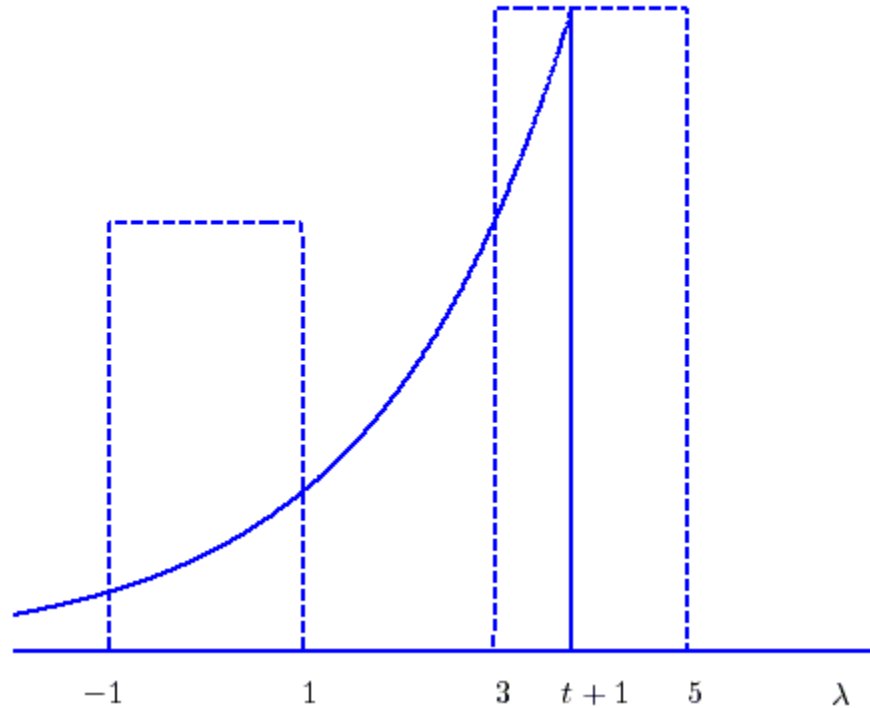
- a)  $h(t) = 6u(t)$    b)  $h(t) = 6u(t-1)$    c)  $h(t) = 6u(t+1)$   
 d)  $h(t) = 6\delta(t)$    e) none of these

Problems 2 - 5 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,  $y(t) = h(t) * x(t)$ .



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

For problems **6-11**, assume we are convolving two functions, and at some point we have the configuration shown below:



The output at this time can be written as the sum of two integrals,

$$y(t) = \int_a^b x(\lambda)h(t-\lambda)d\lambda + \int_c^d x(\lambda)h(t-\lambda)d\lambda$$

- 6)** The value of the parameter  $a$  is a) -1 b) 1 c) 3 d) 5 e)  $t$  f)  $t+1$
- 7)** The value of the parameter  $b$  is a) -1 b) 1 c) 3 d) 5 e)  $t$  f)  $t+1$
- 8)** The value of the parameter  $c$  is a) -1 b) 1 c) 3 d) 5 e)  $t$  f)  $t+1$
- 9)** The value of the parameter  $d$  is a) -1 b) 1 c) 3 d) 5 e)  $t$  f)  $t+1$
- 10)** This sketch is valid for  
a)  $-1 < t < 1$  b)  $3 < t < 5$  c)  $0 < t < 2$  d)  $0 < t < 1$  e) none of these
- 11)** Is this a causal system? a) yes b) no c) it is not possible to tell