

## ECE-205 Practice Quiz 5

**1)** The integral  $\int_{-t+2}^{\infty} \delta(\lambda+5)d\lambda$  is equal to

- a)  $u(t)$
- b)  $u(t+5)$
- c)  $u(t-7)$
- d)  $u(-t+2)$
- e) none of these

**2)** The integral  $\int_{-\infty}^{t-3} \delta(\lambda-2)d\lambda$  is equal to

- a)  $u(t)$
- b)  $u(t-3)$
- c)  $u(t-2)$
- d)  $u(t+5)$
- e)  $u(t-5)$
- f) none of these

**3)** The integral  $\int_{-\infty}^t e^{-\lambda} \delta(\lambda-2)d\lambda$  is equal to

- a)  $e^{-2}u(t-2)$
- b)  $e^{-2}u(t)$
- c)  $e^{-t}u(t)$
- d)  $e^{-t}u(t-2)$
- e)  $e^2u(t-2)$
- f) none of these

**4)** The function  $x(t) = e^{t-1}\delta(t-2)$  can be simplified as

- a)  $x(t) = e^1$
- b)  $x(t) = e^1\delta(t-2)$
- c)  $x(t) = e^1u(t-2)$
- d) none of these

**5)** The integral  $\int_{-\infty}^t u(\lambda-1)\delta(\lambda+2)d\lambda$  can be simplified as

- a)  $u(t+2)$
- b)  $u(t-1)$
- c)  $u(t)$
- d) none of these

**6)** The integral  $\int_2^t \delta(\lambda-1)d\lambda$  is equal to

- a) 0
- b)  $u(t)$
- c)  $-u(1-t)$
- d)  $u(t-2)$
- e) none of these

**7)** The integral  $\int_{-5}^5 u(1-\lambda)u(\lambda+1)d\lambda$  is equal to      a) 0   b) 1   c) 2   d) 10   e) none of these

**8)** The integral  $\int_{-3}^t u(\lambda-1)d\lambda$  is equal to      a) 0   b)  $t+3$    c)  $(t+3)u(t+3)$    d)  $t-1$    e)  $(t-1)u(t-1)$

**9)** The **impulse response** for the LTI system  $y(t) = \frac{1}{2}[x(t) - x(t-1)]$  is

- a)  $h(t) = \frac{1}{2}[u(t) - u(t-1)]$    b)  $h(t) = \frac{1}{2}[\delta(t) - \delta(t-1)]$    c) neither of these

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

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

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

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

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

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

**13)** The **impulse response** for the LTI system  $\dot{y}(t) - 2y(t) = 3x(t+1)$  is

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

**14)** The **unit step response** of a system with impulse response  $h(t) = e^{-(t-1)}u(t-1)$  is

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

**15)** If the unit step response of a system is  $y(t) = A(1 - e^{-t/\tau})u(t)$ , the **impulse response** of the system is

- a)  $h(t) = \frac{A}{\tau}e^{-t/\tau}\delta(t)$
- b)  $h(t) = \frac{A}{\tau}e^{-t/\tau}u(t)$
- c)  $h(t) = \frac{A}{\tau}e^{-t/\tau}$
- d)  $h(t) = A\tau e^{-t/\tau}u(t)$

**16)** The integral  $h(t) = \int_{-\infty}^{t+1} e^{-(t-\lambda)}\delta(\lambda + 3)d\lambda$  can be simplified as

- a)  $e^{-(t+3)}u(t)$
- b)  $e^{-(t+3)}u(t+1)$
- c)  $e^{-(t+3)}u(t+3)$
- d)  $e^{-(t+3)}u(t+4)$

**17)** The integral  $h(t) = \int_{-\infty}^{t-3} e^{-(t-\lambda)}\delta(\lambda - 1)d\lambda$  can be simplified as

- a)  $e^{-(t-1)}u(t)$
- b)  $e^{-(t-1)}u(t-1)$
- c)  $e^{-(t-1)}u(t-3)$
- d)  $e^{-(t-1)}u(t-4)$

**18)** The integral  $h(t) = \int_{-t+2}^5 e^{-(t-\lambda)}\delta(\lambda - 3)d\lambda$  can be simplified as

- a)  $e^{-(t-3)}u(t)$
- b)  $e^{-(t-3)}u(t+1)$
- c)  $e^{-(t-3)}u(t-3)$
- d)  $e^{-(t-3)}u(2-t)$

Answers: 1-c, 2-e, 3-a, 4-b, 5-d, 6-c, 7-c, 8-e, 9-b, 10-b, 11-b, 12-d, 13-a, 14-a, 15-b, 16-d, 17-d, 18-b