

↳ -7- The numerical result of the evaluation of the integral : (p13)

$$\int 12 \delta(1-12t) \cdot \cos(4\pi t) \cdot dt \quad \text{is:}$$

a. -0.5 b. 0.5 c. -1 d. 1 e. None of the above

↳ -8- The result of the evaluation of the integral: $\int \delta(t) \cdot \delta'(t) \cdot dt$ is: (p13)

a. 0 b. 1 c. ∞ d. undetermined e. None of the above

8%

- C 6. The voltage drop across a device is $\delta(t - 2)$ Vs and the current through it, in the direction of voltage drop, is $5t$ A. Determine the energy absorbed by the device. (p. 171)
- A. 1 J
 - B. 5 J
 - C. 10 J
 - D. 20 J
 - E. None of the above

C ✓ **16.** Suppose $v(t) = 2\delta(t-1) - 3\delta(t-3)$ is the input to a relaxed circuit having an impulse response $h(t) = 2u(t) - 2u(t-5)$. Determine the output at time $t=7$. (p.18)

- a. 4
- b. -2
- c. -4
- ✓ d. -6
- e. 6

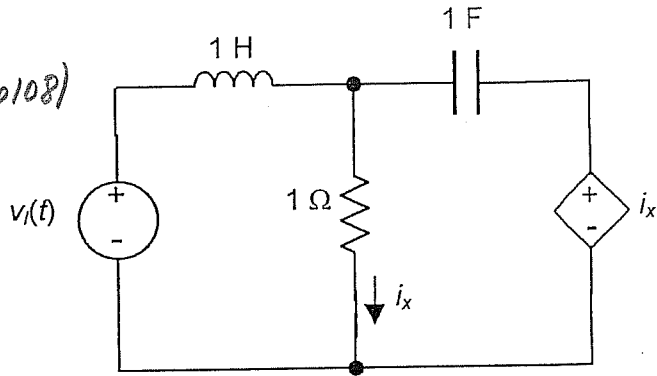
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C 17. The response of a circuit to an impulse at $t = 0$ is $e^{-t}u(t)$. If an input $e^{-0.5t}$ has been applied for a long time (from $t = -\infty$), determine the output at $t = 0$. (p.74)

- A. 2
- B. 4
- C. 0
- D. ∞
- E. None of the above

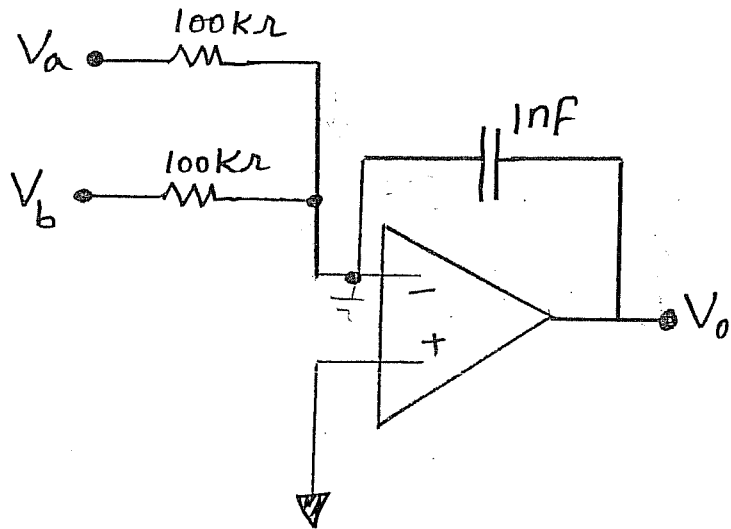
C 17. $v_1(t) = \delta(t)$ is applied to the circuit shown, with zero initial conditions. Determine $i_x(t)$. (p108)

- ✓ A. $e^{-t}u(t)$ A
- B. $2e^{-t}u(t)$ A
- C. $4e^{-t}u(t)$ A
- D. $8e^{-t}u(t)$ A
- E. None of the above



C 18. In the circuit shown, the input voltages $V_a = \frac{1}{5000} \delta(t)$, V_s and

$V_b = \frac{3}{10000} \delta(t - \frac{1}{1000})$, V_s . What is the correct time-domain expression for v_o ? (p-162)



(a) $2u(t) - 3u(t - \frac{1}{1000})$, V

(b) $-2u(t) - 3u(t + \frac{1}{1000})$, V

(c) $-2\delta(t) - 3\delta(t - \frac{1}{1000})$, V

(d) $-2u(t) - 3u(t - \frac{1}{1000})$, V

(e) None of the above

12. For the signals shown in Fig. 11, find $y(t) = x(t) * h(t)$. (p. 72)

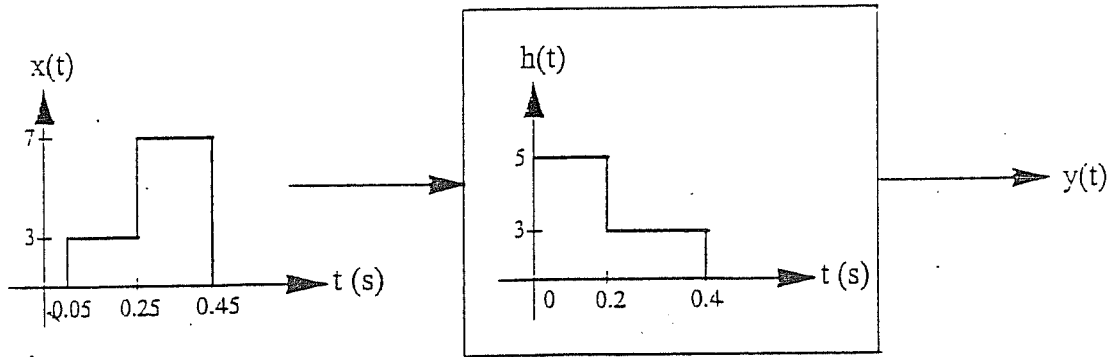
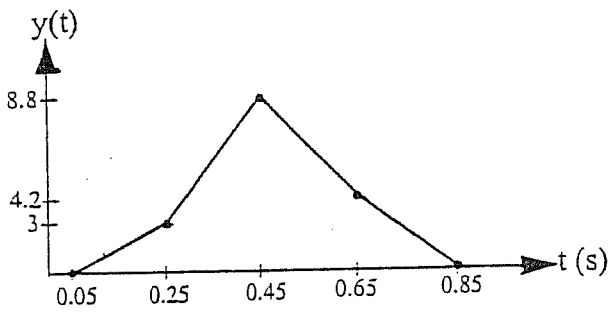
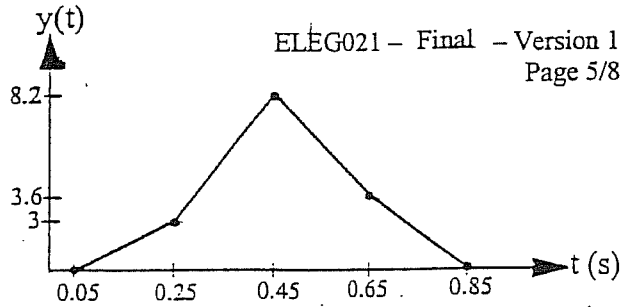


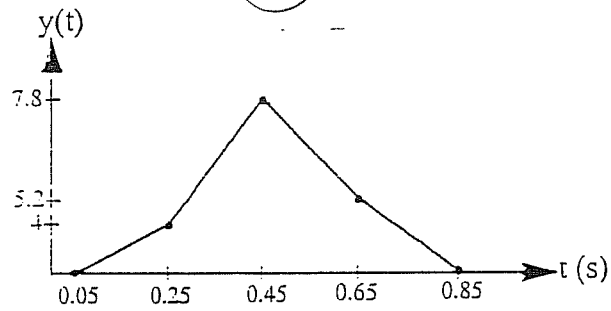
Figure 11



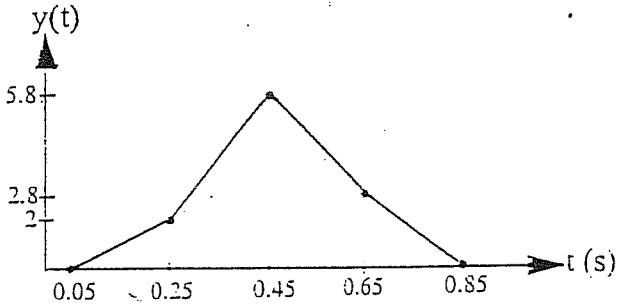
A.



B.



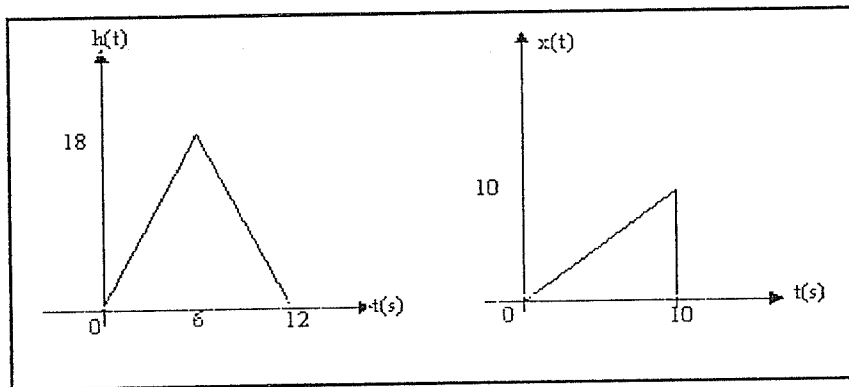
C.



D.

E. None of the above

- C ✓ 20. Use the convolution integral to evaluate $y(t)$ at $t = 6$ s if $y(t) = h(t) * x(t)$ and $h(t)$ and $x(t)$ have the waveforms shown below. *p(109)*



- a) 584
- b) 337.5
- c) 108
- d) 534.5
- e) None of the above

C ✓ 12. Consider the following two functions: (p. 17)

$$f(t) = \begin{cases} 1, & 0 < t < 1 \\ -1, & 1 < t < 2 \\ 0, & \text{elsewhere} \end{cases} \quad \text{and} \quad g(t) = \begin{cases} -t+1, & 0 < t < 1 \\ t+1, & -1 < t < 0 \\ 0, & \text{elsewhere} \end{cases}$$

Evaluate : $f(t)*g(t)$

a. $0.5t^2 - 2t + 2, 0 < t < 1$

b. $0.5(t+1)^2, -1 < t < 0$

c. $\begin{cases} t, & 0 < t < 1 \\ 3-2t, & 1 < t < 2 \\ t-3, & 2 < t < 3 \end{cases}$

d. $0.5t^2 - 2t + 2, -1 < t < 1$

e. None of the above

This is only part of the solution. The rest is:

$0 \leq t \leq 1 : -1.5t^2 + t + 0.5$

$1 \leq t \leq 2 : 1.5t^2 - 5t + 3.5$

$2 \leq t \leq 3 : -0.5t^2 + 3t - 4.5$

$t \geq 3 : 0$

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