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Assignment :-02

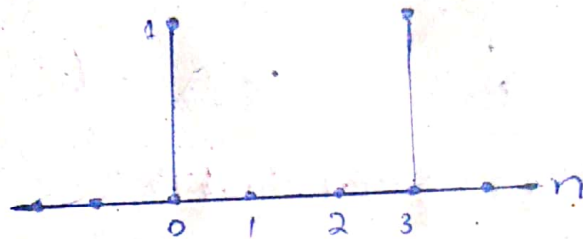
Subject :-Signal & system

Program :- B- tech (E)

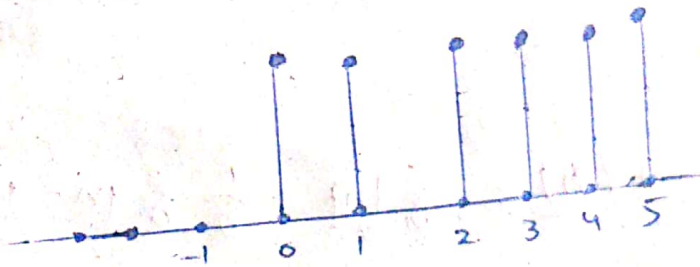
Submitted to ; Engr; Muhammad Aamir Aman

Q No: 1 Sketch each of the following signals

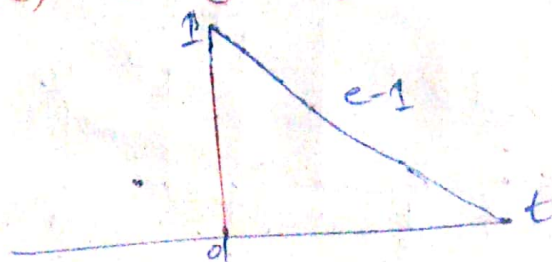
Ans :- A) $x[n] = \delta[n] + \delta[n-3]$



B) $x[n] = u[n] - u[n-5]$



F) $x(t) = e^{-t} u(t)$

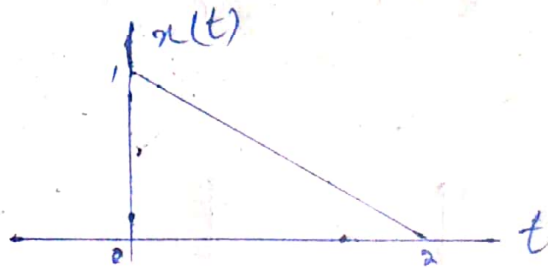


Q No :- 2

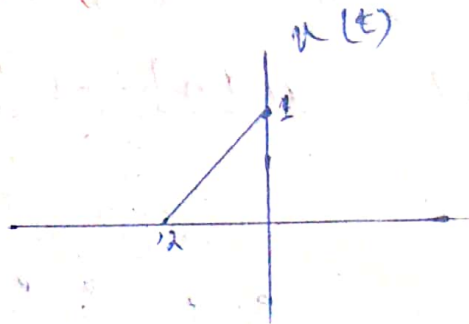
a) $x[1-t] [u(t+1) - u(t-2)]$

b) $(2-t) [u(t+1) - u(t-2)]$

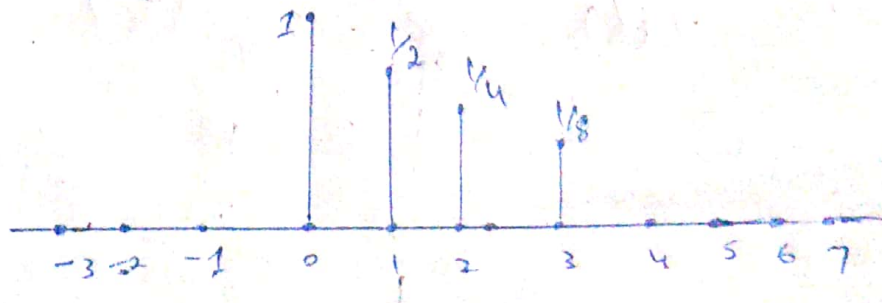
Ans :-



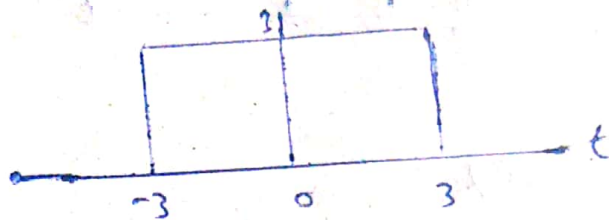
$x(t) \text{ \& \ } x(1-t)$



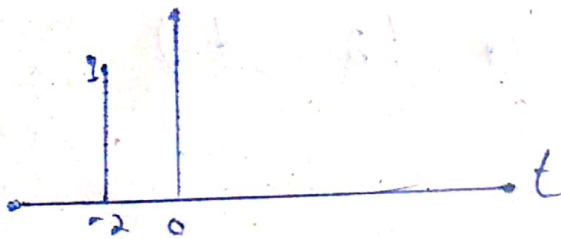
c) $x[n] = \delta[n] + \frac{1}{2} \delta[n-1] + \left(\frac{1}{2}\right)^2 \delta[n-2] + \delta[n-3]$



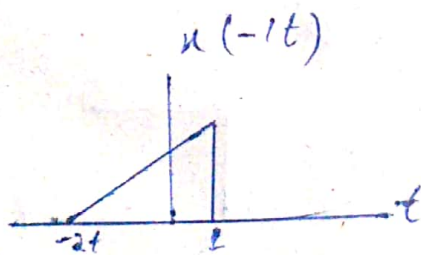
$$D) \quad x(t) = u(t+3) - u(t-3)$$



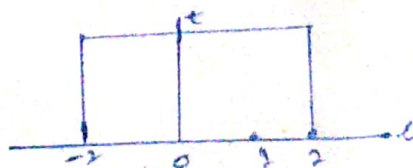
$$E) \quad x(t) = \delta(t+2)$$



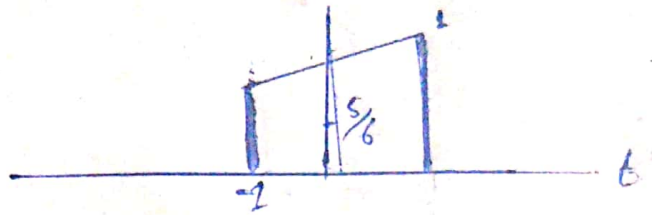
x



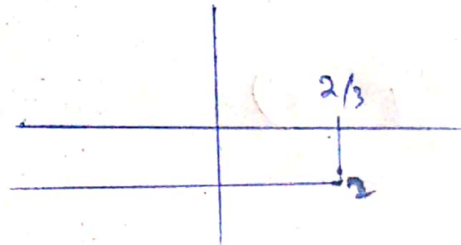
$$u(t+2) - u(t-2)$$



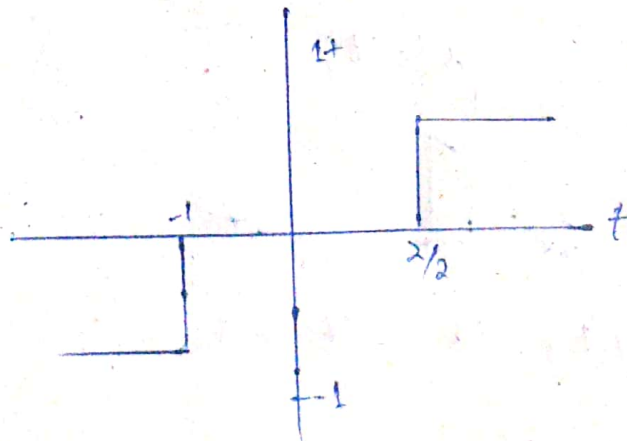
Hence, $x(2-t)u(t+1) - u(t-2)$



$$-u(2-3t)$$



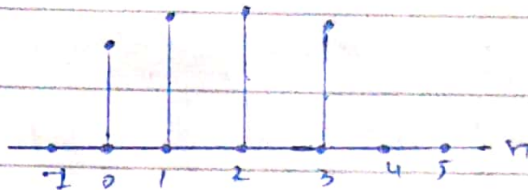
$$u(t+2) - u(2-3t)$$



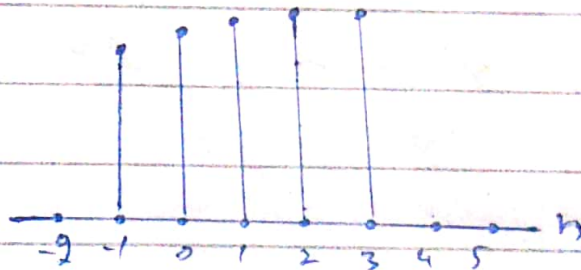
Q No: 3

Determine the discrete-time convolution of $x[n]$ and $h[n]$ for the following two cases

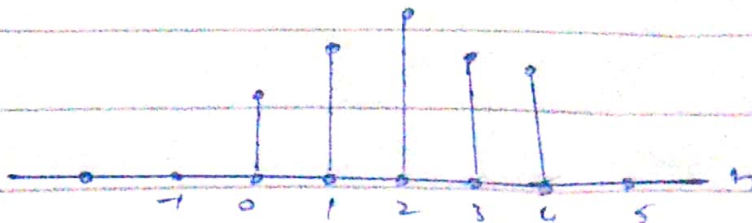
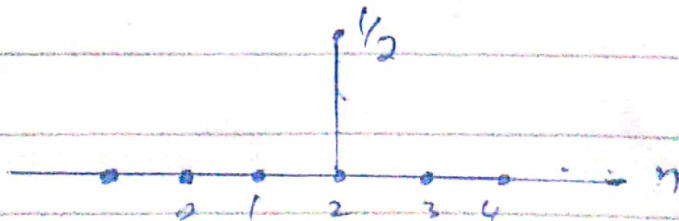
* Case No 1 :-



* For $h[n]$



* For case 2



Convolutions

$$y[n] = \sum_{-\infty}^{\infty} x[k] h[n-k]$$

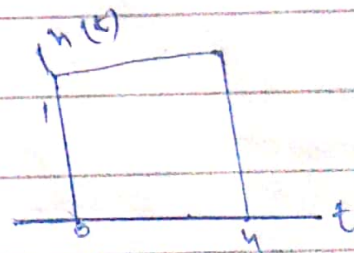
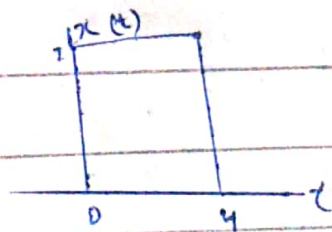
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Q No: 4)

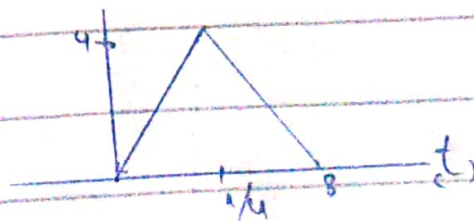
Determine the continuous-time convolution of $x(t)$ and $h(t)$ for the following three cases.

Solve:→

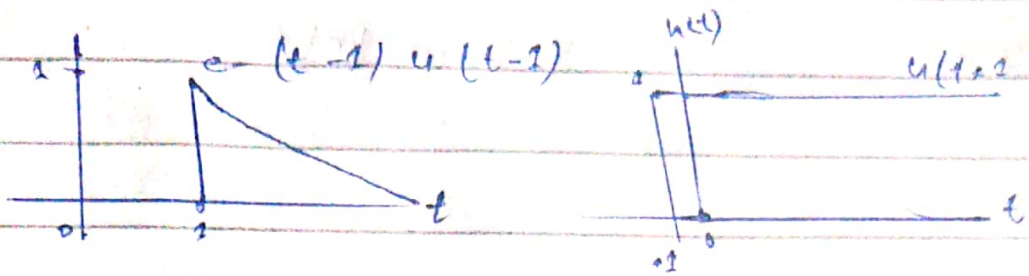
Case-1



$$y(t) = x(t) * h(t)$$



B)



\Rightarrow the limit can be verified by graphically visualizing the convolution

$$y(t) = \int_{-\infty}^{\infty} x(\tau) h(t-\tau) d\tau$$

$$\int_{-\infty}^{\infty} e^{-(\tau-1)} u(\tau-1) u(t-\tau+1) d\tau$$

$$= \int_0^{t+1} e^{-(\tau-1)} u(\tau-1) u(t-\tau+1) d\tau$$

let $\tau = \delta \Rightarrow \tau - 2$ then

$$y(t) = \begin{cases} \int_0^t e^{\delta} d\delta & \text{if } 0 < t < \infty \\ 0 & \text{if } t < 0 \end{cases}$$

Case 3

C)

