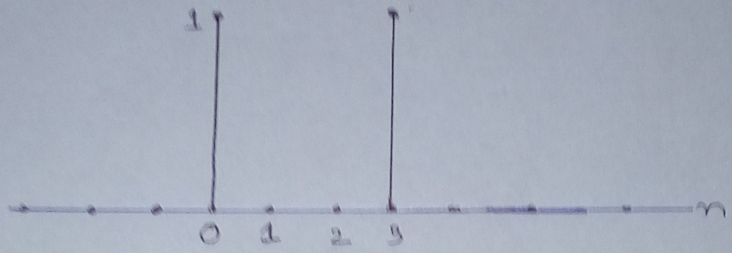
# Assignment

| | |
|---|---|
| Name | Uzair khan |
| ID | 13909 |
| Programe | B-Tech (E) |
| Subject | Signal & System |
| Submitted | To - Sir. Aamir Aman |

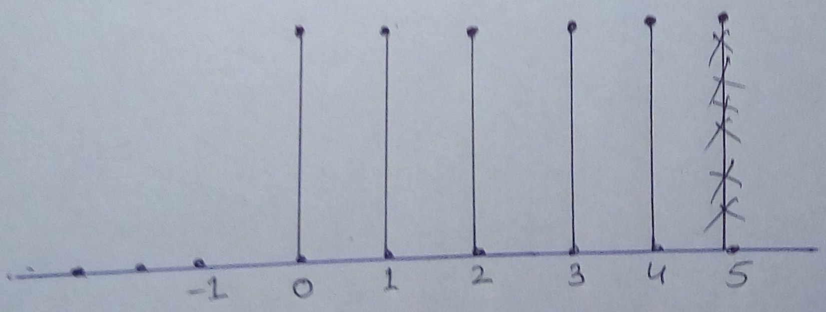
Name Page = 1 Uzairich ID = 13909

Q(1) Sketch each of The following signals

(a) $x[n] = \delta[n] + \delta[n-3]$

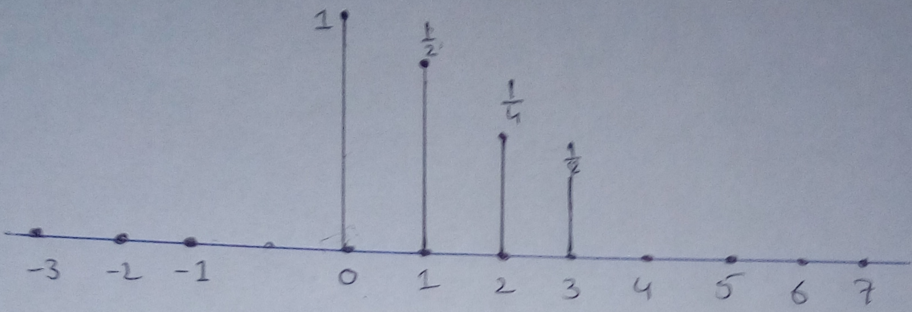



(b) $x[n] = u[n] - u[n-5]$

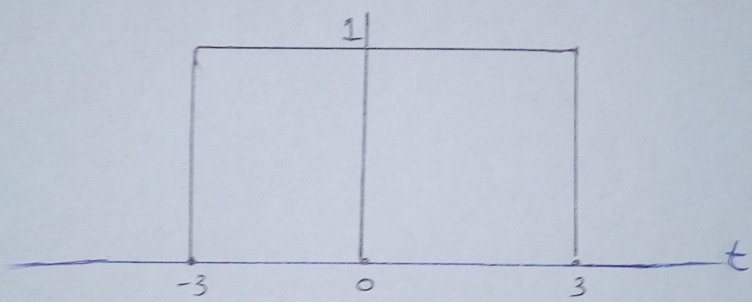


Name = Uzair khan Page 3 I.D = 13909

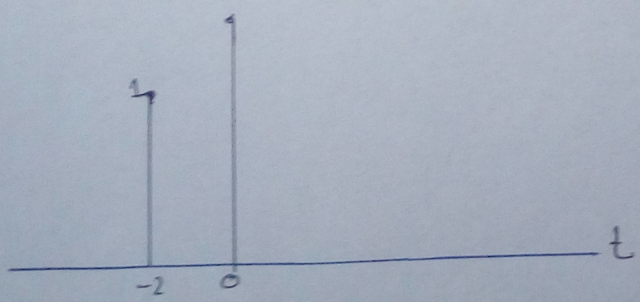
(C) $x[n] = \delta[n] + \frac{1}{2}\delta[n-1] + (\frac{1}{2})^2\delta[n-2] + (\frac{1}{2})^3\delta[x-3]$




(D) $x[t] = u(t+3) - u(t-3)$

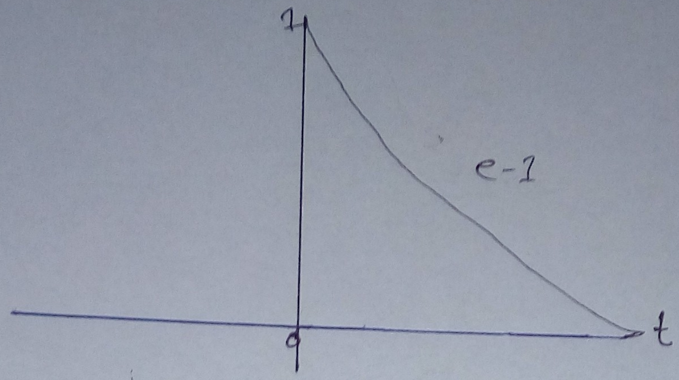



(E) $x[t] = \delta(t+2)$



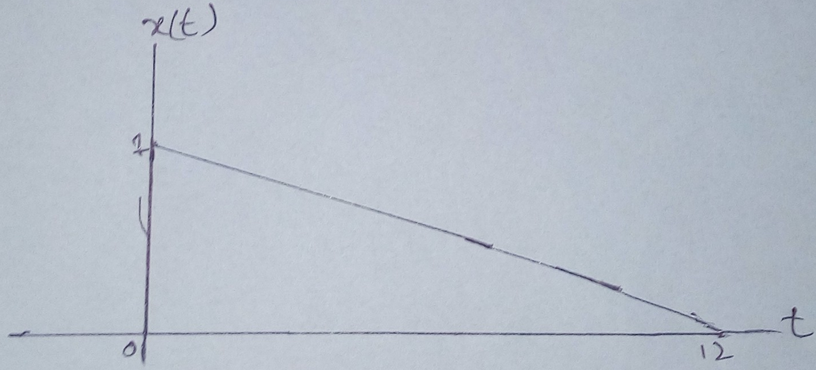
Name = Uzair khan    Page (4)    ID = 13909

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

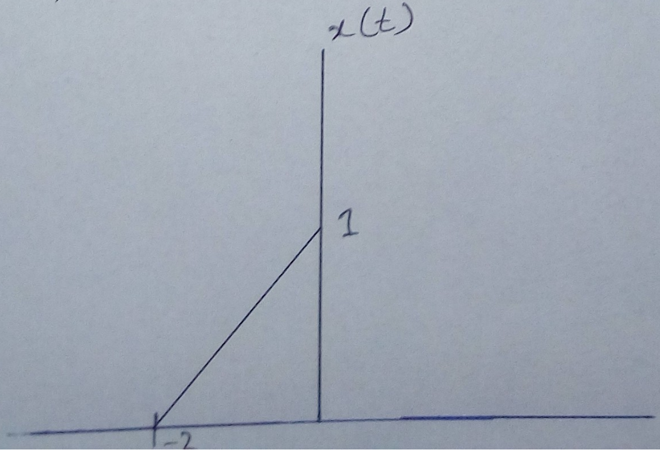



Q(2) (a) $x[1-t)[u(t+1) - u(t-2)]$

(b) $(1-t)[u(t+1) - u(2-3t)$




$x(-t)$ of $x(1-t)$

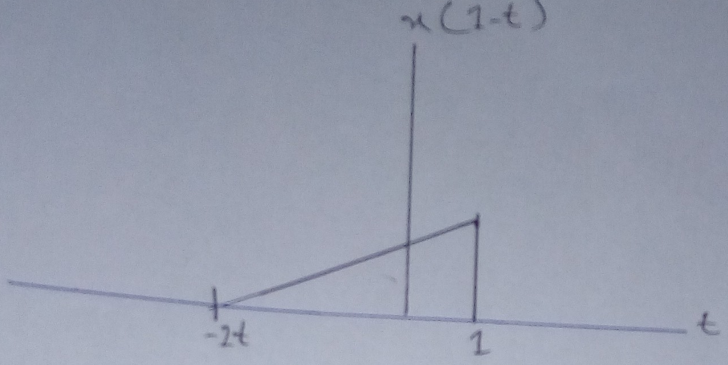


Name = Uzair Khan

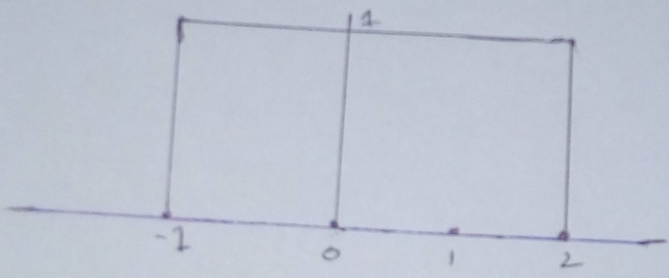
Page 5

ID = 13909

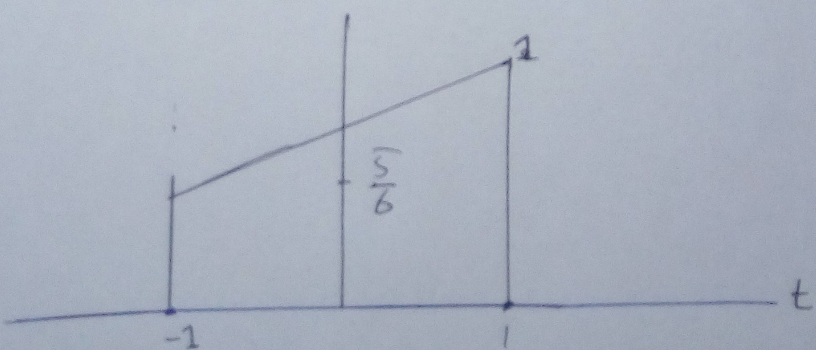
x




u (t + 1) - u (t-2)

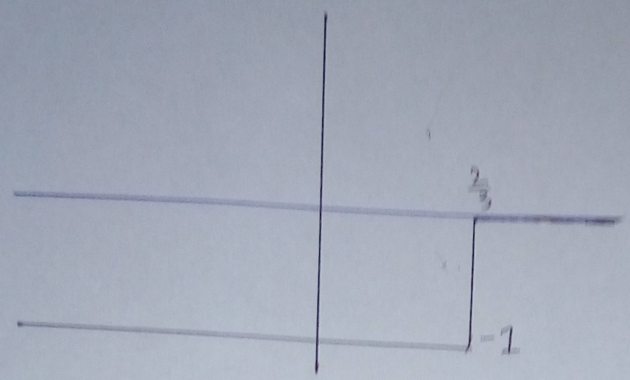



Hence, x (1 - t) u (t+1) - u (t-2)

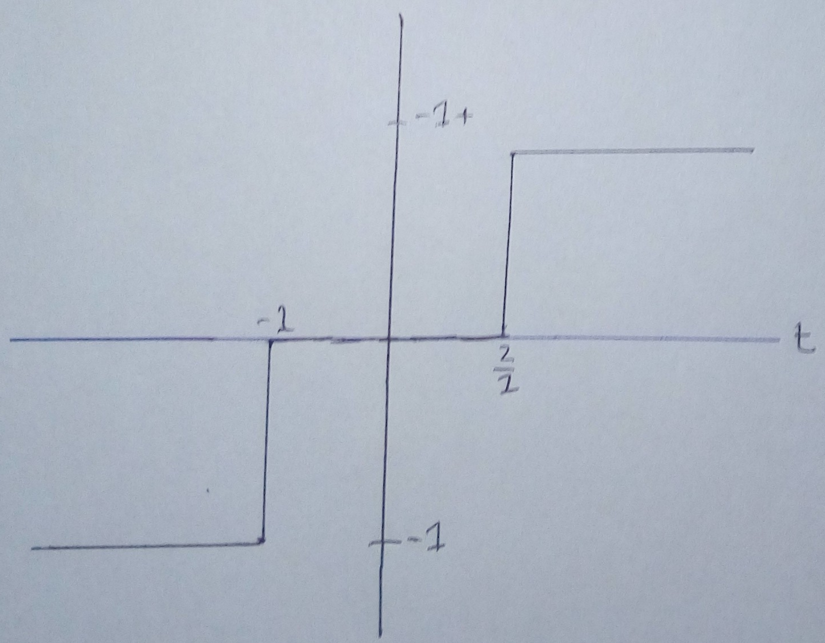


Name = Uzair Khan  ID = 13409

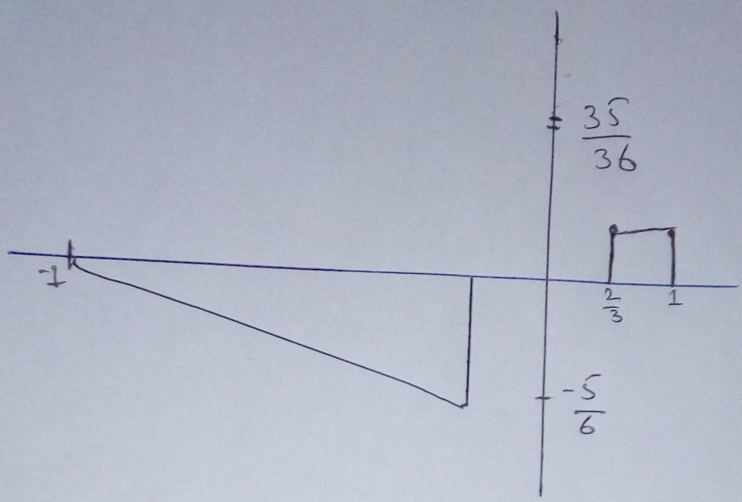
$-u(2-3t)$




$u(t+1) - u(2-3t)$

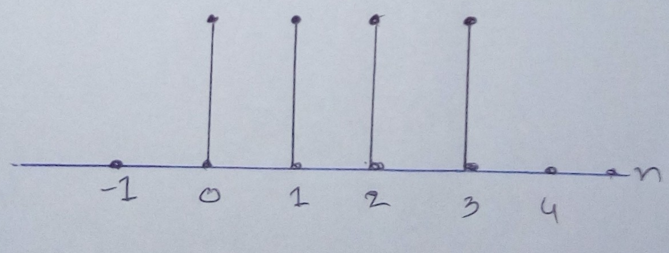


So $x(1-t)\,u(t+1-4\,(2-3t))$

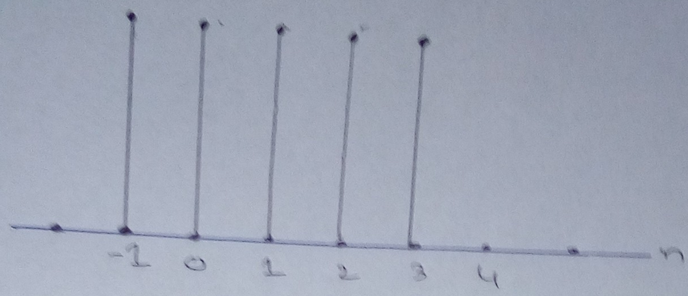



Q(3) Determine the discrete-time convolution of $x[n]$ and $h[n]$ for the following two cases.

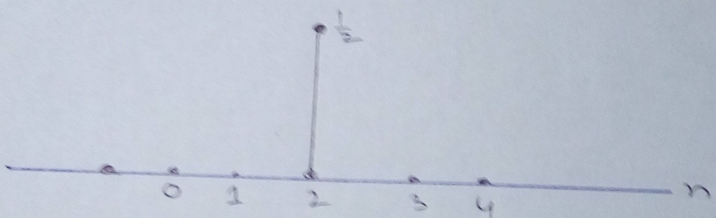
case No-1

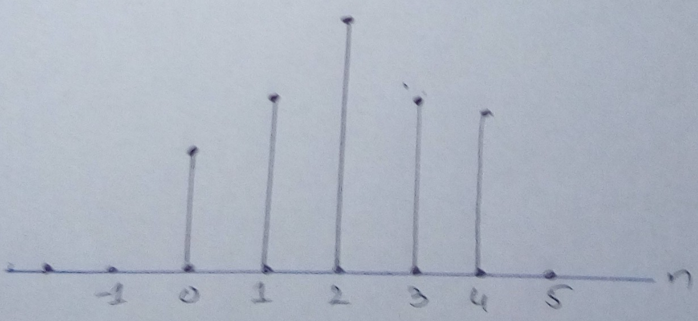


For h [n]




For case (2)




Convolution =>

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

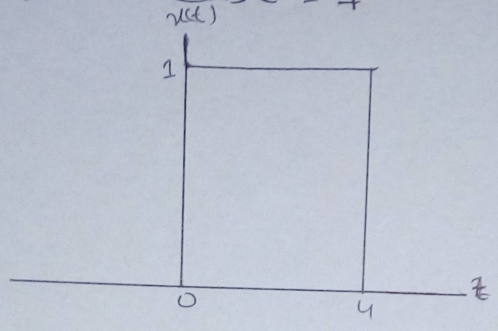
Name= Uzair khan

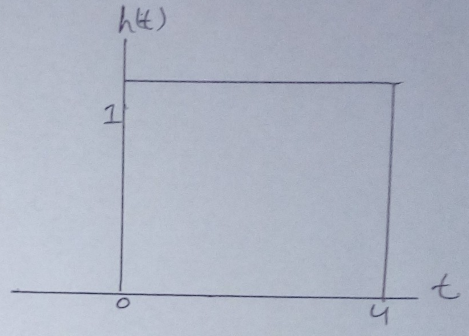


ID: 13909

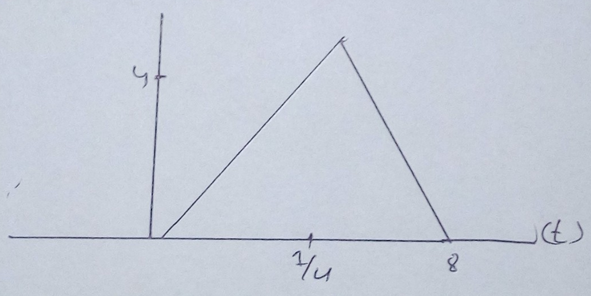
Q(4) Determine the continous-time convolution of $x(t)$ and $h(t)$ for the following three cases.

Solve=) Case = 1




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

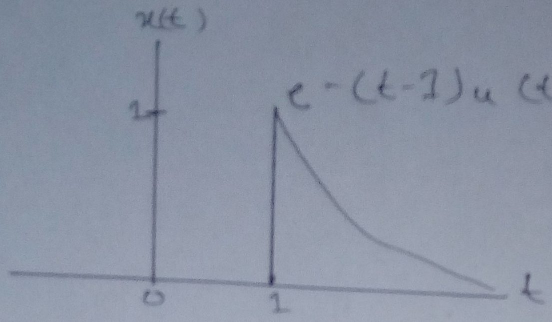


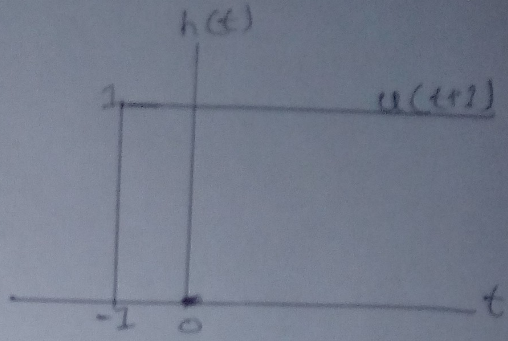
Name= uzair rehan



ID=13909

(B)




=> The Limit can be verified by graphically visualizing the convolution

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

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

$$= \begin{cases} \int_{1}^{t+1} e^{-(\tau-1)}\, d\tau, & t>0, \\ 0 & t<0 \end{cases}$$

Let $\tau' = \tau - 1$, then

$$y(t) = \begin{cases} \int_0^t e^{-\tau'}\, d\tau' \\ 0 \end{cases} = \begin{cases} 1-e^{-t}, & t>0 \\ 0, & t<0 \end{cases}$$

Name = Uzair Khan  ID = 13909

Q.No.3

(e)