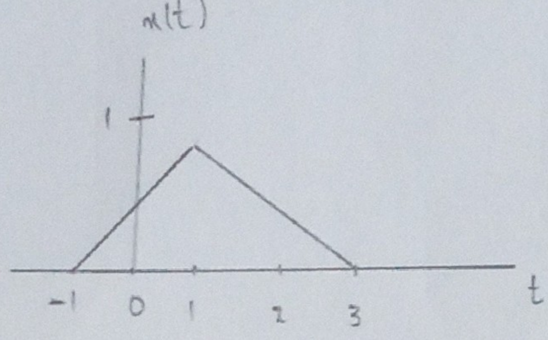
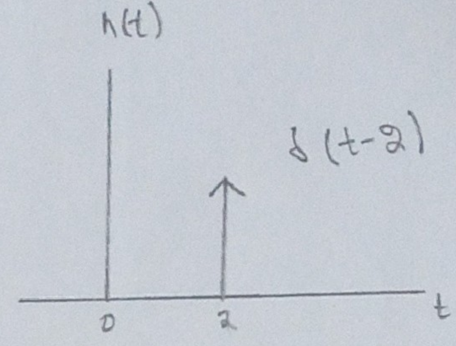
(c) =>

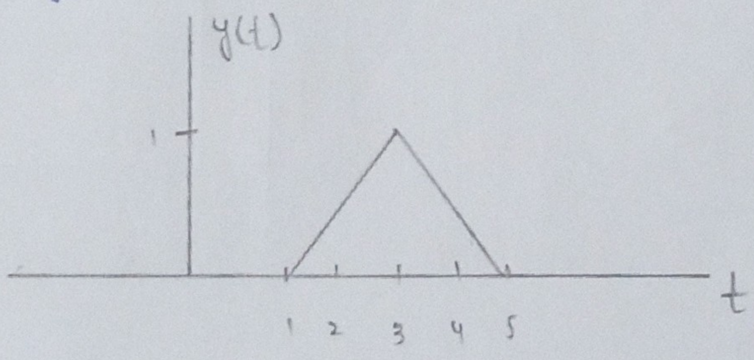




The convolution can be evaluated graphically or by using the convolution formula.

$$y(t) = \int_{-\infty}^{\infty} x(\tau)\,\delta(t-\tau-2)\,d\tau = x(t-2)$$

So $y(t)$ is a shifted version of $x(t)$



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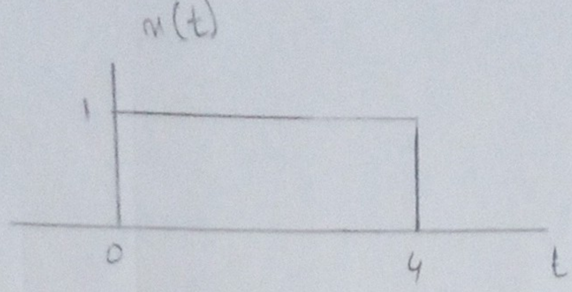
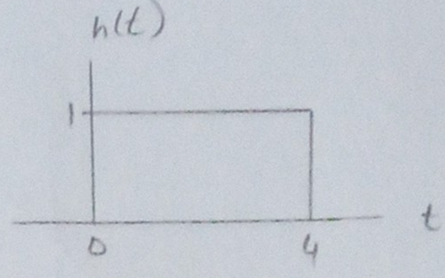
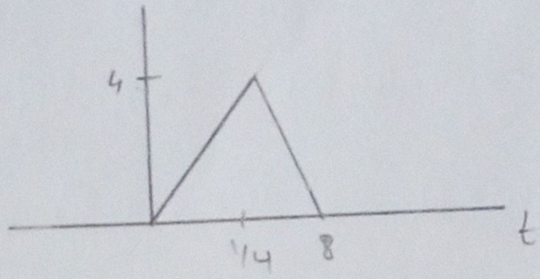
Q4:

ⓐ =>

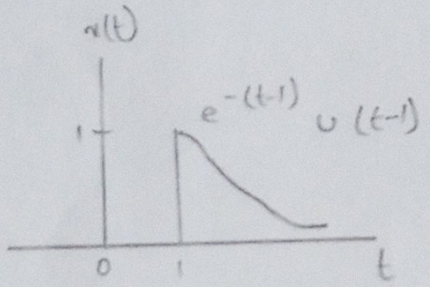


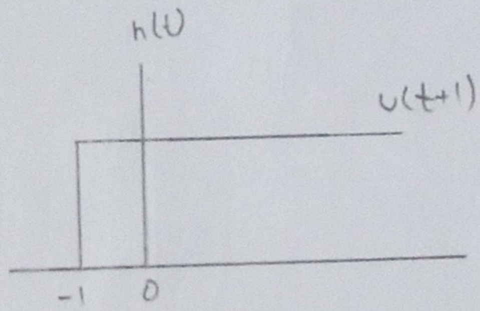


$y(t) = x(t) * h(t)$



ⓑ =>





The limit can be verified by graphically visualizing the convoltion.

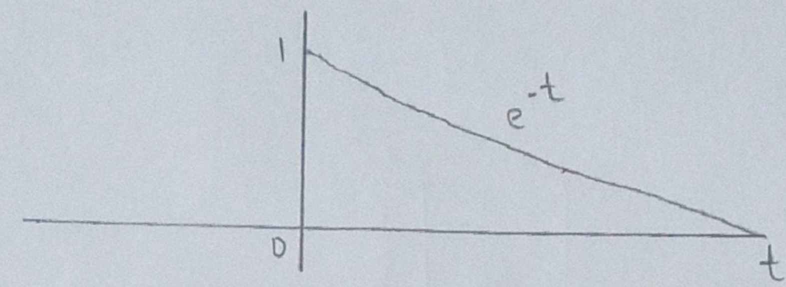
$$y(t) = \int_{-\infty}^{\infty} x(\tau)h(t-\tau)\,d\tau$$

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

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

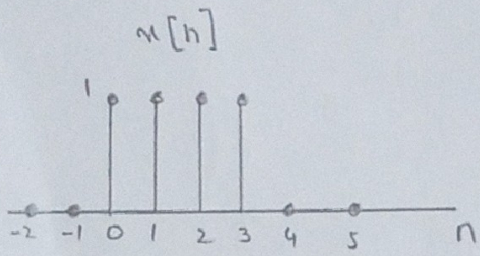
let $\tau' = \tau - 1$, then

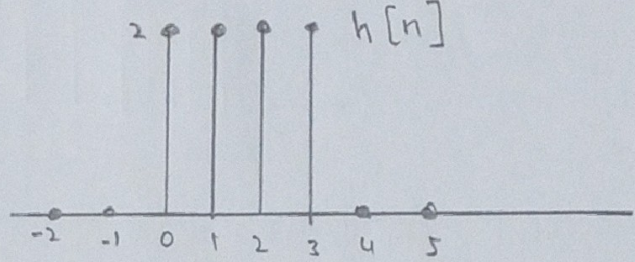
$$y(t) = \begin{cases} \int_{0}^{t} e^{-\tau'}\,d\tau' \\ 0 \end{cases} = \begin{cases} 1-e^{-t}, & t>0 \\ 0, & t<0 \end{cases}$$

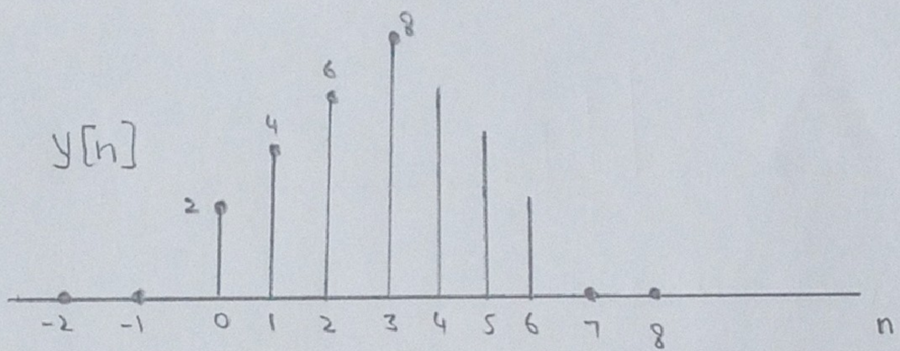


Q3:- Determine the discrete time convalution of $x[n]$ and $h[n]$ for the following two cases.

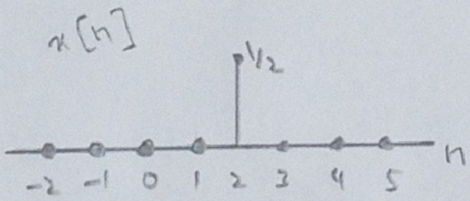
(a)

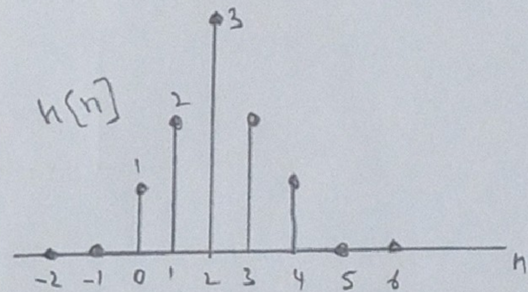


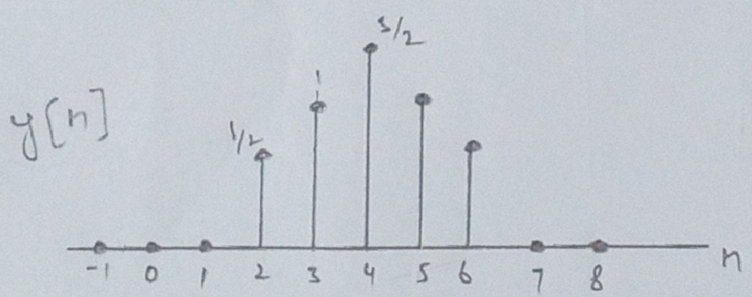




(b)

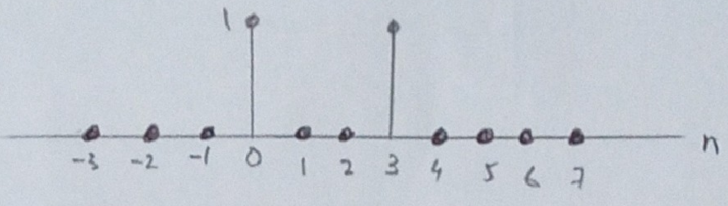




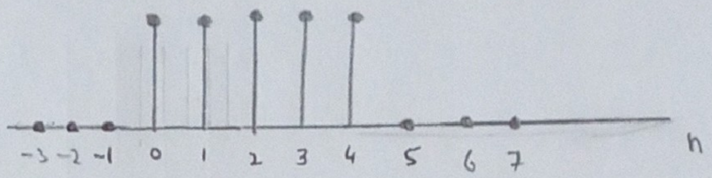


Q1 :-

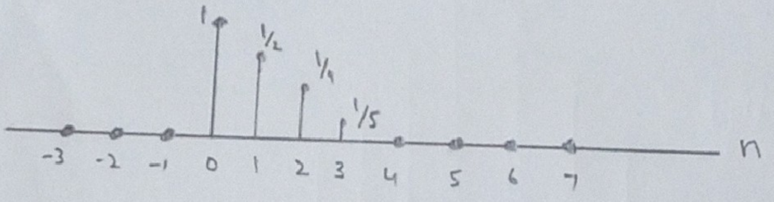
(a) ⇒ $x[n] = \delta[n] + \delta[n-3]$



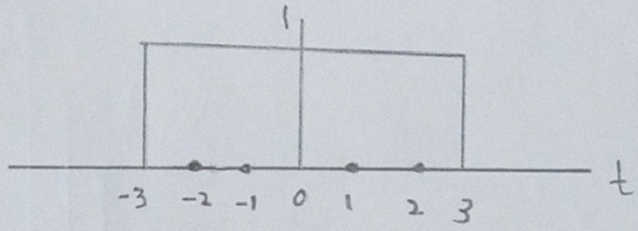
(b) ⇒ $x[n] = u[n] - u[n-5]$



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



(d) ⇒ $x[t] = u[t+3] - u[t-3]$



(e) ⇒ $x[t] = \delta[t+2]$