Name :-

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Subject :- Signals and System

Lab Assignment 5

(Handwritten Solution)

MAHATMA GANDHI MISSION

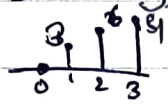
Name :- Purval Madhukar Bhude

~~Class :-~~ Section 4

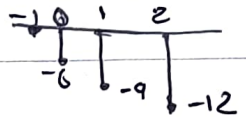
Roll no. S20230010193.

Q1 $x[n] = 3x[n-2] - 6x[n+1] + 3x[n] - 4u[n-4]$.

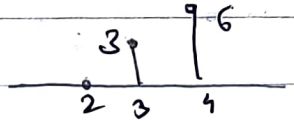
$x[n]$ =



$-6x[n+1]$

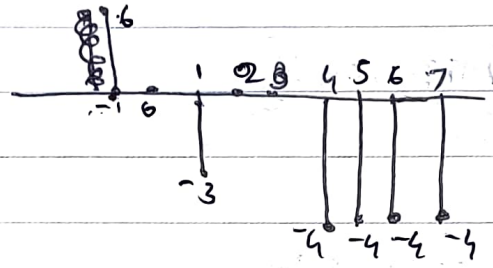


$3x[n-2]$



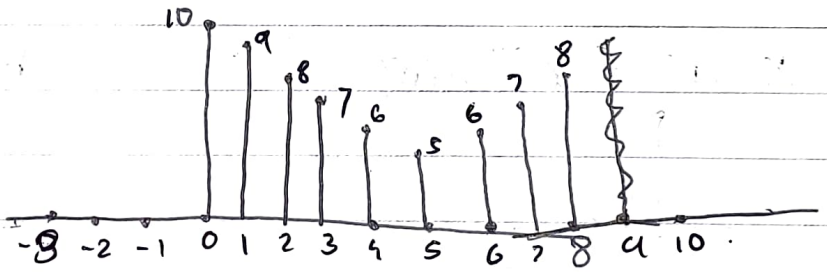
$-4u[n-4]$ =

$\therefore x[n]$ =



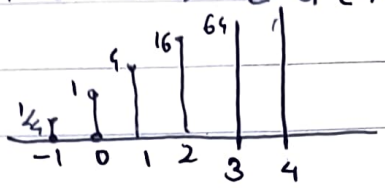
Q2.

$$x[n] = \begin{cases} -n+10, & 0 \le n \le 5 \\ n, & 6 \le n \le 8 \\ 0, & \text{else.} \end{cases}$$

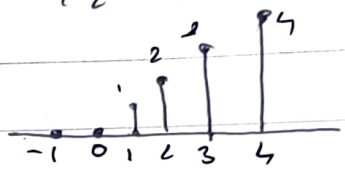


$$x[n] = 10\delta[n] + 9\delta[n-1] + 8\delta[n-2] + 7\delta[n-3] + 6\delta[n-4] + 5\delta[n-5] + 6\delta[n-6] + 7\delta[n-7] + 8\delta[n-8].$$

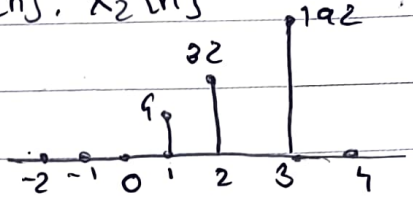
Q3 a) $x_1[n] = (1/4)^{-n}\,[u(n+1) - u(n-4)]$;



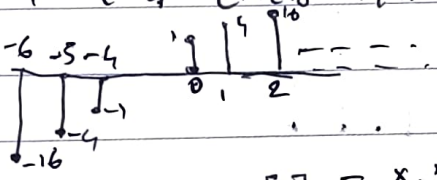
$x_2(n) = \delta[n]$



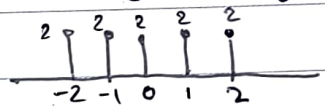
$y[n] = x_1[n] \cdot x_2[n]$



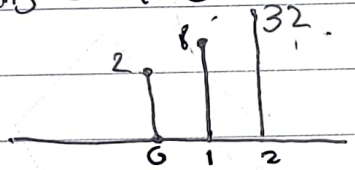
b) $x_1 = (1/4)^{-n}\,[u[n] - u[-n-4]]$



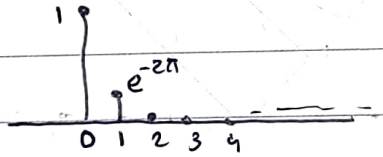
$x_2 = 2[u(n+2) - u(n-3)]$



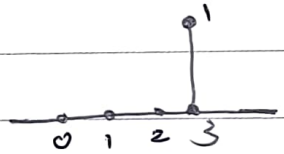
$y[n] = x_1 \cdot x_2$



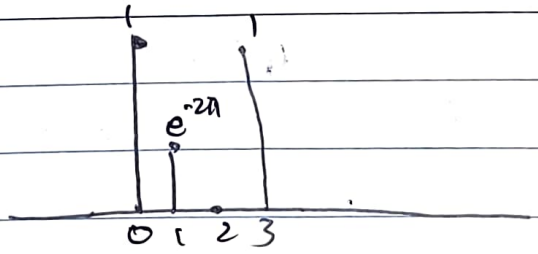
c) $x_1[n] = e^{-2n}\,u[n]$



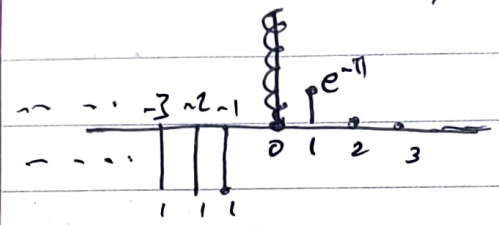
$h[n-3] = \delta[n-3]$



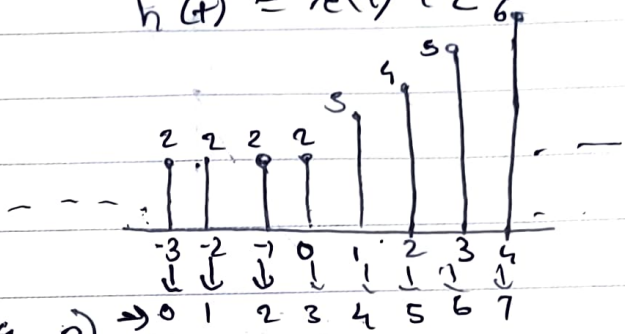
$y[n] = x_1[n] + h[n-3]$



d) $x_1(t) = \begin{cases} e^{-\pi t}\, u(t), & t > 0 \\ -u(-t), & t < 0 \end{cases}$

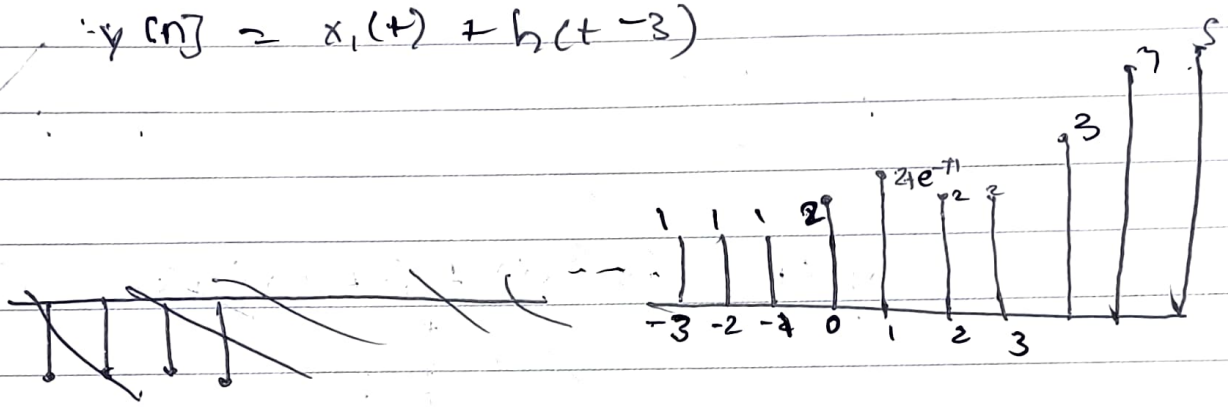


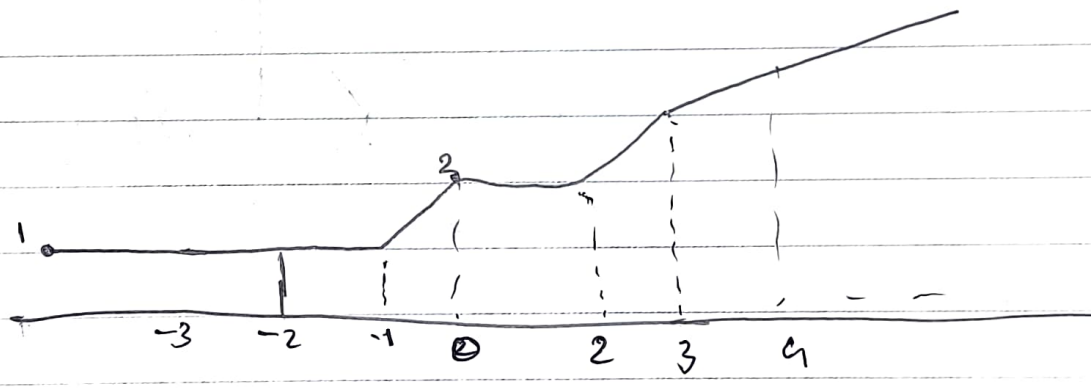
$h(t) = x(t) + 2$



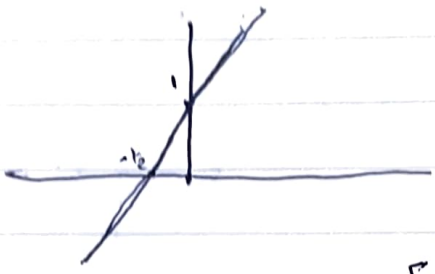
$h(t-3)$

$y[n] = x_1(t) * h(t-3)$

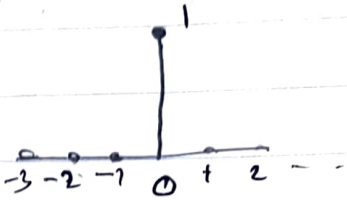




e) $(2t+1)$



$\delta[n]$



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

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

$y(t) = (2t+1) + (-t+3)[u[t-2] - u[t-3]] + \delta(t)$