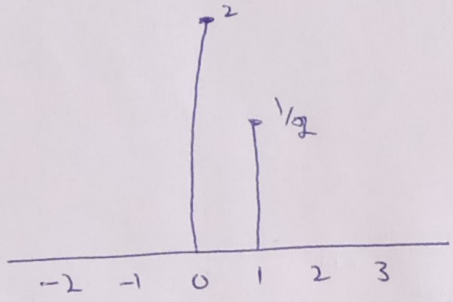
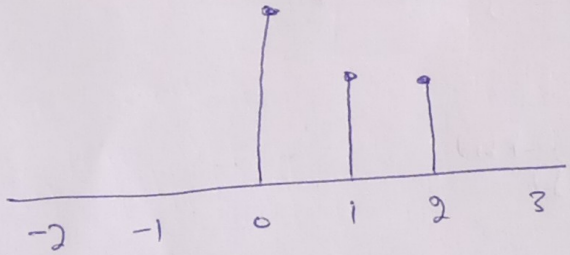
Q4 :

(a) $x[n] = \left[\frac{1}{2}\right]^{n-1} u[n-1]$



(b) $x[n] = \delta[n] + \delta[n-1] + \delta[n-2]$



Q1 :-

Sol :-

$$C_1 = Ck + N_0 = Ck$$

$$b = Ck = CN_0 - 1 = Ck^{\pi}$$

$$x[n] = [7, 8, 4, 3, 2, 6]$$

$$\Rightarrow Ck = \frac{1}{N_0} \sum_{n=0}^{N_0-1} x[n]\, e^{-j\left(\frac{2\pi}{N_0}\right)kn}$$

$$\therefore e^{j\theta} = \cos\theta + j\sin\theta$$

$$\text{So } e^{-j}\left(\frac{2\pi}{2\pi}\right) \Rightarrow \cos(\pi/2) - j \Rightarrow \sin(\pi/2)$$

or

$$e^{-j(\pi/2)} = \cos \pi/2 - j \sin(\pi/2)$$

$$\Rightarrow -j$$

$$Ck = 1/6 \sum_{n=0}^{6-1} x[n]\, [-j]^{kn}$$

$$k=0, \quad C_0 = \frac{1}{6} \sum_{n=0}^{5} x[n]\,[1]$$

$$C_0 = \frac{1}{6}\,[x(7) + x[8] + x[4] + x[3] + x[2] + x[6]]$$

$$C_0 = \frac{1}{6}\,[7+8+4+3+2+6] = 31/6$$

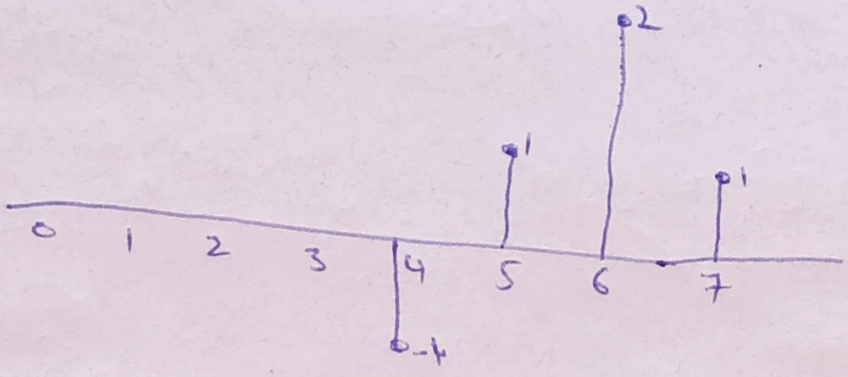
$$\boxed{C_0 = 5.18}$$ DC component

Now at $k = 1$

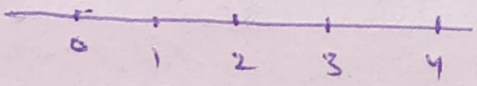
$$C_1 = \frac{1}{6} \sum_{n=0}^{5} x[n]\,(-j)^n$$

$$C_1 = \frac{1}{6}\,[(-j)]^0 + x[7] + (-j)^2\, x[8]$$

n = 6



x[n] h[6-k]

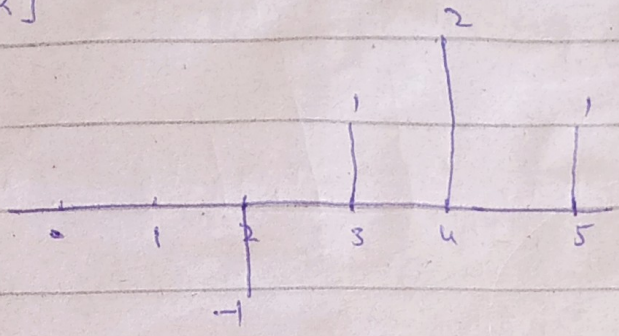


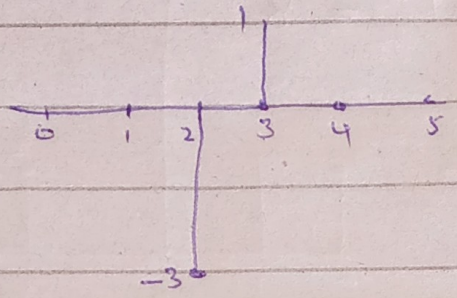
y = 0

$$y[n] = 1, 4, 8, 8, 3, -2, -1$$

n = 4

h[4-k]

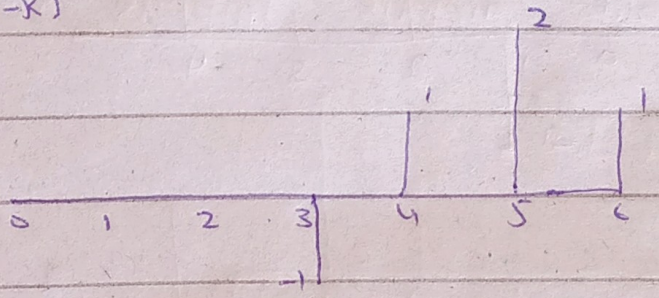




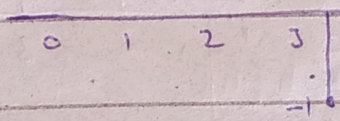
$y[4] = -3+1 = \boxed{-2}$

n = 5

h[5-k]

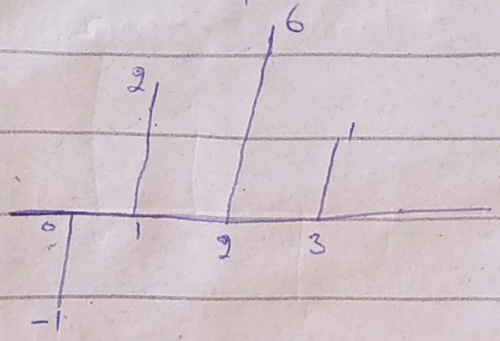


x[n] h[5-k]



$y[5] = -1$

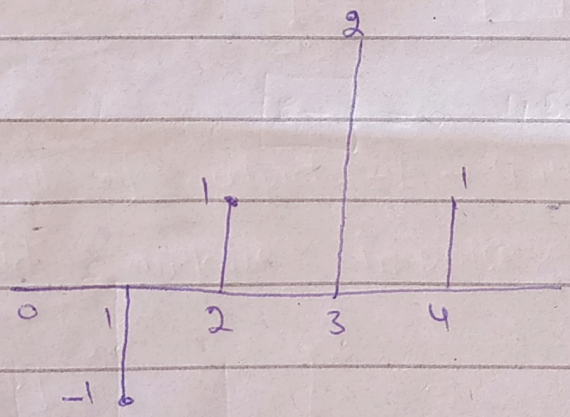
Product Sequence :

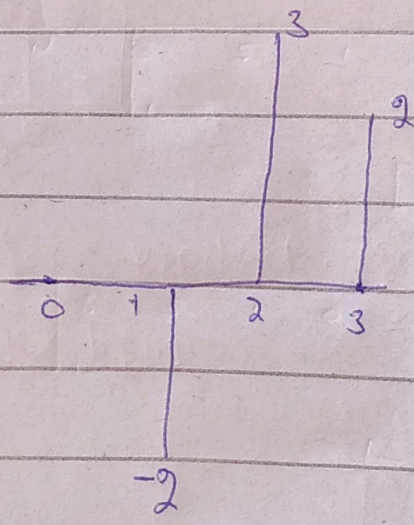


$y[2] = 6+2-1+1 = 8$

$\boxed{n = 3}$

$h[3-k]$





$y[3] = -2+3+2 = \boxed{3}$

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Sum :

$y(0) = 0+0+2+4+0+0$

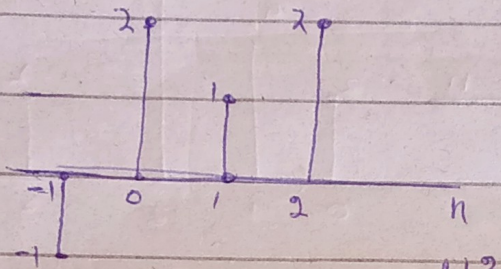
$= 6$

★ Shifting go

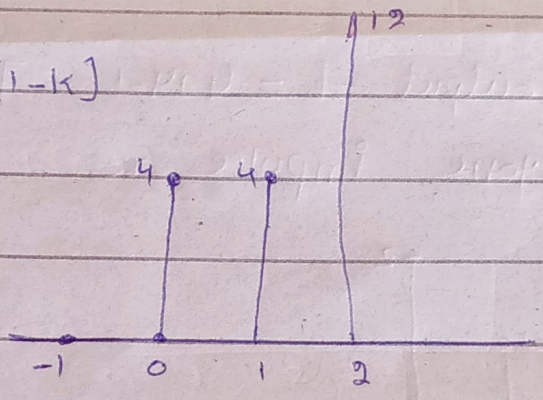
$n-1 = 0$

$\boxed{n = 1}$

$h[1-k]$



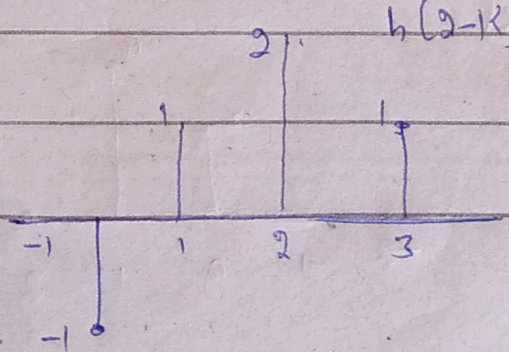
$x[n]\,h[1-k]$



$y[1] = 4+4+12 \Rightarrow \boxed{y[1] = 20}$

$\boxed{n = 2}$

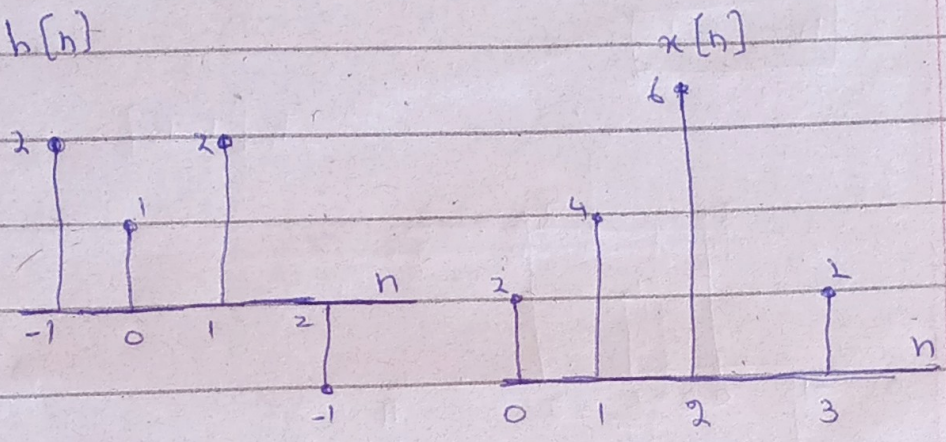
$h(2-k)$



Q3

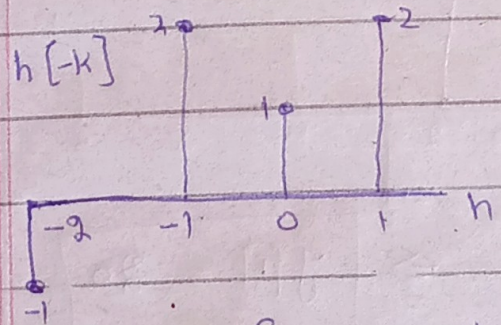
Solo Graphicall Method :

$h[n] = \{2, 1, 2, -1\}$ $x[n] = \{2, 4, 6, 2\}$



⇒ length of output = L = 4+4-1 = 7

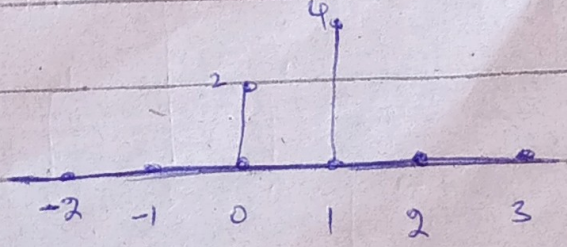
⇒ fold anyone impulse



Now for product sequence

$x[n] * h[n]$

$x[n]h[-k]$



Q2 ?

Sol?

$$x[n] = \{1, 1, 5, 9, 6\}$$

$k = 0$ to 4

$= x[0]\delta[n-0] + x[1]\delta[n-1] + x[2]\delta[n-2] + x[3]\delta[n-3] +$

$x[4]\delta[n-4]$

~~$\delta[n] = \delta[n+1]$~~

$= \delta[n] + \delta[n-1] + 5\delta[n-2] + 9\delta[n-3] + 6\delta[n-4]$

magnitude, location

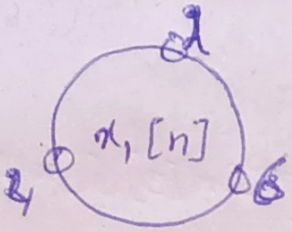
we determine a sequence into impulse Responce

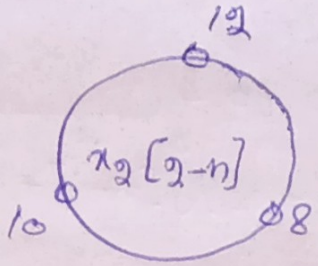
⇒ If we know the impulse Responce of a system we can easily determine its output without physically performed it.

Sum :

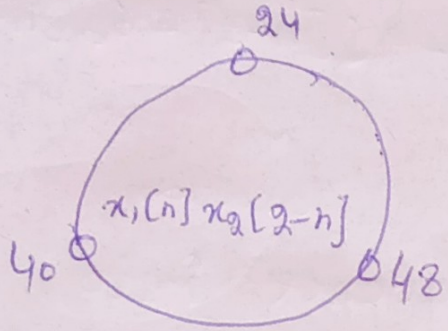
$$\boxed{y[1] = 124}$$

Second shift :





Multiplication :



Sum $\Rightarrow$ $\boxed{y[2] = 112}$

So $y[n] = [124, 124, 112]$

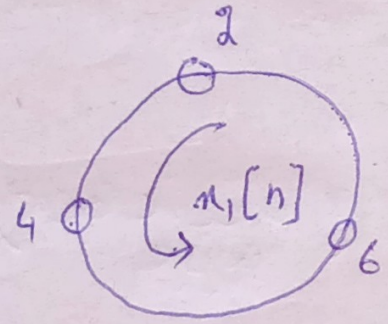
Q5 ⊗

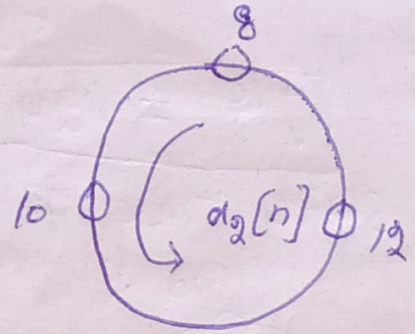
Sol ⊗

$$x_1[n] = [\underset{\uparrow}{2}, 4, 6]$$

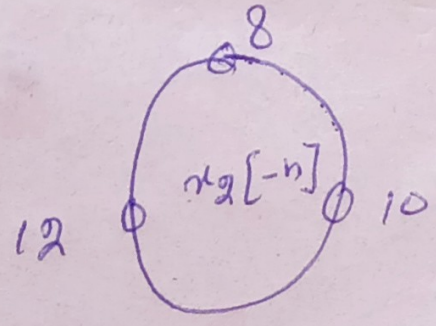
$$x_2[n] = [\underset{\uparrow}{8}, 10, 12]$$

First of all we make the cycle

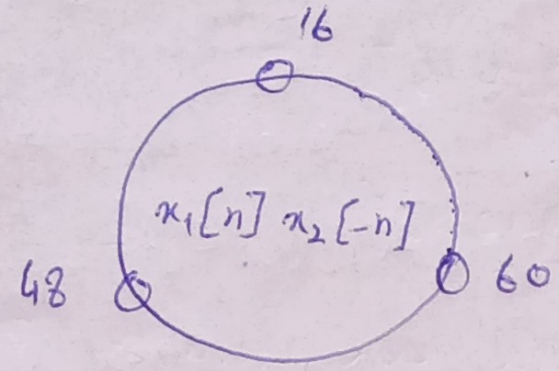




① Folding : In this method we take clockwise mirror image of one sequence



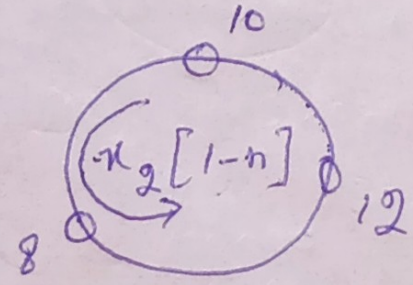
② Multiplication :



Mutiply $x_1[n]$ and $x_2[-n]$

③ Sum $\boxed{y(0) = 124}$

Now shift the folded seq (anticlockwise)



Multiplication :