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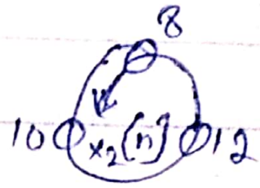
(Q 5)/

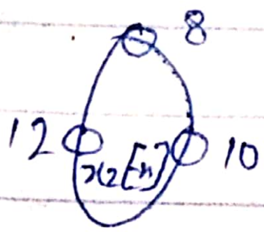
<u>Solution:</u>

$$x_1[n] = [2, 4, 6]$$

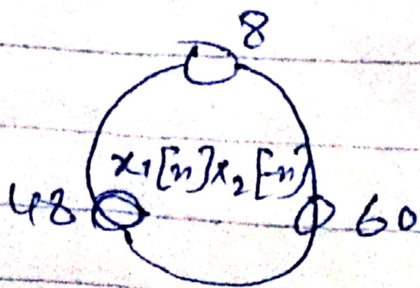
$$x_2[n] = [8, 10, 12]$$



(#) Folding = In this we take clockwise mirror image of one square.



(#) <u>Multiplication #.</u>



(#) Sum $y(1) = 116$

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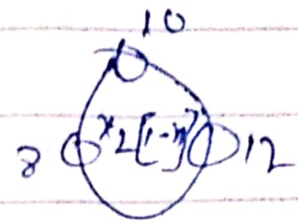
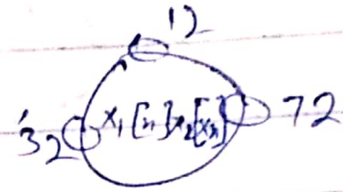
Q 2)

(#) Shift the folder (Anticlockwise)

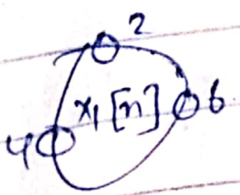


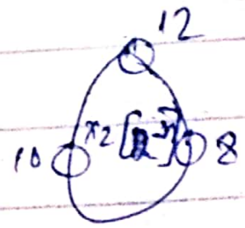
(#) Multiplication #



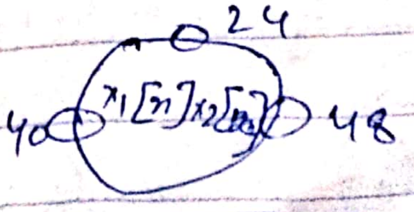
Sum = $y(1) = 116$

(#) Second shift #





(#) Multiplication #



(#) Sum = $\boxed{y(2) = 112}$

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(#) $y[n] = \{116, 116, 112\}$ Ans

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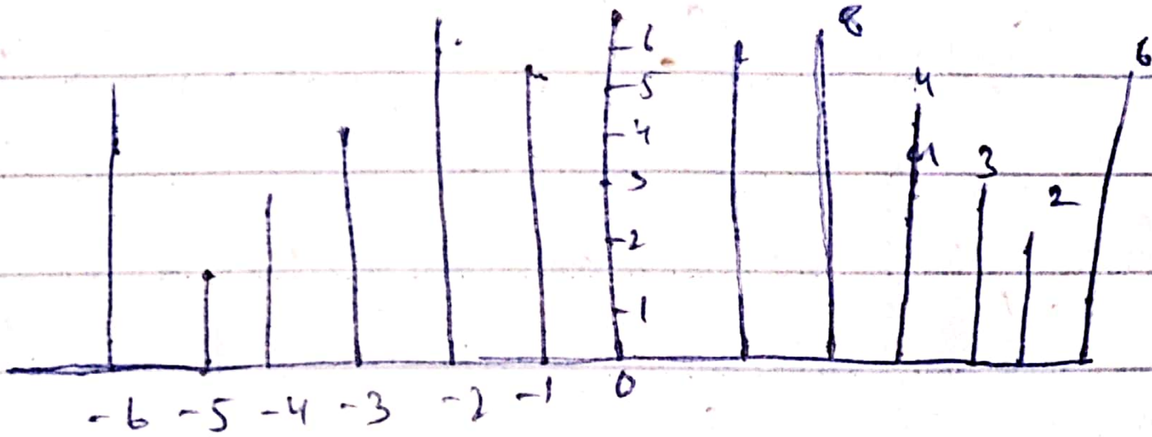
Q No 1

Ans)

$C1 = CK + N0 = CK$

$D = CK = C\,N0 - K = CK^{*}$

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



$CK = \frac{1}{N0} \sum_{n=0}^{N0-1} x[n]\, e^{-j\left(\frac{2\pi}{N0}\right)Kn}$

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

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

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

$= \boxed{-j}$

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$$Ck = \frac{1}{6} \sum_{n=0}^{6-1} x(n) (-j)^{kn}$$

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

$$K=0 \qquad C_0 = \frac{1}{6} \sum_{n=0}^{5} x[n] (1)$$

$$C_0 = \frac{1}{6} \{ x\{7\} + 4\{8\} + \{ x\{4\} + x\{3\} +$$

$$x\{2\} + x\{6\}$$

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

$$\Rightarrow \boxed{C_0 = 5.16}$$

Now at $k=1$

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

$$C_1 = \frac{1}{4} (-j)^0 \; x(7\} + (-j)^1 (\cancel{4} 8 x(8)$$

$$+ -j^2 \; x[4] + (-j)^3 \; x(3] + -j^4 \; x\{2\}$$

$$+ -j^5 \; x\{6\}]$$

$$\cancel{\Rightarrow C_1 = \frac{1}{6} \{ -j - 7 + 23j]}$$

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$$c_1 = \frac{-1}{7} + \frac{j}{23}$$

$$c_2 = \frac{-1}{7} \mp \frac{j}{23}$$

1st Property :

$$CK + NO = CK$$

$$c_1 + 4 = c_2$$

2nd Property :

$$C-K = CNO-K = CK^{x}$$

$$= C4.1 = c_1^{x}$$

$$= C3 = c_1^{x}$$

$$-\frac{1}{7} - \frac{1}{23}j = \frac{-1}{7} + \frac{1}{23}j$$

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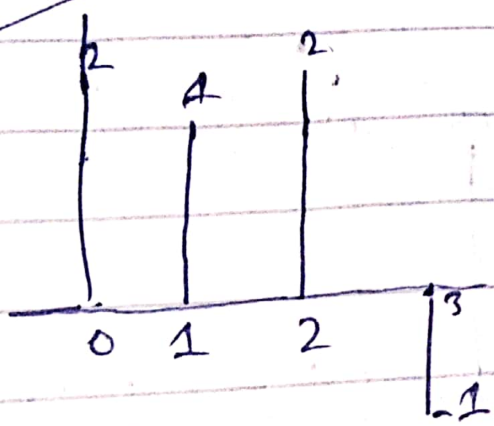
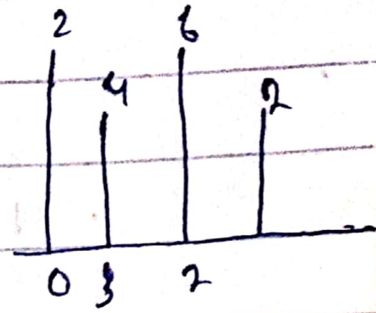
(Q 3)

sol

Ans



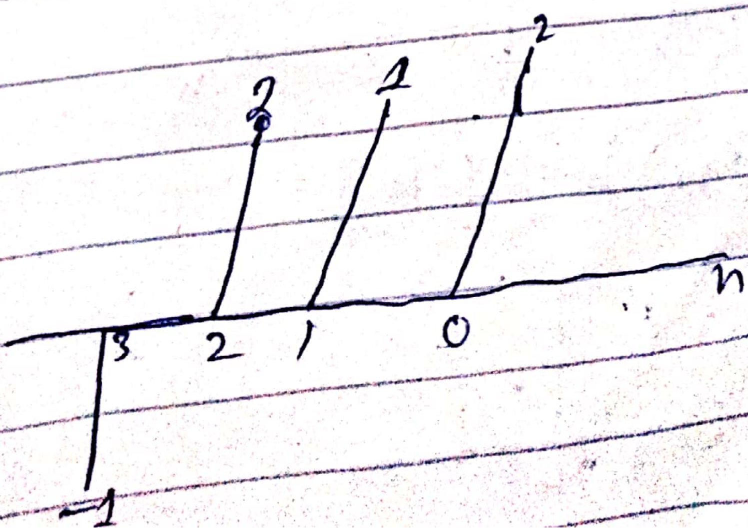
$-x(n]$



Length OF output $\Rightarrow 4+4-1 = \boxed{7}$

Folding any one but we fold impulse response

$x[-k]$



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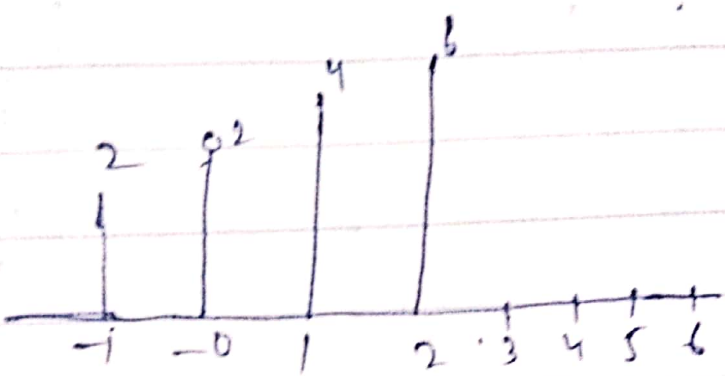
now for product sequence

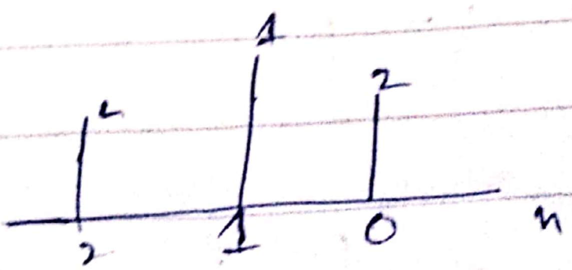
x(n) h(-k]



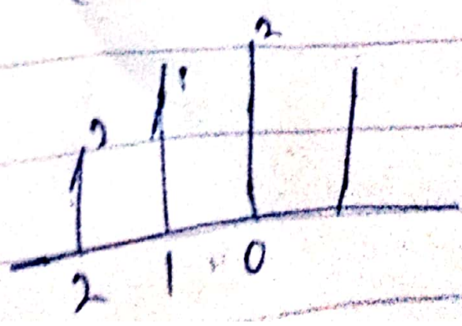
Sum y(1) = 4+2+6-2=10

Shifting

n-1=0



n(n) h [1-k]



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Question : 02.

* Solution:

$$x(n) = \sum_{k}^{\infty} x(k)\,\delta(n-k)$$

$$x(n) = \begin{bmatrix} 6, & 9, & 9, & 0 \\ 0 & 1 & 2 & 3 \end{bmatrix}$$

$$k = 6, 9, 9, 0.$$

~~=> x~~

$$= x[0]\,\delta[n-6] + x(9')\,\delta[n-1]$$

$$= x(2)\,\delta[n-9] + x(3-)\,(n-9)$$

$$= \delta n = 6\delta(n) + 9\delta[n-1]$$

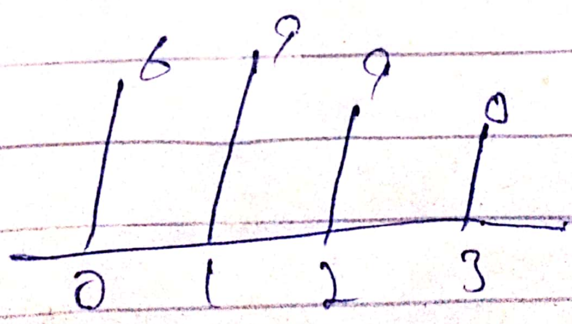
$$\cancel{+\,9}$$

$$+\,9\delta[n-2] + 9\delta[n-3]$$

magnitude = $[\overset{0}{6}, \overset{1}{9}, \overset{2}{9}, \overset{3}{0}]$

Location

$$= \delta(n)$$



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Q NO 4 :=

Solution:

a) $x[n] = (1/2)^{n-1} u(n-1)$

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

a) $x(e^{jw}) = \sum_{n=-\infty}^{n-1=\infty} e[1/2]^{n-1} u(e^{-jw}$

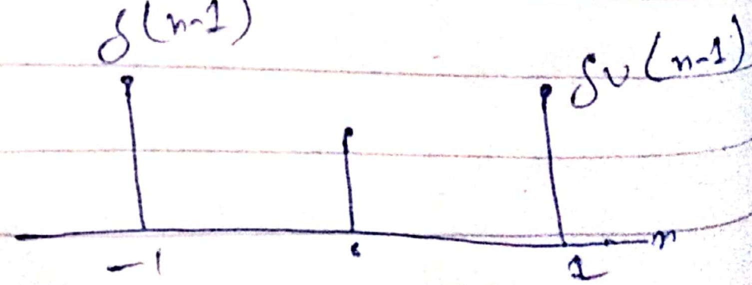
$n=0$ $\sum_{n=\infty}^{n-1=\infty} (1/2)^{n-1} u(e^{-jw})^{n}$

$= \sum_{n=-\infty}^{n-1=\infty} n(1/2\, e^{-jw})^{n-1} u(n-1)$

$x(e^{jw}) = \frac{1}{1-(1/2\; n-1\; jw)}$

Draw with Spectrum:

a)



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b)