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6 A]

(ii)

$$x(n) = \{1, 1, 0, 1, 1\}$$

$$h(n) = \{1, -2, -3, 4\}$$

$$x(n) = L = 5$$

$$h(n) = m = 4$$

$$N = L + m - 1$$

$$= 5 + 4 - 1$$

$$= 8$$

	1	1	0	1	1
1	1	1	0	1	1
-2	-2	-2	0	-2	-2
-3	-3	-3	0	-3	-3
4	4	4	0	4	4

$$y(n) = \{1, -1, -5, 2, 3, -5, 1, 4\}$$

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6B] (ii)

(i)

$$N=4$$

$$x(n) = \{0, 1, 2, 3\}$$

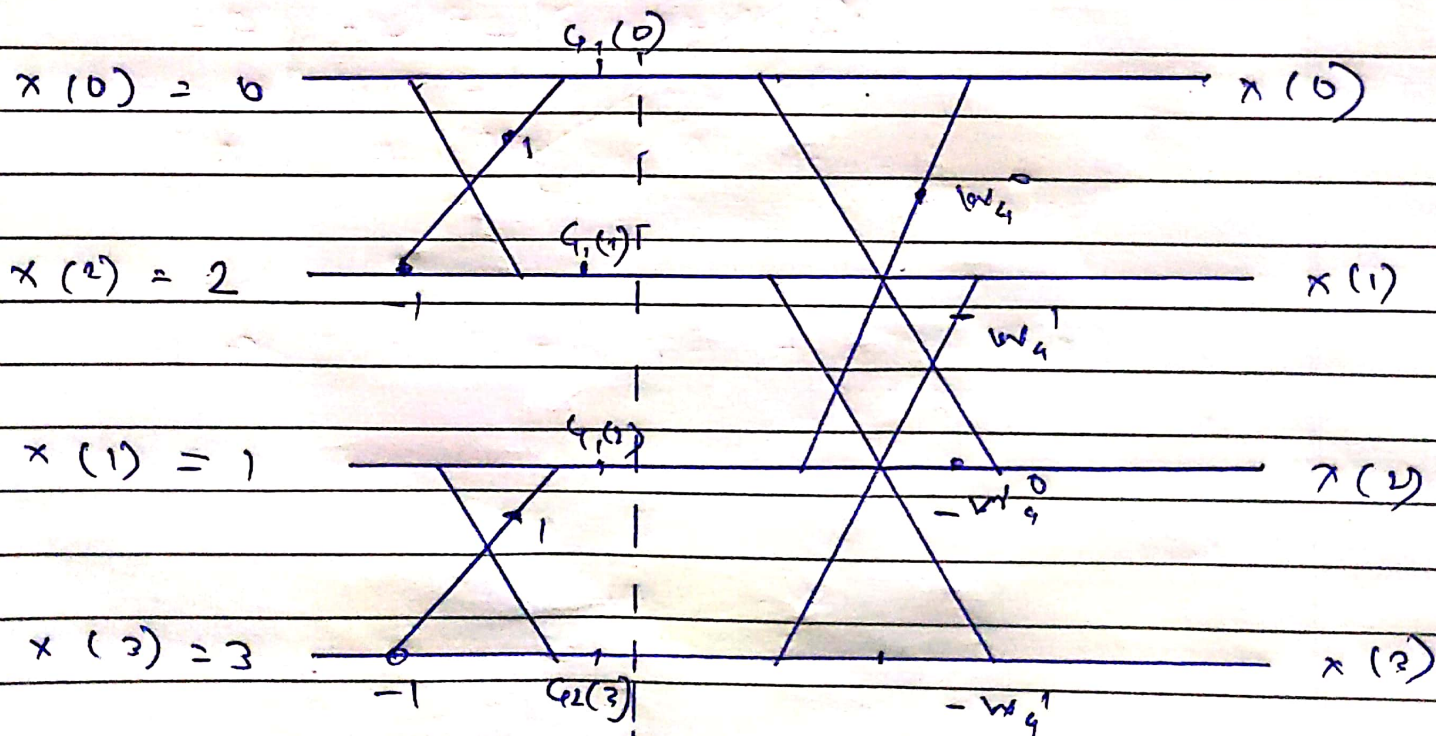
$$x(0) \quad x(1) \quad x(2) \quad x(3)$$

The twiddle factors required are

$$W_4^0 = e^{-\frac{2j\pi}{4} \cdot 0} = 1$$

$$W_4^1 = e^{-\frac{j2\pi}{4}} = \cos \frac{\pi}{2} - j \sin \frac{\pi}{2} = -j$$

We draw a 4-point DIT-FFT Butterfly.





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Stage 1

$$G_1(0) = x(0) + x(2) = 0 + 2 = 2$$

$$G_1(1) = x(0) - x(2) = 0 - 2 = -2$$

$$G_1(2) = x(2) + x(3) = 1 + 3 = 4$$

$$G_1(3) = x(1) - x(3) = 1 - 3 = -2$$

Stage 2

$$x(0) = G_1(0) + W_N^0 G_1(2) = 2 + 1(4) = 6$$

$$x(1) = G_1(1) + W_N^1 G_1(3)$$

$$= -2 + (-j)(-2) = -2 + j2$$

$$x(2) = G_1(0) + W_N^2 G_1(2) = 2 + 1(4) = -2$$

$$x(3) = G_1(1) + W_N^3 G_1(3) = -2 - (-j)(-2) = -2 - j2$$

$$\therefore x(k) = \{6, -2 + j2, -2 - j2\}$$

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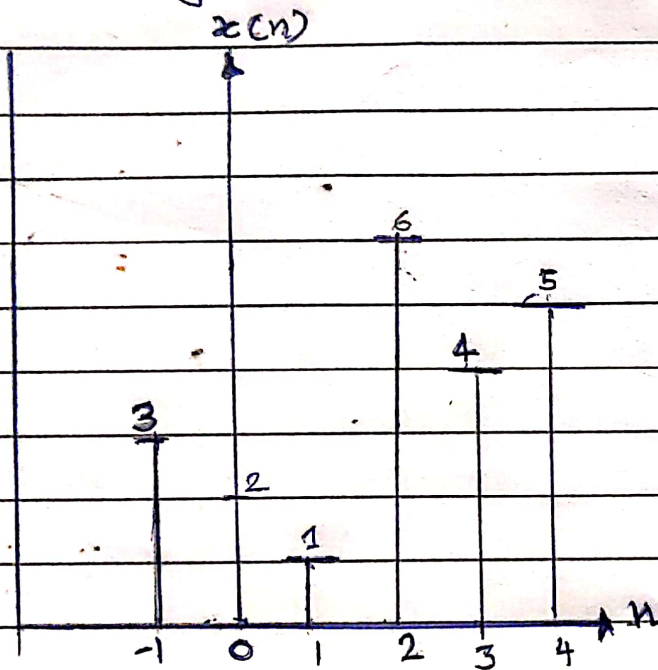
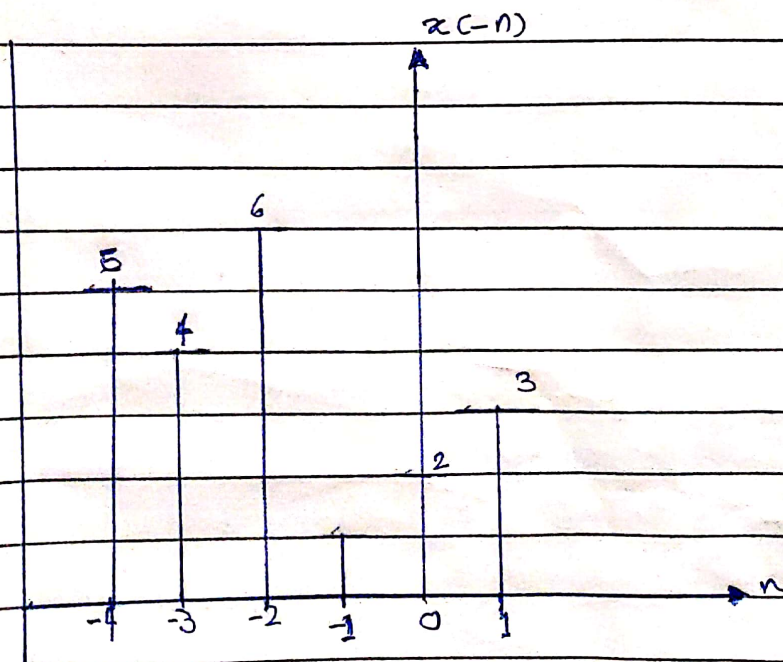
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Q1 (i)

(A)  $x(-n) \cdot u(-n)$ Sol<sup>n</sup>:We begin with drawing  $x(n)$ (A)  $x(-n) \cdot u(-n)$ 



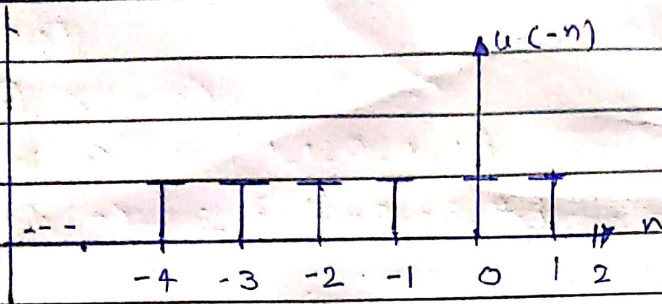
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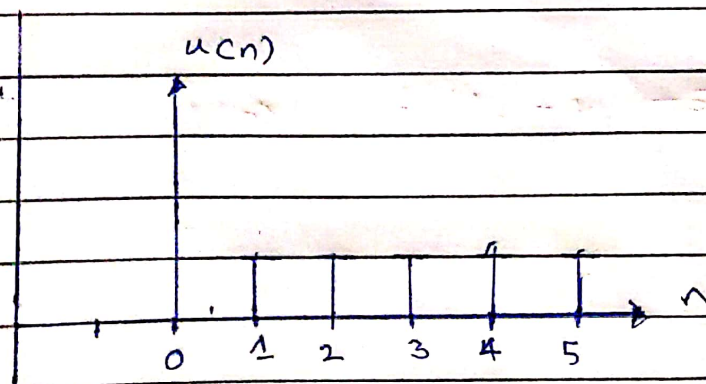
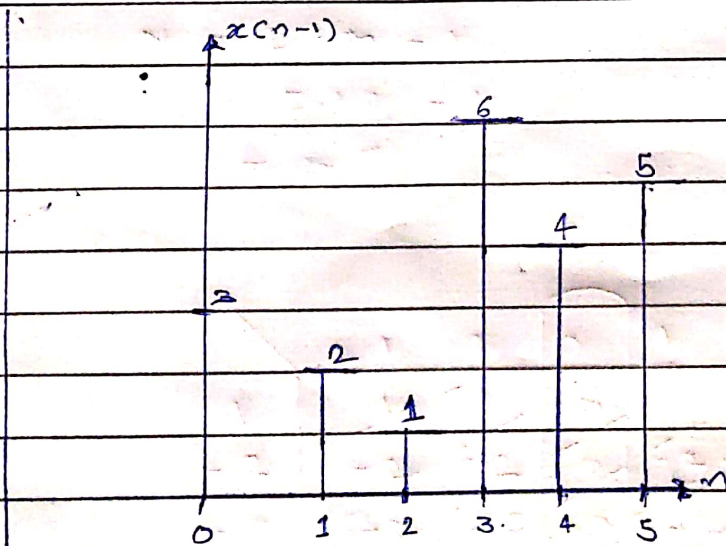
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(B)  $x(n-1) = y(n)$



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