

Maximum value of magnitude is 8

18. [Ans.*]Range: -46 to -46

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

↑

$$h(n) = \{3, a, b\}$$

↑

		↓		
		3	a	b
→ 1		3	a	b
2		6	2a	2b
1		3	a	b

$$h(n) = \{3, 6 + a, 3 + 2a + b, a + 2b, b\}$$

↑

$$y(1) = 6 + a$$

$$y(1) = 8$$

$$6 + a = 8$$

$$a = 2$$

$$y(2) = 3 + 2a + b$$

$$y(2) = 5$$

$$6 + a = 8$$

$$a = 2$$

$$3 + 2a + b = 5$$

$$3 + 4 + b = 5$$

$$b = -2$$

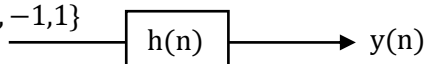
$$y(3) = a + b = 2 - 2 \Rightarrow -2$$

$$y(4) = b \Rightarrow -2$$

$$15y(3) + 8y(4) = 15(-2) + 8(-2) \\ = -30 - 16 = -46$$

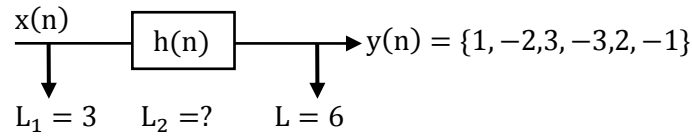
19. [Ans. B]

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



↓

$$\rightarrow \begin{array}{c} 1 \quad -1 \quad 1 \quad -1 \\ 1 \left[\begin{array}{cccc} 1 & -1 & 1 & -1 \\ -1 & +1 & -1 & +1 \\ 1 & 1 & -1 & -1 \end{array} \right. \\ y(n) = \{1, -2, 3, -3, 2, -1\} \\ \uparrow \end{array}$$



$$L = L_1 + L_2 - 1$$

$$6 = 3 + L_2 - 1$$

$$6 = 3 + L_2 - 1$$

$$L_2 = 4 \rightarrow s$$

Option (C) and (D) are wrong

\Rightarrow $h(n)$ should start from zero location option (A) is wrong

so option (B) is correct

20. [Ans. C]

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

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

$$y(t) = \int_0^t h(\tau) d\tau$$

$$\Rightarrow \int_0^t (2e^{-3\tau} - e^{-2\tau}) d\tau$$

$$= \left(2 \frac{e^{-3\tau}}{-3} + \frac{e^{-2\tau}}{2} \right)_0^t$$

$$= \left(\frac{2e^{-3t}}{-3} + \frac{e^{-2t}}{2} - \left(-\frac{2}{3} + \frac{1}{2} \right) \right)$$

$$= \left(\frac{2e^{-3t}}{-3} + \frac{e^{-2t}}{2} + \frac{1}{6} \right) u(t)$$

Option (C) is correct