

Department of Electrical
Engineering

Assignment

DATE: 14/04/2020

Course Details

Course title: Signal & Systems

Module: 6th

Instructor: Engr. Aamir Aman

Student Details

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Q No 1
(A)

Kamran # 10 6990

Pg 1

$$x(n) = 10 u(n)$$

$$y_p(n) + y_h[n] = y[n]$$

$$\frac{dy(n)}{dn} + 2y(n) = x(n) \quad \text{--- (1)}$$

$$x_p(n) = (x) \times (10) + \geq 0$$

$$x_p(n) = 10Y$$

Putting in eq (1)

$$\frac{d}{dn} [10Y] + 10Y = 10$$

$$0 + 10Y = 10$$

$$\boxed{Y = 1}$$

So,

$$\boxed{y_p[n] = 10}$$

Suppose $y_h[n] = Ae^{sn}$

$$\frac{d}{dn} (Ae^{sn}) + 2Ae^{sn} = 0$$

$$Ase^{sn} + 2Ae^{sn} = 0$$

$$Ase^{sn} + 2Ae^{sn} = 0$$

$$s+2 = 0$$

$$\boxed{S = -2}$$

$$Y_h[n] = A e^{-2n}$$

$$y[n] = 10 + A e^{-2n} \quad \pm \geq 0$$

to find A $y(0) = 0$

$$0 = 10 + A e^{(0)}$$

$$A + 10 = 0$$

$$\boxed{A = -10}$$

So,

$$y[n] = 10 - 10 e^{-2n}$$

(Q1(b))

$$y[n] + 0.567 y[n-1] + 33.3 y[n-2] +$$

$$y[n-4] = x[n]$$

$$y[-1] = 1 \cdot y[-2]$$

$$x[n] = 10 u[n]$$

$$y[n] = x[n] - 0.567 y[n-1] - 33.3 y[n-2] - y[n-4]$$

$$y[0] = x[0] - 0.567 y[-1] - 33.3 y[-2] - y[-4]$$

$$y(0) = 10 - 0.567(1) - 33.3(-1) - 0$$

$$y(0) = 42.733$$

$$y(1) = 10 - 0.567 y[0] - 33.3 y[-1] - y[-3]$$

$$y(1) = 10 - 0.567(42.733) - 33.3(1) - 0$$

$$y(1) = -47.53$$

$$y[2] = 10 - 0.567 y[1] - 33.3 y[0]$$

$$- y[-2]$$

$$y[2] = 10 - 0.567(-47.53)$$

$$- 33.3(42.733) - (-1)$$

$$y[2] = 13.38$$

$$y[3] = 10 - 0.567 y[2] - 33.3 y[0]$$

$$- y[-1]$$

$$y[3] = 10 - 0.567(13.38) - 33.3(42.733)$$

$$y[3] = 14.11$$

(134)

Kamran # ID # 6990

Q No 2
a

Solution!

$$5000 \cos 5.0 \pi t$$

Formula

$$T = \frac{2\pi}{\omega}$$

By putting values

$$T = \frac{2\pi}{5.0\pi}$$

$$2.5$$

$$T = 2.5$$

$$\Rightarrow \sin 0.5 \pi t$$

By Formula

$$T = \frac{2\pi}{\omega}$$

$$T = \frac{2\pi}{0.5\pi}$$

$$T = 0.25$$

* $5.89 \cos 10 \pi t$

By Formula

$$T = \frac{2\pi}{\omega}$$

$$T = \frac{2\pi}{10\pi}$$

$$T = 5$$

$$* \sin 0.5\pi t$$

$$T = \frac{2\pi}{\omega}$$

$$T = \frac{2\pi}{0.5\pi}$$

$$T = 0.5$$

$$* \sin 100\pi t$$

$$T = \frac{2\pi}{\omega}$$

$$T = \frac{2\pi}{100\pi}$$

$$T = 50$$

So,

$$F_1 = 2.5, F_2 = 0.25, F_3 = 5, F_4 = 0.25, F_5 = 50$$

From the above equation greatest frequency

is 50

$$F_5 = 2 F_m$$

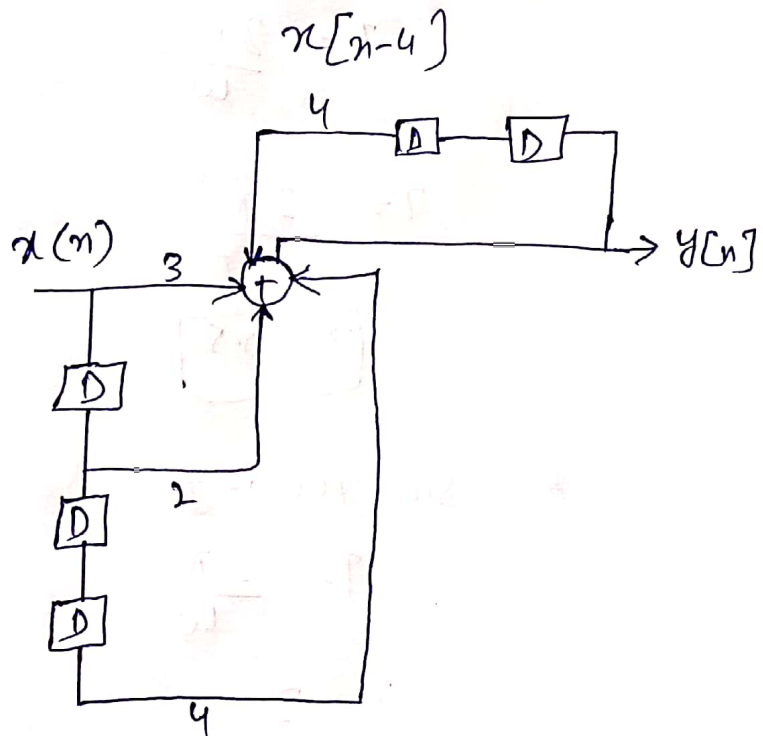
$$F_5 = 2(50)$$

$$F_5 = 100$$

Q9
(b)

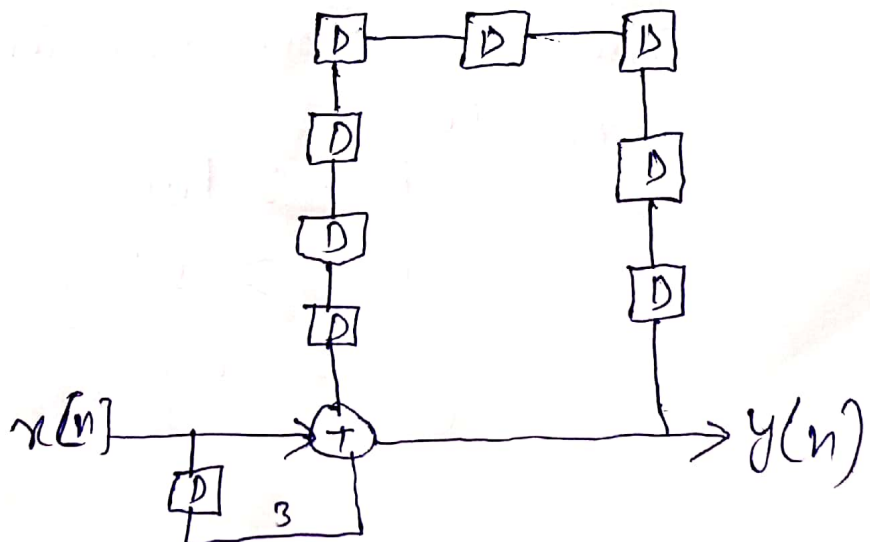
(B) (i) $y[n] - 4y[n-2] = 3x[n] + 2x[n-1] + 4x[n-4]$

$$y[n] = 4y[n-2] + 3x[n] + 2x[n-1] +$$



(ii) $y[n] - 10.3y[n-8] = x[n] + 3x[n-1]$

$$y[n] = 10.3y[n-8] + x[n] + 3x[n-1]$$

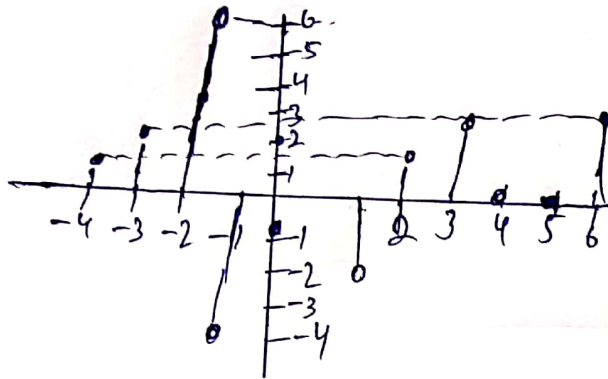


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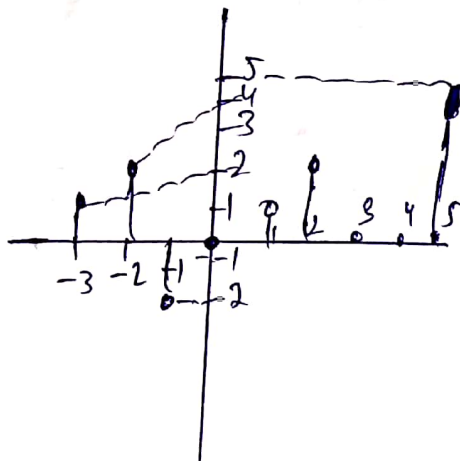
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Q NO 3
A

$$x[n] = [1, 3, 6, -4, 2, -2, 1, 3, 0, 0, 3]$$

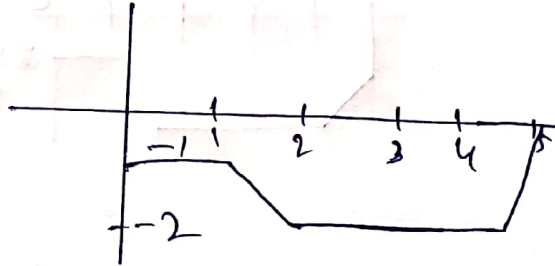
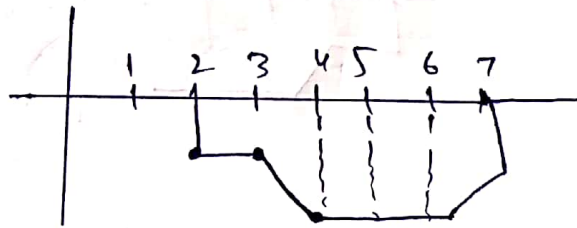
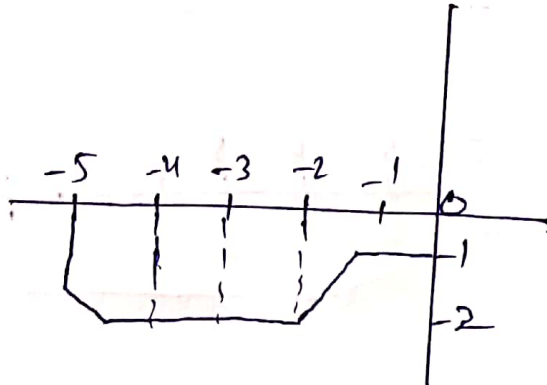


$$y[n] = [2, 4, -2, 1, 2, 0, 0, -2, 5]$$

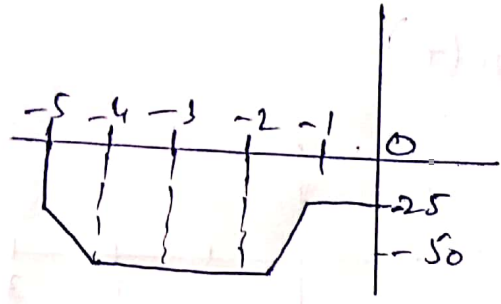


Q3
Ans

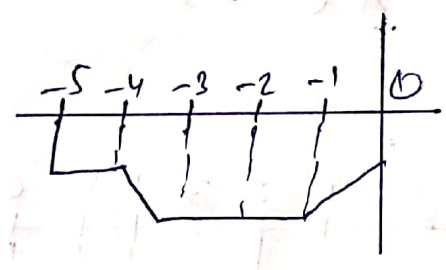
$$x(t) = (-1, -1, -2, -2, -2, -1)$$

 $x(t)$
(i) $x(t-2)$ (ii) $x(-t)$ 

(iii) $25x(-t)$



(iv) $x(t+5)$



(v) $x(t)$

