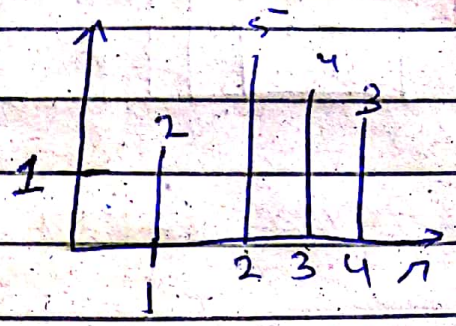
Name	Fawad Niaz
ID#	14568
Module	4th
Subject	Electronic Circuit Desing
Instructor	Engr.Mujtaba Ihsan
Assingment	Sessional

Q No 1

Evaluate The even and odd.

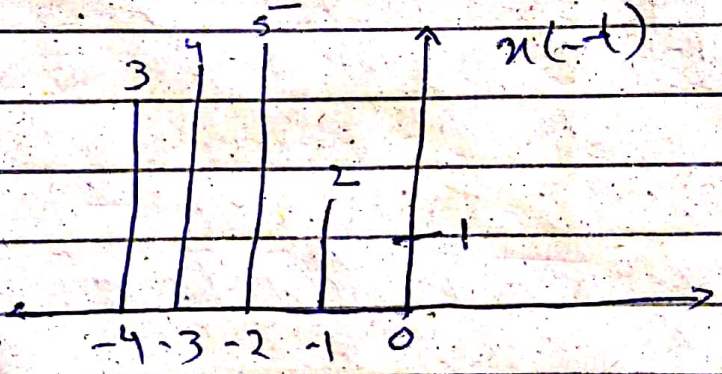
Ans:



$$\text{even} \rightarrow x_e(t) = \frac{x(t) + x(-t)}{2} = \frac{1}{2}\left[x(t) + x(-t)\right]$$

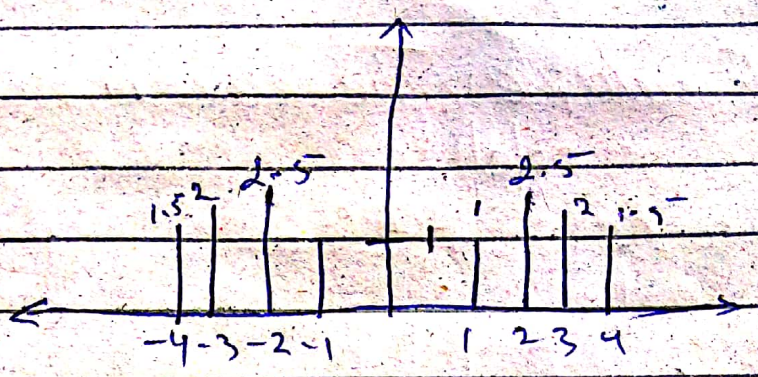
$$\text{odd} \rightarrow x_o(t) = \frac{x(t) - x(-t)}{2} = \frac{1}{2}\left[x(t) - x(-t)\right]$$

so find $x(-t)$



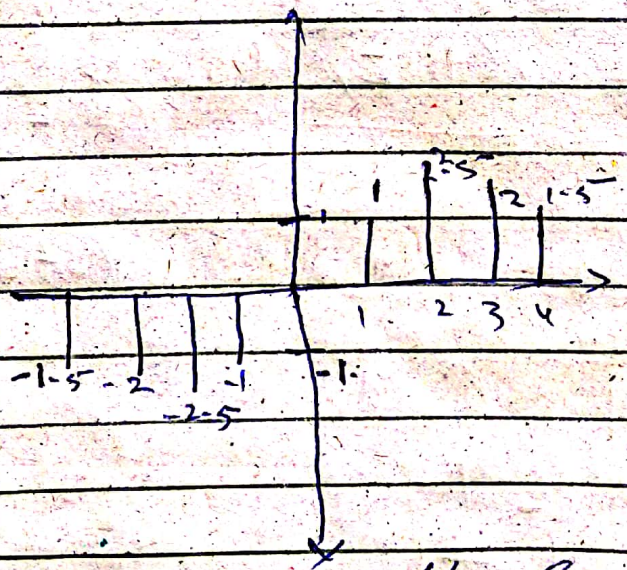
Now even funtion is

even function is



so : this The even function

for odd function



This is odd function of give signal.

In both even and odd The Amplitued is half of The given signal becuse it's divid by (2) two.

Q No 2 :

Ans :

$$Y(s) = \frac{s+4}{s^2+4s-12}$$

So.

$$Y(s) = \frac{s+4}{s^2+2s+6s-12}$$

$$Y(s) = \frac{s+4}{s(s-2)+6(s-2)}$$

$$Y(s) = \frac{s+4}{(s-2)(s+6)}$$

The form for the partial fraction expansion is

$$\frac{s+4}{(s-2)(s+6)} = \frac{A}{s-2} + \frac{B}{s+6}$$

multiply both said $(s-2)(s+0)$

Then.

$$Y(s) =$$

$$s+4 = A(s+6) + (s-2)B$$

So

find

$$s+4 = A(s+6) + (s-2)B$$

if $s = 2$ so

$$2+4 = A(2+6) + (2-2)B$$

$$6 = A8 \Rightarrow A = \frac{6}{8}$$

$$\boxed{A = \frac{3}{4}}$$

if $s = -6$ Then:

$$s+4 = A(s+6) + (s-2)B$$

$$-6+4 = A(-6+6) + (-6-2)B$$

$$-2 = -8B \Rightarrow B = \frac{+2}{+8}$$

$$\boxed{B = \frac{1}{4}}$$

Then

$$Y(s) = \frac{\frac{3}{4}}{s-2} + \frac{\frac{1}{4}}{s+6}$$

$$\mathcal{L}^{-1}(Y) = +\frac{3}{4}\mathcal{L}^{-1}\left(\frac{1}{s-2}\right) + +\frac{1}{4}\mathcal{L}^{-1}\left(\frac{1}{s+6}\right)$$

$$\boxed{\mathcal{L}^{-1}(Y) = +\frac{3}{4}e^{2t} + \frac{1}{4}e^{-6t}}$$

Q no 3 part (i) :-

Ans :-

Analog signal is converted to a digital signal using two step process.

(i) sampling :-

sampling converts a continous time continous amplitude (real value) signal to discrete time continous amplitued (still real valued) signal. Remember only time axis is discretized and not the amplitude axis.

(2) Quantization :-

Quantization converts the discrete time continous amplitued signal to discrete time and discrete valued (from a set of finite values so that it can be represented by finit bits and can be stored on a computer.

(Part B)

Ans:

The Nyquist sampling Rate is the lowest sampling rate that can be used without having aliasing. The sampling rate for a analog signal must be at least two time the bandwidth of the signal. So, for example, an audio signal with a bandwidth of 60 Hz must be sampled at least at 120 Hz to avoid aliasing.

Q No 4:

Ans:

As we are given.

$x[n] * [h_1[n] * h_2[n]]$

$= [x[n] * h_1[n]] * h_2[n]$

consider

$Y[n] = [x[n] * h_1[n]] * h_2[n]$

$x[n] * h_1[n] = w_1[n]$

now

$Y[n] = [x[n] * h_1[n]] * h_2[n]$

$y[n] = w_1[n] * h_2[n]$

$x[n] \rightarrow [h_1[n]] \rightarrow [h_2[n]] \rightarrow Y[n]$

Now consider x that.

$$w_2[n] = h_1[n] * h_2[n]$$

$$y[n] = x[n] * [h_1[n] * h_2[n]]$$

$$y[n] = x[n] * w_2[n].$$

$$x[n] \longrightarrow \boxed{w_2[n]} \longrightarrow x[n].$$

As both block diagrams give the same response

so

$$L.H.S = R.H.S$$