Have You Made Full Use of the OCR Feature?

Make a scan,enhance it and save it.Are these all the features you know about CamScanner?If so,you have missed too many cool experiences. CamScanner offers you lots of features rather than scanning.What we are sharing today is the OCR(Optical Character Recognition)feature.

What can you do with OCR feature?

1.Searching

What can you do if you want to search for a document but just can't remember the names of some docs?Use this feature to recognize all the texts on your scans.Next time you just need to enter some key words in the search box and all the documents within the words will be found.

2.Text extraction

Just purchase the one-time paid version and you can enjoy the text extraction for lifetime!Ever want to edit some texts on a paper document or a PDF file?Import it into CamScanner and all texts can be extracted as.txt file after OCR!

Why wait? Follow the steps to start using OCR!

1.Sign in to CamScanner to sync all your docs->All texts will be auto recognized after syncing.

2.If you don't want to sign in,you can open one single page of any doc-> Tap the Recognize button->All recognized texts will be shown in a dialog box->Tap Share to export the texts.

Department of Electrical Engineering

Assignment

Date: 14/04/2020

Course Details

Course Title: Signals and Systems

Instructor: Engr. Aamir Aman

Module: 6th

Total Marks: 30

Student Details

Name: Sifatullah

Student ID: 14200

Q2 a) Find the sampling frequency
$x(t) = 5000 \cos 5.10\pi t + \sin 0.5\pi t + 5.98 \cos 10\pi t \sin 0.5\pi t + \sin 100\pi t$.

Ans Saluction:

$\omega_1 = 5\pi$

$2\pi f_1 = 5\pi$

$\boxed{f_1 = 5/2 \text{ Hz}}$

$\omega_4 = 100\pi$

$f_4 = \frac{100}{2}$

$\boxed{f_4 = 50 \text{Hz}}$

$\omega_{32} = 0.5\pi$

$f_{32} = \frac{0.5}{2} = 0.25$

$\omega_2 = 0.5\pi$

$\omega_2 = 0.5\pi$

$2\pi f_2 = 0.5\pi$

$f_2 = \frac{0.5}{2}$ (0.25Hz)

~~$\omega_{31} = 10\pi$~~

$\omega_{31} = 10\pi$

$2\pi f_{31} = \frac{10}{2}\pi$

$f_{31} = 5 \text{ Hz}$

Multiplication between $\cos 10\pi t$. $\sin 0.5\pi t$ so frequency will be add

$\omega_3 = \omega_{31} + \omega_{32}$ or $f_3 = f_{31} + f_{32}$

$\boxed{f_3 = 5 + 0.25 = 5.25 \text{ Hz}}$

$f_{max} = \min(f_{max1}, f_{max2}, f_{max3})$
$= \min(5/2, 5.25 = 0.25\ Hz$

$f_s = 2 f_{max}$
$f_s = 2(0.25\ Hz)$
$\boxed{f_s = 0.5\ Hz}$

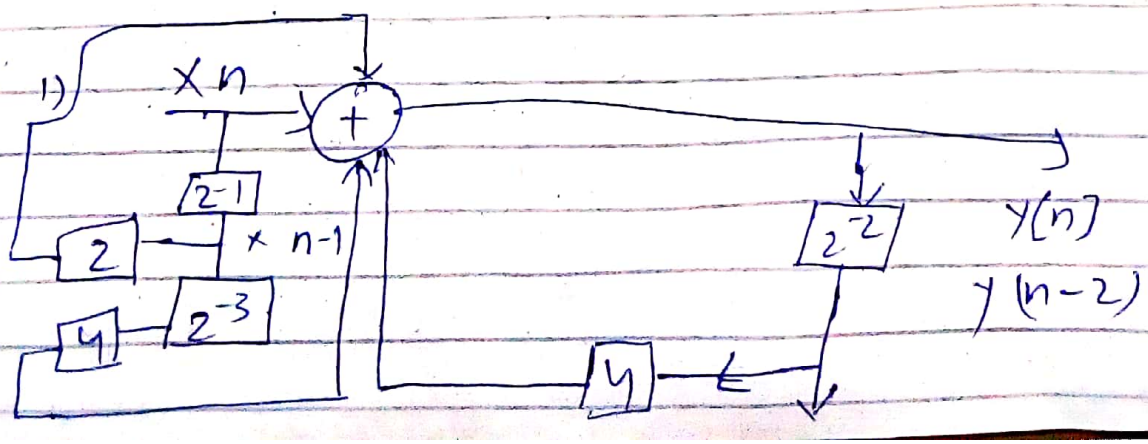
× × × × ×

B) Sketch the block diagram representation of discrete-time system described by the following input-output relation. Also find order of the system total number of adders and scalars.

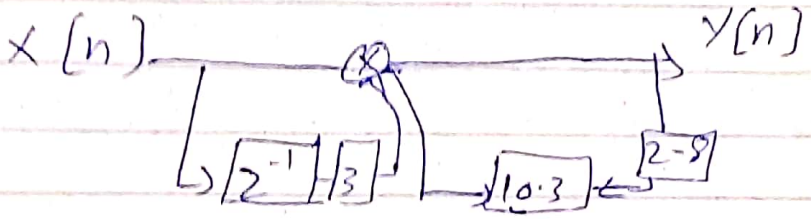
i) $y[n] - 4y[n-2] = 3x[n] + 2x[n-1] + 4x[n-4]$

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

Ans i)



4th order
scales 4, 3, 2, 4 four
adders (4)



adders
scales (1, 3, 10, 3) three
order = 8

× × × ×

Q3a) consider the following two sequences x[n] and y[n]

$x[n] = \{1, 3, 6, 2, -2, 1, 0, 0, 3\}$

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

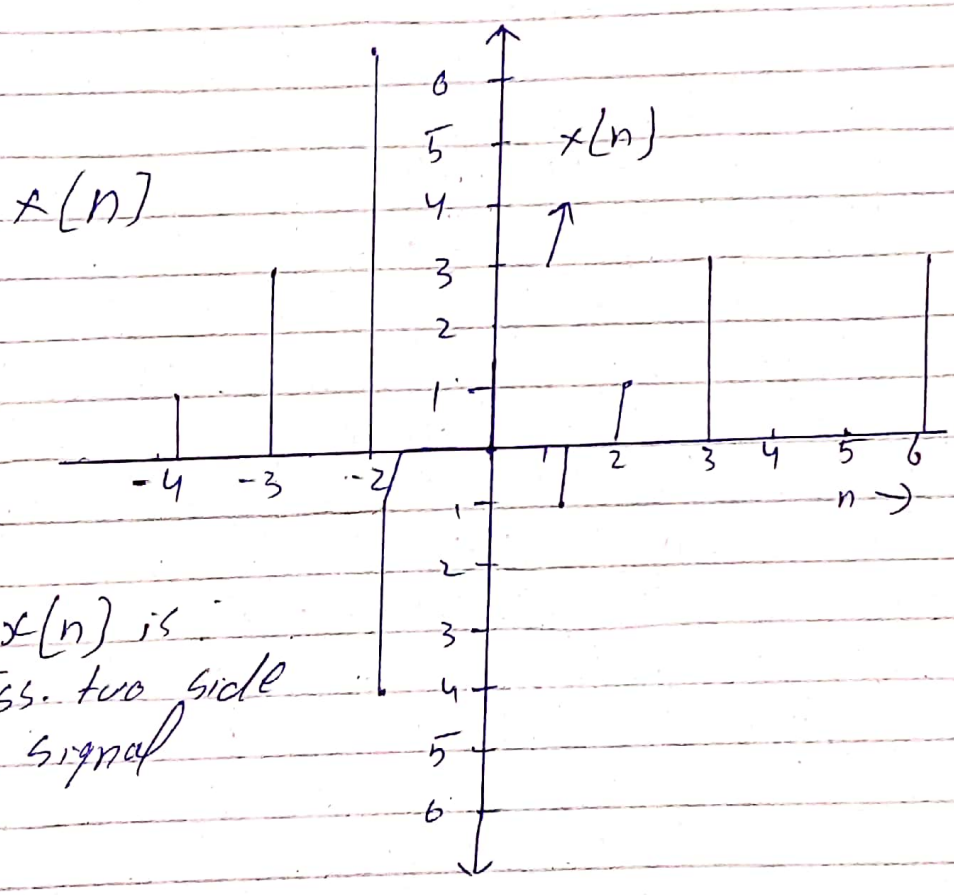
Ans:) $n = [-4\ -3\ -2\ -1\ 0\ 1\ 2\ 3\ 4.5\ 6]$

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

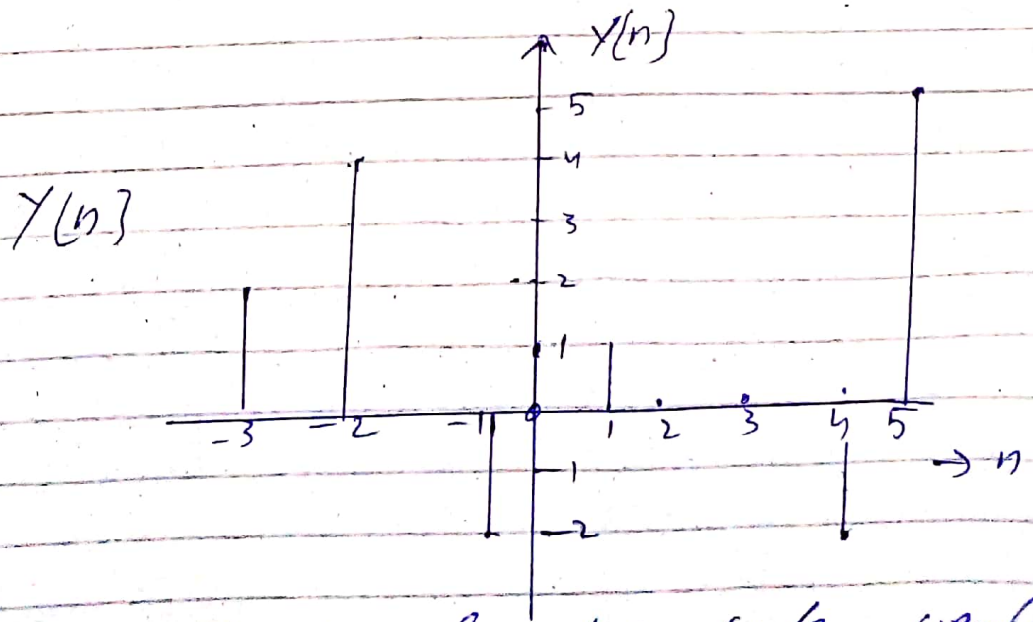
$y[n] = [\underset{-3}{2}, \underset{-2}{4}, \underset{-1}{-2}, \underset{0}{1}, \underset{1}{2}, \underset{2}{0}, \underset{3}{0}, \underset{4.5}{-2}, 5]$

Sifetullah- ID-14200

Sketch and label the sequence Also spacify either they are RSS, LSS, or TSS



x(n) is Tss. two side signal



Y(n) is also two side signal

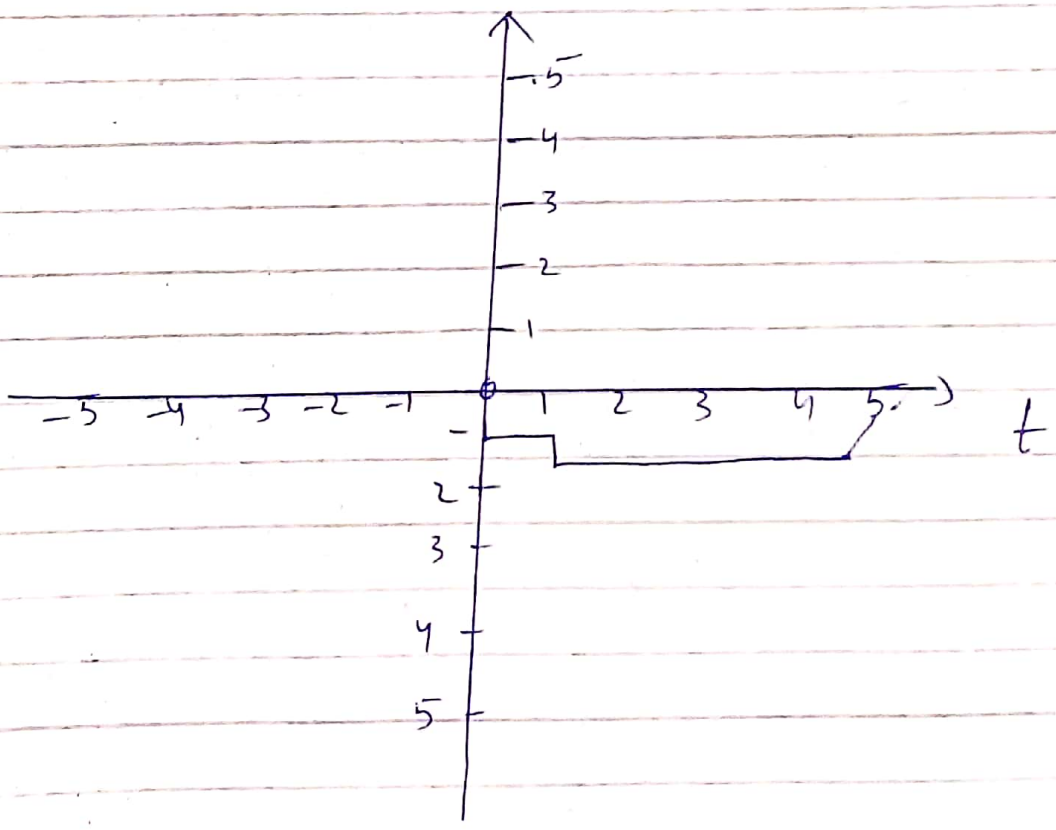
13) Consider the signal $x(t) = (-1, 1, -2, -2, -2, -1)$ plot

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

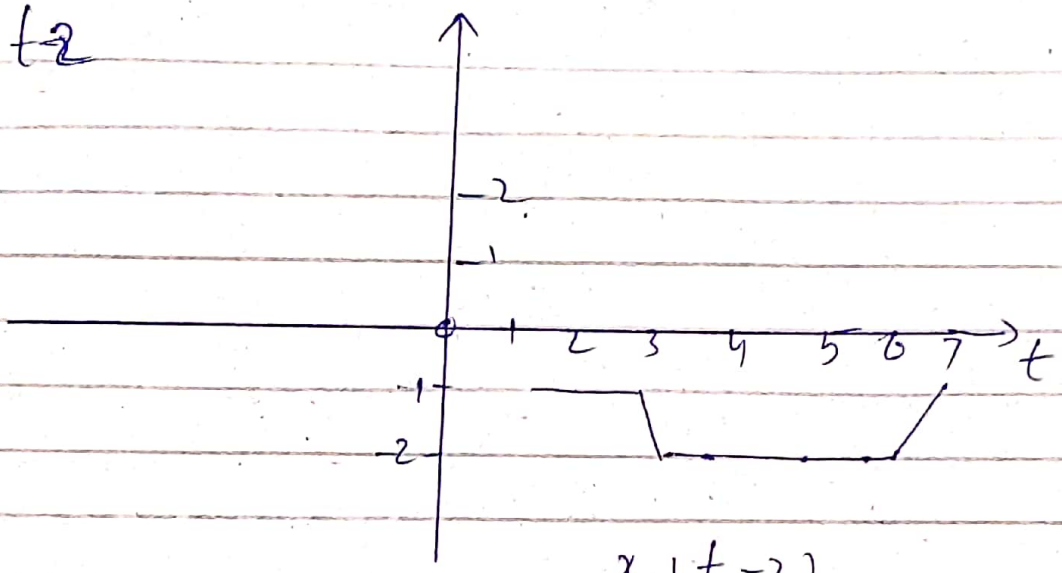
3) $25x(-t)$ (4) $x(t+5)$

5) $x(1/t)$

Solution:

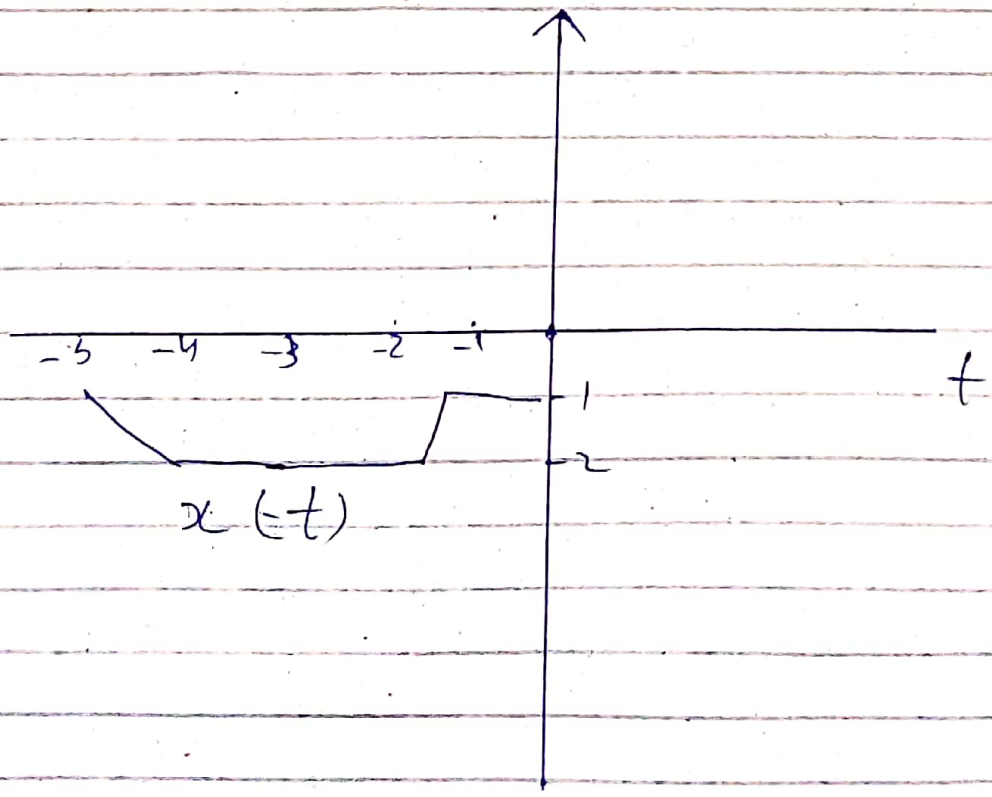


i) $x(t-2)$



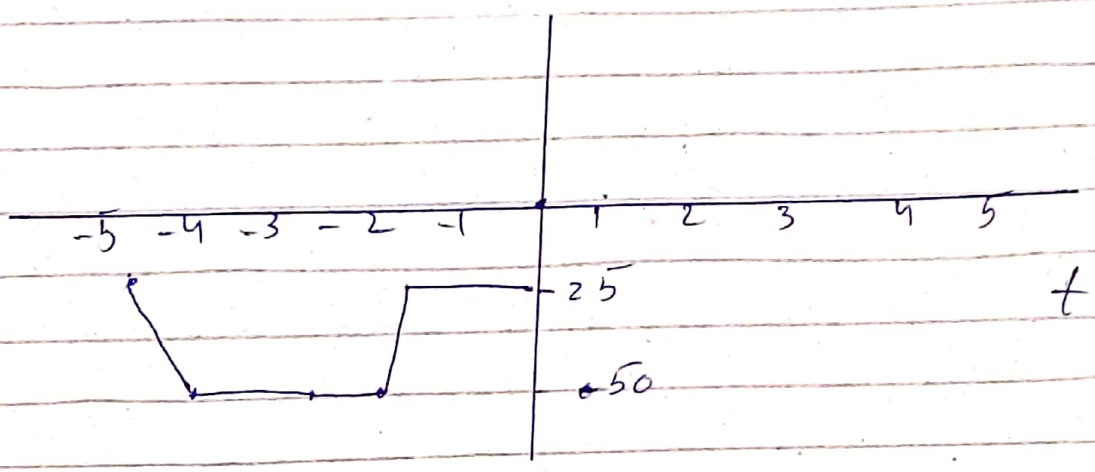
$x(t-2)$

ii) $x(-t)$



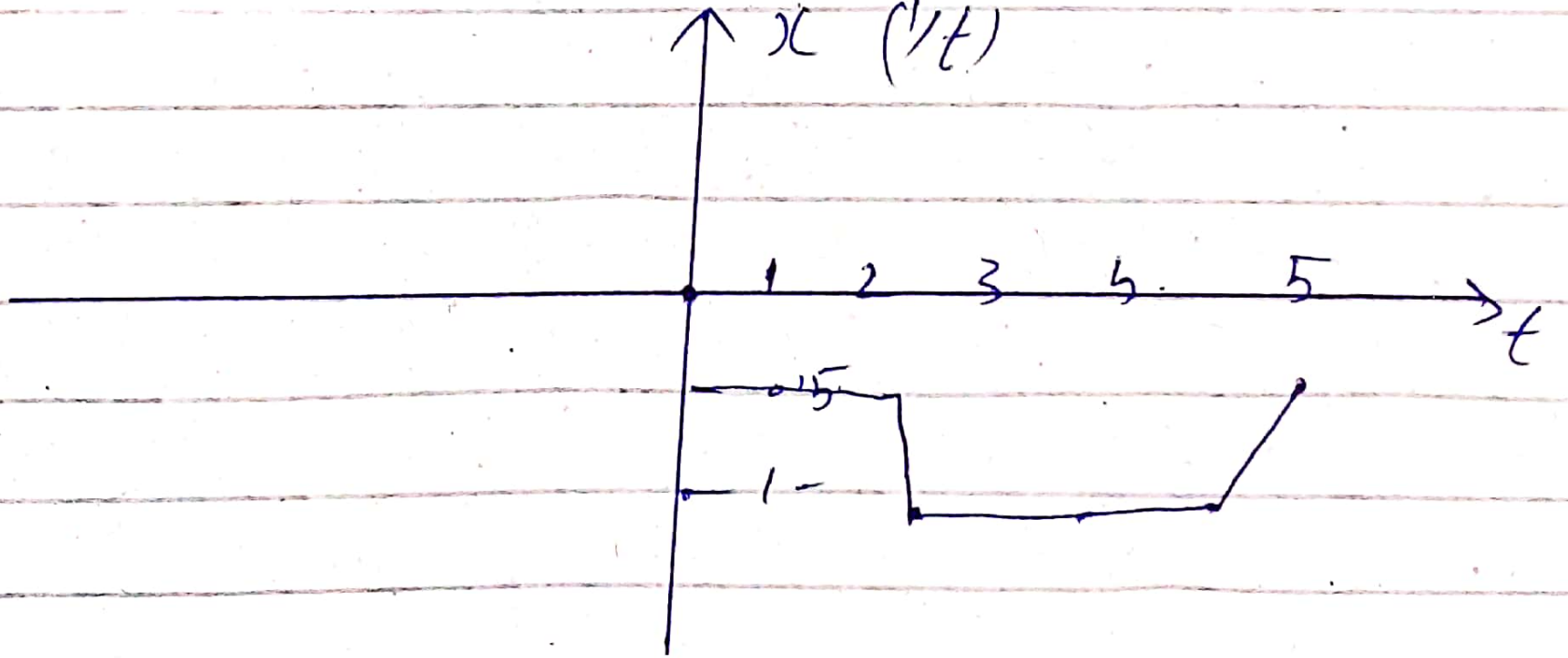
$x(-t)$

iii) $25\,x(t)$



$25\,x(t)$

v) $x(1/t)$



Q) 1 a) Find the total solution of the following linear constant different equation by.

1) Homogenous and particular Solution method.
2) Zero input and zero state Solution method

After finding total solution of the response ~~finding~~ by putting at least for four different value and comment on the both method.

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

for unit step $x[n] = 10\, u[n]$
with $y[-1] = y[-2] = -1$

Ans:

Solution: Homogenous:

$$\lambda^n + 0.567\, \lambda^{n-2} + 33.3\, \lambda^{n-3} + \lambda^{n-4}$$

$x[n] = 0$

$$\lambda^{n-4}(\lambda^4 + 0.567\, \lambda^3 + 33.3\, \lambda^2 + 1) = 0$$

either $(\lambda^n + 0.567\, \lambda^3 + 33.3\, \lambda^2 + 1) = i\, \lambda^{n-4} = 0$

$N^2(N^2 + 0.567N + 33.3) = -1$

either $N^2 = -1$: $N^2 + 0.567N + 33.3 = -1$

$N = \sqrt{-1}$ $N^2 + 0.567N = -1 - 33.3$

$N(N + 0.567) = 34.3$

$N_2 = 34.31$

$N + 0.567 = -34.3$

$N = -34.3 - 0.567$

$N = -34.867$

Now as we know whenever different root 1 imaginary.

for imagenry root.

$y_h(n) = c_1 \cos N_1^n + c_2 \sin N_2^n$

$y_n(n) = c_1 \cos(U^n$

for read and non repeated roots

$y_h(n)$ c_1 $\cos$ $c_1 N_1^n + c_2 N_2^n + c_3 N_3^n$

as we had N_2 and N_3, so

$c_1 N_1^n$ c_2 $(-34.3)^n$

$$+ c_3(-34.867)^n$$

Putting value of $c_1 r_1^n \cdot c_1 \cos \delta_1^n$

$$y_h(n) = c_1 \cos(1)^n + c_2(-34.3)^n + c_3(-34.867)^3$$

→ Particular solution:

As we know that:

$$y_p(n) = 10K\,u(n)$$

So $\Rightarrow 10K\,u(n) + 0.567(10)K\,u(n-1) + 33.3(10)K\,u(n-2) + (1)10K\,u(n-4) = 10\,u(n)$

No for unit step $= 1 = u(n)$

$$10K + 5.67K + 333K + 10K = 10$$

$$K(10 + 5.67 + 333K + 10) = 10$$

multiplying by

of $K(355.67) = 10$

ing by "358.67"

$$K = 10/358.67$$

$$\boxed{K = 0.027}$$

$$yp(n) \quad 10 K U(n)$$

$$= 10 \times 10/358.67 \quad U(n)$$

$$10 \times 0.027 \cdot U(n)$$

$$yp(n) = 2.7 \quad U(n)$$

$$\boxed{yp(n) = 2.7}$$

No for total solution

$$y(n) = yn(n) + yp(n)$$

$$= C1(\cos(1))^n + 2.7$$

$$= C1 \cos(1)^n + C2(.34.3)^n + C34.867) + 2.7$$

$$y(n) = C1 \cos(1)^n + C2(-340 + C3(-345.867))^n + 2.7$$

total solution.

Now applying initial condition.

1) $y(-1) = 1$ $\quad c_1 \cos(1)^{-1} = 0$

$c_1 \cos(-1) + 0$

$c_1 = 0/\cos(-1) = 0$

$\boxed{c_1 = 0}$

$c_1 \cos(1)^{-1} + c_2 C -34.3 -1 \quad c_3(-34.867) = 1$

$c_1 + (-1/34.3)c_2 + (-1/34.867)1C = 3 = 1$

$= -0.02 c_2 1 - 0.028 c_3 = 1$

$y(-1) = 0.02c_2 - 0.028 c_3 = 1$

Now applying 2nd condition.

$y(-2) = -1$

$= c_1 \cos(1)^{-2} + c_2(-34.3)^{-2} + c_3(-34.867)^{-2} = -1$

$= 0 + (-2/34.3)c_2 + (-2/34.867) = -1$

$= 0.05 c_2 + -0.057 c_3 = -1$

Now eqn (1) with (5)

$\rightarrow -5(0.02 c_2 - 0.028 c_3) = 1(-5)$

$0.1 c_2 + 0.014 c_3 = -5$ (3)

Also multiply eqn (2) with "2"

$$-0.1c2 - 0.114c3 = -2 \quad (4)$$

Adding eqn (3) and (4)

$$0.0/c2 + 0.014c3 = -5$$
$$-0.1/c2 - 0.114c3 = -2$$
$$-0.1c3 = -5 - 2$$
$$-0.1c3 = -7$$
$$c3 = -7/-0.1$$
$$\boxed{c3 = 70}$$

Now putting value of c3 into eqn (3)

$$\Rightarrow 0.1c2 + 0.014(70) = -5$$

$$0.1c2 + 0.98 = -5$$

$$0.1c2 = -5 - 0.98$$

$$\frac{0.1\,c2}{0.1} = \frac{-5.98}{0.1}$$

$$\boxed{c2 = -59.8}$$

B) At zero input and zero state.

So this is a like homogenous and the answer must will be same

Solution.

So for zero input.

$$y_n(n) = c_1 \cos(1)^n + c_2 (-34.3)^n + c_3 (-34.867)^n$$

and for zero state;

$$y_p(n) = 10 K u(n)$$

which will be

$$y_p(n) = 2.7$$

→ total solution will be

$$y(n) = y_n(n) + y_p(n)$$

→ $$y(n) = c_1 \cos(1)^n + c_2 (-34.3)^n + c_3 (-34.867)^n + 2.7$$

No putting first 4 random value in total solution.

Ex: $y(n) = n = 1, 2, 3, 4$

(1st)

$y(n) = 1 = n$

$= c_1 \cos(1)' + c_2 (-34.3)' + c_3 (-34.867)' + 2.7$

~~$y(1) = c_1$~~

$y(1) = c_1 (1) + c_2 (-34.3) + c_3 (-34.867) + 2.7$

And

$y(2) = c_1 \cos(1)^2 + c_2 (-34.3)^2 + c_3 (-34.867) + 2.7$

$= c_1 \cos(1) + c_2 (34.3)^2 + c_3 (34.8)^2 + 2.7$

$\rightarrow y(2) = c_1 + 1176.4 c_2 + 1211.04 c_3 - 1 + 2.7$

3rd

$$y(3) = c1\cos(1)^3 + c2(-34.3)^3 + c3(-34.867)^3 + 2.7$$

$$y(3) = c1\cos(1) + c(-40353.6) + c3(-42388.08) + 2.7$$

$$= c1\cos(1) - 40353.6\,c2 - 42388.08\,c3 + 2$$

4th

$$y(4) = c1\,c1\cos(1)^4 + c2(-34.3)^4 + c3(-34.867)^4 + 2.7$$

$$= c1\cos(1) + c2(1384128.7) + c3(1477945.18) + 2.7$$

$$= c1 + 1384128.7\,c2 + 1477945.18\,c3 + 2.7$$

x x x