Question **1**

Complete

Marked out of 3.00

Flag question

Find the impulse response h[n] for the LTI discrete-time system satisfying the following difference equation.
$y[n] = a_1 x[n] + a_2 x[n-1] + a_3 x[n-2]$

a_1=1st index of your roll.no

a_2=5th index of your roll.no

a_3=9th index of your roll.no

Question **2**

Not answered

Marked out of 3.00

Flag question

Find the output response y[n] for the LTI discrete-time system satisfying the following difference equation and the input is x[n] = [1,1,1]

$y[n] = a_1 x[n] + a_2 x[n-1] + a_3 x[n-2]$

a_1=1st index of your roll.no

a_2=5th index of your roll.no

a_3=9th index of your roll.no

Question **3**

Complete

Marked out of 5.00

Flag question

Find the output of the system defined by the differential equation,

$$\frac{d^2y(t)}{dt^2} + 6\frac{dy(t)}{dt} + 9y(t) = a_2 x(t); x(t) = e^{-3t}u(t)$$

a_1 is the 1st index of your roll no; a_2 is the 5th index of your roll no.

The initial condition are as follows: $y(0) = a_1$; $y'(0) = a_2$

Comment on the BIBO stability of the system. Justify your comment.

Is this system time invariant? [3+1+1 marks]

Question **4**

Not answered

Marked out of 5.00

Flag question

Convert the integral equation to differential equation, and draw direct form I and direct form II implementation of

$$y(t) + 6\int y(t) + 9\iint y(t) = a_1 \iint x(t) + a_2 \int x(t) + a_3 x(t)$$

a_1=1st index of your roll.no

a_2=5th index of your roll.no

a_3=9th index of your roll.no [1+2+2] marks

Question **5**

Not answered

Marked out of 3.00

Flag question

Let h(t) be the triangular pulse shown in Figure 1, and let x(t) be the impulse train depicted in Figure 2.

x(t) =

$$\sum_{k=-\infty}^{\infty} \delta(t - kT) = 1$$

. Determine and sketch

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

for T=a_2/2.

(a_2 is the 5th index of your roll. no)

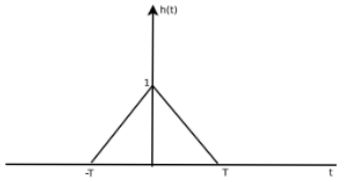

Figure 1: x(t)

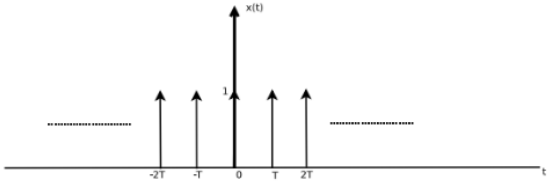

Figure 2: h(t)

Question **6**

Complete

Marked out of 3.00

Flag question

Determine whether or not each of the following signals is periodic. If a signal is periodic, specify its fundamental period.

- $x_1(t) = e^{(-a_1 + ja_2)t}$
- $x_2(t) = 2cos(a_1 t + 1) - sin(a_2 t - 1)$

a_1=1st index of your roll.no

a_2=5th index of your roll.no [1.5+1.5 marks]

Question **7**

Complete

Marked out of 2.00

Flag question

For the signal x(t) in figure 1 sketch the y(t) = $x(a_1t-a_2)$.

$T=a_1$

a_1=1st index of your roll.no

a_2=5th index of your roll.no

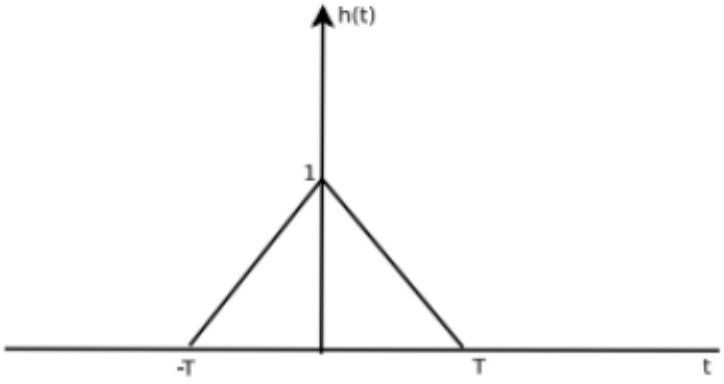

Figure 1: x(t)

Question **8**

Complete

Marked out of 1.00

Flag question

A rectangular pulse of unit amplitude which exists from t=-a_1 to t=a_2 is convolved with itself. Sketch the output of the convolution.

a_1=1st index of your roll.no

a_2=5th index of your roll.no