

- ii For the given discrete time signal
 $x(n) = \{-3, 2, 3, -1, 2, -1, 4\}$

Sketch the following

(i) $x(2-n)$ (ii) $x\left(\frac{2}{3}n+1\right)$ (iii) $x(-2n)$ (iv) $x\left(\frac{-n+8}{4}\right)$

(OR)

- b. Determine whether the following systems are Linear, time invariant, memory less, causal and stable.

(i) $\frac{dy(t)}{dt} + 2y(t) = x(t) + 0.5 \frac{dx(t)}{dt}$

(ii) $y(n) = x^2(n)$

12. a. Determine the trigonometric fourier series for the half wave rectified sine wave.

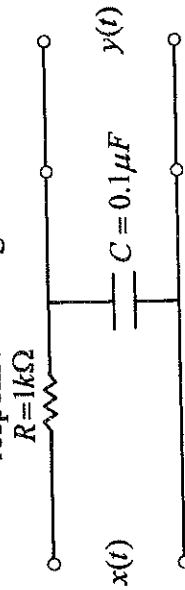
(OR)

- b. Determine the fourier transform of a triangular pulse with amplitude 'A' and width 'W'.

13. a. Obtain the convolution of the following two

(i) Signals $x(t) = e^{2t} u(-t)$ and $h(t) = u(t-3)$

- (ii) Derive the frequency response and impulse response of the given RC circuit.



(OR)

- b. What is impulse response? Compute the frequency response and impulse response of the given system.

$$\frac{d^2 y(t)}{dt^2} + 3 \frac{dy(t)}{dt} + 2y(t) = x(t)$$

14. a.i. State and prove any four properties of DTFT.

- ii. Find the convolution sum of

$$x(n) = 0.5^n u(n) \text{ and } h(n) = \delta(n) + 0.8\delta(n-1) + 0.2\delta(n-2)$$

(OR)

- b.i Find the transfer function. Frequency response and impulse response of the system described by the difference equation. $y(n) = 3x(n) + \frac{1}{3}y(n-1)$ (12 Marks)

- ii State and prove convolution sum. (4 Marks)

- 15.a.i State and prove any four properties of z transform.

- ii Compute the inverse z transform of

$$H(z) = \frac{1}{(1+0.5z^{-1})(1-0.25z^{-1})}$$

(OR)

- b.i Compute the output response of the system whose input is $x(n) = 0.8^n u(n)$ and the impulse response $h(n) = 10\delta(n) + 0.3^n u(n)$.

- ii Describe the characteristic of DT system.
