

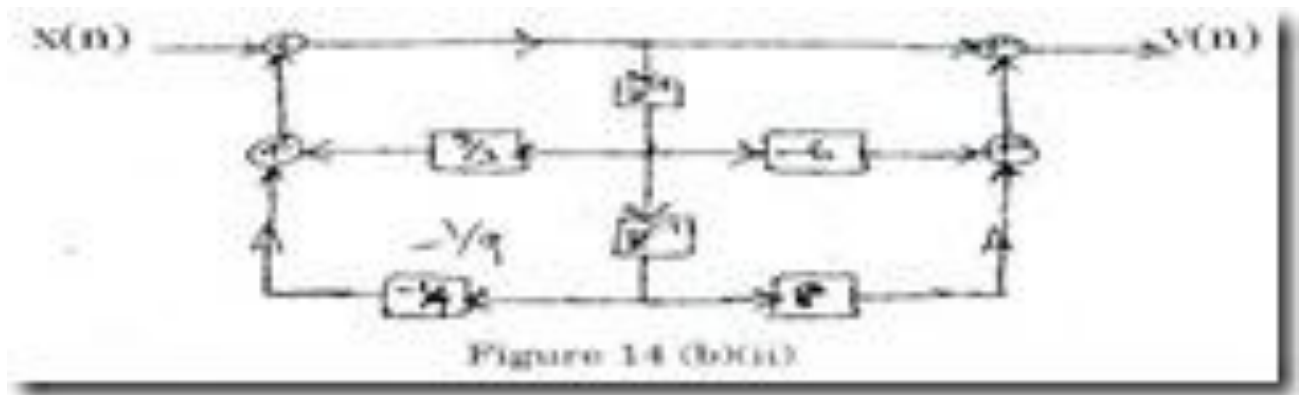
## Unit – IV

### Part A

1. Define Sampling theorem?
2. Define convolution integral of continuous time system?
3. What is main condition to avoid aliasing?
4. What is ROC in Z transforms?
5. What is the relation between DTFT and Z transform?
6. Find DTFT of  $u(n)$ .
7. Define unilateral and bilateral Z transform
8. Define convolution sum with its equation
9. Find the convolution of two sequence  $x(n)=\{1,1,1,1\}$   $h(n)=\{2,2\}$
10. Define system function.
11. Define shifting property of the discrete time unit impulse function.
12. What is meant by sampling.
13. What is meant by aliasing.
14. What are the effects aliasing.
15. Define Nyquist rate. and Nyquist interval.
16. Define sampling of band pass signals.
17. Define Z transform.
18. What are the two types of Z transform?
19. Define unilateral Z transform.
20. What is region of Convergence.
21. What are the Properties of ROC.
22. What is the time shifting property of Z transform.
23. What is the differentiation property in Z domain.
24. State convolution property of Z transform.
25. State the methods to find inverse Z transform.
26. State multiplication property in relation to Z transform.
27. State parseval's relation for Z transform.
28. What is the relationship between Z transform and fourier transform.
29. What is meant by step response of the DT system.
30. Define unilateral Z transform.
31. Give the properties of convolution
32. Determine the Nyquist sampling rate and Nyquist sampling intervals for  $\text{sinc}(200\pi t) + 3\text{sinc}^2(120\pi t)$
33. Determine inverse Discrete Time Fourier Transform of  $X(k)=\{1,0,1,0\}$
34. What are the different types of structure realization.
35. What is natural response?
36. What is zero input Response?
37. What is forced response?
38. What is complete response?

**UNIT IV**  
**Part B**

1. Find the Unilateral Z-transform and R.O.C of  $x(n) = \sin \omega_0 n u(n)$
2. Discuss the block diagram representation of an LTI-DT system
3. Consider a causal LTI system as in the fig



Determine the differential equation relating  $x(n)$  and  $y(n)$ .

4. State and prove the Parseval's relation.
5. Explain any 4 properties of DTFT.
6. State and prove the sampling theorem. Also explain how reconstruction of original signal is done from sampled signal (16)
7. Find the Z – transform of the signal (8)
  - (i)  $x(n) = n a^n u(n)$
  - (ii)  $x(n) = a^n \cos(\omega_0 n) u(n)$
8. Determine the inverse z transform of the following function  
 $x(z) = 1 / ((1+z^{-1})(1-z^{-1})^2)$  ROC :  $|Z| > 1$
9. Explain the properties of z-transform (8)
10. Find the z-transform of  $x(z) = 1 + 2z^{-1} / 1 - 2z^{-1} + z^{-2}$  if  $x(n)$  is anticausal using long division method. (8)
11. find the inverse z-transform of  $x(z) = 1 + 3z^{-1} / 1 + 3z^{-1} + 2z^{-2}$  using residue method (8)
12. Give the relationship between z-transform and fourier transform. (8)