

Digital Signal Processing (DSP)

P. Pages : 2

Time : Three Hours



NKT/KS/17/7380/7385

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) The analog signal given below is sampled by 600 samples per second, 4
 $m(t) = 2 \sin 480\pi t + 3 \sin 20\pi t$
Calculate :
i) Nyquist - sampling rate
ii) Folding frequency
iii) What are frequencies in radions. In discrete time signal $x(n)$
- b) For the following system determine whether the system is - 10
i) Linear ii) Causal
iii) Time invariant iv) Memory less
v) Stable
 $y(n) = x(n) + 3n x(n+1)$

OR

2. a) "Circular convolution is compress version of linear convolution" Justify the statement. 7
- b) Compute convolution $y(n) = x(n) * h(n)$ of the following pair of signal. 7
 $x(n) = \{1, 2, 3, 4\}$ and $h(n) = \{4, 3, 2, 1\}$
3. a) Determine the z-transform with ROC of the signal. 6
 $x(n) = \{1, 2, 3, 4, 5, 6, 1\}$
- b) State and prove convolution and differentiation property of ZT. 7

OR

4. a) Determine all possible signals that the following ZT can have $x(z)$ Calculate Drop Inverse 7
Z transform. $x(z) = \frac{1}{1 - 0.5z^{-1} + 0.25z^{-2}}$

