**Model Question (SET-1)**

**DIGITAL SIGNAL PROCESSING**

**Semester-6TH SEM Branch-E&TC**

**F.M- 80**

1. Answer all. (2\*10)

1. State sampling theoram?
2. What are the properties of frequency response of an LTI system?
3. Define the pole and zero of a system function.
4. What do you mean by time domain aliasing?
5. Verify wheather y(n)=x(2n)is a time invariant system.
6. Define correlation.
7. What is twiddle factor?
8. Define region of convergence.
9. What is zero padding?
10. State convolution properties of z-transform.

2. Answer any six question. (5\*6)

1. Write down the advantages of digital signal processing over analog signal processing.
2. Discuss any five properties of z-transform.
3. Obtain the linear convolution of the following sequence x1(n)={1,2,3,4} &x2(n)={1,-2,3}.
4. Differentiate between circular convolution and linear convolution.
5. State the properties of ROC of Z-transform.
6. Find the 4 point DFT of the sequence x(n)={2,0,3,0}.
7. State and prove final value theorm of Z-transform.
8. Verify wheather the system is linear and time invariant y(n)=2x(n)+3.

3. Find the impulse response of the system described by difference equation y(n)-5y(n-1)+3y(n-2)=x(n) using Z-transform . (10)

4.Obtain the circular convolution of the following sequences x1(n)={2,4,-1,2} and x2(n)={-1,4,2} by using concentric circle method. (10)

5. Discuss the properties of DFT . (10)

6. Find the Z-transform and ROC of the following equation x(n)=2nu(n-2). (10)

**Model Question (SET-2)**

**DIGITAL SIGNAL PROCESSING**

**Semester-6TH SEM Branch-E&TC**

**F.M- 80**

1. Answer all. (2\*10)

1. Define time variant and time invariant signals.
2. What are deterministic and non deterministic signal?
3. Define DFT.
4. State initial value theoram of Z-transform.
5. Define convolution.
6. What is radix-2 FFT?
7. Define correlation.
8. If the signal x(n)={1,0,2,3,4,6} find x(2n).
9. How many complex additions and multiplication are required for a 8 bit sample in DIT-FFT algorithm?
10. Find z-transform of u(n-1).

2. Answer any six question. (5\*6)

1. Determine the value of power and energy of x(n)=(1/2)nu(n).
2. Determine the z-transform and ROC of the signal x(n)={1,2,3,0,-1,4}with the starting index of the sequence is equal to -1.
3. If the signal x(n) = {1,2,3,4,-1,-2,-3} then find x(2n),x(n-1),x(-n+2),4x(n+1),x(n/2).
4. What is twiddle factor and define zero padding with example.
5. Differentiate between FIR and IIR filter .
6. Define linear convolution .state its properties.
7. Compute the 4 point DFT of a sequence x(n)=(0,1,2,3).
8. Find the time period of the signal x(n)=sin(2n).

3. Plot the pole zero pattern and determine the stability of the system :

y(n)=y(n-1)-0.1y(n-1)+2x(n)-x(n-2). (10)

4. Find the IDFT of the sequence X(K)={1,1-2j,-1,1+2j} . (10)

5. Define circular convolution .Find the circular convolution of {1,2,2,-1} and {1,2,3} using concentric circle method . (10)

6. Determine the z-transform and ROC of the following equation x(n)=3n (n+2)u(n).