

Dronacharya College of Engineering, Gurgaon

Department of Electronics and Computers Engineering

Session 2014-2015

Subject: Digital Signal Processing (EC-614-F)

Semester/Branch: VI ECS

Assignment - Section A

- Q1. Discuss the properties of Fourier transform.
- Q2. Describe the Energy & Power theorem.
- Q3. What do you understand by discrete time random signal?
- Q4. Discuss the importance of time domain and frequency domain representation.

Assignment - Section B

- Q1. What is time invariant system?
- Q2. Describe the importance of IIR Filters?
- Q3. What do you understand by Finite impulse response filter?
- Q4. How does sampling occurs in analog signals?

Assignment - Section C

- Q1. What is Region of convergence in Z transform?
- Q2. What do mean by windowing technique?
- Q3. Describe Kaiser Window?
- Q4. Explain Bilinear transformation?

Assignment - Section D

- Q1. What is Sampling rate conversion?
- Q2. Describe the features of Multirate Signal Processing?
- Q3. Describe Interpolation method?
- Q4. Explain Various filter structures used in MSP?

Important Questions- Section A

- Q1. Explain the various properties of Fourier transform.
- Q2. Describe the Energy & Power theorem.
- Q3. What do you understand by discrete time random signal?
- Q4. Discuss the importance of time domain and frequency domain representation.
- Q5. Explain Convolution?
- Q6. What is the significance of Circular convolution?

Important Questions- Section B

- Q1. What is time invariant system?
- Q2. Describe the importance of IIR Filters?
- Q3. What do you understand by Finite impulse response filter?
- Q4. How does sampling occur in analog signals?
- Q5. Mark out the differences between IIR and FIR filters?
- Q6. Why do we need FIR filters in DSP?

Important Questions- Section C

- Q1. What is Region of convergence in Z transform?
- Q2. What do mean by windowing technique?
- Q3. Describe Kaiser Window?
- Q4. Explain Bilinear transformation?
- Q5. Explain Rectangular window with diagrammatic explanation?
- Q6. Explain DSP algorithm implementation?

Important Questions- Section D

- Q1. What is Sampling rate conversion?
- Q2. Describe the features of Multirate Signal Processing?
- Q3. Describe Interpolation method?
- Q4. Explain various filter structures used in MSP?
- Q5. What are digital filter bank and why it is required?
- Q6. Discuss different types of filter structures?

Short Answer questions - Section A

- a. This has an equiripple characteristics in the passband and varies monotonically in the stopband

(A) Type I Chebyshev filter

(B) Type II Chebyshev filter

(C) Butterworth filter

(D) Elliptical filter

Ans: (A)

- b. The multiplication of two Discrete Fourier Transforms is same as

(A) Linear Convolution of the sequences

(B) Correlation of the sequences

(C) Cross Correlation of the sequences
sequences

(D) Circular Convolution of the
sequences

Ans: (D)

- c. What is incorrect about Chirp Transform Algorithm

(A) Its based on expressing the DFT as a convolution.

(B) It is less flexible than FFT.

(C) It doesn't minimize the computational complexity.

(D) It can be used to compute any set of equally spaced samples of the FT on the unit circle.

Ans: (B)

- d. LTI behavior of a system depends on

(A) System must be Linear and Time-Invariant.

(B) Input signal must be bandlimited.

(C) Sampling Rate must be high enough so that any aliased components are removed.

(D) All.

Ans: (D)

- e. An all pass system is for which the frequency response magnitude is

(A) Decreasing

(B) Increasing

(C) Constant

(D) Exponential

Ans: (C)

Short Answer questions - Section B

Q1. Explain the Duality and shifting property of DFT for a finite duration sequence.

Q2. Explain DIF- FFT Algorithm using signal flow graphs for N=8. Compare its computational complexity with DFT.

Q3. Explain Equiripple Approximations for a type I FIR Filter.

Q4. Explain the Duality and shifting property of DFT for a finite duration sequence

Short Answer questions - Section C

Q1. Compute the Circular Convolution of two rectangular pulses where

$$x_1[n] = x_2[n] = \begin{cases} 1 & 0 \leq n \leq 5 \\ 0 & \text{otherwise} \end{cases}$$

Q2. Give the relationship between magnitude and phase of the Fourier transform of a sequence

Q3. Discuss the most commonly used forms for implementing an IIR system and obtain their flow graphs

Q4. LTI behavior of a system depends on

(A) System must be Linear and Time-Invariant.

(B) Input signal must be bandlimited.

(C) Sampling Rate must be high enough so that any aliased components are removed.

(D) All.

Ans: (D)

Short Answer questions - Section D

Q1. An all pass system is for which the frequency response magnitude is

(A) Decreasing

(B) Increasing

(C) Constant

(D) Exponential

Q2. Z transform of $\delta(n)$ is

(A) z^{-n}

(B) 1.

(C) $1/z$.

(D) $1/(1 - z)$.

Ans: (B)

Q3. The phase or group delay

(A) Negative of the derivative of phase

(B) Derivative of phase

(C) Positive of the derivative of phase

(D) Integral of phase

Ans: (A)

Q4. In Impulse Invariance design procedure the relationship between continuous time and discrete time frequency is

(A) Non-linear

(B) Parabolic

(C) Linear

(D) Exponential

