

DRONACHARYA COLLEGE OF ENGINEERING

KHENTAWAS, FARRUKHNAGAR, GURGAON, HR

Department: EEE

Academic Session: 2020-2021(MAY- AUG, 2021)

Lecture Plan with Assignment questions

Subject with code: Digital Signal Processing (PCC-EEE-306G)

Name of Faculty with designation : Ms. Dimple Sapuro , Associate Professor

S.No.	Month	Date & Day	Sem-Class	Unit	Topic/Chapter covered	Write Lecture Wise Questions
1			VI EEE	I	Sequences; representation of signals on orthogonal basis	Q1.What are Signals are the basic elements of Signal Processing Q2. What
2			VI EEE	I	representation of discrete systems using difference equations,	Q1.What is DTFT pair fourier Tranform of a sequence Q2. Define
3			VI EEE	I	Sampling and reconstruction of signals - aliasing; Sampling theorem and Nyquist rate	Q1.What is DTFT pair Define fourier Tranform of a sequence Q2.
4			VI EEE	I	Z-Transform, Region of Convergence, Analysis of Linear Shift Invariant systems using z- transforms,	Q1.Define Z- Transform Linearity Property of Z transform Q2.Explain
5			VI EEE	I	Properties of z-transform for causal signal	Q1.Explain two sided z-Transform the Conditions for Z-transform to exit Q2.Explain
6			VI EEE	I	Properties of z-transform for causal signal	Q1.Explain Scaling Property of Z Transform Explain Time reversal Property of Z Transform Q2.
7			VI EEE	I	Interpretation of stability in z-domain, Inverse z-transforms.	Q1.State and Prove Convolution property of Z-Transform Q2.State the method to find Inverse Transform
8			VI EEE	II	Frequency Domain analysis concept, Discrete Fourier Transform (DFT)	Q1.Explain the application of DFT in linear filtering Q2. What is main advantage of FFT ?
9			VI EEE	II	Properties of DFT, Convolution of signals,	Q1.Explain Circular time shift Explain Circular Frequency Shift Q2.
10			VI EEE	II	Circular convolution, Linear Filtering using DFT	Q1.Differentiate between DTFT & DFT Circular Convolution Q2.Explain
11			VI EEE	II	Fast Fourier Transform Algorithm, Decimation in time and Decimation in frequency algorithms	Q1.Classify FFT algorithm Reversal Q2.Explain Bit

12			VI EEE	II	Fast Fourier Transform Algorithm, Decimation in time and Decimation in frequency algorithms	Q1.Discuss FFT algorithms for composite Value of N Q2. Explain about decimation in frequency FFT algorithm
13			VI EEE	II	Computations Complexity Calculations, Parsevals Identity	Q1.Compute IDFT of the sequence $x(n)=\{7,-0.707-j0.707,-j, 0.707-j0.707,1, 0.707+j0.707,j, -0.707+j0.707\}$ Q2.what is the bit reversal order of 16 point sequence
14			VI EEE	II	Ideal Filter vs Practical Filters,General Specifications and Design Steps,	Q1. What are the advantages and Disadvantage of digital filter. Q2.Why Zero padding is needed?
15			VI EEE	II	Comparison of FIR & IIR Filters, Design of FIR Filters using Window technique,	Q1.Difference between IIR &FIR filter Q2Design the techniques for FIR filter
16			VI EEE	III	Park-McClellan's method	Q1.Why do we use The Parks–McClellan algorithm Q2.What are the steps used for implementing The Parks–McClellan Algorithm
17			VI EEE	III	Design of IIR Filters using Impulse Invariance technique, Bilinear Transformation,	Q1State different type of filters based on impuse response Q2.Explain inverse radix algoritm
18			VI EEE	III	Design of IIR Filters using Butterworth,	Q1.List any two properties of Butterworth filter. Q2. What is the transfer function of H(S) for a normalized Butterworth filter
19			VI EEE	III	Design of IIR Filters using Butterworth,	Q1. Write the design procedure for butterworth filter Q2.What is the reason that FIR filter is always stable?
20			VI EEE	III	Chebyshev and Elliptic filter	Q1.What are the properties of Chebyshev Filter. Q2,Compare the features of Elliptic and Chebyshev interms of Filter order
21			VI EEE	III	, Digital frequency transformation	Q1.what are the requirement for converting stable analog filter into stable digital filter. Q2.What do you mean by the term mapping
22			VI EEE	III	Block diagrams and signal flow graphs for FIR	Q1. Write the structural realization of FIR filter. Q2.State the advantage of direct form II structure over direct form I structure
23			VI EEE	IV	Block diagrams and signal flow graphs for FIR	Q1.What are characteristics between S-plane & Z-plane Q2.What is the disadvantage of cascade realization?
24			VI EEE	IV	Direct form, Cascade form, Frequency Sampling Structures, and Lattice structures for FIR systems	Q1.Obtain the direct form-I, direct form –II , cascade form and parallel form realization of the following FIR system with difference equation Q2.Realize the following FIR system with difference equation $Y(n)=-0.1 v(n-1)+0.2v(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)$
25			VI EEE	IV	Representation of fixed point and floating point numbers	Q1.What do you mean by fixed point numbers Q2.Determine dead band of the filter.
26			VI EEE	IV	Finite word length effects, Parametric and non-parametric spectral estimation. Applications of Digital Signal Processing	Q1. Write the name of vaious field in which DSP finds its application Q2.Explain how speech signal is generated
27			VI EEE	IV	Introduction to multirate digital signal processing, Multi rate structures for sampling rate conversion,	Q1What is aliasing ? Q2.What is the need for anti- aliasing filter prior to down sampling.
28			VI EEE	IV	Multi rate structures for sampling rate conversion,	Q1.Discuss the need for signal compression Q2.What are the advantage of multirate signal processing

29			VI EEE	IV	Multistage decimator and interpolators	Q1.What is decimation and interpolation? Explain briefly with suitable sketches Q2 With the help of block diagram explain the sampling rate conversion by a 10M rational factor '1/D'. Obtain necessary expressions.
30			VI EEE	IV	Polyphase decomposition, Digital Filter Banks	Q1.What are filter banks Q2.What is truncation?