

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: Signals & Systems (PCC-EE-214G)

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

S.No.	Month	Date & Day	Sem-Class	Unit	Topic/Chapter covered	Write Lecture Wise Questions
1			IV EEE	I	Definition, types of signals and their representations, continuous-time, discrete-time,	Q1. Define continuous time signals and classify them the major classifications of the signal? Q2. What are
2			IV EEE	I	periodic, non-periodic, even, odd, energy, power, deterministic, random, one-dimensional,	Q1. Define periodic signal. and nonperiodic signal Q2. Define even and odd signal ?
3			IV EEE	I	Linear Time Invariant and Causal systems; commonly used signals (in continuous-time as well as in discrete-time): unit impulse, unit step, unit ramp (and their inter-relationships),	Q1. Define discrete time unit step & unit impulse Q2. Check whether the system is causal or not ,the H(z) is given by $(z^3 + z)/(z+1)$.
4			IV EEE	I	discrete-time signals (including transformations of independent variables)	Q1. What is meant by linear system? Define Time scaling Q2.
5			IV EEE	II	Exponential, rectangular pulse, sinusoidal; operations on continuous-time and discrete-time signals (including transformations of independent variables)	Q1. Define unit ramp signal. Q2. sketch the graph of exponential rectangular Sinisoidal pulse
6			IV EEE	II	operations on continuous-time and discrete-time signals (including transformations of independent variables).	Q1. Difference between Continous and Discrete time signal n Q2. Define continuous time unit step and unit impulse.
7			IV EEE	II	Fourier Transforms (FT): (i) Definition, conditions of existence of FT, properties,	Q1. Check whether the system is causal or not ,the H(z) is given by $(z^3 + z)/(z+1)$. Q2. Write the equation of Fourier Transform
8			IV EEE	II	F.T properties, magnitude and phase spectra	Q1. State convolution property in relation to fourier transform. Q2. Explain Linearity Property.
9			IV EEE	II	FT Theorems, Parseval's theorem,	Q1. State and prove parseval's theorem for Fourier transform Q2. Difference between Time scaling and time shifting Property.
10			IV EEE	II	Inverse FT, relation between LT and FT	Q1. What is Laplace transform Q2. Application of Laplace Transform
11			IV EEE	I	Discrete time Fourier transform (DTFT),	Q1. Define Transfer function of the DT system. Q2. Explain the Properties of DTFT

12			IV EEE	II	Inverse DTFT, convergence, properties and theorems,	Q1.Find the DTFS of $x(n)=5 + \sin(n\pi/2) + \cos(n\pi/4)$. Q2.Difference between time scaling and time shifting property
13			IV EEE	II	Comparison between continuous time FT and DTFT, Sampling theorem, Applications of Fourier Transform	Q1.Write the condition for existence of DTFT Q2.A continuous time sinusoid $\cos(2\pi ft+\theta)$ is sampled at a rate $f_s=1000\text{Hz}$. Determine the resulting signal sample if the input signal frequency f is 400Hz, 600Hz respectively
14			IV EEE	II	Time and frequency domain analysis of systems, Analysis of first order and second order systems, continuous-time (CT) system analysis using LT	Q1 .Relation between Time and Frequency domain. Q2. Firstorder and Second order systems
15			IV EEE	II	Continuous-time (CT) system analysis using LT, system functions of CT systems, poles and zeros,	Q1.Why CT signals are represented by samples. Q2.Define Poles ,Zeros and plot them
16			IV EEE	II	Block diagram representations; discrete-time system functions, block diagram representation,	Q1.State the significance of block diagram representation. Q2.Explain Cascading in BD
17			IV EEE	II	Block diagram representation,	Q1What will be the result of two blocks in Parallel Q2.Realize the block diagram representing the system $H(s)=s/(s+1)(S=2)$
18			IV EEE	II	Block diagram representation,	Q1.Write the output of the blocks when connected with Positive Feedback Q2 Realize the block diagram representing the system $H(s)=s/(s+1)$
19			IV EEE	II	Illustration of the concepts of system bandwidth and rise time through the analysis of a first order CT low pass filter	Q1.Relationship between rise time and bandwidth Q2. Difference between low-pass filter and High pass filter
20			IV EEE	III	One-sided LT of some common signals, important theorems	Q1.Give one exaple of Left sided signal Q2.Laplace Transform of $\sin(\omega t)u(t)$
21			IV EEE	III	properties of LT	Q1.What is Laplace transform of $t^n e^{-at} u(t)$ Q2 Laplace of $u(t)$ is
22			IV EEE	III	inverse LT,	Q1 Find the inverse Laplace transform for $X(s) = \frac{2}{s^2+8}$ Q2.Find the inverse Laplace transform of $X(s) = \frac{1}{(s+2)^2}$.
23			IV EEE	III	solutions of differential equations using LT, Bilateral LT, Regions of convergence (ROC)	Q1. What are the Properties of ROC of Laplace Transform Q2.Find the Laplace transform and ROC of $x(t) = e^{-t}u(-t)$
24			IV EEE	III	One sided and Bilateral Z-transforms	Q1 What is the one sided z-transform of $x(n)=\delta(n+k)$ Q2.What is the one sided z-transform of $x(n)=\delta(n-k)$?
25			IV EEE	III	ZT of some common signals,ROC	Q1.Define Z transform. Q2.What are the two types of Z transform?
26			IV EEE	III	Properties and theorems, of ZT	Q1.Define unilateral Z transform Q2.What is the time shifting property of Z transform.
27			IV EEE	IV	Properties and theorems, of ZT	Q1 State convolution property of Z transform Q2.What is the z-transform of the signal $x(n)=(0.5)^n u(n)$
28			IV EEE	IV	Properties and theorems, of ZT	Q1.State the methods to find inverse Z transform Q2.What is the z-transform of the signal $x(n)=[3(2^n)-4(3^n)]u(n)$?

29			IV EEE	IV	solution of difference equations using one-sided ZT	Q1. Find the Z transform of the following and determine ROC $x[n]=\{8,3,-2,0,4,6\}$ Q2. Determine the Z transform of following functions $x[n]=(-1)^n$
30			IV EEE	IV	s- to z-plane mapping	Q1. For what kind of signals one sided z-transform is unique. Q2. f all the poles of $H(z)$ are outside the unit circle, then the system is said to be