Ref No:

< Sri Krishna Institute of Technology, Bangalore>



COURSE PLAN

Academic Year 2019

Program:	B E – Electrical and Electronics Engineering			
Semester :	5			
Course Code:	17EE54			
Course Title:	SIGNALS AND SYSTEMS			
Credit / L-T-P:	4 / 4-0-0			
Total Contact Hours:	50			
Course Plan Author:	Vinutha S			

Academic Evaluation and Monitoring Cell

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Note : Remove "Table of Content" before including in CP Book Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

A. COURSE INFORMATION

1. Course Overview

Degree:	BE	Program:	EE
Semester:	5	Academic Year:	2019
Course Title:	SIGNALS AND SYSTEMS	Course Code:	17EE54
Credit / L-T-P:	4-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	50 Hours	SEE Marks:	60 Marks
CIA Marks:	40 Marks	Assignment	1 / Module
Course Plan Author:	Vinutha S	Sign	Dt:
Checked By:		Sign	Dt:
CO Targets	CIA Target : %	SEE Target:	%

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Mod	Content	Teachi	Identified Module	Blooms
ule		ng	Concepts	Learning
		Hours		Levels
1	Introduction: Definitions of signals and a system, classification	10	Signal	L2,L3
	of signals, basic operations on signals.		construction	
	Elementary signals viewed as interconnections of operations,			
	properties of systems.			
2	Time – Domain Representations For LTI Systems:	10	Signal	L3,L4
	Convolution, impulse response, properties,		Representation	
	solution of differential and difference equations, block			
	diagram representation.			
3	The Continuous-Time Fourier Transform: Representation of a	10	CT signal	L4,L5
	non -periodic signals: continuous-time		Representation	
	Fourier transform (FT), Properties of continuous-time Fourier			
	transform, Applications. Frequency			
	response of LTI systems, Solutions of differential equations •			
4	The Discrete-Time Fourier Transform: Representations of	10	DT signal	L4,L5
	non-periodic signals: The discrete-time		Representation	
	Fourier transform (DIFI), Properties of DIFI and			
	applications. Frequency response of LTI system, Solutions of			
	differential equations.		o	
5	\angle - Transforms: Introduction, \angle -transform, properties of ROC,	10	System stability	L4,L5
	properties of \angle -transforms, inversion of			
	Z-transform methods-power series and partial expansion,			
	Transforms analysis of LTT systems, transfer			
	nunction, stability and causality, unitateral Z-transform and its			
		50		
-	roldl	50	-	-

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes

2. Design: Simulation and design tools used – software tools used ; Free / open source

3. Research: Recent developments on the concepts – publications in journals; conferences etc.

	Details	Chapters	Availability
Modul		in book	
A	Text books (Title, Authors, Edition, Publisher, Year,)	-	-
1, 2, 3,	Signals and Systems:Simon Haykin,Berry Van Veen, Wiley 2 nd	1 to 10	In Lib
4, 5	Edition,2002		
B	Reference books (Title, Authors, Edition, Publisher, Year.)	-	-
1, 2	Govind K Sharma,McGraw Hill,2 nd Edition 2010		IN LID
2,3	Signals and Systems,NagoorKani,McGraw Hill,1 st Edition 2010		In Lib
2,3	Signals and Systems A Primer with MATLAB,Matthew N.O. Sadiku Warsame H. Ali,CRC Press, 1 st Edition, 2016		In Lib
3,4	Signals and Systems:Anand Kumar,PHI,3 rd Edition, 2015		In Lib
C	Concept Videos or Simulation for Understanding	-	-
C1	https://nptel.ac.in/courses/108104100/		
C2	https://www.youtube.com/watch?v=npsZ2S		
C3	https://www.youtube.com/watch?v=_HATc2zAhcY_		
C4			
<u>C5</u>			
C7			
C8			
C9			
C10			
D	Software Tools for Design	-	-
1	MA Lad simulink		
F	Recent Developments for Research		
	https://ieeexplore.ieee.org/document/7836860		
	Utners (Web, VIGEO, Simulation, Notes etc.)	-	-
?			

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

Students must have team the following courses / Topics with described content										
Mod	Course	Course Name	Topic / Description	Sem	Remarks	Blooms				
ules	Code					Level				
1	15EE32	Electrical	Laplace transform	4	Basics of laplace	L3				
		circuit Analysis			transform					

Students must have learnt the following Courses / Topics with described Content

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

- 5 -		1.0		
Mod	Topic / Description	Area	Remarks	Blooms
ules				Level
1	Multi stage signal processing	Advanced		L4
		topic		
2	Adaptive signal processing	Advanced		L3
		topic		

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

ulesCode.#At the end of the course, student should be able toHoursMethodnt MethodLevel117EE54.1Understand the basic elementary signals and their classification by mathematical description.05Signal basicsLectureassignme ntL2117EE54.2Represent the interconnection of signals and their construction.05Signal constructio nLectureUnit test and tutorial assignme ntL3217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal tutorial tutorial tionLectureassignme assignme ntL5217EE54.4Represent the linear time invariant system by block diagram05Differential for mod representa tionLectureUnit test and assignme ntL4317EE54.5Resolve the signals in frequency05continuous to modeLecture assignme assignmeL2	ules 1	Code.#						
Image: should be able toMethod117EE54.1Understand the basic elementary signals and their classification by mathematical description.05Signal basicsLecture 	1		At the end of the course, student	Hours		Method	nt	Level
117EE54.1Understand the basic elementary signals and their classification by mathematical description.05Signal basicsLecture basicsassignme ntL2117EE54.2Represent the interconnection of signals and their construction.05Signal constructio nLectureUnderstaL3217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal representa tionLectureassignme and and tutorialL5217EE54.4Represent the linear time invariant system by block diagram05Differential for LTI system and understand the convolution operation for continuous time and Discrete signals.05Differential for LTI system by block diagramLectureUnit test and assignme ntL4317EE54.5Resolve the signals in frequency05continuous continuousLecture assignme assignme tionLaterL3	1		should be able to				Method	
Signals and their classification by mathematical description.basicsntUndersta117EE54.2Represent the interconnection of signals and their construction.05Signal constructioLecture and tutorialUnit test and assignmeL3217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal representa tionLecture and assignmeAssignme assignmeL5217EE54.4Represent the linear time invariant system by block diagram05Differential for mod representa tionLectureUnit test and assignmeL4317EE54.5Resolve the signals in frequency05continuous tionLecture and assignmeL4		17EE54.1	Understand the basic elementary	05	Signal	Lecture	assignme	L2
117EE54.2Represent the interconnection of signals and their construction.05Signal construction and tutorial assignme ntL3217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal tionLecture assignme ntL5217EE54.4Represent the linear time invariant system by block diagram05Differential form of representa tionLecture of representa tionLecture of representa tionL4317EE54.5Resolve the signals in frequency05continuous Lecture assignme tionL4			signals and their classification by		basics		nt	Understand
11/EEG4.2Represent the interconstruction.05Signal constructio nLecture and assignme ntReprese217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal representa tionLecture assignme ntBeerese217EE54.4Represent the linear time invariant system by block diagram05Differential for mod representa tionLectureUnit test and Diagran assignme tionL4317EE54.5Resolve the signals in frequency05continuous tionLectureassignme and and tionL25317EE54.5Resolve the signals in frequency05continuous tionLectureLassignme assignme tionL25317EE54.5Resolve the signals in frequency05continuous tionLectureassignme assignme tionL3	1	17FF54.2	Represent the interconnection of	05	Signal	Lecture	Unit test	13
217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal representa tionLecture assignme ntL5217EE54.4Represent the linear time invariant system by block diagram05Differential for m of representa tionLectureUnit test and and assignme tionL4317EE54.5Resolve the signals in frequency05continuous tionLectureUnit test and assignme tionL4	-	1/ 2234.2	signals and their construction.	00	constructio	and	and	Represent
217EE54.3Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.05Signal representa tionLecture assignme ntL5217EE54.4Represent the linear time invariant system by block diagram05Differential for mod representa tionLectureUnit test and and assignme representa tionL4317EE54.5Resolve the signals in frequency05continuous tionLectureLassignme and assignme tionL2			3		n	tutorial	assignme	-1
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for LTI system and understand the convolution operation for continuous time and Discrete signals.representa tionntDevelop217EE54.4Represent the linear time invariant system by block diagram05Differential form of representa tionLecture and assignme ntUnit test and DiagramL4317EE54.5Resolve the signals in frequency05continuous LectureLecture assignme tionLater LaterLater LaterLater Later317EE54.5Resolve the signals in frequency05continuous LectureLecture LaterL3	2	17EE54.3	Develop input output relationship	05	Signal	Lecture	assignme	L5
convolutionoperationfor continuoustioncontinuoustimeandDiscrete signals.tion217EE54.4Represent the linear time invariant system by block diagram05Differential form of representa tionLectureUnit test and and assignme tionL4317EE54.5Resolve the signals in frequency05continuousLectureLassignme assignmeL3			for LTI system and understand the		representa		nt	Develop
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2 17EE54.4 Represent the tine invariant of system by block diagram 05 Differentiat because of it test of and plagram 3 17EE54.5 Resolve the signals in frequency 05 continuous Lecture assignme	2	17FF54.4	Represent the linear time invariant	05	Differential	Locturo	L Init tost	
representa tionassignme nt317EE54.5Resolve the signals in frequency05continuousLectureassignme		1/2234.4	system by block diagram	0.5	form of	Lociale	and	Diagram
tionnt317EE54.5Resolve the signals in frequency05continuousLectureassignmeL3					representa		assignme	
3 17EE54.5 Resolve the signals in frequency 05 continuous Lecture assignme L3					tion		nt	
	3	17EE54.5	Resolve the signals in frequency	05	continuous	Lecture	assignme	L3
domain using Fourier transform of time signal nt Solve			domain using Fourier transform of		time signal		nt	Solve
continuous time signals representa			continuous time signals		representa			
UION UION		1755746	Determine the colution for	05	lion	Locturo	L Init toct	1.4
differential equation using Frequency and Determin	3	1/LL54.0	differential equation using	05	Frequency	Lecture	and	L4 Determine
frequency response of continuous response assignme			frequency response of continuous		response		assignme	Determine
time signals nt			time signals				nt	
4 17EE54.7 Apply discrete time Fourier 05 Discrete Lecture Assignme L3	4	17EE54.7	Apply discrete time Fourier	05	Discrete	Lecture	Assignme	L3
transform representation to study time signal nt Apply			transform representation to study		time signal		nt	Apply
and resolve the signal and system representa			and resolve the signal and system		representa			
LION		1755649	Determine the colution for	05	tion	Locturo	L Init toct	
4 1/EE54.6 Determine the solution for 05 Frequency Lecture Onlinest L4	4	1/6654.0	differential equation using	05	response	Lecture	and	L4 Determine
frequency response of Discrete for assignme			frequency response of Discrete		for		assignme	Determine
signals.			signals.		Discrete		nt	
time					time			
signals					signals			
5 17EE54.9 Apply z-transform and its 05 System Lecture Assignme L3	5	17EE54.9	Apply z-transform and its	05	System	Lecture	Assignme	L3
properties for the analysis of stability nt Apply			properties for the analysis of		stability		nt	Apply
alscrete time system using partial			discrete time system using partial					
5 17EE5/10 Apply the unilateral z-transform to 05 System Unit test 12	5	17FF5410	Apply the unilateral z-transform to	05	Sustam		Unit tost	10
solve difference equation.	0	1/:)4.10	solve difference equation.	0.5	stability for		and	ulady
right sided assignme					right sided		assignme	· · · · · · · · · · · · · · · · · · ·
sequence nt					sequence		nt	

Total 54	L2-L4
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2. Course Applications

Write 1 or 2 applications per CO.

Students should be able to employ / apply the course learnings to

Stude	ship should be able to employ 7 apply the course tearnings to TT		
Mod	Application Area	CO	Level
ules	Compiled from Module Applications.		
1	Speech and audio processing,biological signal analysis	CO1	L2
1	Remote sensing system	CO2	L3
2	Radars, Digital filter design	CO3	L5
2	Distance phone calls, Digital recording, image processing	CO4	L4
3	Speech recognition,image filtering	CO5	L3
3	Image reconstruction, image construction	CO6	L4
4	Amplitude modulation, frequency multiplexing	CO7	L3
4	Circuit analysis,sampling theorem.	CO8	L4
5	Analysis of digital system, system design, automatic controls in telecommunication.	CO9	L3
5	Simulate the continuous system, Analysis of digital filters	CO10	L3

3. Mapping And Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair. To attain competency required (as defined in POs) in a specified area and the knowledge & ability required to accomplish it.

1090	100.00		inpastra		
Mod	And Mapping Ma		Mapping	Justification for each CO-PO pair	Lev
ules			Level		el
-	CO	PO	-	'Area': 'Competency' and 'Knowledge' for specified 'Accomplishment'	-
1	CO1	PO1	3	Fundamental of signals and systems	L2
1	CO1	PO2	3	Analyse the classification of types of signals	L4
1	CO2	PO1	3	Knowledge of construction of signals	L2
1	CO2	PO2	3	Analyse different types of siganls and their interconnection	L4
2	2 CO3 PO1 3		3	Basic knowledge of convolution	L2
2	CO3	PO2	3	Formulate the solutions for discrete and continous time sysems using convolution	L4
2	CO4	PO1	3	Knowledge of Linear time invariant system	L2
2	CO4	PO2	3	Develop block diagrams for linear time invariant systems	L4
3	CO5	PO1	3	Basic knowledge about frequency domain signals	L2
3	CO5	PO2	3	Analyse the complex frequency domian signals	L4
3	CO5	PO5	3	Apply modern tool like fourier transform to solve the complex frequency domain signals	L5
3	CO6	PO1	3	Apply knowledge of mathematics to the differential equation	L2
3	CO6	PO2	3	Formulate the differential equations using principles of mathematics	L4
3	CO6	PO5	3	Design the solutions for complex differential equations using Fourier transform	L5
4	CO7	PO1	3	Basic knowledge about frequency domain signals	L2
4	CO7	PO2	3	Analyse the complex frequency domian signals	L4
4	CO7	PO5	3	Apply modern tool like disceet time fourier transform to solve the complex frequency domain signals	L5
4	CO8	PO1	3	Apply knowledge of mathematics to the difference equation	L2
4	CO8	PO2	3	Formulate the difference equations using principles of mathematics	L4
4	CO8	PO5	3	Design the solutions for complex difference equations using disceet time Fourier transform	L5
5	CO9	PO1	3	Knowledge of solving partial fraction	L2
5	CO9	PO2	3	Analyse the discrete time system using Partial fraction	L4
5	CO9	PO5	3	Apply proper techniques to solve the problems on z transform	L5
5	CO10	PO1	3	Knowledge of solving difference equation	L2
5	CO10	PO2	3	Analyse the diffrence equation using unilateral z transform	L4
5	CO10	PO5	3	Apply proper techniques to solve the difference equation	L5

4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

-	-	Course Outcomes	Program Outcomes									-						
Mod	CO.#	At the end of the course	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PS	PS	PS	Lev
ules		student should be able to	1	2	3	4	5	6	7	8	9	10	11	12	O1	02	03	el
1	17EE54.1	Understand the basic	X	X														L2
		elementary signals and their																
		classification by mathematical																
		description.																<u> </u>
1	17EE54.2	Represent the interconnection of	X	X														L2
		signals and their construction.																
2	1/EE54.3	relationship for LTL system and	. X	X														L3
		understand the convolution																
		operation for continuous time																
		and Discrete signals.																
2	17EE54.4	Represent the linear time	X		Х													L3
		invariant system by block																
		diagram																
3	17EE54.5	Resolve the signals in frequency	X	X			X											L4
		domain using Fourier transform																
2	17EE46	Determine the solution for					v											
3	1/LL94.0	differential equation using		^														L4
		frequency response of	:															
		continuous time signals																
4	17EE54.7	Apply discrete time Fourier	X	X			Х											L2
		transform representation to																
		study and resolve the signal and																
4	1755-18	System Determine the solution for	- v	v			v											
4	1/2254.0	difference equation using																L4
		frequency response of Discrete																
		signals.																
5	17EE54.9	Apply z-transform and its	X	Х			Х											L4
		properties for the analysis of																
		discrete time system using	r															
		partial fraction expansion																
	1755710	method.		V			v											
5	1/2254.10	to solve difference equation																
-	17EE81	Average attainment (1, 2, or 3)																-
-	PO, PSO	1.Engineering Knowledge; 2.Prob	lem	Ar	haly	sis;	3.1	Des	ign	/	Dei	velc	pm	ent	of	Sc	luti	ons;
		4.Conduct Investigations of Compl	lex l	Prol	oler	ns; ;	5.M	ode	ern T	Тоо	l Us	sage	e; 6.	The	e En	ngine	eer	and
		Society; 7.Environment and Si	usto	aina	bilit	ty;	8.E	thic	:S;	9.lr	ndiv	idu	al	an	d	Теа	тu	ork;
		10.Communication; 11.Project N	1an	age	eme	ent	ar	nd	Fir	and	ce;	. 12	.Life	e-lo	ng	Le	earr	ning;
		S1.Software Engineering; S2.Data E	<u>3as</u> e	e M	ana	iger	ner	nt; S	3.W	'eb	Des	sign						

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Mod	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
ules					
1	1	Fundamentals of signals and systems	workshop	17/08/18	

6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc.

Mod	Gap Topic	Area	Actions Planned	Schedule	Resources	PO Mapping
ules				Planned	Person	

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Mod	Title	Teach.		No. o	f quest	ion in	Exam		CO	Levels
ules		Hours	CIA-1	CIA-2	CIA-3	Asg	Extra	SEE		
							Asg			
1	Introduction to signals and	10	2	-	-	1	0	2	CO1, CO2	L2, L3
	systems									
2	Time – Domain Representations	10	2	-	-	1	0	2	CO3, CO4	L2, L3
	For LTI Systems									
3	The Continuous-Time Fourier	10	-	2	-	1	0	2	CO5, CO6	L4, L5
	Transform									
4	The Discrete-Time Fourier	10	-	2	-	1	0	2	CO7, C08	L3, L4
	Transform									
5	Z- Transforms	10	-	-	4	1	0	2	CO9, CO10	L3, L4
-	Total	50	4	4	4	5	5	10	-	-

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Mod	Evaluation	Weightage in	СО	Levels
ules		Marks		
1, 2	CIA Exam – 1	30	CO1, CO2, CO3, CO4	l3, l4
3, 4	CIA Exam – 2	30	CO5, CO6, CO7, C08	L4, L5
5	CIA Exam – 3	30	CO9, CO10	L3, L4
1, 2	Assignment - 1	10	CO1, CO2, CO3, CO4	l3, l4
3, 4	Assignment - 2	10	CO5, CO6, CO7, CO8	L4, L5
5	Assignment - 3	10	CO9, CO10	L3, L4
1, 2	Seminar - 1			
3, 4	Seminar - 2			
5	Seminar - 3			
	OtherActivities :			
	Final CIA Marks	20		-

D1. TEACHING PLAN - 1

Module - 1

Title:	Introduction to power systems, Overhead transmission lines and insulators	Appr	12 Hrs
		Time:	
a	Course Outcomes	-	Blooms
-	The student should be able to:	-	Level
1	Understand the basic elementary signals and their classification by mathematical description.	CO1	L2

2	Represent the interconnection of signals and their construction.	CO2	L3
b	Course Schedule	-	-
Class No	Module Content Covered	CO	Level
1	Introduction: Definitions of signals and a system	CO1	L1
2	Classification of signals.	CO1	L2
3	Basic operations on signals: Amplitude and time operations	CO1	L2
4	Folding, Time shifting, time scaling operations	CO1	L2,L3
5	Problems	CO1	L3,L4
6	Problems	CO1	L3,L4
7	Elementary signals and their representation	CO1	L1
8	Elementary signals viewed as interconnections of operations,	CO2	L1
9	properties of systems.	CO2	L2
10	problems	CO1	L3,L4
С	Application Areas	CO	Level
1	Speech and audio processing, biological signal analysis	CO1	L2
2	Remote sensing system.	CO2	L3
d	Review Questions	-	-
1	Define Signals and systems?	CO1	L1
2	What are the major classifications of the signal?	CO1	L3
3	Explain the basic elementary signals with their mathematical equation?	CO2	L2
4	Define periodic signal and non-periodic signal?	CO2	L3
5	Define Energy and power signal ?	CO2	L2
6	Define even and odd signal ?	CO2	L3
7	Determine whether the following systems are linear,time invariant,causal ,stable. y(n)=log(x(n)).	CO2	L2
8	Determine whether the following systems are linear or not dy(t) / dt + 3ty(t) = $t_2 x(t) & y(n)=2x(n)+1 / x(n-1)$	CO2	L3
9	Determine whether the following systems are Time-Invarient or not $Y(t) = t x(t) $ & $y(n) = x(2n)$	CO2	L4
10	Find whether the signal x(t) = 2 cos (10 t+1) – sin(4t-1) is periodic or not. (6) Evaluate $\Sigma n_{\rm e}(-\infty t_0 \infty) = 2n \delta (n_{\rm e} 2)$	CO2	L4
11	b) Determine whether the following signals are energy or power and calculate	CO1	15
	their energy and power. i) $x(n)=(1/2)n u(n)$ ii) $x(t)=rect(t/To)$ iii) $x(t)=cos2 (\Omega t)$	001	
12	Define unit step, ramp, pulse, impulse and exponential signals. Obtain the	CO1	L5
	relationship between the unit step and unit ramp function.		
13	Find the fundamental period T of the signal ,	CO1	L5
	x(n)=cos(nπ/2)-sin(nπ/8)+3cos(nπ/4 + π/3)		
14	Determine the power of the following signals. i) x1(t)=5cos(50t+π/3) ii) x2(t)= 20cos50tcos15t	CO2	L5
15	Determine whether the following systems are time variant 0r time -invariant. i) y(t)=tx(t) ii)y(n)=x(2n)	CO1	L5
16	Determine whether the following signal is periodic. If periodic , determine the fundamental period: X(t)=3cost+4cos(t/2) X(t)=cos60πt+sin50πt	CO1	L5
17	Determine whether the following system is linear, time invariant, causal, stable and static 1. $y(n) = x^2$ (n) 2. $y(n) = x(-n)$	CO2	L5
18	A discrete time signal is given by x(n)={1,1,1,1,2} Sketch the following signals a)x(n-2) b)x(n+1) c)x(3-n) d)x(n)u(n-1) e)x(n-1) δ (n-1) f)Even samples of x(n) g)odd samples of x(n)	CO2	L5
е	Experiences	-	-

Title:	Line Parameters	Appr	7 Hrs
		Time:	

a	Course Outcomes	-	Blooms
-	The student should be able to:	-	Level
1	Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.	CO3	L4
2	Represent the linear time invariant system by block diagram.	CO4	L3
b	Course Schedule	-	_
Class No	Module Content Covered	CO	Level
11	Introduction to convolution	CO3	12
12	Convolution sum and convolution integral	<u> </u>	3
13	Problems on convolution sum and covolution integral	<u> </u>	
1/	Impulse response	<u> </u>	
15	Properties of LTL system	<u> </u>	2
16	Solution of difference equations	<u> </u>	
17	Problems on difference equation	CO4	
18	Solution of differential equation	CO4	
10	Problems on difference equation	CO4	
20	Block diagram Representation with problems	CO4	
		004	
C	Application Areas	00	Level
1	Radars Digital filter design		12
2	Distance phone calls. Digital recording, image processing	<u> </u>	
		004	<u> </u>
d	Review Questions	_	_
10	The impulse response of a continuous time LTL system is given by	0.03	13
-5	$h(t)=e^{2t}u(t-1)$ check whether the system is stable causal and memoryless.	005	
20	A continuous time LTI system with unit impulse response h(t)=u(t) and input	CO4	L3
	$x(t)=e^{-at}u(t)$ a>0 find the output $v(t)$ of the system.	1	
21	Find the step response for the LTI system represented by the impulse	CO3	L3
	response $h(n)=(1/2)^n u(n)$.	Ũ	Ũ
22	consider a continuous time LTI system is represented by the impulse	CO4	L4
	response $h(t)=e^{-3t}u(t-1)$ determine whether it is i)stable ii) causal		
23	Solve the differential equation,	CO4	L2
	$d^{2}y(t)/dt^{2} + 3 dy(t)/dt + 2y(t) = 2x(t)$ with y(0)=-1 dy(t)/dt with t=0 and		
	x(t)=cost u(t)		
24	The impulse response of a continuous time LTI system is given by	CO3	L53
	$h(t)=e^{2t}u(t-1)$ check whether the system is stable,causal and memoryless.		
25	Find the response of the system described by difference equations	CO3	L3
	y(n)-1/9 y(n-2)=x(n-1) with y(-1)=1, y(-2)=0 and x(n)=u(n)		
26	find the difference equation representation for the block diagram	CO4	L4
	representation of continuous time LTT system shown in figure 3c,		
	$\chi(t)$ $\rightarrow y(t)$		
	J		
	ů) , ů		
27	Determine the conditions so triat the continuous time system with impulse	CO4	L3
	response $h(t)=e^{at}u(-t)$ is stable. Also find out whether the system is i)causal ii)	1	
	memoryless		
28	Represent the differential equation given below in direct form I and II	CO4	L3
	$d^{2}y(t)/dt^{2} + 3 dy(t)/dt + 2y(t) = d^{2}y(t)/dt^{2} + dx(t)/dt^{2}$		
29	Find the zero input response and forced response for the system described	CO4	L4
	by the difference equation y(n)-1/4 y(n-2)=2x(n)+x(n-1) given x(n)=u(n);		
	y(-2)=8 ,y(-1)=0.		
30	For the given impulse response determine whether system is memory less,	CO4	L3
	stable and causal justify your answer h(n)=2 ⁿ u(-n)		<u> </u>
31	Given impulse response of the system $h(n)=(1/2)^n u(n-2)$ find out step response	CO4	L4

22 Draw direct form I and direct form II implementation for the following	~ ~	
difference equation y(n)-1/4 y(n-1)-1/8y(n-2)=2x(n)+3x(n-1)	CO4	L3
33 Find the step response of a LTI system if impulse response $h(t)=t^2 u(t)$	CO4	L4
34 Obtain the response of the system given by $d^2y(t)/dt^2y(t) + y(t) = 3 dx(t)/dt$ with (y(0)=-1, dy(t)/dt = $d^2y(t)/dt^2=1$ and $2e^{-t}u(t)$	CO4	L3
35 Find the difference equation for the system shown in fig. $35 \qquad \qquad$	CO4	L4

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs (Code:	17EE54	Sem:	1	Marks:	30	Time: 7	5 minute	minutes		
Cou	urse: Design and Analysis of Algorithms										
-	-	Note: Answ	/er any 3 q	uestions, ea	ch carry equ	ıal marks.		Marks	СО	Level	
1	a	Distinguish and Discret periodic sig	between: i e time sigr jnals) Energy sigr Ials iii) Even a	and Powe and Odd sigi	er signal ii)(nal iv)Perio	Continuous dic and non	8	CO1	L3	
	b	Determine i) x(t)=1+t²+t	the even a tant+tan²t o	nd Odd com cot t + cot³t	ii) x(t)=[sir	he signal It+cost]³		7	CO1	L4	
					OR						
2	a	Determine determine t i) x(t)=[2cos	e whether the fundarr ²(⊓t∕2)-1]sir	the follow nental period חתר cosחt	ring signals I ii) x	are perioc (n)=cos(∏n/7	lic, if periodi 7) sin(пn/3)	c 8	CO1	L4	
	b	Determine	the followii	ng signal is E	nergy or Po	wer signal		7	CO2	L4	
		i) x(t)=e ^{-a t}	a>0	ii) x(t) =	5+t for 1 5-t 0	(-5,-4) for (-4, 4) for (4, 5) otherwise					
3	a	Draw the signal interview of the signal interview of the second s	gnal -4r(t-2)-6r(1	:-3)+r(t) i	i)Y(t)={{x(t)+x(2-t)}u(1-t)}u(t)	7	CO3	L4	
	b	b) Express staircase si	x(t) interms ignal	s of g(t) using	g shifting and	l scaling of 3	stepped	8	CO3	L5	
			-		OR						
4	а	Determine memoryles i) y(t)=d/dt[ii) y(n)=x(k+2	whether th is iv) causal [e ^{-t} x(t)} 2)	e system is i . v) stable) Linear ii) Tii	ne Invariant	iii)	8	CO4	L3	
	b	Determine	the relatio	nship betwe	en the signa	ls.		7	CO4	L2	

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

				Model	Assignment	Questions	6			
Crs C	ode:	17EE54	Sem:	1	Marks:	5 / 10	Time:	90 – 120	minute	S
Cours	se:	Design a	and Analysis o	of Algorithm	IS					
Note:	Each	student	to answer 2-3	assignmen	nts. Each assi	gnment c	arries equal m	ark.		
SNo	l	JSN		Assig	nment Desc	ription		Marks	СО	Level
1	1KT17	'EE002	Define signal	s and syste	ms, with app	ropriate e	xamples?	10	CO1	L2
2 1KT17EE003 Write a note on classification of signals with suitable examples?		10	CO2	L3						
3 1KT17EE004 Find the even and odd components of the signal $x(t) = (1+t^3)\cos^3(10t)$.		10	CO2	L4						
4 1KT17EE006 Find the overall operator of the system				10	CO1	L3				

		y(n)= 1/3[x(n+1)+x(n)+x(n-1)].			
5	1KT17EE007	Determine whether the system y(t) = x(t/2) is i) linear ii)Time invarient iii)memory iv)causal v)stable	10	CO2	L3
6	1KT17EE008	Sketch the following signal, hence find the even and odd component of signal, draw even and odd part of x(t)= u(t)- r(t-1)+2r(t-2)-r(t-3)	10	CO1	L4
7	1KT17EE011	State whether the following signals is periodic or not, if periodic find the fundamental period: i)x(n) = cos(πn/2)+sin(πn/2) ii)x(t)=cos(2πt). sin(2πt))	10	CO2	L4
8	1KT17EE014	Consider the system whose output is y(t)=cosω _c +x(t) determine where it is , i)memoryless ii)causal iii)linear iv)time invarient v)stable	10	CO2	L4
9	1KT17EE015	Sketch the signal for the following function, x(t) = 2t for t varies from 0 to 1 and x(t)=4-2t for t varies from 1 to 2. determine the odd component of x(t).	10	CO1	L3
10	1KT16EE010	Given x(n)=[3 2 1 0 1 2 3] and y(n)= [-1 -1 -1 -1 0 1 1 1 1] plot x(n- 2)+y(n+2)	10	CO1	L4
11	1KT18EE401	Determine whether the following systems are time variant 0r time -invariant. i) y(t)=tx(t) ii)y(n)=x(2n)	10	CO1	L4
12	1KT14EE004	Determine whether the following signal is periodic. If periodic , determine the fundamental period: X(t)=3cost+4cos(t/2) X(t)=cos60πt+sin50πt	10	СО	L3
13	1KT14EE008	Determine the power and RMS value of the following signals. i) $x_1(t)=5\cos(50t+\pi/3)$ ii) $x_2(t)=20\cos50t\cos15t$	10	CO1	L4
14	1KT15EE002	Determine whether the following systems are linear,time invariant,causal ,stable. y(n)=log(x(n)).	10	CO1	L4
15	1KT15EE003	Determine whether the following systems are linear or not dy(t) / dt + 3ty(t) = t2 x(t) & y(n)=2x(n)+ 1 / x(n-1)	10	CO4	L4
16	1KT15EE010	Determine whether the following system is linear, time invariant, causal, stable and static 1. y(n) = x2 (n) 2. y(n) = x(-n)	10	CO2	L4
17	1KT17EE002	A discrete time signal is given by $x(n)=\{1,1,1,1,2\}$ Sketch the following signals a) $x(n-2)$ b) $x(n+1)$ c) $x(3-n)$ d) $x(n)u(n-1)$ e) $x(n-1)\delta(n-1)$ f)Even samples of $x(n)$ g)odd samples of $x(n)$	10	CO1	L4
18	1KT17EE003	Determine whether the system is i) Linear ii) Time Invariant iii) memoryless iv) causal v) stable i) y(t)=d/dt{e ^{-t} x(t)} ii) y(n)=x(k+2)	10	CO2	L3
19	1KT17EE004	Draw the signal i)x(t)=3r(t-1)-4r(t-2)-6r(t-3)+r(t) ii)Y(t)={[x(t)+x(2-t)]u(1-t)}u(t)	10	CO1	L4
20	1KT17EE006	Define signals and systems, with appropriate examples?	10	CO1	L2
21	1KT17EE007	Write a note on classification of signals with suitable examples?	10	CO1	L2
22	1KT17EE008	Distinguish between: i) Energy signal and Power signal ii)Continuous and Discrete time signals iii) Even and Odd signal iv)Periodic and non periodic signals	10	CO1	L3
23	1KT17EE011	Determine the even and Odd components of the signal i) x(t)=1+t ² +t tant+tan ² t cot t + cot ³ t ii) x(t)=[sint+cost] ³	10	CO1	L3
24	1KT17EE014	Define signals ?	10	CO1	L4
25	1KT17EE015	The impulse response of a continuous time LTI system is given by h(t)=e²tu(t-1) check whether the system is stable causal and memoryless.	10	CO2	L2
26	1KT16EE010	A continuous time LTI system with unit impulse response h(t)=u(t) and input x(t)=e ^{-at} u(t) a>0 find the output y(t) of the system.	10	CO3	L3
27	1KT18EE401	Find the step response for the LTI system represented by the impulse response $h(n)=(1/2)^n u(n)$.	10	CO4	L3
28	1KT14EE004	consider a continuous time LTI system is represented by the impulse response $h(t)=e^{-3t}$ $u(t-1)$ determine whether it is	10	CO2	L3

		i)stable ii) causal			
29	1KT14EE008	Solve the differential equation,	10	CO2	L3
		$d^{2}y(t)/dt^{2} + 3 dy(t)/dt + 2y(t) = 2x(t)$ with y(0)=-1 dy(t)/dt with t=0			
		and x(t)=cost u(t)			
30	1KT15EE002	The impulse response of a continuous time LTL system is	10	CO2	3
		given by $h(t)=e^{2t}u(t-1)$ check whether the system is		001	-5
		stable causal and memoryless			
21		Find the response of the system described by difference	10	CO_{2}	1.4
151	IN 115EE003	Find the response of the system described by difference	10	003	∟4
		y(n)-1/9 y(n-2)=x(n-1) with y(-1)=1, y(-2)=0 and x(n)=u(n)			
32	1K115EE010	find the difference equation representation for the block	10	CO4	L3
		diagram representation of continuous time LII system shown			
		in figure 3c,			
		$-\frac{1}{2}$ $-\frac{3}{2}$ $-\frac{3}{2}$			
		15.25(0)			
33	1KT17EE002	Determine the conditions so that the continuous time system	10	CO3	L4
		with impulse response $h(t)=e^{at}u(-t)$ is stable. Also find out			
		whether the system is i)causal ii) memoryless			
34	1KT17EE003	Represent the differential equation given below in direct form	10	CO3	L4
	, 0	$d^{2}v(t)/dt^{2} + 3 dv(t)/dt + 2v(t) = d^{2}v(t)/dt^{2} + dx(t)/dt^{2}$		Ū	
35	1KT17FF004	Find the zero input response and forced response for the	10	CO3	14
		system described by the difference equation $y(n)-1/4$ $y(n-1)$		005	
		2)=2x(n)+x(n-1) given $x(n)=u(n)$; $v(-2)=8$ $v(-1)=0$			
26	1KT17EE006	For the given impulse response determine whether system is	10	COA	13
50		memory less stable and causal justify your answer $h(n)-2^n u(-1)$	10	004	L)
7		Civan impulse response of the system $h(n) (1/2)^{11} u(n-2)$ find	10	CO4	
3/	INTITEEOO	Given impulse response of the system ((1/2) u(1-2) ind	10	004	∟3
		out step response of the system.		<u> </u>	
38	1KT17EE008	Draw direct form-I and direct form- II implementation for the	10	CO4	L3
		following difference equation y(n)-1/4 y(n-1)-1/8y(n-2)=2x(n)			
		+3x(n-1)			
39	1KT17EE011	Find the step response of a LTI system if impulse response	10	CO4	L3
		h(t)=t² u(t)			
40	1KT17EE014	Obtain the response of the system given by $d^2y(t)/dt^2y(t) + y(t)$	10	CO3	L4
		= $3 dx(t)/dt$ with y(0)=-1, dy(t)/dt = $d^2y(t)/dt^2=1$ and $2e^{-t}u(t)$			
41	1KT17EE015	Find the difference equation for the system shown in fig.	10	CO4	L4
		YEN OF THE STATE YEND			
		-1/4 1/4			

Fig.Q.3(c)

D2. TEACHING PLAN - 2

Title:	Performance of transmission lines	Appr	12 Hrs
		Time:	
a	Course Outcomes	СО	Blooms
-	At the end of the topic the student should be able to	-	Level
1	Resolve the signals in frequency domain using Fourier transform of continuous time signals.	CO5	L3
2	Determine the solution for differential equation using frequency response of continuous time signals.	CO6	L4
b	Course Schedule		
Class No	Module Content Covered	СО	Level
1	Introduction to Continuous-Time Fourier Transform	CO5	L2
2	Representation of a non -periodic signals: continuous-time	CO5	L3

	Fourier transform (FT),		
3	Properties of continuous-time Fourier transform	CO5	L3
4	Problems on properties	CO5	L4
5	Problems on properties	CO5	L4
6	Applications of Fourier transform.	CO6	L3
7	Problems	CO6	L4
8	Frequency response of LTI systems.	CO6	L3
9	Problems	CO6	L4
10	Solutions of differential equations with problems	CO6	L4
С	Application Areas	CO	Level
1	Radars, Digital filter design	CO5	L5
2	Distance phone calls, Digital recording, image processing	_CO6	L5
d	Paview Questions		
1	State & prove the following properties of ET i) Time shifting property ii)	CO5	3
	parseval's theorem.	000	-5
2	Obtain the fourier transform of x(t) = te ^{-at} u(t)	CO5	L4
3	Find the fourier transform of rectangular pulse shown below $x(\omega) = 1/(a+j\omega)^2$	CO5	L3
4	Find the frequency response & impulse response of the system described by	CO5	L4
	differential equation dy(t)/dt + 8y(t) =x(t)		
5	Find the Fourier transform of i) $x(t)$ = t2 u(t) u(1-t) and ii) $x(t)$ = t exp(- t) u(t) , >0	CO6	L4
6	Find the fourier transform of triangular pulse (10) $x(t) = (t/m) = \frac{102 t }{m t } o otherwise$	CO6	L4
7	Obtain the exponential fourier series of the waveform	CO6	L4
	ло 1 + А		
8	Find the Fourier transform of rectangular pulse. Sketch the signal and its	CO5	L3
	Fourier transform		
9	Find the Fourier transform of a triangular pulse.	CO6	L3
10	State and prove following properties of Fourier Transformation.	CO5	L4
	i) Frequency shift ii) Convolution theorem.		
11	Determine Fourier transformation of following signals.	CO5	L4
12	Find the frequency response and the impulse response of the system	CO6	L4
	described by the differential equation.		
	$d^2 y/dt^2 + 5d y/dt + 6y = -d /dt x(t).$		
13	State and explain parsavel's theorem	CO6	L3
14	Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t)	CO6	L4
15	The impulse response of continuous time signal is given by h(t)=1/Re e-t/RC	CO5	L4
	u(t) find the frequency response and plot the magnitude		· ·
е	Experiences	-	-

Title:	Corona and underground cable	Appr	13 Hrs
		Time:	
a	Course Outcomes	СО	Blooms
-	At the end of the topic the student should be able to	-	Level
1	Apply discrete time Fourier transform representation to study and resolve the signal and system.	C07	L5
2	Determine the solution for differential equation using frequency response of Discrete signals.	CO8	L4
b	Course Schedule		

Class No	Module Content Covered	СО	Level
1	Introduction to Discrete-Time Fourier Transform	CO7	L3
2	Representations of non-periodic signals: The discrete-time Fourier transform (DTFT),	C07	L3
3	Problems	CO7	L4
4	Applications of DTFT	CO8	L4
5	Problems	CO8	L4
6	problems	CO8	L4
7	Frequency response of LTI system,	CO8	L3
8	Problems	CO8	L4
9	Solutions of differential equations	CO8	L4
10	Problems	CO8	L4
С	Application Areas	CO	Level
1	Amplitude modulation, frequency multiplexing	CO8	L3
2	Circuit analysis, sampling	CO7	L4
d	Review Questions	-	-
1	State and explain following DTFT properties I) Time shift ii) Linearity	CO7	L3
2	Determine the DTFT of the following signal,	CO7	L3
	I)X(N)=U(N) II) X(N)=2'' U(-N)		1
3	Obtain the frequency response of the impulse response of the system	CO8	L4
4	Described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1)	CO7	1.4
4	Define transfer function of the DT system and Define impulse response of a DT system	0	L4
5	State the significance of difference equations and Write the difference equation	CO8	L3
	for Discrete time system		_0
6	Define frequency response of the DT system and explainWhat is the condition	CO8	L3
7	Obtain the DTET of the signal $y[n] = 2n y(n)$	CO7	14
/	Clate & prove the following properties of DTET i) Convolution property ii)	<u> </u>	
0	Frequency differentiation	07	L3
9	Using DTFT find the total solution to the difference equation for discrete time signal. $5y(n+2) - 6y(n+1) + y(n) = 0.8 u(n)$	CO8	L4
10	Find the fourier transform of the following. x(n) = 1 ; -2 ≤ n≤ 2 = 0 : Otherwise	CO8	L4
11	Find the fourier transform of x[n] = an u[n] for -13. Determine the fourier transform of the discrete time rectangular pulse of amplitude A and length L i.e x[n] = A for 0= n=L-1 0 otherwise	C07	L4
12	Determine the discrete time sequence where DTFT is given as $X(w) = 1$ for $-wc = w = wc$. 0 for $wc < w $?	C07	L4
13	Find the DTFT of the signal $x(n) = a^{ n }$; $ a < 1$	C07	L4
14	Find the inverse DTFT of the signal X($e^{j\Omega}$)=3-(1/4 $e^{-j\Omega}$)/-1/16 $e^{-2j\Omega}$ +1	, CO8	L4
15	Find the impulse response of the system having output $y(n)-1/4(1/2)^n u(n)$	CO8	L4
16	Obtain the difference equation for the system with frequency response $h(e^{j\Omega})=1+e^{-j\Omega}/(1-(1/2 e^{-j\Omega}))(1=(1/24e^{-j\Omega}))$	CO8	L4
	Experiences		
е		-	-

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs	Code:	17EE54	Sem:	5	Marks:	30	Time:	75 minute	S	
Cou	rse: Signals and systems									
-	-	Note: Answ	lote: Answer any 2 questions, each carry equal marks.							
1	а	Determine I i) x(t) = e ^{-at} u	Fourier trans (t) ii) x(t) = co	formation c st Wot.	of following	signals.		5	CO5	L4

	b	Find the frequency response and the impulse response of the system described by the differential equation.	4	CO6	L4
		$d^2 y/dt^2 + 5d y/dt + 6y = -d /dt x(t).$			
	С	Find the DTFT of the signal $x(n) = a^{ n }; a < 1$	3	CO5	L3
	d	Find the fourier transform of the following. x(n) = 3; -4 ≤ n≤ 24	3	CO8	L4
		= 0 ; Otherwise			
		OR			
2	а	State and explain parsavel's theorem	3	CO6	L3
	b	Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t)	4	CO5	L4
	С	The impulse response of continuous time signal is given by h(t)=1/Re e ⁻ t ^{/RC} u(t) find the frequency response and plot the magnitude	3	CO6	L4
	d	Find the inverse DTFT of the signal X($e^{j\Omega}$)=3-(1/4 $e^{-j\Omega}$)/-1/16 $e^{-2j\Omega}$ +1	5	CO7	L4
3	а	State and explain following DTFT properties I) Time shift ii) Linearity	3	CO7	L3
	b	Determine the DTFT of the following signal,	4	CO8	L4
		i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n)			
	С	Obtain the frequency response of the impulse response of the system	5	CO7	L4
		described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1)			
	d	Find the fourier transform of the following. x(n) = 1 ; -2 ≤ n≤ 2	3	CO8	L4
		= 0 ; Otherwise			
		OR			
4	а	Obtain the DTFT of the signal x[n] =2n u(-n)	3	CO7	L4
	b	State & prove the following properties of DTFT. i) Convolution property ii)	4	CO8	L3
		Frequency differentiation			
	С	Using DTFT find the total solution to the difference equation for discrete	4	CO7	L4
		time signal. 5y(n+2) – 6y(n+1) +y(n) = 0.8 u(n)			
	d	Obtain the difference equation for the system with frequency response $h(e^{j\Omega})=1+e^{-j\Omega}/(1-(1/2 e^{-j\Omega}))(1=(1/24e^{-j\Omega}))$	5	CO8	L4

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

	Model Assignment Questions									
Crs C	ode: 17EE54	Sem:	5	Marks:	10	Time:	90 - 120	minutes	S	
Cours	se: Signals	and systems								
Note:	Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.									
SNo USN Assignment Description							Marks	CO	Level	
1	1KT17EE002	State & prov property ii) pa	e the arseva	following propert al's theorem.	ies of FT. i)	Time shiftin	g 10	CO5	L3	
2	1KT17EE003	Obtain the fo	urier t	ransform of x(t) = t	e-atu(t)		10	CO6	L4	
3	1KT17EE004	Find the four x(ω) = 1/(a+jω	ier tra	ansform of rectang	gular pulse	shown belo	w 10	CO6	L4	
4	1KT17EE006	Find the freq	uency ribed l	response & impul by differential equa	se response ation dy(t)/c	e of the dt + 8y(t) =x(t)	10	CO6	L4	
5	1KT17EE007	Find the Four exp(- t) u(t) , >	ier tra ∙0	ansform of i) x(t)= t2	u(t) u(1-t) ai	nd ii) x(t)= t	10	CO5	L4	
6	1KT17EE008	Find the four ={102 t /m t	ier tra 5 othe	ansform of triangu erwise	lar pulse (10) x(t) = _(t∕n	n) 10	CO5	L4	
7	1KT17EE011	Obtain the ex	ponei	ntial fourier series	of the wave	form	10	CO6	L3	
8	1KT17EE014	Find the Fou signal and its	ırier tı Fouri	ransform of recta er transform	ngular puls	e. Sketch th	e 10	CO5	L3	
9	1KT17EE015	Find the Four	ier tra	ansform of a triang	ular pulse.		10	CO5	L3	
10	1KT16EE010	Obtain the D	FFT of	f the signal x[n] =2n	u(-n)		10	CO7	L4	

11					
	1KT18EE401	State & prove the following properties of DTFT. i) Convolution property ii) Frequency differentiation	10	CO8	L4
12	1KT14EE004	Using DTFT find the total solution to the difference equation for discrete time signal. $5v(n+2) - 6v(n+1) + v(n) = 0.8 u(n)$	10	CO8	L4
13	1KT14EE008	Obtain the difference equation for the system with frequency response	10	CO7	L4
		$h(e^{j\Omega})=1+e^{-j\Omega}/(1-(1/2 e^{-j\Omega}))(1=(1/24e^{-j\Omega}))$			
14	1KT15EE002	State and explain following DTFT properties I) Time shift ii) Linearity	10	CO7	L4
15	1KT15EE003	Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n)	10	CO8	L4
16	1KT15EE010	Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1)$	10	CO7	L4
17	1KT17EE002	Find the fourier transform of the following. x(n) = 1 ; -2 ≤ n≤ 2 = 0 ; Otherwise	10	CO7	L4
18	1KT17EE003	State and explain parsavel's theorem	10	CO5	L3
19	1KT17EE004	Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t)	10	CO6	L4
20	1KT17EE006	The impulse response of continuous time signal is given by $h(t)=1/\text{Re }e^{-t/\text{RC}}$ u(t) find the frequency response and plot the magnitude	10	CO5	L4
21	1KT17EE007	Find the inverse DTFT of the signal X(e ^{jΩ})=3-(1/4 e ^{-jΩ})/-1/16 e ^{-2jΩ} +1	10	CO6	L4
22	1KT17EE008	Determine Fourier transformation of following signals. i) x(t) = e-at u(t) ii) x(t) = cost Wot.	10	CO6	L4
23	1KT17EE011	Find the frequency response and the impulse response of the system described by the differential equation. d² y/dt² +5d y/dt +6y =-d /dt x(t).	10	CO6	L4
24	1KT17EE014	Find the DTFT of the signal x(n)= a ⁿ ; a <1	10	CO7	L4
25		Find the fourier transform of the following $y(n) = 1 + 2 < n < 2$			
	INTITEOIS	= 0; Otherwise	10	CO8	L4
26	1KT16EE010	= 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n)	10	CO8 CO8	L4 L4
26 27	1KT16EE010 1KT18EE401	Prind the fourier transform of the following: $x(n) = 1, -2 \le n \le 2$ = 0; Otherwise Determine the DTFT of the following signal, i) $x(n)=u(n)$ ii) $x(n)=2^n u(-n)$ Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)=1/4 y(n=1)=3x(n)=3/4 x(n=1)$	10 10 10	CO8 CO8 CO8	L4 L4 L3
26 27 28	1KT16EE010 1KT18EE401 1KT14EE004	Prind the fourier transform of the following: $x(n) = 1$, $-2 \le n \le 2$ = 0; Otherwise Determine the DTFT of the following signal, i) $x(n)=u(n)$ ii) $x(n)=2^n u(-n)$ Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)=1/4 y(n=1)=3x(n)=3/4 x(n=1)$ Find the fourier transform of the following: $x(n) = 4$; $-3 \le n \le 3$ = 0; Otherwise	10 10 10 10	CO8 CO8 CO8 CO8	L4 L4 L3 L4
26 27 28 29	1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE008	 = 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2ⁿ u(-n) Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n- 1)=3x(n)-3/4 x(n-1) Find the fourier transform of the following. x(n) = 4; -3 ≤ n≤ 3 = 0; Otherwise State and explain parsavel's theorem 	10 10 10 10 10	CO8 CO8 CO8 CO8 CO8	L4 L4 L3 L4 L3
26 27 28 29 30	1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE008 1KT15EE002	 Find the fourier transform of the following. x(ii) = 1, -2 ≤ H≤ 2 = 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2ⁿ u(-n) Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n- 1)=3x(n)-3/4 x(n-1) Find the fourier transform of the following. x(n) = 4; -3 ≤ n≤ 3 = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal i)x(t)=e^{-at} u(t);a>0 ii)x(t)=delta(t) 	10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6	L4 L4 L3 L4 L3 L4 L4
26 27 28 29 30 31	1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE008 1KT15EE002 1KT15EE003	 Find the fourier transform of the following. x(ii) = 1, -2 ≤ H≤ 2 = 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2ⁿ u(-n) Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n- 1)=3x(n)-3/4 x(n-1) Find the fourier transform of the following. x(n) = 4; -3 ≤ n≤ 3 = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal i)x(t)=e^{-at} u(t);a>0 ii)x(t)=delta(t) Using DTFT find the total solution to the difference equation for discrete time signal. 5y(n+2) – 6y(n+1) +y(n) = 0.8 u(n) 	10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7	L4 L3 L4 L3 L4 L3 L4 L4
26 27 28 29 30 31 32	1KT16EE010 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE008 1KT15EE002 1KT15EE003 1KT15EE010	Find the fourier transform of the following: $x(n) = 1, -2 \le n \le 2$ = 0; Otherwise Determine the DTFT of the following signal, $i)x(n)=u(n)$ ii) $x(n)=2^n u(-n)$ Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)-1/4$ $y(n-1)=3x(n)-3/4 x(n-1)$ Find the fourier transform of the following: $x(n) = 4$; $-3 \le n \le 3$ = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal $i)x(t)=e^{-at}$ u(t);a>0 $ii)x(t)=delta(t)Using DTFT find the total solution to the difference equationfor discrete time signal. 5y(n+2) - 6y(n+1) + y(n) = 0.8 u(n)Obtain the difference equation for the system with frequencyresponseh(e^{i\Omega})=1+e^{-j\Omega}/(1-(1/2 e^{-j\Omega}))(1=(1/24e^{-j\Omega}))$	10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7	L4 L4 L3 L4 L4 L4 L4 L4
26 27 28 29 30 31 32 33	1KT17EE015 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE008 1KT15EE002 1KT15EE003 1KT15EE010 1KT17EE002	Find the fourier transform of the following: $x(n) = 1, -2 \le n \le 2$ = 0; Otherwise Determine the DTFT of the following signal, $i)x(n)=u(n)$ ii) $x(n)=2^n u(-n)$ Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)-1/4$ $y(n-1)=3x(n)-3/4 x(n-1)$ Find the fourier transform of the following: $x(n) = 4$; $-3 \le n \le 3$ = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal $i)x(t)=e^{-at}$ u(t);a>0 $ii)x(t)=delta(t)Using DTFT find the total solution to the difference equationfor discrete time signal. 5y(n+2) - 6y(n+1) + y(n) = 0.8 u(n)Obtain the difference equation for the system with frequencyresponseh(e^{i0})=1+e^{-j0}/(1-(1/2 e^{-j0}))(1=(1/24e^{-j0}))State and explain following DTFT properties I) Time shift ii)Linearity$	10 10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7 CO7	L4 L3 L4 L4 L4 L4 L4 L4
26 27 28 29 30 31 32 33 33	1KT17EE015 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE004 1KT15EE002 1KT15EE003 1KT15EE010 1KT17EE002 1KT17EE003	Find the fourier transform of the following: $x(n) = 1, -2 \le n \le 2$ = 0; Otherwise Determine the DTFT of the following signal, $i)x(n)=u(n)$ ii) $x(n)=2^n u(-n)$ Obtain the frequency response of the impulse response of the system described by the difference equation $y(n)=1/4$ $y(n=1)=3x(n)=3/4 x(n=1)$ Find the fourier transform of the following: $x(n) = 4$; $-3 \le n \le 3$ = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal $i)x(t)=e^{-at}$ u(t);a>0 $ii)x(t)=delta(t)Using DTFT find the total solution to the difference equationfor discrete time signal. 5y(n+2) - 6y(n+1) + y(n) = 0.8 u(n)Obtain the difference equation for the system with frequencyresponseh(e^{i\Omega})=1+e^{-j\Omega}/(1-(1/2 e^{-j\Omega}))(1=(1/24e^{-j\Omega}))State and explain following DTFT properties I) Time shift ii)LinearityObtain the fourier transform of x(t) = te-atu(t)$	10 10 10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7 CO7 CO7	L4 L3 L4 L4 L4 L4 L4 L4 L4 L4
26 27 28 29 30 31 32 33 33 34 35	1KT17EE015 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE004 1KT15EE002 1KT15EE003 1KT15EE010 1KT17EE002 1KT17EE003 1KT17EE003 1KT17EE004	Find the fourier transform of the following. x(ii) = 1, -2 ≤ Hs 2= 0 ; OtherwiseDetermine the DTFT of the following signal,i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n)Obtain the frequency response of the impulse response of thesystem described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1)Find the fourier transform of the following. x(n) = 4 ; -3 ≤ n ≤ 3= 0 ; OtherwiseState and explain parsavel's theoremObtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t)Using DTFT find the total solution to the difference equationfor discrete time signal. 5y(n+2) – 6y(n+1) +y(n) = 0.8 u(n)Obtain the difference equation for the system with frequencyresponseh(e ^{iΩ})=1+e ^{-iΩ} /(1-(1/2 e ^{-jΩ}))(1=(1/24e ^{-jΩ}))State and explain following DTFT properties I) Time shift ii)LinearityObtain the fourier transform of x(t) = te-atu(t)Find the fourier transform of rectangular pulse shown belowx(ω) = 1/(a+jω) ²	10 10 10 10 10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7 CO7 CO7 CO7	L4 L3 L4 L4 L4 L4 L4 L4 L4 L4 L4 L4
26 27 28 29 30 31 32 33 33 34 35 36	1KT17EE015 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE004 1KT15EE002 1KT15EE003 1KT15EE010 1KT17EE002 1KT17EE003 1KT17EE004 1KT17EE006	= 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n) Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1) Find the fourier transform of the following. x(n) = 4; -3 ≤ n ≤ 3 = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t) Using DTFT find the total solution to the difference equation for discrete time signal. 5y(n+2) – 6y(n+1) +y(n) = 0.8 u(n) Obtain the difference equation for the system with frequency response h(e ^{iα})=1+e ^{-jΩ} /(1-(1/2 e ^{-jΩ}))(1=(1/24e ^{-jΩ})) State and explain following DTFT properties I) Time shift ii) Linearity Obtain the fourier transform of x(t) = te-atu(t) Find the fourier transform of rectangular pulse shown below x(ω) = 1/(a+jω) ² Find the frequency response & impulse response of the system described by differential equation dy(t)/dt + 8y(t) =x(t)	10 10 10 10 10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7 CO7 CO7 CO6 CO6 CO6	L4 L3 L4 L4 L4 L4 L4 L4 L4 L4 L4 L4
26 27 28 29 30 31 32 33 33 34 35 36 37	1KT17EE015 1KT16EE010 1KT18EE401 1KT14EE004 1KT14EE004 1KT15EE002 1KT15EE003 1KT15EE010 1KT17EE003 1KT17EE003 1KT17EE004 1KT17EE006 1KT17EE007	= 0; Otherwise Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n) Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1) Find the fourier transform of the following. x(n) = 4; -3 ≤ n ≤ 3 = 0; Otherwise State and explain parsavel's theorem Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t) Using DTFT find the total solution to the difference equation for discrete time signal. 5y(n+2) – 6y(n+1) +y(n) = 0.8 u(n) Obtain the difference equation for the system with frequency response h(e ^{iΩ})=1+e ^{-iΩ} /(1-(1/2 e ^{-jΩ}))(1=(1/24e ^{-jΩ})) State and explain following DTFT properties I) Time shift ii) Linearity Obtain the fourier transform of x(t) = te-atu(t) Find the fourier transform of rectangular pulse shown below x(ω) = 1/(a+jω) ² Find the frequency response & impulse response of the system described by differential equation dy(t)/dt + 8y(t) =x(t) Find the Fourier transform of i) x(t)= t2 u(t) u(1-t) and ii) x(t)= t exp(- t) u(t), >0	10 10 10 10 10 10 10 10 10 10 10	CO8 CO8 CO8 CO8 CO5 CO6 CO7 CO7 CO7 CO7 CO7 CO6 CO6 CO6	L4 L3 L4 L4 L4 L4 L4 L4 L4 L4 L4 L4 L4

D3. TEACHING PLAN - 3

Title:	Distribution and Reliability and Quality of distribution system	Appr Time:	10 Hrs
a	Course Outcomes	СО	Blooms
-	At the end of the topic the student should be able to	-	Level
1	Apply z-transform and its properties for the analysis of discrete time system using partial fraction expansion method.	CO9	L4
2	Apply the unilateral z-transform to solve difference equation.	CO10	L4
b	Course Schedule		
Class No	Module Content Covered	со	Level
1	Introduction to Z-transform	CO9	L2
2	Z-transform and properties of ROC,	CO9	L2
3	Properties of Z-transforms.	COg	L2
4	Problems on Z-transform	COg	L4
5	inversion of Z-transform by power series method	CO10	L4
6	Inverse Z-transform by partial fraction expansion method	CO10	L4
7	Problems	CO10	L4
8	Transforms analysis of LTI systems, Transfer function, stability and causality,	CO10	L3
9	unilateral Z-transform and its application to solve difference equations .	CO10	L4
10	Problems.	CO10	L4
С	Application Areas	со	Level
1	Analysis of digital system,system design,automatic controls in telecommunication.	CO10	L3
2	Simulate the continuous system, Analysis of digital filters	CO9	L4
d	Review Questions	_	_
1	Define 7-Transform for a general discrete time signal xini	COq	12
2	What is ROC w.r.t. 7-Transform?	COq	12
3	What are the properties of ROC?	COq	 L2
4	What are the properties of Z-Transforms?	COg	
5	State and prove the properties of Unilateral Z-Transform and ROC.	COg	
6	Find the Z-Transform of x[n] = $-u(n-1)+(1/2)^n u(n)$	COg	L4
7	Determine the Z-Transform, ROC, pole and zero locations for the following signals: a) $x(n) = (1/2)^n u(n) + (-1/3)^n u(n)$ b) $x(n) = e^{i\Omega} 0^n u(n)$	CO10	L4
8	Find the inverse Z-Transform of $H(Z) = (1+Z^{-1})/(1-0.9e^{j\pi/4}Z^{-1})(1-0.9e^{j\pi/4}Z^{-1})$	CO10	L4
9	Find the inverse Z-Transform assuming a) Signal is causal; b) Signal has DTFT $1/(1-1/2 Z^{-1}) + 2/(1-2Z^{-1})$	CO10	L4
10	A system is described by the difference equation y[n] – y[n-1] + 1/4 y[n-2] = x[n] + 1/4 x[n-1] – 1/8 x[n-2] a) Find the Transfer Function of the Inverse System. b) Does a stable and causal inverse system exist?	CO10	L4
11	Define Z transform?What are the two types of Z transform? Define unilateral Z transform.	CO9	L2
12	What is region of Convergence and What are the Properties of ROC.	CO9	L2
13	What is the time shifting property of Z transform, differentiation property in Z domain, convolution property of Z transform.	CO9	L3
14	State the methods to find inverse Z transform.	CO10	L3
15	State and prove parseval's relation for Z transform	CO10	L3
e	Experiences	-	-
- -		1	

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs C	Code	17EE54	Sem:	5	Marks:	30	Time:	75 minute	es	
Cour	se:	Signals an	d Systems							
-	-	Note: Ans	wer any 2 qu	estions, ea	ch carry e	qual marks.		Marks	СО	Level
1	а	Find the Z location	-transform of	the seque	nce, and s	ketch the RO	C and pole ze	ero 8	CO9	L4
		i) x(n)=(1/3	3) ⁿ sin(∏∕4 n)	u(n)	ii)x(n)=a	a ⁿ u(n)+b ⁿ u(-n-	1)			
	b	What is R(DC with respe	7	CO9	L3				
2	а	Find the ir X(z)=(z ⁴ + z	Find the inverse z transform of the following by partial fraction method $X(z)=(z^4 + z^2) / (z^2 - 3/4 z + 1/8)$ $ z >1/2$							L4
	b	Find the ir X(Z)= 1/ 1-	iverse Z trans 1.5Z ⁻¹ +0.5Z ⁻²	form of X(Z) by powe R	r series expar OC: Z <1	nsion methoc	1 7	CO9	L4
3	a	A differen transfer fi system is	ce equation unction of th causal and sta	of the syst ne inverse able.y(n)-y(tem is giv system. (n-1)+1/4 y	′en as below Check wheth (n-2)=x(n)+1/4	determine f her the inve x(n-1)-1/8x(r	the 8 rse 1-2)	CO10	L3
	b	Determine	e the forced re	esponse for	r the follow	ving system		7	CO10	L2
		y(n)-5/6 y	(n-1)+1/6 y(n-	2)=x(n)	if	input x(n)=2 ⁿ ı	u(n)			
4	а	Solve the with y(-1)=	following diffe 0, y(-2)=1 & >	erence equ ((n)=3u(n)	ation y(n)-	1/9 y(n-2)=x(n	-1)	8	CO10	L4
	b	Explain the theorem	e following p	roperties i)	Convolutio	on property	ii) Initial va	lue 7	CO10	L4

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

	Model Assignment Questions									
Crs C	ode:	17EE54	Sem:	5	Marks:	10	Time:	90 - 120	minutes	S
Cours	se:	Design a	and Analysi	s of Algoi	rithms					
Note	: Each	n student	to answer 2	2-3 assigr	ments. Each as	signmen	t carries equal ma	ark.		
SNo	I	USN		Α	Assignment Des	cription		Marks	CO	Level
1	1KT17	7EE002	Determine	the trans	sfer function and	d impuls	e response for th	e 5	CO9	L4
			causal LT	l system	n described b	y the e	equation using	Z		
			transform `	Y(n) – 1/4	.y(n-1)-3/8y(n-2)	= -x(n) +	2x(n-1)			
2	1KT17	7EE003	Find the in	verse Z 1	Fransform of X(z	z) = 1/(1-0	0.5Z ⁻² -1 + 0.5Z ⁻¹ -2) 5	CO9	L3
			for ROC Z	>1						
3	1KT17	7EE004	Find the Z-	transforn	n of the followir	ig i) x(n)	= 2n u(-n-1) ii) x(n)	= 5	CO10	L4
			(3)2n u(-n)	<u> </u>				_		
4	1K 17	7EE006	Solve the	following	g difference eq	uation u	ising unilateral 2	- 5	CO10	L4
			transform	Y(n) + 3y	(n-1) = x(n) with	i X(n) = l	u(n) and the initia	al		
	41/74-		Condition y	$\frac{(-1) = 1}{(-1) = 1}$		7 4	· · · · · · · · · · · · · · · · · · ·		000	
5	1611,	/EE00/	Prove the	TOLLOWING	g properties of	Z-transi	orm I) Linearity	10 5	COg	L3
6	a1/Ta-	755000	Initial value theorem					n F	<u> </u>	
0		/EE006	Find invers	e Z-trans	$\nabla(z) = (1+2z, 1+z, 2)$		1+0 F7 2)	n 5	COg	L4
	1 L/ T1-		Chock who	thor tho	(2) = (1+22-1+2-2)	.// (1-1.52)	-1+0.52-2) the U(z) is aiven h	<u>у</u> г	<u> </u>	14
/		/EE011	(72 + 7)/(7+1)		s givon by (7/70	1 01 1101 ,1 12) 121/1	The m(z) is given b	у 5	COg	L4
8	1 K T 1 -	755014	Dotormina	1. 11/ 1 1(2/ 1 + + + - +	s given by (2720	r tha ar	tom decaribed b	N E	<u> </u>	14
		/LL014		. 1	0-07502 /	AIDA		С	COg	L4
0	1KT17	7EE016	0	Jey.	551	20.02	5.0-	5	CO10	14
9				1	0/1	C	304	5	0010	L4
10	1KT16	3FF010	JDA.	e 0.0	5-2 00			5	CO10	14
	121111	0000			204	Tote	* Connector.		0010	4

	1				
		x(z)=1/(1+z-1) (1-z-1)2 ROC : Z>1			
11	1KT18EE401	A single phase distributor one km long has resistance and	10	C09	L4
		reactance per conductor Of 0.1 Ω and 0.15 Ω respectively. At			
		the far end, the voltage VB = 200 V and the current is 100 A at			
		a p.r. of 0.8 lagging. At the mid-point M of the distributor, a			
		current of 100 A is tapped at a p.i. of 0-0 tagging with			
		Calculate :			
		Calculate . (i) voltage at mid-point			
		(ii) sending end voltage VA			
		(iii) sending end voltage VA (iii) phase angle between VA and VB			
12	1KT14EE004	A 2-phase ring main ABCD fed at A at 11 kV supplies balanced	10	Coo	14
12	11(1140004	loads of 50 A at 0.8 pf lagging at B 120 A at unity pf at C and	10	cog	64
		70 A at 0.866 lagging at D the load currents being Referred to			
		the supply voltage at A. The impedances of the various			
		sections are : Section AB = $(1 + i 0.6) \Omega$: Section BC = $(1.2 + i 0.9)$			
		Ω Section CD = (0.8 + j 0.5) Ω ; Section DA = (3 + j 2) Ω . Calculate			
		the currents in various sections and station bus-bar voltages			
		at B, C and D.			
13	1KT14EE008	Distinguish between reliability, availability, adequacy and	10	CO10	L2
		security.			
14	1KT15EE002	Discuss the commonly used distributors for failure	10	CO10	L2
15	1KT15EE003	What are life failure rate curves?	10	CO10	L2
16	1KT15EE010	Why is PQ important?	10	CO10	L2
17	1KT17EE002	Define failure rate.	10	CO10	L2
18	1KT17EE003	Define under voltage, over voltage sag and swell.	10	CO10	L2
19	1KT17EE004	Distinguish between sag and interruption.	10	CO10	L2
20	1KT17EE006	What are transients?	10	CO10	L2
21	1KT17EE007	What are harmonics?	10	CO10	L2
22	1KT17EE008	Define THD.	10	CO10	L2
23	1KT17EE011	What are the properties of Z-Transforms?	5	CO9	L3
24	1KT17EE014	State and prove the properties of Unilateral Z-Transform and ROC.	5	CO9	L3
25	1KT17EE015	Find the Z-Transform of x[n] = -u(n-1)+(1/2) ⁿ u(n)	5	CO9	L4
26	1KT16EE010	Determine the Z-Transform, ROC, pole and zero locations for	5	CO9	L4
		the following signals: a) $x(n) = (1/2)^n u(n) + (-1/3)^n u(n) b)x(n)$			
		$=e^{j\Omega}0^{n}u(n)$			
27	1KT18EE401	Find the inverse Z-Transform of $H(Z) = (1+Z^{-1})/(1-0.9e^{i\pi/4}Z^{-1})(1-0.9e^{i\pi/4}Z^{-1})$	5	CO9	L4
28		Eind the inverse 7-Transform assuming a) Signal is causal b	E	CO10	14
		Signal has DTFT $1/(1-1/2 Z^{-1}) + 2/(1-2Z^{-1})$	5	010	L4
29	1KT14EE008	A system is described by the difference equation $y[n] - y[n-1] +$	5	CO10	L4
		1/4 yln-2] = xln] + 1/4 xln-1] - 1/8 xln-2] a) Find the Transfer			
		Function of the Inverse System. b) Does a stable and causal			
		Inverse system exist?		00-	1
30	1K115EE002	Define \angle - I ransform for a general discrete time signal x[n].	5	LUG	L4

F. EXAM PREPARATION

1. University Model Question Paper

Course:		SIGNALS AND	SYSTEMS				Month /	∕ Year	May /	2019
Crs Code:		17EE54	Sem:	5	Marks:	80	Time:		180 mi	nutes
Mod	Note	Answer all FIVE	E full questi	ons. All questic	ons carry eq	qual marks.		Marks	СО	Level
ule										
1	а	Distinguish bet	ween i) Eve	en and Odd Sig	gnals ii) Per	iodic and non	periodic	4	CO1	L3
		signals								
	b	b. Determine	whether th	ne following s	signals are	periodic, if	periodic	4	CO1	L3
		determine the	fundamenta	al period. i) x(t)	= cos2t + sir	n3t ii)x[n] = sin2	n			
	С	c. Sketch the fo	ollowing sig	nal for x(t) is sl	nown in fig	ure. i) x(3t+2) ii)	x(2(t +2)	8	CO2	L4

		iii) x(-2t-1) iv) x(-2t+3)			
		4%0			
		3- 1			
1	а	a Find total energy of the following signals i) $x(t) = A \cdot -T/2 < t < T/2$	8	CO2	
-	0.	ii) $\frac{1}{\pi} [\cos(\omega t) + 1] = \frac{-\pi}{\pi} \le t \le \pi/\omega$	Ū	001	
		otherwise = 0; Otherwise			
	b	Determine whether the system y(t) = x(n2) is i) Linear ii) Time-invarient iii)	8	CO2	L3
		Memory iv) Causal v) Stable			
-					
2	а	Consider an LTT system with input x(n) & unit impulse response n(n) given below. Compute $y(n) = 2n y(-n)$: 8, $h(n) = y(n)$	8	CO3	L3
	h	Find the step response for the LTL system represented by impulse	1	CO4	Ιı
	D	response i) $h(n) = u(n)$ ii) $h(n) = (1/2)n u(n)$	4	004	-4
	С	Determine stability & causality of the following i) h(n) = (1/2)n u(n) ii) h(t) =	4	CO4	L4
		e-3tu(t-1)			
		OR			
2	а	Find Forced $r_{d^3y(t)} + \frac{2dy(t)}{dt} + 3y(t) = x(t) + \frac{3dx(t)}{dt}$ (n) - 5/6 y(n-1) + 1/6 y(n-2) = x(t) + $\frac{3dx(t)}{dt}$	10	CO3	L3
	b	Draw direct	6	CO4	L4
		form-I & II structures for the system described by the differential			
		equation.			
3	а	State & prove the following properties of FT i) Time shifting property ii)	10	CO6	3
5	u	parseval's theorem	10		-5
	d	Obtain the fourier transform of x(t) = te ^{-at} u(t)	6	CO5	L4
		OR			
3	а	Find the fourier transform of rectangular pulse shown below $x(\omega) = 1/(a+j\omega)^2$	8	CO5	L3
	b	Find the frequency response & impulse response of the system	8	CO6	L4
		described by differential equation. dy(t)/dt + 8y(t) =x(t)			
		Obtain the DIFT of the signal what are w(m)	6	<u> </u>	1.4
4	d h	State & prove the following properties of DTET i) Convolution property ii)	10		L4 L2
	5	Frequency differentiation.	TO		പാ
		OR			
4	а	Using DTFT find the total solution to the difference equation for discrete	8	CO8	L3
		time signal. $5y(n+2) - 6y(n+1) + y(n) = 0.8 u(n)$			-
	b	Find the fourier transform of the following. $x(n) = 1$; $-2 \le n \le 2$	8	CO7	L4
		= 0 ; Otherwise			
		Final the \overline{Z} transforms of the following: $(Y, f_{2}) = 2\pi (f_{2}, f_{3}) (f_{2}) (f_{2}) (f_{3}) (f_{3})$			
5	a L	Find the 2 -transform of the following I) $X(n) = 2n u(-n-1) II) X(n) = (3)2n u(-n)$	<u>لح</u>		L3
	a	theorem	0	CUY	∟4
		OR			
5	а	Find Inverse Z-transform of the following using partial fraction expansion	8	COg	L4
		method. $X(z) = (1+2z^{-1}+z^{-2})/(1-1.5z^{-1}+0.5z^{-2})$		Ľ	
	b	Solve the following difference equation using unilateral Z-transform Y(n) +	8	CO10	L4
		3y(n-1) = x(n) with x(n) = u(n) and the initial condition y(-1) =1			

2. SEE Important Questions

Course: Transmission and Distribution

Month / Year May /2018

Crs Code:		17EE43 Sem: IV Marks: 60 Time:	-	180 minutes	
	Note	Answer all FIVE full questions. All questions carry equal marks.	-	-	
Mod	Qno.	Important Question	Marks	со	Year
1	1	Distinguish between: i) Energy signal and Power signal ii)Continuous and Discrete time signals iii) Even and Odd signal iv)Periodic and non periodic signals	6	CO1	2016
	2	6	CO1	2016	
	3	Determine whether the following signals are periodic, if periodic determine the fundamental period i) x(t)=[2cos²(Пt/2)-1]sinПt cosПt ii) x(n)=cos(Пn/7) sin(Пn/3)	6	CO1	2017
	4	Determine the following signal is Energy or Power signal i) x(t)=e ^{-a t} a>0 ii) x(t) = 5+t for (-5,-4) 1 for (-4, 4) 5-t for (4, 5) 0 otherwise	6	CO1	2017
	5	Determine whether the system is i) Linear ii) Time Invariant iii) memoryless iv) causal v) stable i) y(t)=d/dt[e ^{-t} x(t)] ii) y(n)=x(k+2)	6	CO2	2016
2	1	The impulse response of a continuous time LTI system is given by h(t)=e²nu(n-1) and the input x(n)= 2u(n)+5u(n-1)	8	CO3	2015
	2	A continuous time LTI system with unit impulse response h(t)=u(t) and input x(t)=e ^{-at} u(t) a>0 find convolution of the signals	6	CO3	2016
	3	Find the step response for the LTI system represented by the impulse response h(n)=(1/2) ⁿ u(n).	8	CO3	2009
	4	consider a continuous time LTI system is represented by the impulse response h(t)=e ^{-3t} u(t-1) determine whether it is i)stable ii) causal	6	CO4	2017
	5	Solve the differential equation, d²y(t)/dt² + 3 dy(t)/dt + 2y(t) = 2x(t) with y(0)=-1 dy(t)/dt with t=0 and x(t)=cost u(t)	8	CO4	2017
3	1	Determine Fourier transformation of following signals. i) x(t) = e-at u(t) ii) x(t) = cost wot.	6	CO5	2016
	2	Find the frequency response and the impulse response of the system described by the differential equation. d² y/dt² +5d y/dt +6y =-d /dt x(t).	8	CO6	2017
	3	State and explain parsavel's theorem	6	CO5	2017
	4	Obtain the fourier transform of the following signal i)x(t)=e ^{-at} u(t);a>0 ii)x(t)=delta(t)	8	CO6	2017
	5	obtain the fourier transform of x(t) = te ^{-at} u(t)	6	CO5	2015
4	1	State and explain following DTFT properties I) Time shift ii) Linearity	6	C07	2017
	2	Determine the DTFT of the following signal, i)x(n)=u(n) ii) x(n)=2 ⁿ u(-n)	6	C07	2017
	3	Obtain the frequency response of the impulse response of the system described by the difference equation y(n)-1/4 y(n-1)=3x(n)-3/4 x(n-1)	8	C07	2016
	4	Find the fourier transform of the following. x(n) = 1 ; -2 ≤ n≤ 2 = 0 ; Otherwise	6	CO8	2016
	5	Obtain the DTFT of the signal x[n] =2n u(-n)	6	CO8	2017
5	1	Find the inverse Z-Transform assuming a) Signal is causal; b) Signal has DTFT $1/(1-1/2 Z^{-1}) + 2/(1-2Z^{-1})$	5	CO9	2016
	2	What is z-transformation? List the properties of ROC. State and prove following properties i) Convolution ii) Time reversal	8	CO9	2016
	3	Find Inverse Z-transform of the following using partial fraction expansion method. $X(z) = (1+2z^{-1}+z^{-2})/(1-1.5z^{-1}+0.5z^{-2})$	6	CO10	2016

4	Solve the following difference equation using unilateral Z-transform Y(n) +	6	CO10	2017
	3y(n-1) = x(n) with x(n) = u(n) and the initial condition y(-1) =1			
5	Find the z-transformation of	8	CO10	2017
	i) x(n) = n a nu(-n) ii) x(n) = n sin (∏/2n)u(-n)			