SRI BHARATHI
ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Kaikkurichi, Pudukkottai -622 303

www.sbec.edu.in

NAAC DOCUMENTS

Quality Indicator Frame Work

Criterion – 1
CURRICULAR ASPECTS

Submitted by

IQAC
Internal Quality Assurance Cell

Sri Bharathi Engineering College for Women

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Criterion 1	Curricular Aspects	100

1.1 Curricular Planning and Implementation (20)

1.1.1 *The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal assessment*

Table of Contents

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PREFACE OF THE COURSE FILE

Batch   : **2021-2025**

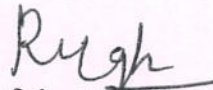Academic Year   : **2022-2023 / ODD**

Program   : **ELECTRONICS AND COMMUNICATION ENGINEERING**

Year & Semester   : **2nd Year /3rd Semester**

Course Code   : **EC 3354**   NBA Course Code **: C203**

Name of the Course   : **SIGNALS AND SYSTEMS**

Faculty Incharge   : **Mrs.R.Yogeshwari, A.P / ECE**

Signature of the Faculty Incharge   HoD / ECE

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

REVIEW OF COURSE FILE

(to be pasted on the inner side of the file-backside).(#-State Yes/No.)

S.N	Details Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&$	R-V-*&$@
1.	Preface of the course file	Yes				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy	Yes				
3.	Subject handlers of yesteryears					
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities	Yes				
5.	Syllabus signed by staff & HoD	Yes				
6.	Lecture Schedule signed by staff & HoD	Yes				
7.	Course Committee meeting circular and minutes	NA				
8.	Identification of Curricular gap and Content Beyond the syllabus	Yes				
9.	Self-study topics	.				
10.	Previous AU Question papers	Yes				
11.	Unit wise Q&A and Objective type questions	Yes				
12.	Unit wise course material	Yes				
13.	Assignment question paper with sample answer sheets and mark entry		Yes			
14.	Tutorial question paper with key and mark entry		Yes			
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry		Yes			
16.	IA Test- result analysis-CAP-evidence-root cause analysis.		Yes			
17.	Retest –Q paper-Attendance-marks		Yes			
18.	AU Web portal entry sheet		Yes			
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence		NA			
20.	Absence for two tests-action taken-communication to parents-evidence.		.			
21.	Indiscipline of student reported, if any		NA			
22.	Special class/coaching class/remedial class/attendance-CAP					
23.	Conduct of Seminar, Quizzes - proof		Yes	Yes		
24.	Content beyond the syllabus - proof		.		Yes	
25.	Student feedback on faculty		.	Yes		
26.	Course end survey					
27.	Internal Assessment sheet			Yes		
28.	AU question paper with students feedback				Yes	
29.	Discrepancy of the question paper and correspondence, if any					
30.	AU result analysis-Details of arrear students.					
31.	AU grade sheet				.	Yes
32.	CO – PO & PSO attainment sheet					Yes
	Signature of Course handling faculty	Rugh	Rugh	Rugh	Rugh	Rugh
	Signature of HoD	Rugh	Rugh	Rugh	Rugh	Rugh

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INDIVIDUAL STAFF WORKLOAD (2022-2023) ODD SEMESTER

S. NO	NAME OF THE STAFF	SUBJECTS HANDLED	YEAR & DEPT	HOURS ALLOCATED	TOTAL HOURS
1.	Mrs.R.YOGESHWARI	EC3354-Signals and Systems	II ECE	05	12
		EC8561-Communication Systems Laboratory	III ECE	03	
		HX8001-Professional Readiness For Innovation and Entrepreneurship	IVECE	04	
2.	Dr K.AMBUJAM	EC3353 –Electronic Devices and Circuits	II ECE	04	10
		EC3353-Electronic Devices and Circuits Lab	II ECE	03	
		EC8681- Microprocessors and Microcontrollers Lab	IIICSE	03	
3.	Mrs. T.K MOHANAPRIYA	EC8501-Digital Communication	III ECE	04	10
		EC8562-Digital Signal Processing Laboratory	III ECE	03	
		EC8561-Communication Systems Laboratory	III ECE	03	
4	Mrs.G.VIDHYA	EC8691 - Microprocessors and Microcontrollers	III CSE	04	10
		EC8681- Microprocessors and Microcontrollers Lab	IIICSE	03	
		EC3361- Electronic Devices and circuits lab	II ECE	03	
5	Mrs M.SUGANYA	OEC756-Medical Electronics	IV CSE	04	10
		EC8761-Advanced Communication Laboratory(Skilled)	IVECE	03	
		CS3352- Digital Principles and Computer Organization Lab	II CSE	03	

S.No	Name	Subject	Year & Dept	Hours Alloca ted	Total Hours
6.	Mrs.V.NITHYAPOORANI	EC8701-Antennas and Microwave Engineering	IV ECE	05	12
		EE8551 - Microprocessors and Microcontrollers	III EEE	04	
		EC8761-Advanced Communication Laboratory	IV/ECE	03	
7	MsP..KEERTHANA	EC8791-Embedded and Real Time Systems	IV ECE	04	10
		EC 8791 -Embedded and Real Time Systems Lab	IV ECE	03	
		EC8562-Digital Signal Processing Laboratory	III ECE	03	
8	Dr.V.VIJAYASARO	CS3352- Digital Principles and Computer Organization	II CSE	05	14
		EE8591 -Digital Signal Processing	III EEE	05	
		HX8001-Professional Readiness For Innovation and Entrepreneurship	IVECE	04	
9.	Mr.M.PALANIAPPAN	EC8751-Optical Communication	IV ECE	04	10
		EC3353-Electronic Devices and Circuits Lab	II ECE	03	
		EC8562-Digital Signal Processing Laboratory	III ECE	03	
10.	Mrs.G.GOPPERUMDEVI	EC8553-Discrete-Time Signal Processing	III ECE	05	11
		EC8562-Digital Signal Processing Laboratory	III ECE	03	
		EC8681- Microprocessors and Microcontrollers Lab	IIICSE	03	

HoD/ECE

HOD / ECE
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE PLAN

Subject code: EC 3354	**Branch/Year/Sem/Section: B.E ECE/II/III**
Subject Name: SIGNALS AND SYSTEMS	**Batch:2021-2025**
Staff Name: R.YOGESHWARI	**Academic year:2022-2023**

COURSE OBJECTIVE

- To understand the basic properties of signal &systems
- To know the methods of characterization of LTI systems in timedomain
- To analyze continuous time signals and system in the Fourier and Laplacedomain
- To analyze discrete time signals and system in the Fourier and Z transformdomain

TEXT BOOK:

T1. Oppenheim, Willsky and Hamid, "Signals and Systems", 2nd Edition, Pearson Education, New Delhi, 2015.(Units I -V)

T2. Simon Haykin,Barry Van Veen, "Signals and Systems", 2nd Edition, Wiley,2002

REFERENCES:

R1. B. P. Lathi, "Principles of Linear Systems and Signals", 2nd Edition, Oxford,2009.

R2 M. J. Roberts, "Signals and Systems Analysis using Transform methods and MATLAB", McGraw- Hill Education, 2018

R3. John Alan Stuller, "An Introduction to Signals and Systems", Thomson,2007.

TEACHING METHODOLOGIES:

- BB   - BLACKBOARD
- PPT   - POWER POINTPRESENTATION

WEB SOURCES:

1. https://www.digimat.in/nptel/courses/video/117104074/L25.html

2. https://www.youtube.com/watch?v=mC3TiBJiCsY

3. https://www.youtube.com/watch?v=nzPHWjEc4kg

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC3354	SIGNALSANDSYSTEMS	L	T	P	C
		3	1	0	4

UNIT I   CLASSIFICATION OF SIGNALSANDSYSTEMS   12

Standard signals- Step, Ramp, Pulse, Impulse, Real and complex exponentials and Sinusoids_Classificationofsignals–Continuoustime(CT)andDiscreteTime(DT)signals,Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals –Classification of systems-CtsystemsandDTsystems–Linear&Nonlinear,Time-variant&Time-invariant,Causal& Non-causal, Stable &Unstable

UNIT II   ANALYSIS OF CONTINUOUSTIMESIGNALS   12

Fourier series for periodic signals – Fourier Transform – properties- Laplace Transforms and Properties

UNIT III   LINEAR TIME INVARIANT CONTINUOUSTIMESYSTEMS   12

Impulse response–Difference equations-Convolution sum- Discrete Fourier Transform and Z Transform Analysis of Recursive & Non-Recursive systems-DT systems connected in series and parallel

UNIT IV   ANALYSIS OF DISCRETETIMESIGNALS   12

Baseband signal Sampling–Fourier Transform of discrete time signals (DTFT)– Properties Of DTFTZ Transform &Properties

UNIT V   LINEAR TIME INVARIANT-DISCRETETIMESYSTEMS   12

Impulse response–Difference equations-Convolution sum- Discrete Fourier Transform and Z Transform Analysis of Recursive & Non-Recursive systems-DT systems connected in series and parallel.
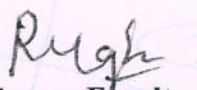
TOTAL: 60 PERIODS

Course Faculty

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt

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PUDUKKOTTAI - 622 303.

No	Topic	Book for Reference	Page No	Teaching Methodology	Periods	
17	Laplace Transforms and Properties	T1	152	BB	1	21
18	Inverse Laplace Transform problems	T1	154	BB	2	22,23
19	Unilateral Laplace Transform problems	R1	99-127	BB	2	24,25
20	Laplace Transform In real Life(CBS)	-	-	BB	1	26
21	Revision			BB	1	27
UNIT–III	**LINEAR TIME INVARIANT CONTINUOUSTIMESYSTEMS**					**(12)**
22.	Impulse response	T1	371	BB	1	28
23.	convolution integrals	T1	371-378	BB	1	29
24.	Differential Equation	T1	378	BB	1	30
25.	Laplace transforms in Analysis of CT systems	T1	383-389	BB	1	31
26	Fourier transforms in Analysis of CT systems	T1	394	BB	2	32,33
27	Systems connected in series / parallel	T1	406	BB	1	34
28	Solution of differential equations	T1	421	BB	1	35
29	Laplace transform of Network analysis	T1	424	BB	2	36,37
30	Frequency response of the system	T1	438-441	BB	2	38,39
31	Revision	-	-	BB	1	40

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Topic No	Topic Name	Books For reference	Page No	Teaching Methodology	No of periods required	Cumulative periods
UNIT I	**CLASSIFICATION OF SIGNALSANDSYSTEMS**					**(12)**
1.	Standard signals- Step, Ramp, Pulse, Impulse, Real and complex exponentials and Sinusoids	T1	30	BB	1	1
2.	Classificationofsignals–3Continuous time(CT)andDiscreteTime(DT)signals	T1	2-5	BB	1	2
3.	Periodic & Aperiodic signals	T1	11	BB	1	3
4.	Deterministic & Random signals, Energy & Power signals	T1	5	BB	2	4,5
5	Classification CTsystemsandDTsystems of systems	T1	19	BB	1	6
6	Linear&Nonlinear	T1	53	BB	1	7
7	Time-variant&Time-invariant,	T1	50	BB	1	8
8	Causal & Non-causal	T1	46	BB	2	9,10
9	Stable &Unstable	T1	48	BB	2	11,12
10	Revision			BB	1	13
UNIT II	**ANALYSIS OF CONTINUOUSTIMESIGNALS**					**(12)**
11	Fourier series for periodic signals	T1	122	BB	1	14
12	Fourier Series based problems	TI	123	BB	2	15,16
13	Fourier Transform	T1	123	BB	1	17
14	Fourier Transform and its properties	T1	141	BB	1	18
15	Fourier Transform problems	T1	142	BB	1	19
16	Fourier Transform Problems	T1	142	BB	1	20

UNIT IV	ANALYSIS OF DISCRETE TIME SIGNALS					(12)
32	Baseband signal Sampling	T1	261	BB	1	41
33	Fourier Transform of discrete time signals	T1	261	BB	1	42
34	DTFT	T1	272	BB	1	43
35	Properties of DTFT	T1	282	BB	1	44
36	Z Transform &Properties	T1	286	BB	1	45
37	Inverse Z transform and its three types	T1	321	BB	2	46,47
38	Relation of z Transform and other Transforms	T1	619	BB	1	48
39	Unilateral Z Transform	T1	619	BB	2	49,50
40	Unilateral Z Transform and its properties	T1	633	BB	2	51,52
41	Application o of Z Transform(CBS)	R1	635	BB	1	53
42	Revision	-	-	BB	1	54
UNIT V	LINEAR TIME INVARIANT-DISCRETE TIME SYSTEMS					(12)
43	Impulse response	RI	454	BB	1	55
44	Difference equations	R1	455	BB	1	56
45	Convolution sum	R1	455-464	BB	2	57,58
46	Discrete Fourier Transform of DT systems	T1	505	BB	1	59
47	Block diagram Representation	T1	512	BB	1	60
48	Impulse response properties	R1	691-692	BB	1	61

49	Z Transform Analysis of DT systems	R1	692	BB	2	62,63
50	Transfer Function of the LTI system	R1	693-699	BB	1	64
51	Recursive & Non-Recursive systems	R1	693-699	BB	2	65,66
52	Revision	-	-	-	1	67

COURSE OUTCOME

At the end of the course, the student should be able to:

C203.1: Determine if a given system is linear/causal/stable
C203.2: Determine the frequency components present in a deterministic signal
C203.3: Characterize continuous LTI systems in the time domain and frequency domain
C203.4: Characterize continuous LTI systems in the time domain and frequency domain
C203.5 : Analyze discrete time signals and system in the Fourier and Z transform domain
C203.6: Compute the output of an LTI system in the time and frequency domains

CONTENT BEYOND THE SYLLABUS

➢ Application of Z Transform
➢ Laplace Transform in Real Life

INTERNAL ASSESSMENT DETAILS

ASSESMENT NUMBER	I	II
Syllabus	Unit 1 &2 ,Unit 3(Half)	Unit 3(Half), Unit 4 &5

ASSIGNMENT NUMBER	I	II	III	IV	V	VI	VII	VIII	IX	X
Dead line	13.9.22	19.9.22	22.9.22	29.9.22	19.10.22	5.11.22	16.11.22	21.11.22	29.11.22	2.12.22

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ASSIGNMENT NUMBER	UNIT	DESCRIPTIVE QUESTIONS/TOPIC (Minimum of 8 Pages)
1	I	Classification of signals
2		Classification of systems
3	II	Fourier series and Transform
4		Properties of Laplace Transform
5	III	Solution of differential equation using Laplace Transform
6		Realization of Direct form I ,II and cascade and parallel structure in LTI CT systems
7	IV	Inverse z Transform
8		Sampling theorem
9	V	Realization of Direct form I ,II and cascade and parallel structure in LTI DT systems
10		Solution of differential equation using Z Transform

PREPARED BY

R.YOGESHWARI, AP/ECE

VERIFIED BY

HOD/ECE

APROVED BY

PRINCIPAL

23/8/22

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

REVIEW OF COURSE FILE

(to be pasted on the inner side of the file-backside).(#-State Yes/No.)

S.N	Details / Date:	R-I-*	R-II-*&	R-III-*&	R-IV-*&$	R-V-*&$@
1.	Preface of the course file	Yes				
2.	Vision, Mission, PEOs, POs, PSOs, Blooms taxonomy	Yes				
3.	Subject handlers of yesteryears					
4.	Timetable/Workload of the staff – Distribution of teaching load – Roles and Responsibilities	Yes				
5.	Syllabus signed by staff & HoD	Yes				
6.	Lecture Schedule signed by staff & HoD	Yes				
7.	Course Committee meeting circular and minutes	NA				
8.	Identification of Curricular gap and Content Beyond the syllabus	Yes				
9.	Self-study topics					
10.	Previous AU Question papers	Yes				
11.	Unit wise Q&A and Objective type questions	Yes				
12.	Unit wise course material	Yes				
13.	Assignment question paper with sample answer sheets and mark entry		Yes			
14.	Tutorial question paper with key and mark entry		Yes			
15.	Class test/IA test Q Paper with Key, sample answer papers and mark entry		Yes			
16.	IA Test- result analysis-CAP-evidence-root cause analysis.		Yes			
17.	Retest –Q paper-Attendance-marks		Yes			
18.	AU Web portal entry sheet		Yes			
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence		NA			
20.	Absence for two tests-action taken-communication to parents-evidence.					
21.	Indiscipline of student reported, if any		NA			
22.	Special class/coaching class/remedial class/attendance-CAP					
23.	Conduct of Seminar, Quizzes - proof		Yes	Yes		
24.	Content beyond the syllabus - proof				Yes	
25.	Student feedback on faculty			Yes		
26.	Course end survey					
27.	Internal Assessment sheet			Yes		
28.	AU question paper with students feedback				Yes	
29.	Discrepancy of the question paper and correspondence, if any					
30.	AU result analysis-Details of arrear students.					
31.	AU grade sheet					Yes
32.	CO – PO & PSO attainment sheet					Yes
	Signature of Course handling faculty	Rugh	Rugh	Rugh	Rugh	Rugh
	Signature of HoD	Rugh	Rugh	Rugh	Rugh	Rugh

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty :R.YOGESHWARI   Course Code & Name: EC 3354 –SIGNALS AND SYSTEMS

Degree & Program: B.E. /ECE   Semester : III   Academic Year: 2022 -2023 /ODD

I. Mapping of Course Outcomes with POs & PSOs.(Before CBS)

Table.1 Mapping of COs, C, PSOs with POs - before CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.2	3	3	3	3	2	2	-	-	-	-	1*	1	2	1	1
C203.3	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.4	3	3	3	3	2	2	-	-	-	-	l*	1	2	1	1
C203.5	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.6	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203	3	3	3	3	2	2	-	-	-	-	1	1	2	1	1

II. Identification of content beyond syllabus.

Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus(CBS) added	POs strengthened/ vacant filled	CO/Unit
1.Laplace Transform In Real Life 2.Application Of Z Transform	PO(2),PO2(4) Vacant filled	C203.2, & C203.4 II & IV

III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table.3 Mapping of COs, C, PSOs with POs- after CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO2
C203.1	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.2	3	3	3	3	2	2	-	-	-	-	1*	1	2	1	1
C203.3	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.4	3	3	3	3	2	2	-	-	-	-	l*	1	2	1	1
C203.5	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.6	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203	3	3	3	3	2	2	-	-	-	-	1	1	2	1	1

Signature of the Faculty Incharge

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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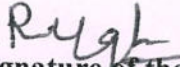
Assignment Answer Paper
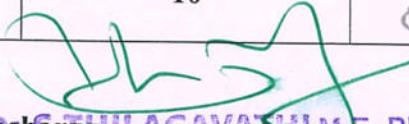
NAME : PAVITHRA. P

REGISTER NUMBER : 91262110b007

Assignment – 01			Date of Issue:	8.9.2023	Marks	10
Course code	EC3354	Course Title	SIGNALS AND SYSTEMS			
Year	II	Semester	IV	Date of Submission:		13.9.2023

Q.No	Questions	CO
1	Determine the following systems are linear, causal, Time invariant, stable, static (i) $\dfrac{d}{dt} y(t) + 10y(t) = x(t)$ (ii) $y(t) = \cos x(t)$ (iii) $y(t) = x(t-3) + x(3-t)$ (iv) $y(t) = \cos(100\pi t)$ (v) $y(n) = x(n) - x(n-1)$ (vi) $y(n) = 2x(x^n)$ (vii) $y(t) = tx(-t)$	C203.1

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	5
Presentation Quality	2	2
Timely submission	2	2
Total marks	10	09

Name and Signature of the Faculty Incharge

(C R. YOGESHWARI)

Dr. G. THILAGAVATHI M.E., Ph.D.,
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COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai. Dt.

HoD/ECE

HOD / ECE
SRI BHARATHI ENGINEERING
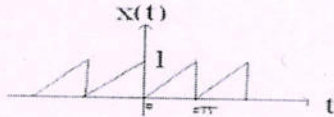COLLEGE FOR WOMEN
KAIKKURICHI,
PUDUKKOTTAI - 622 303

Assignment Answer Sheet

NAME : C. Suguna

REGISTER NUMBER : 912621106010

Assignment – 07			Date of Issue:	11.11.2022	Marks	10
Course code	EC3354	Course Title	SIGNALS AND SYSTEMS			
Year	II	Semester/Section	III	Date of Submission:	16.11.2022	

Q.No	Questions	CO
1	Determine the inverse z transform of $$X(Z) = \frac{1}{1-1.5z^{-1}+0.5\,z^{-2}},$$ For (i) ROC: $|z| > 1$, (ii) ROC: $|z| < 0.5$ and (iii) ROC: $|z| < 1$	C203.4
2	Explain he Sampling theorem with proof.	C203.4

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	05
Presentation Quality	2	02
Timely submission	2	02
Total marks	10	09

Ryah

Name and Signature of the Faculty Incharge

[R. YOGESHWARI]

Ryah

HoD/ECE

Dr. **S.THILAGAVATHI** M.E., Ph.D.,
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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Tutorial Answer Sheet

Name of the Student: C. SUGUNA

AU Register Number 912621106010

Tutorial – 01			Date of Issue:	13.9.22	Marks	10
Course code	EC3354	Course Title	SIGNALS AND SYSTEMS			
Year	II	Semester	III	Date of Submission:	15.9.22	

Q.No	Questions	CO
1	Determine whether the following systems are linear or not $dy(t) / dt + 3ty(t) = t^2 x(t)$ & $y(n) = 2x(n) + 1 / x(n-1)$	C203.1
2	Determine whether the following systems are Time- Invarient or not $Y(t) = t\, x(t)$ & $y(n) = x(2n)$	C203.1
3	(a) Find whether the signal $x(t) = 2 \cos(10\,t+1) - \sin(4t-1)$ is periodic or not. (b) Evaluate $\sum n_{=(-\infty \text{ to } \infty)} e^{2n} \delta(n-2)$ (c) Find the fundamental period of the Continuous time signal $x(t) = 20\cos\left(10\pi t + \frac{\pi}{6}\right)$	C203.1

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Problem solving approach	6	05
Correctness of Answer	2	02
Timely submission	2	02
Total marks	10	09

Name and Signature of the Faculty In charge

(R. YOGESHWARI)

HoD/ECE

Tutorial Answer Sheet

NAME : M. Amrin

REGISTER NUMBER : 912621106001

Tutorial – 02				Date of Issue:	26.9.22	Marks	10
Course code	EC3354	Course Title		SIGNALS AND SYSTEMS			
Year	II	Semester		III	Date of Submission:	28.9.22	

Q.No	Questions	CO
1	Find the inverse Laplace transform of $X(S) = S / S^2+5S+6$	C203.2
2	Obtain the cosine Fourier series representation of x(t)	C203.2
3	Find Laplace transform of the following signals (i) $x(t) = \sin(3t)\,u(t)$ (ii) $x(t) = e^{-at}\cos(wt)$ (iii) $x(t) = r(t)$	C203.2

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Problem solving approach	6	05
Correctness of Answer	2	02
Timely submission	2	02
Total marks	10	09

Name and Signature of the Faculty Incharge

[R. YOGESHWARI]

HoD/ECE

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

IQAC Academic Audit Form

ACADEMIC YEAR: 2022-2023 ODD SEMESTER

Name of Department :	ECE	Year / Sem :	II / III	No. of Students Registered :	12
Details of Examination :	CT -1 / CT-2 / CT -3 ✓				

S.No.	Course Code	List of Reg.No Verified	Course Log Book Verified (Y / N)	Course File Verified (Y / N)	No of students Passed	No of Absentees	No of Failures	Pass %	Remarks
1	MA3355	912621106001	Y	Y	10	1	2	82%	–
2	CS3353	912621106009	Y	Y	8	–	4	67%	–
3	EC3354	912621106003	Y	Y	6	–	6	50%	–
4	EC3353	912621106005	Y	Y	10	1	2	82%	–
5	EC3351	912621106301	Y	Y	7	–	5	58%	–
6	EC3352	912621106008	Y	Y	9	–	3	75%	–

Verified by

External Member Name and Signature:	Iswari. M [ISWARYA.M]
Internal Member Name and Signature:	M. Plllle [M. PALANIAPPAN]

Overall Remarks:

Try to improve the pass percentage in EC 3354 & EC3351. subjects!

Rugh
HoD/ ECE

IQAC Coordinator 6/12/22

Dr. S.THILAGAVATHI M.E., PRINCIPAL
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Principal
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KAIKKURICHI - 622 303.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

STUDENT FEEDBACK ON FACULTY

Course Code & Name: EC 3354-SIGNALS AND SYSTEMS

Year & Sem   **: II/III**

S.NO.	DESCRIPTION	SCORED OUT OF 4	SCORED OUT OF 100
1.	Syllabus coverage as prescribed by university	3.83	95.8
2.	Technical Knowledge of the teacher	3.83	95.8
3.	Teacher Communication Skill	4	100
4.	Regularity in taking classes	3.92	97.9
5.	Helping the students in conducting the experiment through set of instructions And Demonstrations	3.5	87.5
6.	Tendency of inviting opinion and questions on subject matter from students	3.75	93.75
7.	Knowledge of the teacher in latest Development of field	3.75	93.75
8.	Perfectness of Valuation	3.6	89.5
	OVERALL SCORE	3.78	94.25
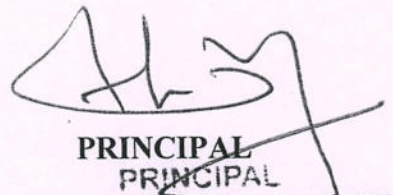
REPORT SHEET

S .NO	REG.NO	NAME	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1.	912621106001	AMRIN. M	4	4	4	4	4	4	4	4
2.	912621106002	BHUVANESWARI.C	4	4	4	4	3	4	3	3
3.	912621106003	DHANYASHREE.A	4	4	4	4	3	3	3	2
4.	912621106004	KALAIVANI.R	3	3	4	4	3	4	3	4
5.	912621106005	KAVIYA.K	4	3	4	4	4	4	4	4
6.	912621106006	KEERTHANA.V	4	4	4	4	4	4	4	3
7.	912621106007	PAVITHRA.P	3	4	4	4	4	3	4	3
8.	912621106008	RAJESHWARI.R	4	4	4	4	4	4	4	4
9.	912621106009	SUBALAKSHMI.M	4	4	4	4	3	4	4	4
10.	912621106010	SUGUNA.C	4	4	4	3	2	3	3	3
11.	912621106301	JAYAPRIYA.M	4	4	4	4	4	4	4	4
12.	912621106302	KIRUBASHINI.E	4	4	4	4	4	4	4	4
		AVERAGE	3.83	3.83	4	3.92	3.5	3.75	3.75	3.6
		PERCENTAGE	95.8	95.8	100	97.9	87.5	93.75	93.75	89.5

EXCELLENT	VERY GOOD	GOOD	AVERAGE	POOR
4	3	2	1	0

Faculty Incharge

HOD/ECE

PRINCIPAL

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
KAIKKURICHI, PUDUKKOTTAI – 622 303.

<u>**CIRCULAR**</u>   Date: 28.09.2022

The First cycle test will be conducted from **10.10.2022 to 15.10.2022** for the III semester (II year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 100 marks.
  (PART A 10X2=20 **PART B** 5X16=80 Only for Mathematics Subject**) and (PART A** 10X2=20 **PART B** 5X13=65 & **PART C** 1X15=15)

- It is responsibility of the faculty members to prepare **two set of question papers** and take the Xerox copies of the required number and it should be handed over to the Exam cell Coordinators Mr**. J. Sathyaraj AP/ EEE, Ms. G. Gayathri AP/CIVIL** along with **answer key** on or before **07.10.2022**.

- The Exam Coordinator (exam cell) is requested to make necessary arrangements (hall arrangements, invigilation duty etc.,) for conducting the cycle test.

- Faculty members are requested to handover the valued answer scripts to the students on or before **17.10.2022** and the class in-charges are requested to send the consolidated mark sheet along with the attendance percentage (from **22 August 2022** to **08 October 2022**) to the parents on or before **20.10.2022**.

PRINCIPAL

28/09/22

Cc:
- All HoD's /CIVIL/CSE/EEE/ECE
- All faculty
- IQAC Co-ordinator
- Exam cell
- Office file

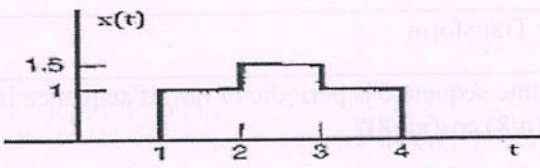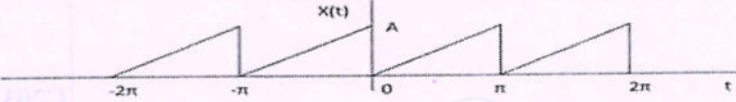Dr. S.THILAGAVATHI M.E.,Ph.D.
PRINCIPAL
SRI BHARATHI ENGINEERING
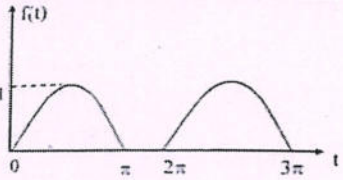COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
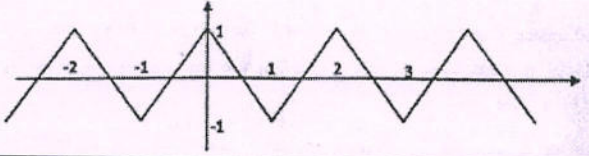## KAIKKURICHI, PUDUKKOTTAI – 622 303.

<u>CIRCULAR</u>

Date: 28.09.2022

The First cycle test will be conducted from **10.10.2022 to 15.10.2022** for the **III semester** (II year) B.E students for **100 marks** as per the time table given below. Students are directed to prepare well and score good marks.

Date	12.45 pm -03.45 pm (AN)
10.10.2022	**CE3302**-Construction Materials and Technology(CIVIL) **CS3301**-Data Structures(CSE) **EE3301**-Electromagnetic Fields(EEE) **EC3353**-Electronic Devices and Circuits(ECE)
11.10.2022	**CE3351**-Surveying and Leveling(CIVIL) **CS3391**-Object Oriented Programming(CSE) **CS3353**-C Programming and Data Structures (EEE/ECE)
12.10.2022	**CE3301**-Fluid Mechanics(CIVIL) **CS3351**-Digital Principles and Computer Organization(CSE) **EE3302**-Digital Logic Circuits(EEE) **EC335**-Digital System Design(ECE)
13.10.2022	**CE3303**-Water Supply and Wastewater Engineering(CIVIL) **CS3352**-Foundations of Data Science(CSE) **EC3301**-Electron Devices and Circuits(EEE) **EC3354**-Signals and Systems(ECE)
14.10.2022	**ME3351**-Engineering Mechanics(CIVIL) **EE3303**-Electrical Machines - I(EEE) **EC3351**-Control Systems(ECE)
15.10.2022	**MA3351**-Transforms and Partial Differential Equations(CIVIL) **MA3303**-Probability and Complex Functions(EEE) **MA3354**-Discrete Mathematics(CSE) **MA3355**-Random Processes and Linear Algebra(ECE)

PRINCIPAL
28/09/12

Cc:
- All II year B.E Classes
- All faculty
- IQAC Co-ordinator
- Exam cell
- Notice Board
- Office file

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Cycle Test - I			Date/Session	13.10.2022/AN	Marks		100
Course code	EC 3354	Course Title	SIGNALS AND SYTEMS				
Regulation	2021	Duration	3 Hours	Academic Year		2022 - 2023	
Year	II	Semester	III	Department		ECE	

COURSE OUTCOMES

C203.1:	Determine if a given system is linear/causal/stable
C203.2:	Determine the frequency components present in a continuous time signal
C203.3:	Characterize continuous LTI systems in the time domain and frequency domain
C203.4:	Characterize discrete LTI systems in the time domain and frequency domain
C203.5:	Analyze discrete time signals and system in the Fourier and Z transform domain
C203.6:	Compute the output of an LTI system in the time and frequency domains

Q.No.	Question	CO	BTL
	PART A		
	(Answer all the Questions 10 x 2 = 20 Marks)		
1	Determine average power P_∞ for the signal x(t)=2cos (t)	C203.1	K2
2	Find even and odd part of the signal?	C203.1	K3
3	What are the Dirichlet's conditions of Fourier series?	C203.2	K2
4	State the Parseval's theorem in Fourier Transform	C203.2	K2
5	Determine whether the given discrete time sequence is periodic or not. If sequence is periodic, Find the fundamental period x(n)= cos(n/8) cos(πn/8)?	C203.1	K2
6	Determine the fourier transform of the unit step signal?	C203.2	K2
7	Define random signal? Give an example.	C203.1	K1
8	Find the Laplace transform of x(t)= e^{-at} u(t)	C203.2	K3
9	State the difference between causal and non-causal systems.	C203.1	K1
10	Represent the following function into unit step function.	C203.1	K2
	PART B		
	(Answer all the Questions 5 x 13 = 65 Marks)		
11a	Check whether the following system is linear, causal, time variant, static and stable a) y(n) = x(n)-x(n-1) b) y(t) = x(t)cos (100πt) c) y(t) = x(t/2)	C203.1	K1

(13)

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| 11b	(i)Determine whether the following signals are energy or power signals $x(t) = e^{-2t}u(t)$		
	(ii)Check whether the periodicity of the signals and also find the fundamental period if they are periodic (a) $x(t) = e^{-j2t}$ (b) $x(n) = \sin(\frac{6\pi}{7}n+1)$ $\qquad\qquad$ (04+09)	C203.1	K1
12a	Find the inverse Laplace transform of (i) $X(s) = \dfrac{2s+3}{s^2+5s+6}$ (ii) $X(s) = \dfrac{3s+4}{(s+1))(s+2)^2}$ $\qquad\qquad$ (06+07)	C203.2	K2
	OR		
12b	Write any seven properties of laplace transform with proof. $\qquad\qquad$ (13)	C203.2	K2
13a	Draw the waveforms represented by following step functions. (i) $f_1(t) = 2\,u(t-1)$ (ii) $f_2(t) = -2\,u(t-2)$ (iii) $f(t) = f_1(t) + f_2(t)$ (iv) $f(t) = f_1(t) - f_2(t)$ $\qquad\qquad$ (13)	C203.1	K1
	OR		
13b	i) For the signal x(t) shown in Figure, sketch $x\left(2-\dfrac{t}{2}\right)$. ii) Sketch the even and odd part of the signal x(t) shown in Figure. Figure $\qquad\qquad$ (09+04)	C203.1	K1
14a	(i)Find Inverse Laplace transform of $X(s) = \dfrac{1}{(s+5))(s-3)}$ For (1) -5<Re(s)<3, (2) Re(s) > 3 (ii) Find the initial value and final value of $X(s) = \dfrac{2s+3}{s^2+5s+6}$ $\qquad\qquad$ (08+05)	C203.2	K3
	OR		
14b	(i)Write any five properties of Fourier transform $\qquad\qquad$ (10) (ii)Find the Laplace transform of $x(t) = e^{-at}\cos(wt)u(t)$ $\qquad\qquad$ (03)	C203.2	K3
15a	Derive the Fourier series representation of the given transform and plot the magnitude spectrum. $\qquad\qquad$ (13)	C203.2	K3
	OR		
15b	Solve the trigonometric Fourier series representation of following signal.	C203.2	K3

		(13)		

PART C
(Answer all the Questions 1 x 15 = 15 Marks)

16a	Solve the inverse Laplace transform of (i) $\quad X(s) =(8s+10)/(s+1)(s-2)^2$ (ii) $\quad X(s)=(s^2+s-3)/(s^2+3s+2)$ (15)	C203.2	K3

OR

16b	Derive the Fourier series representation of following signal and also plot the spectrum (15)	C203.2	K3

Course Faculty 6/10/22
(Name /Sign / Date)
[R. YOGESHWARI]

HoD 6/10/22
(Name /Sign / Date)
[R. YOGESHWARI]

Answer key.   Answer key

(1) $P \Rightarrow \lim\limits_{T \to \alpha} \dfrac{1}{T} \displaystyle\int_{-T/2}^{T/2} [x(t)]^2 \, dt$ —————— (1)

$P \Rightarrow \lim\limits_{T \to \alpha} \dfrac{1}{T_0} \displaystyle\int_{-T_0/2}^{T_0/2} [2\cos t]^2 \, dt$

$\Rightarrow \lim\limits_{T \to \alpha} \dfrac{1}{T_0} \times 4 \displaystyle\int_{-T_0/2}^{T_0/2} \dfrac{[1+\cos 2t]}{2} \, dt$

$= \lim\limits_{T \to \alpha} \dfrac{4}{T_0}\left(\dfrac{1}{2}\right)\left[t \right]_{-T_0/2}^{T_0/2} + \left[\dfrac{\sin 2t}{2} \right]_{-T_0/2}^{T_0/2}$

$\Rightarrow \lim\limits_{T \to \alpha} \dfrac{2}{T_0}\left[\dfrac{T_0}{2} + \dfrac{T_0}{2} \right]$

$P_\alpha \Rightarrow \lim\limits_{T \to \alpha} \dfrac{2}{T_0}\left[T_0 \right] \Rightarrow 2.$

power signal $\boxed{P_\alpha = 2}$ ————————◯ (1)

(2) **Even and odd signal.**
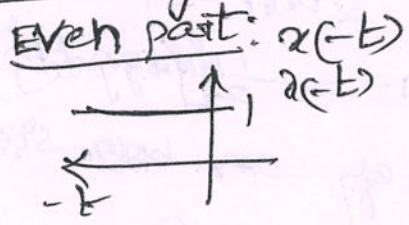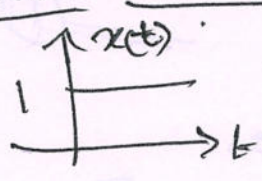
Even part: $x(-t)$ $x_e(t) \Rightarrow \dfrac{x(t)+x(-t)}{2}$
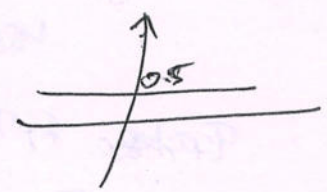
odd signal: $x_o(t)$ ———————— (2)
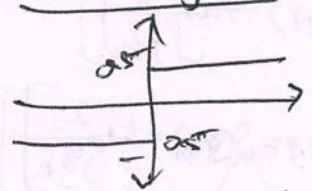
(3) **Dirichlet's conditions**

1) single valued property
2) Finite discontinuities
3) finite peaks
4) Absolute integrability. $\displaystyle\int_{\alpha} [x(t)] \, dt$

④ parseval's theorem:

$$E = \int_{-\alpha}^{\alpha} |x(t)|^2 \, dt \Rightarrow \int_{-\alpha}^{\alpha} |x(f)|^2 \, df.$$

$$= \frac{1}{2\pi} \int_{-\alpha}^{\alpha} |x(\omega)|^2 \, d\omega. \quad ——② $$

⑤ $x(n) = \cos(n/8) \, en(\pi n/8) ——①$

$$\frac{1}{2}[\sin(a+b) + \sin(a-b)]$$

$$\Rightarrow \frac{1}{2}[\sin[n/8 + \pi n/8] + \sin[n/8 - \pi n/8]]$$

$$\Rightarrow \frac{1}{2} \sin\left(\frac{\pi n}{8} + n/8\right) + \left(\sin[\pi n/8 - n/8]\right)$$

$$w_1 = 1/8 \quad | \quad w_2 = \pi/8 \qquad \Big| \quad f_1 = \frac{1}{16\pi}$$

$$2\pi f_1 = 1/8 \quad | \quad 2\pi f_2 = \pi/8 \quad \Big| \quad f_2 = \frac{1}{16}$$

It is not rational? $f_1/f_2 \Rightarrow 4/\pi$

Not periodic signal. ——③

⑥ FT of unit step signal.

$$Sgn(t) = 2u(t) - 1$$

$$u(t) = \frac{1}{2}[1 + sgn(t)] \qquad ——①$$

Take F-T of on both sides

$$F\cdot T[u(t)] = \frac{1}{2}[FT(1) + FTS(t)]$$

$$\Rightarrow \frac{1}{2}\left[2\pi \delta(\omega) + \frac{2}{j\omega}\right]$$

$$\therefore u(t) \xleftrightarrow{F.T.} \frac{1}{2}\left[2\pi \delta(\omega) + \frac{2}{j\omega}\right] ——①$$

⑦ Random signal:-

A signal which cannot be represented by any mathematical equation is called random signal. ————— ①

Ex: Noise generated in electronic components cables, transmission channels etc. ——— ①

⑧ find Laplace transform of $x(t) = e^{-at} u(t)$ ——— ①

$$X(S) = \frac{1}{S+a}, \quad ROC: S > a \quad ——— ①$$

⑨ Causal & Non causal systems:

Causal s/m: o/p of causal s/m depends on past and present inputs only

Non causal s/m: depends upon future input also. ——— ②

⑩
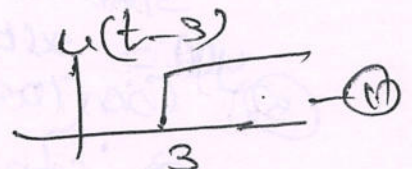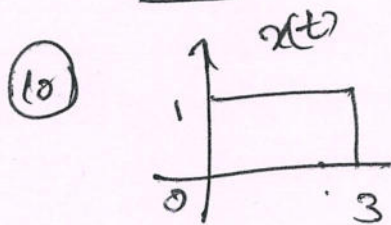
$$x(t) = u(t) - u(t-3) ——— ②$$

PART-B:

⑪ (a) (i) $y(n) = x(n) - x(n-1)$ ————— ④

1) Two inputs are simply added. So it is linear

② output is function of present, and previous input. It is causal s/m

③ Time factor n is not altered. It is Time Invariant:

Stable: output is bounded as long as inputs are bounded.

(iii) $y(t) = x(t/2)$ —— ⑤

The s/m is <u>dynamic</u>, o/p depends upon

<u>past input:</u>

$y(4) = x(2)$

<u>Non causal s/m:</u> $t = -4$,

$y(-4) = x(-2)$.

<u>Stability:</u> $x(t)$ is bounded, $y(t)$ is bounded

<u>Time variant:</u> time factor is modified

<u>linearity:</u> It is <u>linear.</u>

output is direct function of input.

s/m is invertible.

⑤ $y(t) = \dfrac{x(t)}{\cos(100\pi t)}$ —— ④

① static and causal.,

linear s/m

shift variant.

stable s/m

(11) (5) ① $x(t) = e^{-2t} \cdot u(t)$ —— ④ It must be

It is non-periodic signal. an energy signal.

$\text{Energy} = \displaystyle\int_{-\infty}^{\infty} [x(t)]^2 \cdot dt = \int_{-\infty}^{\infty} |e^{-2t} \cdot u(t)|^2 \cdot dt$

$\displaystyle\int_{0}^{\infty} e^{-4t} \cdot dt \cdot dt = \left[\dfrac{e^{-4t}}{-4}\right]_{0}^{\infty}$

$\boxed{E = \dfrac{1}{4}}$

energy is finite and non-zero i.t's

energy signal.

(ii) ⓐ $x(t) = e^{-j2t}$

$x(t) = e^{j2t} = \cos 2t - j \sin 2t$

$= \cos 2\pi f t - j \sin 2\pi f t$

$\cancel{2\pi} f \cancel{t} \Rightarrow \cancel{2} t$

$f = \frac{1}{\pi} \Rightarrow \frac{1}{T} \Rightarrow \boxed{T = \pi}$ ⟵ ⑤

signal is periodic with period $T = \pi$.

ⓑ $x(n) = \sin\left(\frac{6\pi}{7} n + 1\right)$

$x(n) = \sin\left(2\pi f n + \theta\right)$

$\cancel{2\pi} f \cancel{n} \Rightarrow \frac{\overset{3}{\cancel{6}\pi}}{7} \cancel{n}$

$\boxed{f = 3/7}$ It is the ratio of two integers. It is not periodic.

fundamental period $\boxed{T = 7}$ ⟵ ④

⑫ ⓐ $\dfrac{ILT}{X(s)} \Rightarrow \dfrac{2s+3}{s^2 + 5s + 6}$

$X(s) = \dfrac{2s+3}{s^2 + 5s + 6} = \dfrac{A}{(s+3)} + \dfrac{B}{(s+2)}$

$2s + 3 = A(s+2) + B(s+3)$

sub $s = -2$,

$-4 + 3 \Rightarrow \boxed{B \Rightarrow -1}$

$s = -3 \Rightarrow \qquad -6 + 3 = A(-3+2)$

$-3 = -A$

$\boxed{A = 3}$

$X(s) = 3/s+3 + ^{-1}/s+2$

Take ILT: $\boxed{x(t) = 3 e^{-3t} u(t) - e^{-2t} u(t)}$

⟵ ⑥

(B) (ii) $X(S) = \dfrac{3S+4}{(S+1)(S+2)^2}$

$K_2 = (S+2)^2 \dfrac{3S+4}{(S+1)(S+2)^2}$

$\boxed{K_2 \Rightarrow 2}$

$X(S) = \dfrac{k_0}{S+1} + \dfrac{k_1}{S+2} + \dfrac{k_2}{(S+2)^2}$

$K_1 \Rightarrow \dfrac{(S+1)\,3 + (3S+4)\,1}{(S+1)^2} \cdot \dfrac{}{6S+7}$

$\Rightarrow \dfrac{3S+3 \;\;\; 3S+4}{(S+1)^2}$

$k_0 \Rightarrow 1, \quad k_2 = +2, \quad k_1 = 2 = -1$

$\Rightarrow \dfrac{6S+7 \;-1}{(S+1)^2}$

$X(S) = \dfrac{1}{S+1} - \dfrac{1}{S+2} + \dfrac{2}{(S+2)^2}$ ——⑦

$\Rightarrow -\dfrac{1}{}$

$\Rightarrow -1$

$\underline{\text{Take ILT:}}$
$x(t) = e^{-t}u(t) - e^{-2t}u(t) + 2t\,e^{-2t}\cdot u(t)$

[12] (5) Seven properties of Laplace transform

$\underline{\text{Linearity:}}$-
$L[a_1 x_1(t) + a_2 x_2(t)] = a_1 X_1(S) + b X_2(S),$
$\qquad\qquad \text{ROC: } R_1 \cap R_2$
$\qquad \text{proof} \text{——} ②$

$\underline{\text{Time shifting:}}$
$L(x(t-t_0)) = e^{-St_0}\,X(S). \;\; \text{ROC: } R \;②$
$\qquad\qquad\qquad \text{proof}$

$\underline{\text{shifting s-domain:}}$
$L[e^{S_0 t}\,x(t)] = X(S-S_0) ; \; \text{ROC: } R+Rd(S_0)$
$\qquad\qquad \text{with proof} \text{——} ②$

$\underline{\text{Time scaling:}}$
$x(at) \xleftrightarrow{L} \dfrac{1}{|a|} \cdot X(S/a) ; \; \text{ROC: } R/a$
$\qquad\qquad\qquad\qquad ②$

$\underline{\text{Convolution in Time domain:}}$
$x_1(t) * x_2(t) \xleftrightarrow{L} X_1(S)\cdot X_2(S); \; \text{ROC:}$
$\qquad\qquad\qquad\qquad\qquad R_1 \cap R_2$
$\qquad\qquad\qquad ②$

(13) (b) $x(2-t/2)$ $x(2-t/2)$

$x(t)$

$x_e(t)$

$$x_e(t) = \frac{x(t) + x(-t)}{2}$$

$x(t/2)$

$x(2-t/2)$

④

$$x_0(t) = \frac{x(t) - x(-t)}{2}$$

⑨
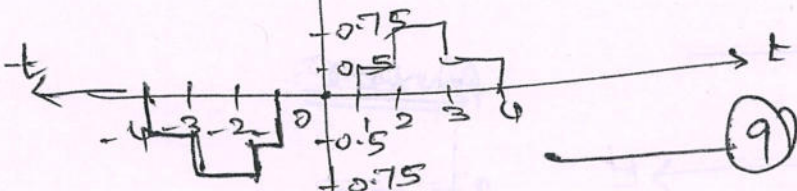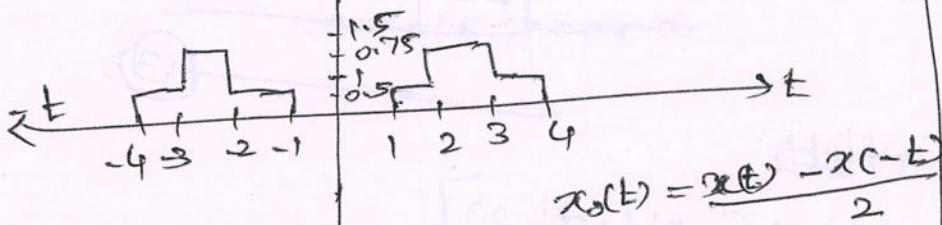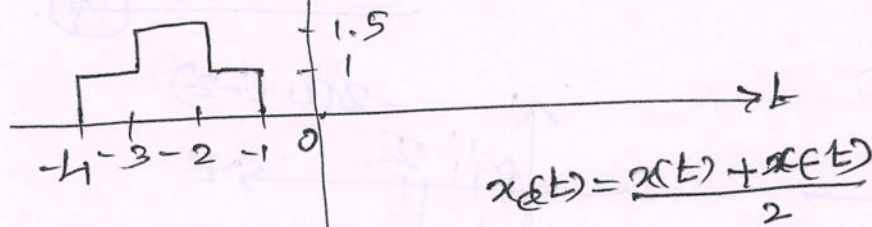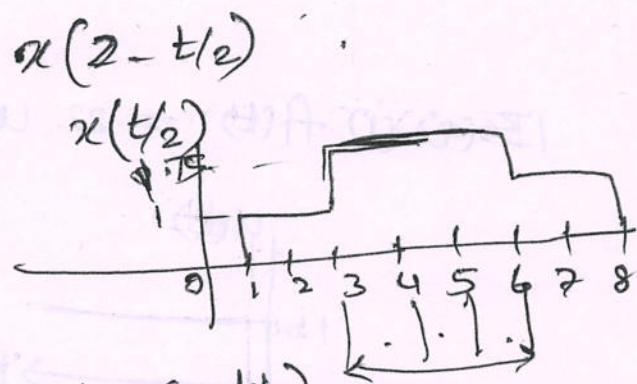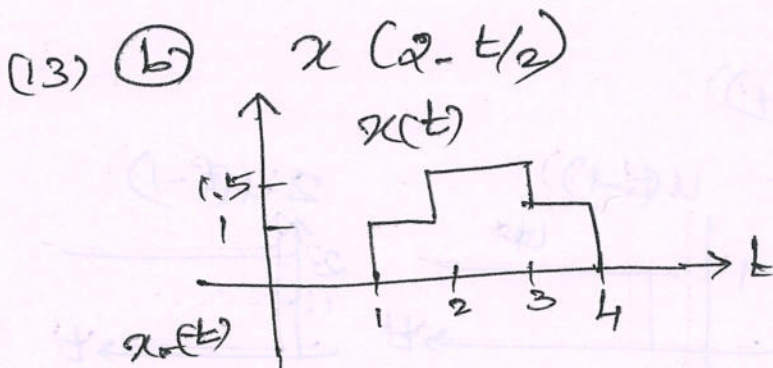
(iii)   Energy signal,

$$0 < E < \alpha$$

$$E = \int_{-\alpha}^{\alpha} |x(t)|^2 \, dt$$

$$= \sum_{n=-\alpha}^{\alpha} |x(n)|^2$$

Most of the signals are non periodic ~~power~~ Energy signals
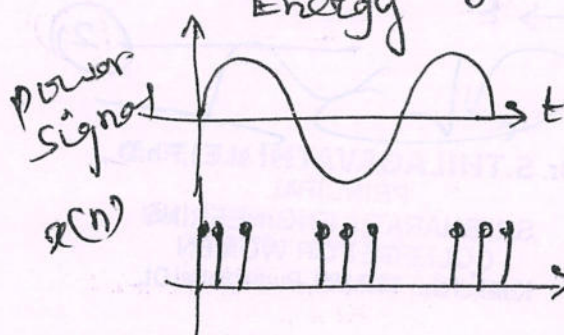
power signal

$$0 < p < \alpha$$

$$P = \lim_{T \to \alpha} \frac{1}{T} \int_{-T/2}^{T/2} x^2(t) \, dt$$

$$= \lim_{N \to \alpha} \frac{1}{2N+1} \sum_{n=-N}^{N} |x(n)|^2$$

Most of the signals are power signals
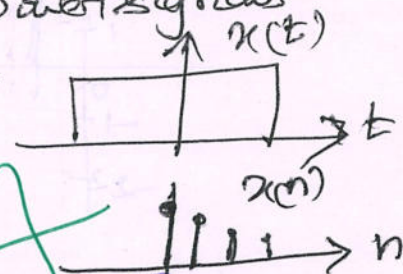
$x(t)$

$x(n)$

power signal

$x(n)$

④

13.(a) (i) $f_1(t) = 2\, u(t-1)$

$u(t)$

$u(t-1)$

$2\,u(t-1)$

(ii) $f_2(t) = -2\,u(t-2)$

$u(t-2)$
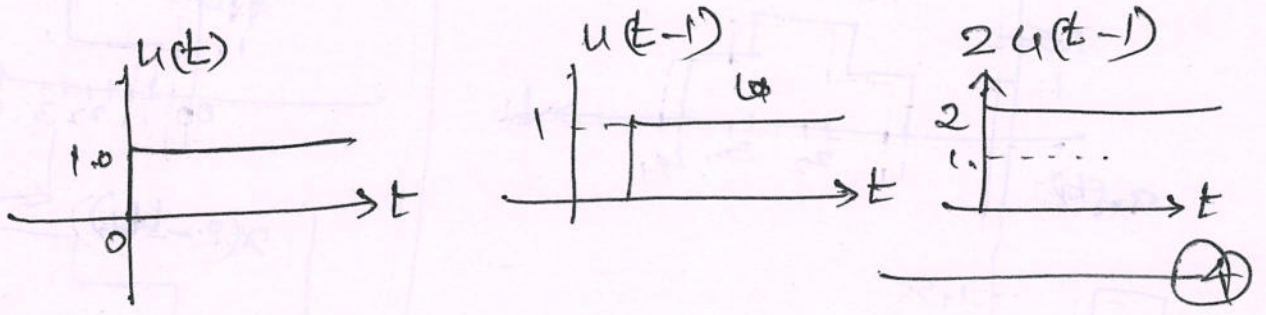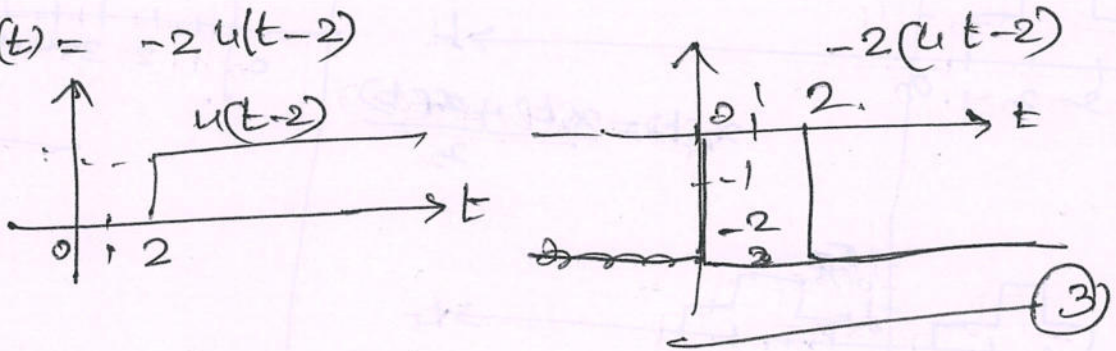
$-2(u\,t-2)$

(iii) $f(t) = f_1(t) + f_2(t)$

$\qquad = 2(t-1) + (-2\,u(t-2)]$
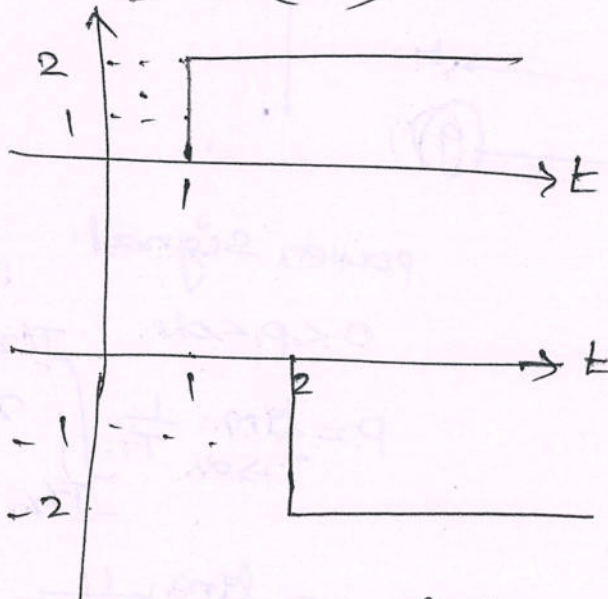
Answer:
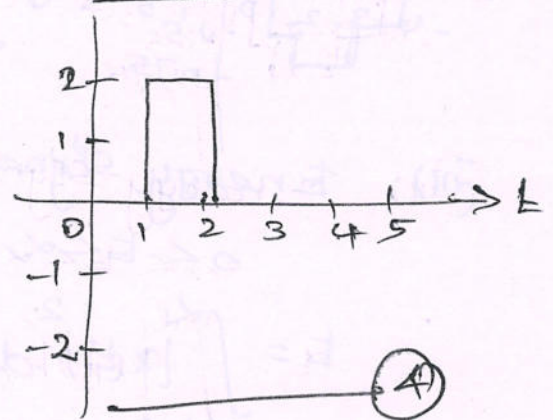
(iv) $f(t) = f_1(t) - f_2(t)$
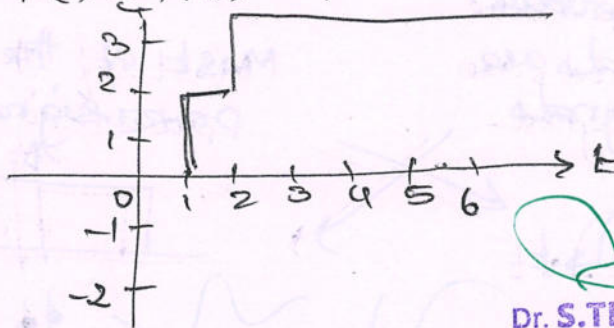
(4) (a) $X(S) = \dfrac{1}{(S+5)(S-3)}$

$\dfrac{1}{(S+5)(S-3)} = A/S+5 + B/S-3$

$1 = A(S-3) + B(S+5)$

$S = 3, \quad A = 1/8, \quad B = 1/8$
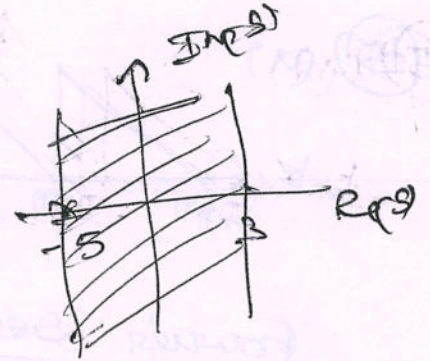
(i) $x(t) = -1/8\, e^{3t} u(-t) - 1/8\, e^{-5t} \cdot u(t)$ —— ⑧

(ii) $x(t) = 1/8\, e^{3t} u(t) - 1/8\, e^{-3t} \cdot u(t)$

(iii) Initial value of $X(S) = \dfrac{2S+3}{S^2+5-S+6}$

$x(0+) = 2.$ —————— ⑤

final value $x(\alpha) = 0$

(4) (b) (i) Five properties of fourier transform

linearity $a\,x(t) + b\,y(t) \overset{FT}{\longleftrightarrow} a\,X_1(\omega) + b\,y(\omega)$

Shifting in time domain: $x(t-t_0) \overset{FT}{\longleftrightarrow} e^{-j\omega t_0} x(\omega)$

Frequency shift: $y(t) = e^{j\beta t} \cdot x(t) \overset{FT}{\longleftrightarrow} X(\omega - \beta)$

Frequency differentiation: $-jt\,x(t) \overset{FT}{\longleftrightarrow} \dfrac{d}{d\omega}(x(\omega))$

Convolution: $x(t) * y(t) \overset{FT}{\longleftrightarrow} x(\omega) \cdot y(\omega)$

(ii) $X(S) = \dfrac{(\beta+a)}{(S+a)^2 + \omega^2}, \quad R_a > \sigma > -a$

with explanation ———— ⑧

(15) (a)
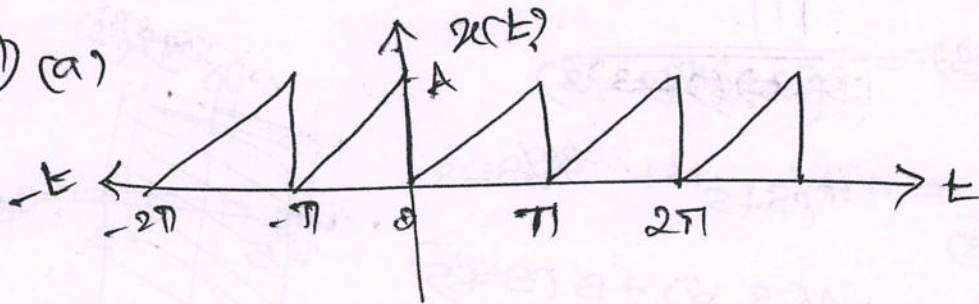
Fourier series

$x(t) = A$, for $0 \le t \le \pi$ for period $T = \pi$

$$X(k) = \frac{1}{T} \int_{\langle T \rangle} x(t) e^{-jw_0 kt} dt = \frac{1}{\pi} \int_0^\pi t \, e^{-jkw_0 t} dt$$

$\int x e^{ax} dx \Rightarrow e^{ax}\left[x/a - 1/a^2 \right]$ ⟶ Ⓐ

$$X(k) \Rightarrow \frac{A}{\pi}\left\{ e^{-jkw_0 t}\left[\frac{t}{-jkw_0} - \frac{1}{(-jkw_0)^2} \right]_0^\pi \right.$$

$$\Rightarrow \frac{A}{\pi}\left(e^{-jkw_0 \pi}\left[\frac{\pi}{jkw_0} - \frac{1}{(jkw_0)^2} \right] + \frac{1}{(jkw_0)^2} \right.$$

$w_0 = \frac{2\pi}{\pi}$

$$\Rightarrow \frac{1}{\pi}\left(e^{-jk2\pi} \cdot \left(\frac{-\pi}{jkw_0} \right) + \frac{1}{jk} \right.$$

$$= \frac{-1}{jkw_0} \Rightarrow j/kw_0, \quad k \ne 0$$

$k = 0$.

$$X(k) = \int_0^\pi t \, dt = \frac{\pi}{2}.$$

$$X(k) \Rightarrow \begin{cases} Aj/kw_0, & k \ne 0 \\ 1/2, & k = 0 \end{cases} \bigg] A=1 \quad Ⓐ$$

Fourier series

$$x(t) = \sum_{k=-\infty}^{\infty} X(k) e^{jkw_0 t} = \frac{1}{2} + \sum_{k=-\infty}^{\infty} j/kw_0 \, e^{jkw_0}$$

⟶ Ⓑ

15)b)

Trigonometric fourier Series

$x(t) = \sin t, \; 0 \text{ to } 2\pi$ ———————④

Fourier coefficients:

$$a_0 = \frac{1}{2\pi} \int_0^{2\pi} x(t) \, dt \Rightarrow \frac{1}{\pi}$$

$$a_k \Rightarrow \frac{1}{\pi} \int_0^{2\pi} x(t) \cos 2\pi \, w_0 t \, dt$$

$$= \begin{cases} \dfrac{-2}{\pi(k^2-1)}, & k \text{ is even}, \; 0,2,4\ldots \\[3mm] 0 & k \text{ is odd}, \; 1,3,5,7. \end{cases}$$

$$b_k = \frac{1}{\pi} \int_0^{2\pi} x(t) \sin k w_0 t \, dt = 0 \quad\text{———④}$$

Fourier series:

$$x(t) = \frac{1}{\pi} + \sum_{k=2,4,6\ldots}^{\alpha} \frac{2}{\pi(1-k^2)} \cos kt. \quad\text{———⑤}$$

PART: C)

(16) ⓐ ⑩ ILT: of $X(S) = \dfrac{8s+1}{(s+1)(s-2)^2}$: ———④

$$x(t) = \left\{ 2e^{-t} + 3(t^2 - 2t - 2) e^{-2t} \right\} u(t) \quad ⑦$$

ⓗ $X(S) = \dfrac{s^2 + s - 3}{s^2 + 3s + 2} = \dfrac{A}{(S+2)} + \dfrac{B}{S+1}$

fn not proper form

$$K(S) = 1 + - \frac{2s+5}{(S+2)(S+1)}$$

$$= 1 - \left(\frac{A}{S+2} + B/S+1 \right)$$

ILT: $X(S) = 1 - \frac{3/S+1}{} - \frac{1}{S+2} \quad\text{———⑧}$
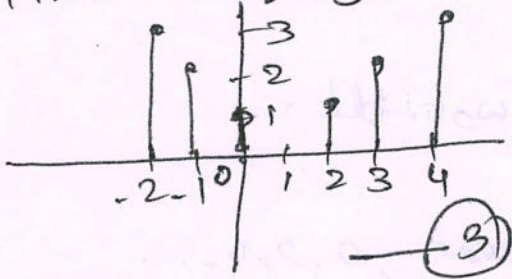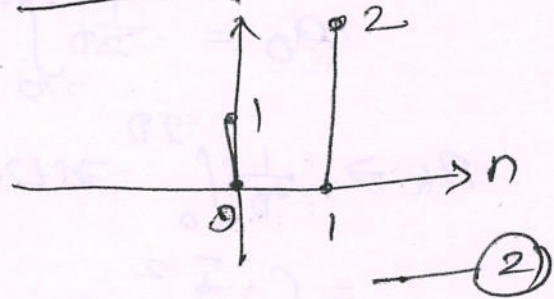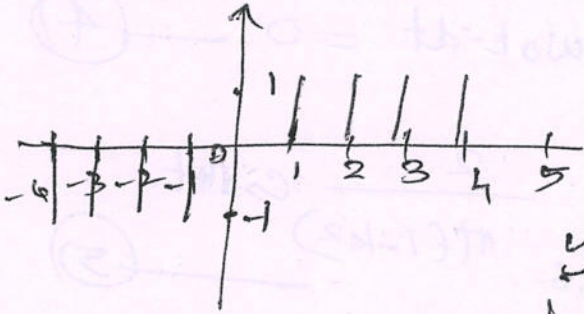
$$\boxed{x(t) \Rightarrow \delta(t), -3e^{-t} u(t) + e^{-2t}}$$

(1a) (b) $x(n)$

③

$x(3n-1)$ $x(n-1)$

i) Time shifting :

③

Time scaling :
$x(3n-1)$

②

$\dfrac{y(1-n)}{y(n)}$

$y(n)$ - reflection then $y(-n)$
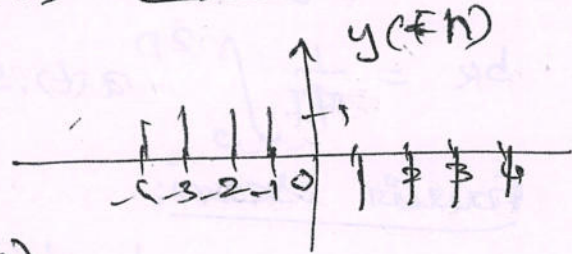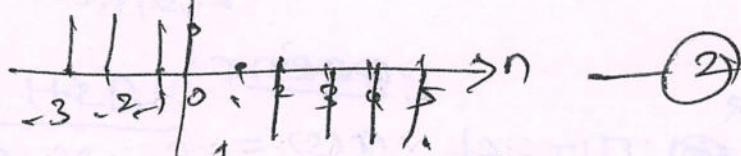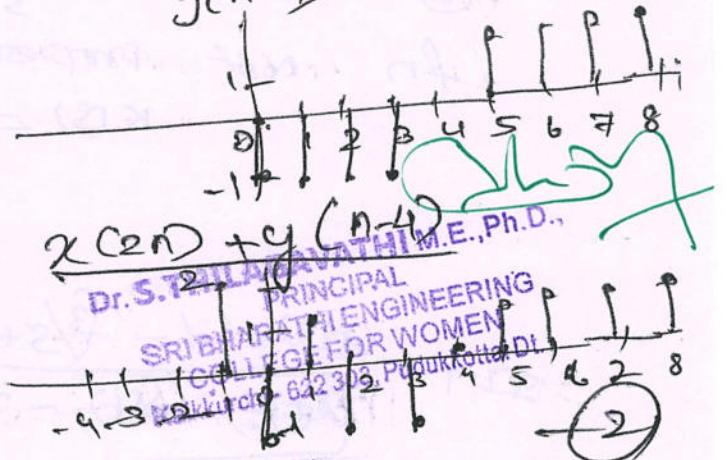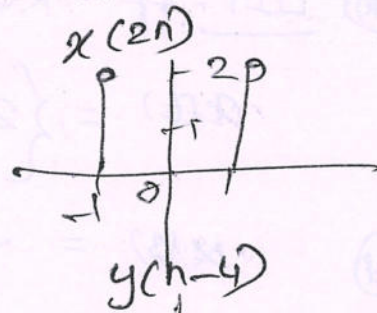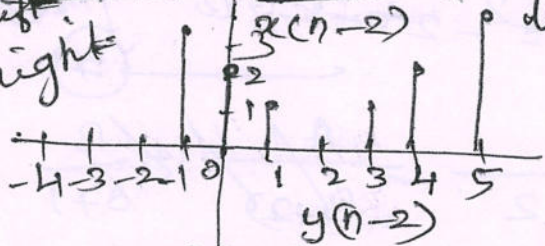
$y(-n)$

$y(1-n)$

②

Shift $x(n-2) + y(n+2)$, toward
right $\dfrac{}{x(n-2)}$ left by 2 units

$y(n-2)$

$x(2n)$

$y(n-4)$

$x(n+2)+y(n-2)$

③

$x(2n) + y(n-4)$

②

15) b)

Trigonometric fourier
Series

$$x(t) = \sin t, \quad 0 \text{ to } 2\pi$$

Fourier coefficients:

$$a_0 = \frac{1}{2\pi} \int_0^{2\pi} x(t) . dt \Rightarrow \frac{1}{\pi}$$ ④

$$a_k \Rightarrow \frac{1}{\pi} \int_0^{2\pi} x(t). \cos 2\pi w_0 t . dt$$

$$= \begin{cases} \dfrac{\cancel{5}2}{\pi.(k^2-1)}, & k \text{ is even}, 0, 2, 4 \dots \\[2mm] 0 & k \text{ is odd}, 1,3,5,7. \end{cases}$$

$$b_k = \frac{1}{\pi} \int_0^{2\pi} a(t). \sin k w_0 t. dt = 0$$ ④

Fourier series:

$$x(t) = \frac{1}{\pi} + \sum_{k=2,4,6..}^{\alpha} \frac{2}{\pi(1-k^2)} \cos kt.$$ ⑤

PART: C)

(16) ⑪ ILT of $X(S) = \dfrac{8s+1}{(s+1)(s-2)^2}$: ④

$$x(t) = \left\{ 2e^{-t} + 3(t^2 - 2t - 2) e^{-2t} \right\} u(t) $$ ⑦

⑪ $X(S) = \dfrac{s^2+s-3}{s^2+3s+2} = \dfrac{A}{(s+2)} + \dfrac{B}{s+1}$
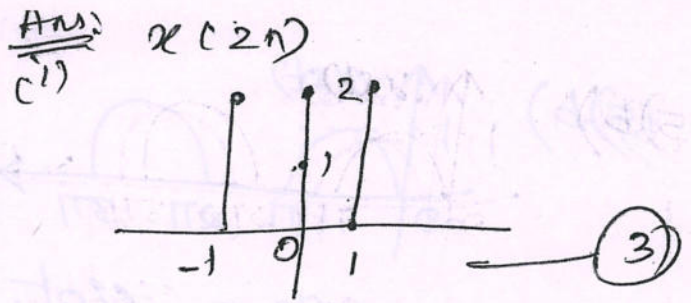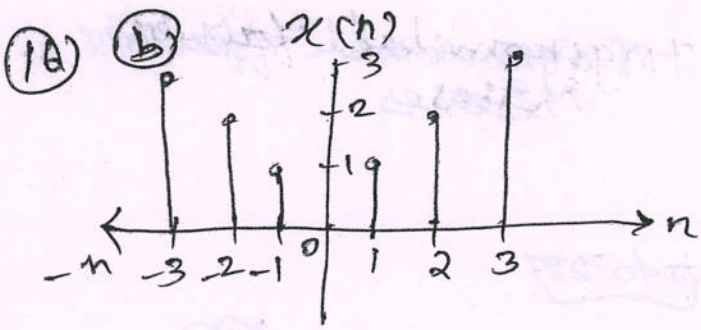
fn Not proper form

$$X(S) = 1 + - \frac{2s+5}{(s+2)(s+1)}$$

$$= 1 - \left(\frac{A}{s+2} + B/s+1 \right)$$ ⑧

$$X(S) = 1 - \left(3/s+1 \right) - 1/s+2$$

ILT $\boxed{x(t) \Rightarrow \delta(t) - 3e^{-t} u(t) + e^{-2t} . dt}$

(1a) (b) $x(n)$

$-n$ -3 -2 -1 0 1 2 3 $\rightarrow n$

-1 0 1 ③

$x(3n-1)$ $x(n-1)$

i) Time shifting

-2 -1 0 1 2 3 4 ③

Time Scaling:
$x(3n-1)$

0 1 $\rightarrow n$ ②

$\dfrac{y(1-n)}{y(n)}$

-6 -5 -4 -1 0 1 2 3 4 5

$y(n)$ — reflection then $y(-n)$

$y(-n)$

-3 -2 -1 0 1 2 3 4

$y(1-n)$

-3 -2 -1 0 1 2 3 4 $\rightarrow n$ ②

Shift $x(n-2) + y(n+2)$ toward
right $x(n-2)$ left by 2 units

-4 -3 -2 -1 0 1 2 3 4 5

$y(n-2)$

-5 -4 -3 -2 -1 0 1 2 3 4 5 6

$x(2n)$

-1 0 1

$y(n-4)$

0 1 2 3 4 5 6 7 8

$x(n+2) + y(n-2)$

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 $\rightarrow n$ ③

$x(2n) + y(n-4)$

-4 -3 0 1 2 3 4 5 6 7 8 ②
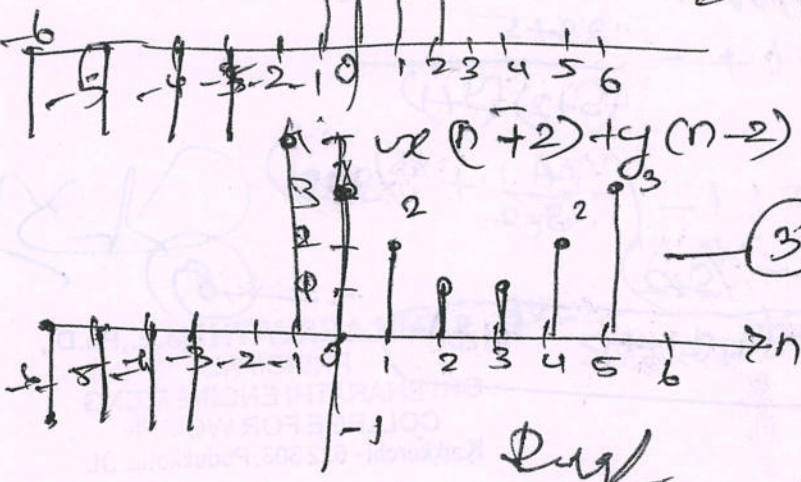
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Cycle Test Answer Book

Name	KEERTHANA · V			Year/ Semester		II / III
Reg No.	912621106006	Date/Session	13/10/22 AN	Department		ECE
Course code	EC 8354	Course Title	SIGNALS AND SYSTEMS			
Cycle Test (Put a tick mark)		CT 1 ✓	CT 2 ☐	CT 3 ☐		Model ☐
Name and Signature of the Invigilator with date			P·D~ 13/10/22 [P· Dennis thora].			

Instruction to the Student: Put tick mark to the question attended in the column against question.

Part A			Part B / Part C						Total Marks
Q. No.	✓	Marks	Q. NO.	✓	a Marks	✓	b Marks		Total Marks
1	✓	2	11			✓	13		13
2	✓	2	12	✓	13				13
3	✓	2	13	✓	13				13
4	✓	2	14	✓	12				12
5	✓	2	15			✓	13		13
6	✓	2	16	✓	15				15
7	✓	2					Total		79
8	✓	2							
9	✓	2				Ruah (R. YOHESHWAR T) 14/10/22			
10	✓	1		98/100					
Total		19	Grand Total			Name and Signature of the Examiner with date			

To be filled by the examiner							
Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	38	47	15				100
Marks Obtained	37	46	15				98

IQAC Audit - Remarks

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Kaikkurchi - 622 303, Pudukkottai Dt.

Name and Signature
of the IQAC member

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)
STUDENTS MARK STATEMENT- CO BASED
CYCLE TEST-I
COURSE CODE &NAME: EC3354-SIGNALS AND SYSTEMS
YEAR/SEM: II/III
MONTH & YEAR: OCT'22

S.NO	REG NO	STUDENT NAME	CO1 (38)	CO2 (47)	CO3 (15)	TOTAL (100)
1.	912621106001	AMRIN. M	26	20	05	51
2.	912621106002	BHUVANESWARI.C	13	20	02	35
3.	912621106003	DHANYASHREE.A	26	11	00	37
4.	912621106004	KALAIVANI.R	15	11	05	31
5.	912621106005	KAVIYA.K	28	32	03	63
6.	912621106006	KEERTHANA.V	37	46	15	98
7.	912621106007	PAVITHRA.P	25	20	05	50
8.	912621106008	RAJESHWARI.R	36	30	11	77
9.	912621106009	SUBALAKSHMI.M	07	07	00	14
10.	912621106010	SUGUNA.C	28	20	05	53
11.	912621106301	JAYAPRIYA.M	12	04	00	16
12.	912621106302	KIRUBASHINI.C	08	08	00	16

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
03	-	03	01	02	01	01	-	01

Total No.of Candidates Present	12
Total No.of Candidates Absent	NIL
Total No.of Students Pass	06
Total No. of Students Fail	06
Percentage of Pass	50 %

Faculty Incharge

HoD/ECE

HOD / ECE
SRI BHARATHI ENGINEERING
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PRINCIPAL 18/10/22

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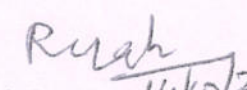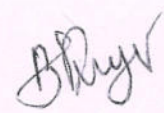PUDUKKOTTAI DISTRICT

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty : Mrs.R.YOGESHWARI   Course Code & Name : EC3354-Signals and Systems

Degree & Program : B,E & ECE   Semester : III

Cycle Test : I /II/III   Exam/Month & Year :

Target : 100 %   Achieved : 50 %

S.NO	REG NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN
1.	912621106002	Bhuvaneshwari.C	Mistakes in problem solving	Advised to take more practice & formula bank given to students
2.	912621106003	Dhanyasree . A	Mistakes in applying formulas.	Formula bank given and need More practice
3.	912621106004	Kalai Vani . R.	Mistakes in problem solving.	Formula bank given.
4.	912621106009	Subalakshmi . M	Not attended all the questions	Advised to attend all the questions
5.	912621106301	Jayapriya . M	Health Issue.	Advised to take avoid careless of health & More problems give & practice at home
6.	912621106302	Kirubashini.C	Careless Mistakes in problem solving.	Formula bank given & advised to practice in home.

Signature of the Faculty Incharge

Signature of the HoD/ECE

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
KAIKKURICHI, PUDUKKOTTAI – 622 303.

CIRCULAR

Date: 17.10.2022

Retest for First cycle test will be conducted from **20.10.2022 to 31.10.2022** for the III semester (II year) students.

The following instructions are to be followed by the faculty members.

- Total marks for which the question paper to be set will be for 50 marks.
  (PART A 9X2=18 PART B 2X16=32 Only for Mathematics Subject**) and (PART A** 5X2=10 **PART B** 2X13=26 & **PART C** 1X14=14**)**
- It is the responsibility of the **question paper** setter to take the Xerox copies of the required number of question papers.
- Concerned Faculty members are requested to conduct the examination as per the scheduled and handover the valued answer scripts to the students on or before 01.11.2022.

PRINCIPAL
17/6/22

Cc:
- All HoD's CIVIL/CSE/EEE/ECE
- All faculty
- IQAC Co-ordinator
- Exam cell
- Office file

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
KAIKKURICHI, PUDUKKOTTAI – 622 303.

CIRCULAR

Date: 16.10.2022

Retest for First cycle test will be conducted from **20.10.2022 to 31.10.2022** for the **III semester** (II year) B.E students for **50 marks** as per the time table given below. Students are directed to prepare well and score good marks.

Date	04.00 pm -05.00 pm
20.10.2022	CE3302-Construction Materials and Technology(CIVIL) CS3301-Data Structures(CSE) EE3301-Electromagnetic Fields(EEE) EC3353-Electronic Devices and Circuits(ECE)
21.10.2022	CE3351-Surveying and Leveling(CIVIL) CS3391-Object Oriented Programming(CSE) CS3353-C Programming and Data Structures (EEE/ECE)
26.10.2022	CE3301-Fluid Mechanics(CIVIL) CS3351-Digital Principles and Computer Organization(CSE) EE3302-Digital Logic Circuits(EEE) EC3352-Digital System Design(ECE)
27.10.2022	CE3303-Water Supply and Wastewater Engineering(CIVIL) CS3352-Foundations of Data Science(CSE) EC3301-Electron Devices and Circuits(EEE) EC3354-Signals and Systems(ECE)
29.10.2022	ME3351-Engineering Mechanics(CIVIL) EE3303-Electrical Machines - I(EEE) EC3351-Control Systems(ECE)
31.10.2022	MA3351-Transforms and Partial Differential Equations(CIVIL) MA3303-Probability and Complex Functions(EEE) MA3354-Discrete Mathematics(CSE) MA3355-Random Processes and Linear Algebra(ECE)

PRINCIPAL

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
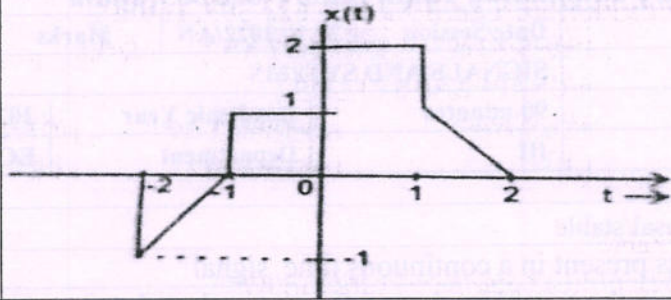COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

Cc:
- All II year B.E Classes
- All faculty
- IQAC Co-ordinator
- Exam cell
- Notice Board
- Office file

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Cycle Test – I (RETEST)			Date/Session	27.10.2022/AN	Marks		50
Course code	EC 3354	Course Title	SIGNALS AND SYTEMS				
Regulation	2021	Duration	90 minutes		Academic Year	2022=2023	
Year	II	Semester	İII		Department	ECE	

COURSE OUTCOMES	
C203.1:	Determine if a given system is linear/causal/stable
C203.2:	Determine the frequency components present in a continuous time signal
C203.3:	Characterize continuous LTI systems in the time domain and frequency domain
C203.4:	Characterize discrete LTI systems in the time domain and frequency domain
C203.5:	Analyze discrete time signals and system in the Fourier and Z transform domain
C203.6:	Compute the output of an LTI system in the time and frequency domains

Q.No.	Question		CO	BTS
	PART A **(Answer all the Questions 05 x 2 = 10 Marks)**			
1	Define causal and Non causal systems.		C203.1	K1
2	Define Energy and Power signal?		C203.1	K1
3	What are the Dirichlet's conditions of Fourier series?		C203.2	K1
4	Determine whether the given discrete time sequence is periodic or not. If sequence is periodic, Find the fundamental period $x(t)= \cos^2(2\pi t)$?		C203.1	K3
5	Find the Laplace transform of the unit step signal		C203.2	K2
	PART B **(Answer all the Questions 2 x 13 = 26 Marks)**			
11a	Explain in detail about classifications of signals and systems?	(13)	C203.1	K2
	OR			
11b	Draw the waveforms represented by following step functions. (i) $f_1(t) = 2\,u(t-1)$ (ii) $f_2(t) = -2\,u(t-2)$ (iii) $f(t) = f_1(t) + f_2(t)$ (iv) $f(t) = f_1(t) - f_2(t)$	(13)	C203.1	K2
12a	State and Prove the properties of Laplace Transforms	(13)	C203.2	K2
	OR			
12b	State and prove any Five properties of Fourier Transforms	(13)	C203.2	K2
	PART C **(Answer all the Questions 1 x 14 = 14 Marks)**			
13a	Check whether the following system is linear, causal, time variant, static and stable a) $y(n) = nx(n) + x^2(n)$ b) $y(t) = x(t-3) + 3\,x(3-t)$ c) $y(t) = dx(t)/dt$	(13)	C203.1	K2
	OR			
13b	Sketch and label for the following functions (i) $x(t-1)$		C203.1	K2

(ii) x(2-t)
(iii) x(t) [δ(t+3/2)-δ(t-3/2)]
(iv) x(2t-1)

(13)

Cycle Test 1
[Retest Answer key]
PART-A

1. Causal: output of the causal system depends upon past and present input only

Non causal: depends upon future input also

2. Energy and power signal:
for an energy signal $0 < E < \alpha$, $E = \int_{-\alpha}^{\alpha} |x(t)|^2 dt$
for an power signal $0 < p < \alpha$, $P = \lim_{T \to \alpha} \frac{1}{T} \int_{-T/2}^{T/2} |x(t)|^2 dt$

3 (1) Single valued property
2) Finite disconknuties
3) Finite peaks
4) Absolute Integrability. $\int_{<T>} |x(t)| < \alpha$.

4. $x(t) = \cos^2(2\pi t)$.
periodic signal. $f = 1/2$.

5 - $L[u(t)] = 1/s$

PART = B

6. Classification of Signal and systems.
Signal: definition and Examples ——②
types. 1) standard signals
2) Complex and exponential signals
3) periodic and Non periodic signals
4) odd and Even signal
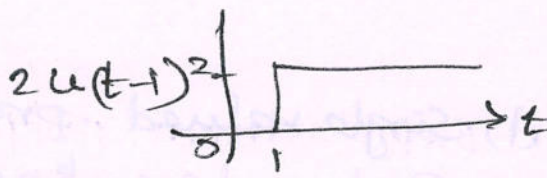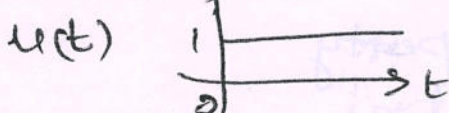5) deterministic and Random signals
6) Energy & power signals ⑤

<u>systems</u> definition and types
$\begin{cases} \text{continous type signal} \\ \text{discrete type signals.} \end{cases}$ —②
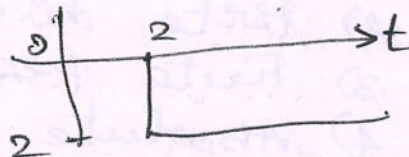
CT systems and DT systems

1) causal and Non causal systems
2) Time invariant and Time variant systems
3) Stable and unstable systems ⎤
4) Static and dynamic s/m   ⎥ ⑥
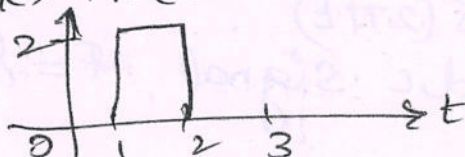5) linear and Non-linear s/m
   with examples

6(b) $f_1(t) = 2(u(t-1))$
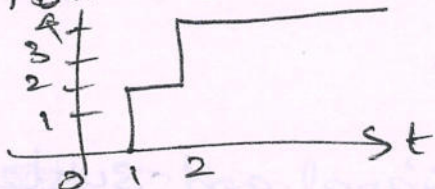
$u(t)$

(ii) $f_2(t) = -2u(t-2)$

(iii) $f(t) = f_1(t) + f_2(t) =$

(iv) $f_3(t) = f_1(t) - f_2(t)$

7(a) Laplace transform properties
       statement and proof for any 6
       per properties ——⑬
       each ② marks. and
       Laplace transform definition ——①

7(b) Fourier Transform:
    definition ——③
    5 properties State and proof. ——⑩

8(a) $y(n) = n x(n) + x^2(n)$ State. and causal system,
      Non linear s/m,
      Time variant system ——⑤

      $y(t) = x(t-3) + \frac{3}{t} x(3-t)$
      linear, dynamic, Non causal, Time Variant
                        ——④

      $y(t) = d/dt^{x(t)}$
      linear, Time invariant, causal,
      dynamic. Static systems ——④
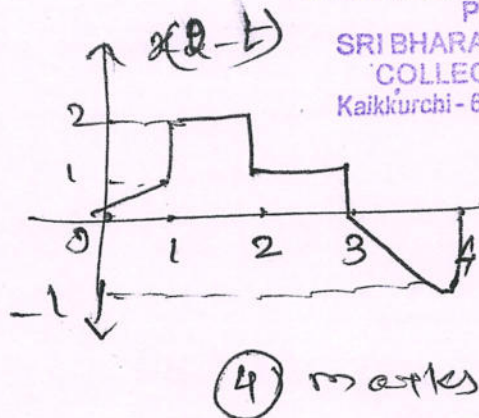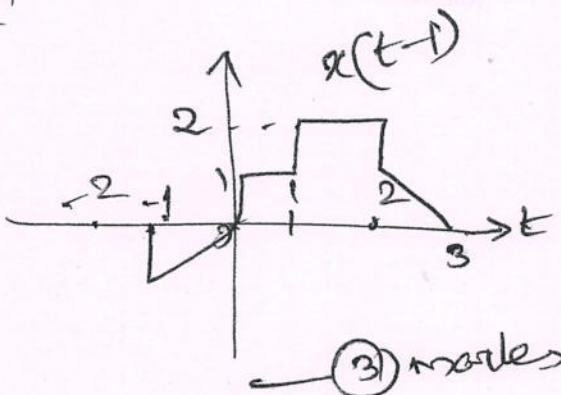
8(b)

$x(t-1)$ $x(2-t)$

③ marks   ④ marks

$$x(t) \left(\delta(t + \tfrac{3}{2}) \mp \delta(t - \tfrac{3}{2}) \right)$$

— ④

$$x(2t+1)$$

Compression ②

Ruah
Faculty Incharge

Ruah
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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ATTENDANCE SHEET - RETEST FOR CYCLE TEST-I

Name of the Faculty   : Mrs.R.Yogeshwari

Course Code & Name : EC 3354-SIGNALS AND SYSTEMS

Academic Year   : 2022 -2023 /ODD

Degree & Program   : B.E/ECE   **Year/ Semester: II/III**

Date   : 27.10.22

S.NO	REG.NO	NAME	SIGNATURE
1.	912621106002	BHUVANESWARI.C	C. Bhuvay
2.	912621106003	DHANYASHREE.A	A.Dhy
3.	912621106004	KALAIVANI.R	Kalaivani R
4.	912621106009	SUBALAKSHMI.M	M-subalaksf
5.	912621106301	JAYAPRIYA.M	MPf
6.	912621106302	KIRUBASHINI.C	Kut

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PUDUKKOTTAI DISTRICT

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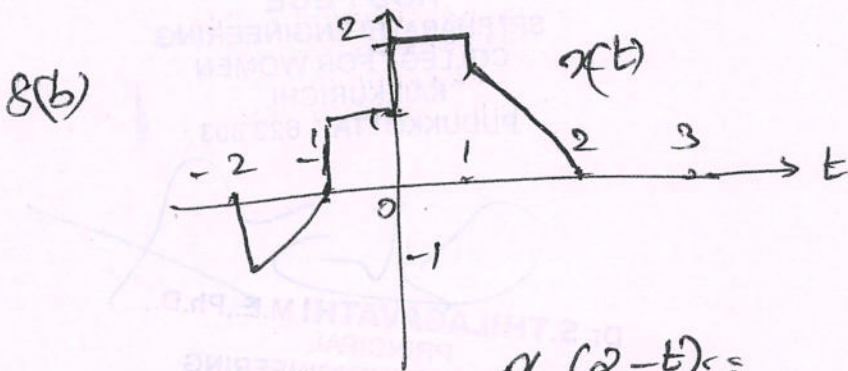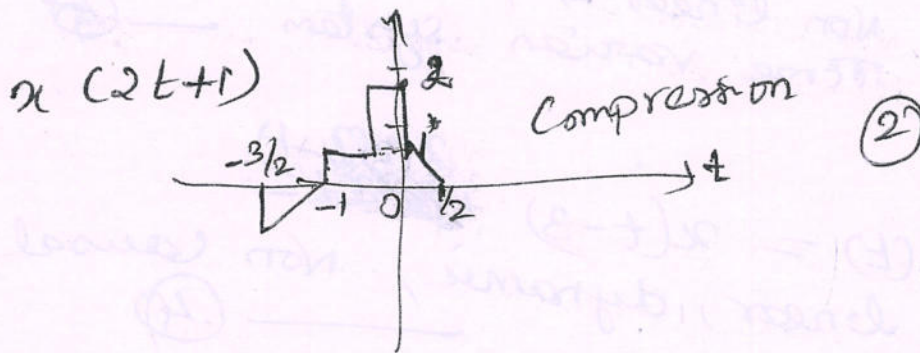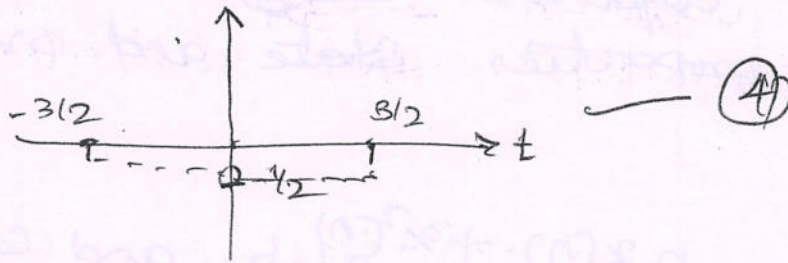# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED
RETEST FOR CYCLE TEST-I

SUBJECT CODE &TITLE: EC 3354-SIGNALS AND SYSTEMS

YEAR/SEM: II/III

MONTH & YEAR: OCT & 2022

S.NO	REG NO	STUDENT NAME	CO1 (32)	CO2 (18)	TOTAL (50)	TOTAL (100)
1.	912621106002	BHUVANESWARI.C	20	15	35	70
2.	912621106003	DHANYASHREE.A	15	20	35	70
3.	912621106004	KALAIVANI.R	15	15	30	60
4.	912621106009	SUBALAKSHMI.M	20	12	32	64
5.	912621106301	JAYAPRIYA.M	20	15	35	70
6.	912621106302	KIRUBASHINI.C	24	10	34	68

MARKS RANGE:
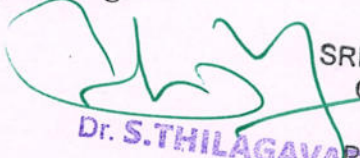
<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
-	-	-	-	01	05	-	-	-
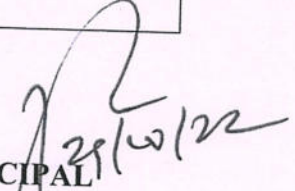
Total No.of Candidates Present	06
Total No.of Candidates Absent	NIL
Total No.of Students Pass	06
Total No. of Students Fail	-
Percentage of Pass	100%

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

FINAL INTERNAL STUDENTS MARK STATEMENT(Out of 40)

SUBJECT CODE &TITLE: EC 3354 –SIGNALS AND SYSTEMS

YEAR/SEM   : II/III

REGULATION   : 2021

S.NO	REG NO	STUDENT NAME	TOTAL (40)
1.	912621106001	AMRIN. M	35
2.	912621106002	BHUVANESWARI.C	33
3.	912621106003	DHANYASHREE.A	33
4.	912621106004	KALAIVANI.R	34
5.	912621106005	KAVIYA.K	37
6.	912621106006	KEERTHANA.V	39
7.	912621106007	PAVITHRA.P	34
8.	912621106008	RAJESHWARI.R	39
9.	912621106009	SUBALAKSHMI.M	33
10.	912621106010	SUGUNA.C	34
11.	912621106301	JAYAPRIYA.M	32
12.	912621106302	KIRUBASHINI.E	32

Faculty Incharge

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ANNA UNIVERSITY RESULT STATEMENT NOV/DEC-2022

SUBJECT CODE &TITLE: EC 3354 –SIGNALS AND SYSTEMS

YEAR/SEM   : II/III

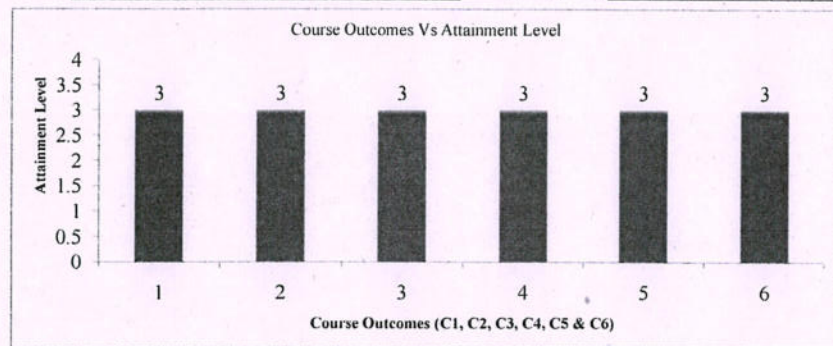| S.NO	REG NO	STUDENT NAME	GRADE
1.	912621106001	AMRIN. M	B+
2.	912621106002	BHUVANESWARI.C	B+
3.	912621106003	DHANYASHREE.A	B+
4.	912621106004	KALAIVANI.R	U
5.	912621106005	KAVIYA.K	B+
6.	912621106006	KEERTHANA.V	A
7.	912621106007	PAVITHRA.P	B+
8.	912621106008	RAJESHWARI.R	U
9.	912621106009	SUBALAKSHMI.M	B+
10.	912621106010	SUGUNA.C	B+
11.	912621106301	JAYAPRIYA.M	U
12.	912621106302	KIRUBASHINI.E	U

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Kaikkuruchi, Pudukkottai- 622303.

Department of Electronics and Eommunication Engineering

Internal Assessment -Attainment of Course Outcomes (Through Direct Assessment)

ACADEMIC YEAR - 2022 - 23			BATCH		2021 - 2025					
COURSE CODE/TITLE	EC 3354 /SIGNALS AND SYSTEMS		COURSE OUTCOME	1	2	3	4	5	6	
YEAR / SEM	II/III		TARGET(%)	65	65	65	65	65	65	
COURSE COORDINATOR	Mrs R.Yogeshwari		TOTAL STRENGTH	12						

ATTAINMENT LEVEL	Level	Range
	1	UP TO 60% of the students scored more than target
	2	61 - 79% of the students scored more than target
	3	80% & ABOVE of the students scored more than target

S.NO	REG NO	NAME OF THE STUDENT	IAT 1 - MARKS ALLOTED						IAT 2 - MARKS ALLOTED						IAT 3 - MARKS ALLOTED						Assignment / Mini Project /Tutorial / Seminar						TOTAL COURSE OUTCOME					
			C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6	C1	C2	C3	C4	C5	C6
			40	30	30							30	30	40								10	10		10	10	40	30	30	40	30	30
1	9.12621E+11	AMRIN M	36	27	27							33	25	25								7	9		9	8	36	34	36	33	34	33
2	9.12621E+11	BHUVANESWARI C	34	25	25							33	25	25								8	8		9	7	34	33	33	33	34	32
3	9.12621E+11	DHANYASHREE A	34	26	26							32	24	24								9	8		9	8	34	35	34	32	33	32
4	9.12621E+11	KALAIVANI R	35	26	26							32	24	24								7	8		9	8	35	33	34	32	33	32
5	9.12621E+11	KAVIYA K	36	27	27							37	28	28								8	7		9	9	36	35	34	37	37	37
6	9.12621E+11	KEERTHANA V	40	30	30							38	28	28								7	8		9	9	40	37	38	38	37	37
7	9.12621E+11	PAVITHRA P	35	26	26							34	26	26								9	9		9	9	35	35	35	34	35	35
8	9.12621E+11	RAJESHWARI R	38	29	29							40	30	30								9	8		9	7	38	38	37	40	39	37
9	9.12621E+11	SUBALAKSHMI M	32	24	24							33	25	25								7	8		9	9	32	31	32	33	34	34
	9.12621E+11	SUGUNA C	34	26	26							35	26	26								9	9		9	9	34	35	35	35	35	35
	9.12621E+11	JAYAPRIYA M	33	25	25							32	24	24								9	9		9	9	33	34	34	32	33	33
10	9.12621E+11	KIRUBASHINI C	36	27	27							31	23	23								9	9		9	9	36	36	36	31	32	32

	C1	C2	C3	C4	C5	C6
CO's Target Value	26.0	19.5	19.5	26.0	19.5	19.5
No. of Students scored above CO's Target Value	12	12	12	12	12	12
Percentage of Students scored above Target	100.0	100.0	100.0	100.0	100.0	100.0
CO Attainment	3	3	3	3	3	3
CO attainment Values to plot the Graph	3	3	3	3	3	3

Course Outcomes Vs Attainment Level

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE OUTCOME ATTAINMENT - UNIVERSITY EXAMINATION
ACADEMIC YEAR : 2022 - 2023 (ODD SEM)

YEAR /SEM: II / III   Batch:2021-2025

SUBJECT : EC3354 /SIGNALS AND SYSTEMS

CO Attainment Level: 1 - (UPTO 60%)   2- (61%-79%)   3-(80% and Above)

TOTAL STRENGTH :   12

S.NO	Register No	NAME	Univ. Grade	
1	912621106001	AMRIN M	B+	
2	912621106002	BHUVANESWARI C	B+	
3	912621106003	DHANYASHREE A	B+	
4	912621106004	KALAIVANI R	U	
5	912621106005	KAVIYA K	B+	
6	912621106006	KEERTHANA V	A	
7	912621106007	PAVITHRA P	B+	
8	912621106008	RAJESHWARI R	B+	
9	912621106009	SUBALAKSHMI M	U	
10	912621106010	SUGUNA C	B+	
11	912621106301	JAYAPRIYA M	U	
12	912621106301	KIRUBASHINI C	U	
No. of O Grade			0	0
No. of A+ Grade			0	0
No. of A Grade			1	1
No.of B+ Grade			7	7
No. of B Grade			0	0
No of C Grade			0	0
No. of U Grade			4	4
No. of UA Grade			0	0
Target for course outcome Attainment			60	12
No of students above the target			8	
CO-Attainment University (%)			66.67	

Faculty Incharge

HoD/ECE

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HOD / ECE
SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN
KAIKKURICHI,
PUDUKKOTTAI - 622 303

Overall Attainment Sheet – COs - POs & PSOs attainment calculation

CO	CO-Attainment Internal (CO-INT) (Avg. Attainment of All section) (%)	CO-Attainment University (CO-UNI) (Avg. Attainment of All section) (%)	Direct CO Attainment (0.20xCO-INT + 0.80xCO-UNI) (%)	CO Attainment Level
C203.1	100.0	66.67	73.3	2
C203.2	100.0	66.67	73.3	2
C203.3	100.0	66.67	73.3	2
C203.4	100.0	66.67	73.3	2
C203.5	100.0	66.67	73.3	2
C203.6	100.0	66.67	73.3	2

Expected CO-PO Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.2	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.3	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.4	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.5	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203.6	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C203	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1

PO Attainment Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203.2	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203.3	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203.4	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203.5	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203.6	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
C203	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67
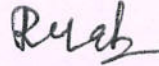
Attainment of POs and PSOs:

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
Attainment	2	2	2	2	1.33	1.33	-	-	-	-	-	0.67	1.33	0.67	0.67

Comments by Program Coordinator	1.
	2.
Remarks by HoD	

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Name and Signature
of the Faculty Member

HoD/ECE

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