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***

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1	Preface of the Course File
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17	Retest Sample Question Paper
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20	Internal Mark Sheet- Anna University Portal
21	AU Grade Sheet
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PREFACE OF THE COURSE FILE

Batch	: 2016-2020
Academic Year	: **2018-2019 / ODD SEM**
Program	: **ELECTRONICS AND COMMUNICATION ENGINEERING**
Year & Semester	: 3rd Year/5th **Semester**
Course Code	: **EC6503** **NBA Code: C303**
Name of the Course	: **TRANSMISSION LINES AND WAVEGUIDES**
Faculty in-charge	: **Mrs.M.SATHYA, A.P / ECE**

Signature of the Faculty Incharge

HoD / ECE

Dr. S.THILAGAVATHI M.E.,Ph.D.
PRINCIPAL
SRI BHARATHI ENGINEERING
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Kaikkurichi - 622 303, Pudukkottai Dt.

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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					
8.	Identification of Curricular gap and Content Beyond the syllabus	YES				
9.	Self-study topics	YES				
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					
19.	Very poor performance in first two tests-action taken.-communication to parents-evidence					
20.	Absence for two tests-action taken-communication to parents-evidence.					
21.	Indiscipline of student reported, if any					
22.	Special class/coaching class/remedial class/attendance-CAP					
23.	Conduct of Seminar, Quizzes - proof					
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					
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					
	Signature of HoD					

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

INDIVIDUAL STAFF WORKLOAD FOR ODD SEMESTER (2018-2019)

S.NO	STAFF NAME	SUB.CODE & SUB.NAME	DEPT	YEAR / SEM	PERIDS	TOTAL PERIODS
1	Mrs.V.KAVITHA	EC6702 - Optical Communication & Networks	ECE	IV/VII	05	13
		EC8361-Analog and Digital Circuits Laboratory	ECE	II/III	03	
		EC6501 - Digital Communication	ECE	III/V	05	
2	Mr.S.UDAYANAN	EC8352 - Signals and Systems	ECE	II/III	06	14
		EC6016 - Opto Electronic Devices	ECE	IV/VII	05	
		CS 8382-Digital Systems Lab	CSE& IT	II/III	03	
3	Ms M.SATHYA	EC6701 - RF & Microwave Engineering	ECE	IV/VII	05	17
		EC6503 - Transmission Lines and Waveguides	ECE	III/V	06	
		EC6712 - Optical & Microwave Laboratory	ECE	IV/VII	03	
		EC 8311 Electronics lab	EEE	II/III	03	
4	Mr.C.PALANIAPPAN	EC8351 - Electronic Circuits- I	ECE	II/III	05	15
		EC6703 - Embedded & Real Time Systems	ECE	IV/VII	05	
		EC6504-Microprocessor And Microcontroller	ECE	III/V	05	
5	Mrs.T.K.MOHANA PRIYA	EC6502 - Principles of Digital Signal Processing	ECE	III/V	06	15
		IT6502-Digital Signal processing	IT	III/V	06	
		EC6511 - Digital Signal Processing Laboratory	ECE	III/V	03	
6	Mrs.M.SUGANYA	EC 6801 Wireless communication	IT	III/V	05	18
		EE 6008 Microcontroller Based System Design	EEE	IV/VII	05	
		EC6711 - Embedded Laboratory	ECE	IV/VII	03	
		EC8395 -Communication Engineering	CSE	II/III	05	

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7	Ms.T.SUGANTHI	EC6011 - Electro Magnetic Interference &Compatibility	ECE	IV/VII	05	18
		EC8394- Analog and Digital Communication Engineering	IT	II/III	05	
		EE6502 Microprocessor and Microcontroller	EEE	III/V	05	
		EC6513 - Microprocessor and Microcontroller Laboratory	ECE	III/V	03	
8	Mrs.R.YOGESHWARI	EC6004 - Satellite Communication	ECE	IV/VII	05	14
		CS8351-Digital Principle and System Design	CSE&IT	II/III	06	
		CS8382-Digital Systems Lab	CSE&IT	II/III	03	
9	Mrs.G.VIDYA	EC8392 - Digital Electronics	ECE	II/III	05	14
		EE 8351-Digital Logic circuits	EEE	II/III	06	
		EC6512 - Communication System Laboratory	ECE	III/V	03	

HoD

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Department of ECE

COURSE PLAN

Sub.Code	: EC6503	Branch/Year/Sem	: ECE/ III/V
Sub.Name	: **TRANSMISSION LINES AND WAVEGUIDES**	Batch	: 2016-2020
Staff Name	: M.SATHYA	Academic Year	: 2018-2019(ODD)

COURSE OBJECTIVE

- To introduce the various types of transmission lines and to discuss the losses associated.
- To give thorough understanding about impedance transformation and matching.
- To use the Smith chart in problem solving.
- To impart knowledge on filter theories and waveguide theories

TEXT BOOKS:

1. John D Ryder, —Networks, lines and fields‖, 2nd Edition, Prentice Hall India, 2015. (UNIT IIV)

REFERENCES:

1. E.C.Jordan and K.G. Balmain, —Electromagnetic Waves and Radiating Systems‖ PrenticeHall of India, 200(
2. G.S.N Raju "Electromagnetic Field Theory and Transmission Lines‖ Pearson Education, Firstdition 2005.

TEACHING METHODOLOGIES:

BB - BLACK BOARD
PPT - POWER POINT PRESENTATION

WEB SOURCES:

1. https://www.youtube.com/watch?v=surDm-x5Uwo
2. https://www.youtube.com/watch?v=i958Yl1wSTg
3. https://www.youtube.com/watch?v=u59IUA6uvjk

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EC8651	TRANSMISSION LINES AND RF SYSTEMS	L	T	P	C
		3	1	0	3

OBJECTIVES:

- To introduce the various types of transmission lines and to discuss the losses associated.
- To give thorough understanding about impedance transformation and matching.
- To use the Smith chart in problem solving.
- To impart knowledge on filter theories and waveguide theories

UNIT I TRANSMISSION LINE THEORY 9

General theory of Transmission lines - the transmission line - general solution - The infinite line Wavelength, velocity of propagation - Waveform distortion - the distortion-less line - Loading and different methods of loading - Line not terminated in Z0 - Reflection coefficient - calculation of current, voltage, power delivered and efficiency of transmission - Input and transfer impedance - Open and short circuited lines - reflection factor and reflection loss.

UNIT II HIGH FREQUENCY TRANSMISSION LINES 9

Transmission line equations at radio frequencies - Line of Zero dissipation - Voltage and current on the dissipation-less line, Standing Waves, Nodes, Standing Wave Ratio - Input impedance of the dissipation-less line - Open and short circuited lines - Power and impedance measurement on lines - Reflection losses - Measurement of VSWR and wavelength.

UNIT III IMPEDANCE MATCHING IN HIGH FREQUENCY LINES 9

Impedance matching: Quarter wave transformer - Impedance matching by stubs - Single stub and double stub matching - Smith chart - Solutions of problems using Smith chart - Single and double stub matching using Smith chart

UNIT IV PASSIVE FILTERS 9

Characteristic impedance of symmetrical networks - filter fundamentals, Design Constant K - Low Pass, High Pass, Band Pass, Band Elimination, m- derived sec pass, high pass composite filters

UNIT V WAVE GUIDES AND CAVITY RESONATORS 9

General Wave behaviours along uniform Guiding structures, Transverse Electromagnetic waves, Transverse Magnetic waves, Transverse Electric waves, TM and TE waves between parallel plates, TM and TE waves in Rectangular wave guides, Bessel"s differential equation and Bessel function, TM and TE waves in Circular wave guides, Rectangular and circular cavity Resonators.

TOTAL:45PERIODS

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Course Faculty **HoD/ECE**

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

S. No	Topic Name	Books for Reference	Page No	Teaching Methodology	No. of Periods required	Cumulative no. of Periods
UNIT – I TRANSMISSION LINE THEORY						
1.	General theory of Transmission lines general solution	T1	233	BB	1	1
2.	The infinite line Wavelength	T1	236	BB	1	2
3.	Wavelength ,velocity of propagation	T1	240-245	BB	1	3
4.	Waveform distortion	T1	249	BB	1	4
5.	The distortion-less line	T1	251	PPT	1	5
6.	Loading and different methods of loading	T1	252	BB	1	6
7.	Loading and different methods of loading Line not terminated in Z0	T1	256	BB	1	7
8.	Reflection coefficient calculation of current, voltage, power delivered and efficiency of transmission	T1	263	BB	1	8
9.	Open and short circuited lines - reflection factor and reflection loss.	T1	264-267	BB	1	9
10.	Revision				1	10
11.	Tutorial				1	11
12.	Tutorial				1	12
UNIT –II HIGH FREQUENCY TRANSMISSION LINES						
13.	Transmission line equations at radio frequencies	T1	279	BB	1	13
14.	Line of Zero dissipation	T1	282	BB	1	14
15.	Voltage and current On the dissipation-less line	T1	285	BB	2	15
16.	Standing Waves, Nodes, Standing Wave Ratio	T1	291	BB	1	16
17.	Input impedance of the dissipation-less line	T1	295	BB	2	18
18.	Open and short circuited lines	T1	297	BB	1	19
19.	Power and impedance measurement on lines - Reflection losses	T1	299	BB	2	21
20.	Measurement of VSWR and wavelength	T1	302	PPT	1	22
21.	Tutorial				1	23
22.	Tutorial				1	24

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UNIT –III IMPEDANCE MATCHING IN HIGH FREQUENCY LINES						
23	Impedance matching: Quarter wave transformer	T1	304	BB	1	25
24	Impedance matching by stubs	T1	305	BB	2	27
25	Single stub and double stub matching	T1	307	BB	2	29
26	Smith chart - Solutions of problems using Smith chart	T1	312	BB	2	31
27	Single and Double stub matching using Smith chart.	T1	317	BB	2	33
28	Revision				1	34
29	Tutorial				1	35
30	Tutorial				1	36
UNIT IV PASSIVE FILTERS						
31	Characteristic impedance of symmetrical networks	T1	143-146	BB	1	37
32	Filter fundamentals	T1	152-155	BB	1	38
33	Design of filters, Constant K - Low Pass	T1	157-161	BB	1	39
34	Design of filters, Constant K -High Pass	T1	161-162	BB	2	41
35	Band Pass ,Band Elimination	T1	174-181	BB	2	43
36	m- derived sections - low pass	T1	162-174	BB	1	44
37	High pass composite filters.	T1	186-188	BB	1	45
38	Revision				1	46
39	Tutorial				1	47
40	Tutorial				1	48
UNIT – V WAVE GUIDES AND CAVITY RESONATORS						
41	General Wave behaviours along uniform Guiding structures	T1	469-472	BB	1	49
42	Transverse Electromagnetic waves	T1	473	BB	1	50
43	Transverse Magnetic waves,	T1	473	PPT	1	51
44	Transverse Electric waves	T1	474	BB	1	52
45	TM and TE waves between parallel plates	T1	474-480	BB	1	53
46	TM and TE waves in Rectangular wave guides,	T1	500-510	BB	1	54
47	Bessel"s differential equation and Bessel function	R1	254-257	BB	1	55
48	TM and TE waves in Circular wave guides,	T1	510-516	BB	1	56

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49	Rectangular and circular cavity Resonators	T1	528-530	BB	2	57
50	Tutorial				1	58
51	Tutorial				1	59
52	(Content Beyond the Syllabus)RF System Design Concepts			PPT	1	60

COURSE OUTCOME:

C303.1: To Discuss the propagation of signals through transmission lines
C303.2: To analyze signal propagation at Radio frequencies.
C303.3: To impart technical knowledge in impedance matching using smith chart
C303.4: To introduce passive filters and basic knowledge of active RF components
C303.5: To explain radio propagation in guided systems.
C303.6: To utilize cavity resonators

INTERNAL ASSESSMENT DETAILS

ASSESSMENT NUMBER	I	II	III
Topic Number (unit)	Unit 1 &2	Unit 3& half unit in Unit 4)	Half Unit in Unit 4 &Unit 5

ASSIGNMENT DETAILS

ASSIGNMENT DETAILS	I	II	III
DATE OF SUBMISSION	09.07.2018	24.7.2018	16.09.2018

ASSIGNMENT NUMBER	UNIT	DESCRIPTIVE QUESTIONS/TOPIC (Minimum of 8 Pages)
1	I	General solution of transmission lines
2	II	Power and Impedance Measurement
3	III	Single stub and double stub matching
4	IV,V	Low Pass, High Pass, Band Pass, Band Elimination Filters, Rectangular and circular waveguides

PREPARED BY

M.Sathya
AP/ECE

APPROVED BY 27/6/18

PRINCIPAL

VERIFIED BY

Mrs.V.Kavitha
HoD/ECE

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DEPARTMENT OF ELECTRONICS &COMMUNICATION ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty :Mrs.M.Sathya Course Code & Name: EC6503 &Transmission Lines and Waveguides

Degree & Program: B.E. /ECE Semester/Year : V/III Academic Year: 2018 -2019 /ODD

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

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

Course Outcomes	Program Outcomes (POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C303.1	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.2	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.3	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.4	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.5	3	2	2	2	-	-	-	-	-	1	-	1	-	2	2
C303.6	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303	3	2	2	2	-	-	-	-	-	1	-	1	-	2	2

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
RF System Design Concepts	PO5 Vacant filled	C303.5 & V

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

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

Course Outcomes	Program Outcomes (POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO2
C303.1	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.2	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.3	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.4	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.5	3	2	2	2	1*	-	-	-	-	1	-	1	-	2	2
C303.6	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303	3	2	2	2	-	-	-	-	-	1	-	1	-	2	2

Course Faculty

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Assignment Answer Paper

Name of the Student : A. Dharaniya

AU Register Number: 912616106005

Assignment – 04			Date of Issue:	24.09.2018	Marks	10
Course code	EC6503	Course Title	TRANSMISSION LINES AND WAVEGUIDES			
Year	III	Semester/Section	V	Date of Submission:	29.10.2018	

Q.No	Questions	CO
1	Design a m-derived T-section low pass filter having a cutoff frequency of 5000 Hz and a design impedance of 600 ohms. The frequency of infinite attenuation is f=1.25fc.	C303.4
2	[a] Explain wave impedance and obtain the expressions of wave impedance for TE and TM waves guided along parallel planes. Also sketch the variations of wave impedance with frequency. [b] For a frequency of 5 GHz and plane separation of 8 cm in air, find the following for TM10 mode: [1] cut-off wavelength [2] Characteristic impedance [3] Phase constant	C303.5

Mark Allocation

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

(M. SATHYA)
Name and Signature of the Faculty Incharge

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Tutorial Answer Sheet

Name of the Student : Maheswari.V

AU Register Number: 912616106007

Tutorial – 02			Date of Issue:	16.07.2018	Marks	10
Course code	EC6503	Course Title	Transmission lines and waveguides			
Year	III	Semester	V	Date of Submission:	26.07.2018	

Q.No	Questions	CO
1	A loss less line has a SWR of 4. The R0 is 150 ohms and the maximum voltage measuredin the line is 135V. Find the power delivered to the load.	C303.2
2	Derive the expressions for input impedance of open & short circuited lines	C303.2

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 (M.SATHYA)

HoD/ECE

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IQAC Academic Audit Form

ACADEMIC YEAR: 2018-2019 ODD SEMESTER

Name of Department :	ECE	Year / Sem :	III / V	No. of Students Registered :	17
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.	EC6501	912616106010	Y	Y	12	02	03	80%	-
2.	EC6502	912616106004	Y	Y	06	02	09	40%	-
3.	EC6503	912616106007	Y	Y	15	01	01	93.7%	-
4.	GE6351	912616106302	Y	Y	13	01	03	81.25%	-
5.	EC6504	912616106012	Y	Y	14	01	02	87.5%	-

Verified by

External Member Name and Signature:	R. Sarath [R. SARATHA]
Internal Member Name and Signature:	[S. UDHAYANAN, AP/ECE]

Overall Remarks: Improve the pass percentage in subject with EC6502 (subject code)

24/8/2018

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COLLEGE FOR WOMEN
KAIKKURICHI,

IQAC Coordinator
Dr. S.THILAGAVATHI M.E., Ph.D.
PRINCIPAL
SRI BHARATHI ENGINEERING

24/8/18

Principal
PRINCIPAL
SRI BHARATHI ENGINEERING
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

STUDENT FEEDBACK ON FACULTY

Course Code & Name: EC6503 & Transmission Lines and Waveguides
Year/ Sem : III Year & V Semester

S.NO.	DESCRIPTION	SCORED OUT OF 4	SCORED OUT OF 100
1.	Syllabus coverage as prescribed by university	3.18	79.5
2.	Technical Knowledge of the teacher	3.29	82.25
3.	Teacher Communication Skill	3.53	88.25
4.	Regularity in taking classes	3.29	82.25
5.	Helping the students in conducting the experiment through set of instructions And Demonstrations	3.18	79.5
6.	Tendency of inviting opinion and questions on subject matter from students	3.53	88.25
7.	Knowledge of the teacher in latest Development of field	3.18	79.5
8.	Perfectness of Valuation	3.29	82.25
	OVERALL SCORE	3.31	82.72

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Kaikkurchi - 622 303, Pudukkotta. Dt.

REPORT SHEET

S .NO	REG.NO	NAME	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1.	912616106001	ABINAYA.R	4	4	4	4	4	4	4	4
2.	912616106002	AGALYA.A	4	4	4	4	4	4	4	4
3.	912616106003	ATCHAYA.G	4	4	4	4	4	4	4	4
4.	912616106004	DEEPA.N	4	4	4	4	4	4	4	4
5.	912616106005	DHARANIYA.A	2	3	3	3	1	3	1	2
6.	912616106006	JEEVITHA.U	4	4	4	4	4	4	4	4
7.	912616106007	MAHESWARI.V	3	4	1	4	3	1	3	2
8.	912616106008	PAZHANIYAMMAL.R	2	2	4	2	2	4	2	3
9.	912616106009	PRIYANKA.E	4	3	4	3	2	4	2	3
10.	912616106010	ROJA.A	2	2	4	2	2	4	2	3
11.	912616106011	SHANMUGAPRIYA.R	4	4	4	4	4	4	4	4
12.	912616106012	SHIYAMALA.E	2	3	3	3	1	3	1	4
13.	912616106013	SIVA BHARATHI.P	4	4	4	4	4	4	4	4
14.	912616106014	SIVARUBINI.S	3	4	1	4	3	1	3	3
15.	912616106015	THENMOZHI.A	2	2	4	2	2	4	2	4
16.	912616106016	VINCY.A	4	3	4	3	2	4	2	4
17.	912616106302	SANKAVI M	2	2	4	2	2	4	2	2
		AVERAGE	**3.18**	**3.29**	**3.53**	**3.29**	**3.18**	**3.53**	**3.18**	**3.29**
		PERCENTAGE	**79.5**	**82.25**	**88.25**	**82.25**	**79.5**	**88.25**	**79.5**	**82.25**

EXCELLENT	VERY GOOD	GOOD	AVERAGE	POOR
4	3	2	1	0

Faculty Incharge

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PUDUKKOTTAI - 622 303

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

KAIKKURICHI, PUDUKKOTTAI – 622 303.

Circular Date: 30-08-2018

The second cycle test will be conducted on 07.09.2018, 08.09.2018 &10.09.2018 for the III, V & VII semester (II, III & IV 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.
- It is the responsibility of the question paper setter to take the Xerox copies of the required number of question papers with the help of Mr. Pandi. S & Ms. Anusha. G and it should be handed over to the Exam Coordinator Mr. J. Sathyaraj A.P/ EEE on or before 05.09.2018.
- The Exam Coordinators (exam cell) are requested to make necessary arrangements (hall arrangements, invigilation duty etc.,) for conducting the test.
- Faculty members are requested to handover the valued answer scripts to the students on or before 11.09.2018 and the class in-charges are requested to send the consolidated mark sheet along with the attendance percentage to the parents on or before 12-09-2018.

PRINCIPAL 30/8/18

Cc:

- All faculty
- Exam cell
- Office file

D. SUNDARAVADIVELAVATHI M.E., Ph.D.,
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Circular

Date: 30-08-2018

The second cycle test will be conducted on 07.09.2018, 08.09.2018 & 10.09.2018 for the V semester (III year) B.E/ B.Tech students for 50 marks as per the time table given below. Students are directed to prepare well and score good marks.

Date	10.00 am -11.30 am	2.30 pm -4.00 pm
07.09.2018	CE6505 Design of RC Elements(Civil) CS6504 Computer Graphics (CSE) IT6501 Graphics and Multimedia (IT) IC6501 Control Systems (EEE) GE6351 Environmental Science and Engineering(ECE)	CE6504 Highway Engineering (Civil) CS6502 Object Oriented Analysis and Design (CSE & IT) ME6701 Power Plant Engineering (EEE) EC6504 Microprocessors and Microcontrollers (ECE)
08.09.2018	CE6503 Environmental Engineering-I (Civil) IT6503 Web Programming(IT) EE6501 Power System Analysis (EEE) COACHING (ECE &CSE)	CE6506 Construction Techniques, Equipment and Practice (Civil) CS6501 Internet Programming (CSE) CS6551 Computer Networks (IT) EE6502 Microprocessors and Microcontrollers (EEE) EC6503 Transmission Lines and Wave guides(ECE)
10.09.2018	CE6501 Structural Analysis I (Civil) MA6566 Discrete Mathematics (CSE) IT6502 Digital Signal Processing (IT) EE6503 Power Electronics (EEE) EC6502 Principles of Digital Signal Processing (ECE)	CE6502 Foundation Engineering(Civil) CS6503 Theory of Computation (CSE) EC6801 Wireless Communication (IT) EE6504 Electrical Machines II (EEE) EC6501 Digital Communication (ECE)

PRINCIPAL 30/8/18

Cc:

- All III year B.E / B.Tech Classes
- All faculty
- Exam cell
- Notice Board
- Office file

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Register Number: | | | | | | | | | | | | |

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

CYCLE TEST- II			Date/Session	08.09.2018/AN	Marks	50
Course code	EC6503	Course Title	TRANSMISSION LINES AND WAVEGUIDES			
Regulation	2013	Duration	90 minutes	Academic Year	2018-2019	
Year	III	Semester	V	Department	ECE	

COURSE OUTCOMES

C303.1	To Discuss the propagation of signals through transmission lines
C303.2	To analyze signal propagation at Radio frequencies.
C303.3	To impart technical knowledge in impedance matching using smith chart
C303.4	To introduce passive filters and basic knowledge of active RF components
C303.5	To explain radio propagation in guided systems
C303.6	To utilize cavity resonators.

Q.No.	Question	CO	BTL
	PART A (Answer all the Questions 7 x 2 = 14 Marks)		
1	What is the input impedance of a eighth wave , quarter wave and half wave line?	C303.3	K2
2	What are the applications of smith chart?	C303.3	K2
3	Write the expression for the length of the stub in single stub matching.	C303.3	K1
4	Give an application of an eighth wave line.	C303.3	K1
5	Define skin depth.	C303.3	K1
6	What are guides waves? Give examples.	C303.5	K2
7	Define phase and group velocity.	C303.5	K1
	PART B (Answer all the Questions 2 x 13 = 26 Marks)		
8a	Find the input impedance of a quarter wave transformer and design to match a load of 200Ω to a source resistance of 500 Ω. Operating frequency is 200MHz.	C303.3	K3
	OR		
8b	A load impedance of 90-j50 Ω is to be matched to a line of 50 Ω using single stub matching. Find the length and position of the stub.	C303.3	K3
9a	Derive the field equations of TE waves travelling in Z direction in a rectangular wave guide.	C303.5	K3
	OR		
9b	An air filled resonant cavity with dimensions a=5cm,b=4cm and c=10cm is made of copper σc =5.8X10^7 mhos/m. Find the resonant frequency of five lowest order mode and quality factor TE101 mode.	C303.5	K3
	PART C (Answer all the Questions 1 x 10 = 10 Marks)		
10	A 50 Ω lossless transmission line is terminated in a load impedance of ZL=25+j50 Ω. Use the smith chart to find a) Voltage reflection co-efficient b)VSWR c) input impedance of the line given that the line is 3.3 λ long and d) input admittance of the line.	C303.3	K3

Course Faculty
(Name /Sign / Date)
M. SATHYA

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HOD
(Name /Sign / Date)
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EC6503 - TRANSMISSION LINE & WAVE GUIDES

PART-A

(1) What is the input impedance of a eighth-wave, quarterwave and half wave lines?

For Eighth wave line,

$$Z_{in} = R_0 \left[\frac{R_R + jR_0}{R_0 + jR_R} \right]$$

For quarter wave line,

$$Z_{in} = \frac{R_0^2}{Z_R}$$

For a half wave line $Z_{in} = Z_R$.

(2) What are the applications of Smith chart?

- ✓ Measurement of Input impedance
- ✓ Measurement of SWR
- ✓ Measurement of reflection co-efficient
- ✓ Location of voltage maximum and minimum.

(3) Write the expression for the length of the Stub in single Stub matching.

$$L = \frac{\lambda}{2\pi} \tan^{-1} \frac{\sqrt{S}}{S-1}$$

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(4) Give an application of an Eight wave line.

✓ The input impedance of an Eight wave line is given by $|Z_S| = R_0$.

✓ To obtain a magnitude match between a resistance of any value and a source of R_0 internal resistance.

✓ Used to transform any resistance to an

(5) define skin depth.

$$\delta = \frac{1}{\sqrt{\pi f \mu \sigma}}$$

$\mu \rightarrow$ permeability $\quad \sigma \rightarrow$ Conductivity.

it is defined as a measure of depth to which an EM wave can penetrate the medium.

(6) what are guided waves ? Give examples.

→ Electromagnetic waves that are guided along (or) over conducting (or) dielectric surfaces are called guided waves.

Examples : waves along parallel wire transmission lines.

(7) Define phase & group velocity.

phase velocity :- $V_p = \frac{\omega}{\beta} = \frac{V}{\sqrt{1-\left(\frac{f_c}{f}\right)^2}}$ $\quad V = \frac{1}{\sqrt{\mu\epsilon}}$

$\because V = 3 \times 10^8$ m/s

group velocity :- $V = \frac{d\omega}{d\beta} = V\sqrt{1-\left(\frac{f_c}{f}\right)^2}$

PART-B

(8) a) Design a quarter wave transformer to match a load of 200 Ω to a source resistance of 500 Ω. Operating frequency is 200 MHz.

Given: $Z_R = 200\,\Omega$, $Z_S = 500\,\Omega$, $f = 200$ MHz.

Solution: $Z_S = \frac{R_0^2}{Z_R}$ $\quad R_0 = \sqrt{Z_S Z_R} = \sqrt{(500)(200)}$ → [3 Marks]

$R_0 = 316.22\,\Omega$. Formulae & Conditions → [3 Marks]

Input impedance of $\lambda/4$ transformer $R_0 = 316.22\,\Omega$.

Freq of operation is $f = 200$ MHz.

$\lambda = \frac{c}{f} = \frac{3 \times 10^8}{200 \times 10^6} = 1.5$ m.

The length of the quarter wave line $S = \lambda/4$ ⟶ [2 Marks]

$$S = \lambda/4 = \frac{1.5}{4} = 0.375 \text{ m}.$$ ⟶ [3 Marks]

(b) A load impedance of $90 - j50\ \Omega$ is to be matched to a line of $50\ \Omega$ using single stub matching. Find the length and position of the stub. $Z_0 = 50\ \Omega$; $Z_L = 90 - j50\ \Omega$.

Solution:

$$K = \frac{Z_L - Z_0}{Z_L + Z_0}$$ ⟶ [2 Marks]

$$K = 0.4307 \angle -31.69^\circ \qquad \frac{\phi = -31.69^\circ}{|K| = 0.4307}$$ ⟶ [4 Marks]

Location of the stub $S = \lambda/4\pi \left[\phi + \pi - \cos^{-1}|K|\right]$ ⟶ [2 Marks]

$$S = \lambda/4\pi \left[0.466\pi\right] = 0.116\lambda.$$ ⟶ [2 Marks]

Length of the stub $L = \frac{\lambda}{4\pi} \tan^{-1}\left[\frac{\sqrt{1-|K|^2}}{2|K|}\right]$

$$L = \frac{\lambda}{4\pi}\left[0.257\pi\right]$$

$$\boxed{L = 0.1286\lambda.}$$ ⟶ [3 Marks]

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(9) a) Derive the field equations of TE waves Travelling in z direction in a rectangular wave guide.

For TE waves, $E_z = 0$. ($H_z \neq 0$) ⟶ [1 Mark]

The wave equations is given by,

$$\frac{\partial^2 H_z}{\partial x^2} + \frac{\partial^2 H_z}{\partial y^2} + \gamma^2 H_z = -\omega^2 \mu \varepsilon H_z$$ ⟶ [2 Marks]

$$\frac{d^2 x}{dx^2} + x\frac{d^2 y}{dy^2} + h^2 xy = 0.$$ Condition ⟶ [2 Marks]

$X = C_1 \cos Bx + C_2 \sin Bx$.

$Y = C_3 \cos Ay + C_4 \sin Ay$.

$$E_x^0 = \frac{-j\omega\mu}{h^2}\frac{\partial H_z^0}{\partial y}$$

$$E_y^0 = \frac{j\omega\mu}{h^2}\frac{\partial H_z^0}{\partial x}$$

$A = \frac{n\pi}{b}$ $n = 1, 2, 3 \ldots$

$B = \frac{m\pi}{a}$ $m = 1, 2, 3 \ldots$

} → 4 Marks

$H_z = H_z^0 e^{-j\beta z}$

$$E_x = j\omega\frac{\mu}{h^2} A C \cos Bx \sin Ay \, e^{-j\beta z}$$

$$E_y = -j\omega\frac{\mu}{h^2} BC \sin Bx \cos Ay \, e^{-j\beta z}$$

$$H_x = j\frac{\beta}{h^2} CB \sin Bx \cos Ay \, e^{-j\beta z}$$

$$H_y = j\frac{\beta}{h^2} CA \cos Bx \sin Y \, e^{-j\beta z}$$

} → 4 MARKS

(a) (b) An air filled resonant cavity with dimensions $a = 5$cm, $b = 4$cm and $c = 10$cm is made of copper ($\sigma_c = 5.8 \times 10^7$ mhos/m). Find the resonant frequency of a) five lowest order mode. b) quality factor TE101 mode.

Given

$a = 5$cm, $b = 4$cm, $c = 10$cm.

Solution

a) Resonant frequency $f_0 = \frac{v}{2}\sqrt{\left(\frac{m}{a}\right)^2 + \left(\frac{n}{b}\right)^2 + \left(\frac{l}{c}\right)^2}$

$TE_{101} \Rightarrow f_0 = \frac{3\times10^8}{2}\sqrt{\left(\frac{1}{5\times10^{-2}}\right)^2 + \left(\frac{1}{10\times10^{-2}}\right)^2} = 3.35$ GHz.

$TE_{110} \rightarrow 4.8$ GHz $TE_{011} \rightarrow 4.038$ GHz $TE_{111} \rightarrow 5.83$ GHz

$TE_{102} \rightarrow 4.24$ GHz.

each carries } → 2 marks [4×2 = 8M]

b) Quality factor for TE101 mode:

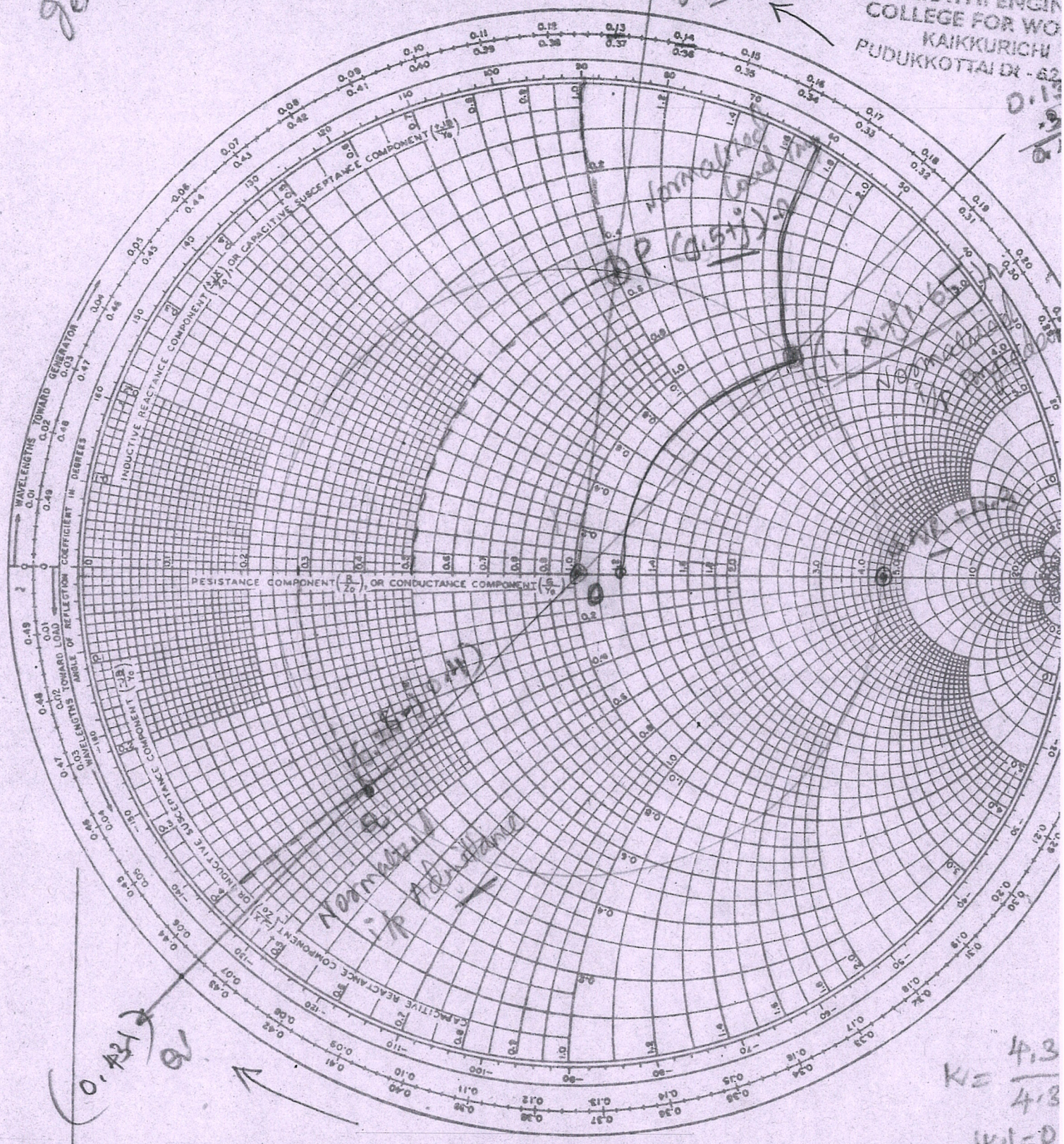
$$Q_{TE101} = \frac{(a^2+c^2)\,abc}{\delta[2b(a^3+b^3)+ac(a^2+c^2)]}$$

} → 5 Marks

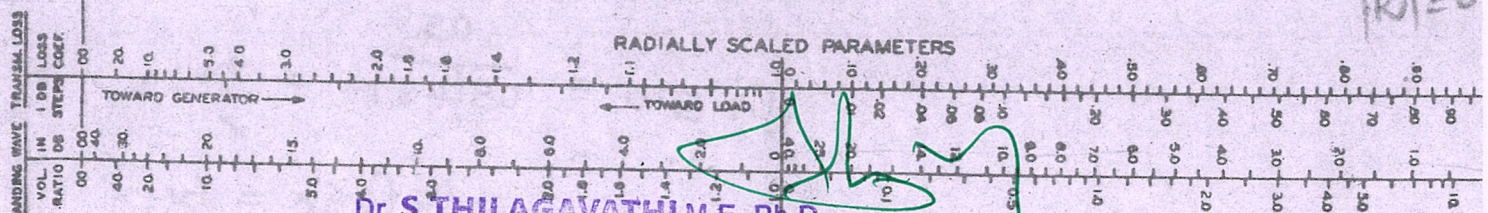
$= 2.0164\sqrt{\quad}$ → 4.35 δ

SMITH-CHART

IMPEDANCE OR ADMITTANCE COORDINATES



RADIALLY SCALED PARAMETERS



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PART-C

(10) A 50 Ω lossless transmission line is terminated in a load impedance of $Z_L = 25 + j50\ \Omega$. Use the Smith chart to find a) voltage reflection co-efficient b) VSWR c) Input impedance of the line, given that the line is 3.3 λ long and (d) Input admittance of the line.

Solution:

1) Normalized load impedance

$$Z_L' = \frac{Z_L}{Z_0} = \frac{25 + j50}{50}$$

$$Z_L' = 0.5 + j1\ \Omega. \longrightarrow [2 \text{ marks}]$$

2) SWR = 4.3 $\longrightarrow$ [3 marks]

3) reflection co-efficient $k = 0.64$. $\longrightarrow$ [2 marks]

4) Smith chart diagram $\longrightarrow$ [5 marks]

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Cycle Test Answer Book

Name	S. SIVARUBINI			**Year/ Semester**	III / V
Reg No.	912616106014	**Date/Session**	08.09.18/AN	**Department**	ECE
Course code	EC6503	**Course Title**	Transmission Lines & waveguides		
Cycle Test (Put a tick mark)	**CT 1** ☐	**CT 2** ☑	**CT 3** ☐	**Model** ☐	
Name and Signature of the Invigilator with date	P.D 8/9/18 [P. Devan Flora, AP/CIVIL]				

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	
1		2	~~11~~ 11		12			12
2		2	~~12~~ 12				13	13
3		2	~~13~~ 13		10			10
4		2	14					
5		2	15					
6		2	16					
7		2					Total	35
8			49/50 Grand Total				8/9/18 Name and Signature of the Examiner with date	
9							M. SAIPRIYA	
10								
Total		14						

To be filled by the examiner							
Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	–	–	33	–	17	–	50
Marks Obtained	–	–	32	–	17	–	49

IQAC Audit - Remarks

P. SUBHA

Name and Signature of the IQAC member

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2018 – 2019 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-II

Course Code & Name: EC6503 &TRANSMISSION LINES &WAVEGUIDES

YEAR/SEM: III YEAR & V SEMESTER **MONTH & YEAR: SEPTEMBER-2018**

S.NO	REG NO	STUDENT NAME	CO3 (33)	CO5 (17)	CO3+ CO5 (50)	TOTAL (100)
1.	912616106001	ABINAYA.R	18	08	26	52
2.	912616106002	AGALYA.A	20	11	31	62
3.	912616106003	ATCHAYA.G	17	8	25	50
4.	912616106004	DEEPA.N	24	12	32	64
5.	912616106005	DHARANIYA.A	25	15	40	80
6.	912616106006	JEEVITHA.U	18	12	30	60
7.	912616106007	MAHESWARI.V	19	07	26	52
8.	912616106008	PAZHANIYAMMAL.R	27	14	41	82
9.	912616106009	PRIYANKA.E	21	10	31	62
10.	912616106010	ROJA.A	27	15	42	84
11.	912616106011	SHANMUGAPRIYA.R	24	08	32	64
12.	912616106012	SHIYAMALA.E	18	12	30	60
13.	912616106013	SIVA BHARATHI.P	18	12	30	60
14.	912616106014	SIVARUBINI.S	32	17	49	92
15.	912616106015	THENMOZHI.A	20	12	32	64
16.	912616106016	VINCY.A	23	12	35	70
17.	912616106302	SANKAVI M	12	08	20	**40**

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MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
-	-	1	1	5	6	1	2	1

Total No.of Candidates Present	**17**
Total No.of Candidates Absent	**-**
Total No.of Students Pass	**16**
Total No. of Students Fail	**01**
Percentage of Pass	**94.1%**

Faculty Incharge

HoD/ECE

HOD / ECE
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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.M.Sathya
Course Code & Name: EC6503-Transmission Lines & Waveguides
Degree & Program : B.E & ECE
Semester : V
Cycle Test : I /II/III
Exam/Month & Year: September - 2018
Target : 100 %
Achieved : 94.7 %

S.NO	REG NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN
1.	912616106001	ABINAYA. R	Difficulties in understanding mathematical concepts	Practise more problems & previous year question papers
2.	912616106002	ACALYA. A	Poorly prepared	Insist to prepare well & Avoid social media distractions
3.	912616106007	MAHESHWARI. V	Health issue	Advised to take care of ur health with appropriate medicine
4.	912816106302	SANKAVI. M	Confused in derivative part & Problems	Insist to solve more Problems.

Signature of the Faculty Member

Signature of the HoD/ECE

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

Circular Date: 11.09.2018

Retest for second cycle test will be conducted from **14.09.2018 to 20.09.2018** for the III, V and VII semester (II, III & IV year) students.

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

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** 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 **24.09.2018.**

PRINCIPAL

11/09/18

Cc:

- All faculty
- Exam cell
- Office file

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COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

Register Number: | | | | | | | | | | | | |

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– II (RETEST)			Date/Session	17.09.2018/AN	Marks	50
Course code	EC6503	Course Title	TRANSMISSION LINES AND WAVEGUIDES			
Regulation	2013	Duration	90 Minutes	Academic Year	2018-2019	
Year	III	Semester	V	Department	ECE	

COURSE OUTCOMES

C303.1	To Discuss the propagation of signals through transmission lines
C303.2	To analyze signal propagation at Radio frequencies.
C303.3	To impart technical knowledge in impedance matching using smith chart
C303.4	To introduce passive filters and basic knowledge of active RF components
C303.5	To explain radio propagation in guided systems
C303.6	To utilize cavity resonators.

Q.No.	Question	CO	BTL
	PART A (Answer all the Questions 7 x2 = 14 Marks)		
1	What are the applications of smith chart?	C303.3	K2
2	Distinguish between single stub and double stub matching.	C303.3	K1
3	Write the expression for location of the stub in single stub matching.	C303.3	K1
4	Define skin depth.	C303.3	K1
5	Define critical frequency.	C303.5	K1
6	Give the expression for g, b,l and n of TE and TM waves in parallel plate waves guides.	C303.5	K1
7	What is the characteristics impedance of a symmetrical Й Section?	C303.5	K2
	PART B (Answer all the Questions 2 x 13 = 26 Marks)		
8a	Derive the expression for quarter wave transformer and mention its important applications.	C303.3	K3
	OR		
8b	A 50 Ω lossless transmission line is terminated in a load impedance of ZL=30+j40 Ω. Use the smith chart to find a) Voltage reflection co-efficient b)VSWR c) input impedance of the line given that the line is 1.25y long and c) input admittance of the line.	C303.3	K3
9a	Derive the field component of a transverse electric wave in rectangular waveguides.	C303.5	K3
	OR		
9b	For a frequency of 10 GHz and plane separation of 5 cm in air, find the cut-off frequency,cut off wavelength phase velocity and group velocity of the wave.	C303.5	K3
	PART C (Answer all the Questions 1 x 10 = 10 Marks)		
10	Explain the significance of smith chart and its applications.	C303.3	K2

Course Faculty
(Name /Sign / Date)
CM-SATHYA

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

HoD
(Name /Sign / Date)
V. KAVITHA

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-II

Name of the Faculty : Mrs.M.Sathya

Course Code & Name : EC6503 &Transmission Lines and Waveguides

Academic Year : 2018-2019/ODD

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

Date : 17.09.2018

S.NO	REG.NO	NAME	SIGNATURE
1.	912616106001	ABINAYA.R	R.Abinaya
2.	912616106002	AGALYA.A	Agalya.A
3.	912616106007	MAHESHWARI.V	Mahesh
4.	912616106302	SANKAVI.M	Sankavi.M

Faculty Incharge

HoD/ECE

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

Principal

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COLLEGE FOR WOMEN
KAIKKURICHI - 622 303.
PUDUKKOTTAI DISTRICT

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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KAIKKURICHI, PUDUKKOTTAI - 622 303

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2018 – 2019 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

CYCLE TEST-II (RETEST)

Course Code & Name: EC6503 &TRANSMISSION LINES &WAVEGUIDES

YEAR/SEM: III YEAR & V SEMESTER **MONTH & YEAR: SEPTEMBER-2018**

S.NO	REG NO	STUDENT NAME	CO3 (31)	CO5 (19)	CO3+ CO5 (50)	TOTAL (100)
1.	912616106001	ABINAYA.R	25	12	37	76
2.	912616106003	ATCHAYA.G	19	12	31	62
3.	912616106007	MAHESWARI.V	26	09	35	70
4.	912616106302	SANKAVI M	23	10	33	66

MARKS RANGE:

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

Total No.of Candidates Present	**04**
Total No.of Candidates Absent	**NIL**
Total No.of Students Pass	**04**
Total No. of Students Fail	**NIL**
Percentage of Pass	**100%**

Faculty Incharge

HoD/ECE

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KAIKKURICHI,
PUDUKKOTTAI - 622 303.

PRINCIPAL

19/9/18

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KAIKKURICHI - 622 303.
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2018- – 2019 (ODD SEMESTER)

FINAL INTERNAL STUDENTS MARK STATEMENT (Out of 20)

Course Code & Name: EC6503& TRANSMISSION LINES AND WAVEGUIDES

YEAR/SEM: III/V

S.NO	REG NO	STUDENT NAME	TOTAL (20)
1.	912616106001	ABINAYA.R	17
2.	912616106002	AGALYA.A	16
3.	912616106003	ATCHAYA.G	16
4.	912616106004	DEEPA.N	18
5.	912616106005	DHARANIYA.A	17
6.	912616106006	JEEVITHA.U	17
7.	912616106007	MAHESWARI.V	17
8.	912616106008	PAZHANIYAMMAL.R	18
9.	912616106009	PRIYANKA.E	17
10.	912616106010	ROJA.A	18
11.	912616106011	SHANMUGAPRIYA.R	16
12.	912616106012	SHIYAMALA.E	16
13.	912616106013	SIVA BHARATHI.P	16
14.	912616106014	SIVARUBINI.S	19
15.	912616106015	THENMOZHI.A	14
16.	912616106016	VINCY.A	15
17.	912616106302	SANKAVI M	16

Faculty Incharge **HoD/ECE** **Principal**

HOD / ECE
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONENGINEERING

ACADEMIC YEAR 2018 – 2019 (ODD SEMESTER)

ANNA UNIVERSITY RESULT STATEMENT NOV/DEC-2018

Course Code & Name: EC6503 & Transmission Lines and Waveguides

YEAR/SEM: III/V

S.NO	REG NO	STUDENT NAME	GRADE
1.	912616106001	ABINAYA.R	C
2.	912616106002	AGALYA.A	C
3.	912616106003	ATCHAYA.G	U
4.	912616106004	DEEPA.N	D
5.	912616106005	DHARANIYA.A	D
6.	912616106006	JEEVITHA.U	E
7.	912616106007	MAHESWARI.V	B
8.	912616106008	PAZHANIYAMMAL.R	E
9.	912616106009	PRIYANKA.E	D
10.	912616106010	ROJA.A	B
11.	912616106011	SHANMUGAPRIYA.R	E
12.	912616106012	SHIYAMALA.E	C
13.	912616106013	SIVA BHARATHI.P	U
14.	912616106014	SIVARUBINI.S	B
15.	912616106015	THENMOZHI.A	RA
16.	912616106016	VINCY.A	U
17.	912616106302	SANKAVI M	C

Faculty Incharge **HoD/ECE** **Principal**

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Kaikkuruchi, Pudukkottai- 622303.

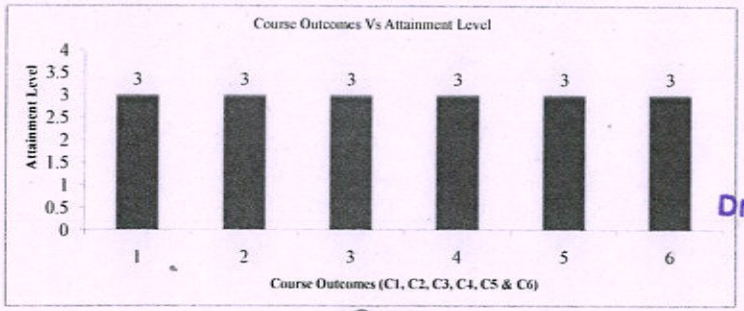
Department of Electronics and communication Engineering

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

ACADEMIC YEAR - 2018- 2019		BATCH	2015 - 2019					
COURSE CODE/TITLE	EC6503 - Transmission Lines and Waveguides	COURSE OUTCOME	1	2	3	4	5	6
YEAR/SEM	III/V	TARGET(%)	65	65	65	65	65	65
COURSE COORDINATOR	Mrs M SATHYA	TOTAL STRENGTH	16					

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
			60	40							40	60							60	40		10	10			10	60	50	50	60	60	50
1	912616106001	ABINAYA R	50	33							34	51							56	38		8	8			8	50	41	42	51	56	46
2	912616106002	AGALYA A	49	33							33	49							49	32		8	7			7	49	41	40	49	49	39
3	912616106003	ATCHAYA G	46	30							32	48							48	32		7	9			8	46	37	41	48	48	40
4	912616106004	DEEPA N	56	37							34	51							57	38		9	7			8	56	46	41	51	57	46
5	912616106005	DHARANIYA A	49	33							34	51							50	34		8	7			7	49	41	41	51	50	41
6	912616106006	JEEVITHA U	53	35							35	53							52	34		8	9			8	53	43	44	53	52	42
7	912616106007	MAHESWARI V	50	34							36	53							50	34		9	9			9	50	43	45	53	50	43
8	912616106008	PAZHANIYAMMAL R	56	38							36	54							54	36		8	7			7	56	46	43	54	54	43
9	912616106009	PRIYANKA E	46	30							37	55							52	34		8	7			8	46	38	44	55	52	42
10	912616106010	ROJA A	59	39							38	57							56	38		7	9			8	59	46	47	57	56	46
11	912616106011	SHANMUGAPRIYA R	48	32							32	48							53	35		8	9			8	48	40	41	48	53	43
12	912616106012	SHIYAMALA E	47	31							33	50							50	34		8	7			7	47	39	40	50	50	41
13	912616106013	SIVABHARATHI P	42	28							33	49							48	32		8	7			7	42	36	40	49	48	39
14	912616106014	SIVARUBINI S	59	39							38	57							58	38		9	8			9	59	48	46	57	58	47
15	912616106016	VINCY A	42	28							32	48							49	33		7	8			7	42	35	40	48	49	40
16	912616106302	SANKAVI M	44	30							32.4	49							51	34		9	9			9	44	39	41	49	51	43
CO's Target Value																											39.0	32.5	32.5	39.0	39.0	32.5
No. of Students scored above CO's Target Value																											16	16	16	16	16	16
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



Faculty In-charge

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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN
DEPARTMENT OF ECE
COURSE OUTCOME ATTAINMENT - UNIVERSITY EXAMINATION
ACADEMIC YEAR : 2018 - 2019(ODD SEM)

YEAR/ SEM: III /V **Batch:2015-2019**
SUBJECT : EC6503 / Transmission Lines and Waveguides
CO Attainment Level: 1 - (UPTO 60%) 2- (61%-79%) 3-(80% and Above)
TOTAL STRENGTH : 16

S.NO	Register No	NAME	Univ. Grade
1	912616106001	ABINAYA R	C
2	912616106002	AGALYA A	C
3	912616106003	ATCHAYA G	U
4	912616106004	DEEPA N	D
5	912616106005	DHARANIYA A	D
6	912616106006	JEEVITHA U	E
7	912616106007	MAHESWARI V	B
8	912616106008	PAZHANIYAMMAL R	E
9	912616106009	PRIYANKA E	D
10	912616106010	ROJA A	B
11	912616106011	SHANMUGAPRIYA R	E
12	912616106012	SHIYAMALA E	C
13	912616106013	SIVABHARATHI P	U
14	912616106014	SIVARUBINI S	B
15	912616106016	VINCY A	U
16	912616106302	SANKAVI M	C

No. of S Grade	0	0
No. of A Grade	0	0
No. of B Grade	3	3
No. of C Grade	3	3
No. of D Grade	3	3
No.of E Grade	3	3
No. of U Grade	3	3
No. of UA Grade	1	1
Target for course outcome Attainment	60	16
No of students above the target	9	
CO-Attainment University (%)	56.25	

Faculty

HOD/ECE

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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
C303.1	100.0	56.25	65.0	2
C303.2	100.0	56.25	65.0	2
C303.3	100.0	56.25	65.0	2
C303.4	100.0	56.25	65.0	2
C303.5	100.0	56.25	65.0	2
C303.6	100.0	56.25	65.0	2

Expected CO-PO Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS03
C303.1	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.2	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.3	2	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.4	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303.5	3	2	2	2	-	-	-	-	-	1	-	1	-	2	2
C303.6	3	2	2	2	-	-	-	-	-	1	-	1	-	-	2
C303	2.666666667	2	2	2	-	-	-	-	-	1	-	1	-	2	2

PO Attainment Level

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	1.33	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	-	1.33
C303.2	2	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	-	1.33
C303.3	1.33	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	-	1.33
C303.4	2	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	-	1.33
C303.5	2	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	1.33	1.33
C303.6	2	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	-	1.33
C303	1.78	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	1.33	1.33

Attainment of POs and PSOs:

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303	2.666666667	2	2	2	-	-	-	-	-	1	-	1	-	2	2
Attainment	1.78	1.33	1.33	1.33	-	-	-	-	-	0.67	-	0.67	-	1.33	1.33

Comments by Program Coordinator	1. 2.
Remarks by HoD	

Name and Signature of the Faculty Member (M.SATHYA)

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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