

DADI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi & Permanently Affiliated to JNTUK, Kakinada)

NAAC Accredited Institute

Recognized by UGC 2(F) and 12(B)

An ISO 9001:2008, 14001:2004 & OHSAS 18001:2007 Certified Institute

NH-16, Anakapalle, Visakhapatnam-531002, Andhra Pradesh

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE FILE

Name of the Course: Antennas and Wave Propagation

Class and Branch : III B.Tech ECE

Department : ECE

Academic Year: 2020-2021

Prepared by Course Instructor

Name : Dr J BABU

Designation : Professor

Signature :

Date :

Reviewed by Course Co-Ordinator

Name : Dr J BABU

Designation : Professor

Signature :

Date :

Reviewed by Module Co-Ordinator

Name :

Designation :

Signature :

Date :

Reviewed by Program Co-Ordinator

Name :

Signature :

Date :

Reviewed by HOD

Name : Mr K Jogi Naidu

Signature :

Date :

Approved by Academic Convenor

Name : Mr A venkateswara Rao

Signature :

Date :

1. Syllabus of the Course

III Year B.Tech ECE - I Semester	L	T	P	C
	3	0	0	3
Antennas and Wave Propagation				

UNIT I

ANTENNA FUNDAMENTALS: Introduction, Radiation Mechanism – single wire, 2 wire, dipoles, Current Distribution on a thin wire antenna. Antenna Parameters - Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beamwidths, Polarization, Beam Area, Radiation Intensity, Beam Efficiency, Directivity, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Height, illustrated Problems.

UNIT II

THIN LINEAR WIRE ANTENNAS: Retarded Potentials, Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Evaluation of Field Components, Power Radiated, Radiation Resistance, Beamwidths, Directivity, Effective Area and Effective Height. Natural current distributions, fields and patterns of Thin Linear Center-fed Antennas of different lengths, Radiation Resistance at a point which is not current maximum. Antenna Theorems – Applicability and Proofs for equivalence of directional characteristics, Loop Antennas: Small Loops - Field Components, Comparison of far fields of small loop and short dipole, Concept of short magnetic dipole, D and Rr relations for small loops.

UNIT III

ANTENNA ARRAYS : 2 element arrays – different cases, Principle of Pattern Multiplication, N element Uniform Linear Arrays – Broadside, End-fire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison; Concept of Scanning Arrays. Directivity Relations (no derivations). Related Problems. Binomial Arrays, Effects of Uniform and Non-uniform Amplitude Distributions, Design Relations. Arrays with Parasitic Elements, Yagi-Uda Arrays, Folded Dipoles and their characteristics.

UNIT IV

NON-RESONANT RADIATORS : Introduction, Traveling wave radiators – basic concepts, Long wire antennas –field strength calculations and patterns, Microstrip Antennas-Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas –Geometry and Parameters, Impact of different parameters on characteristics.

Broadband Antennas: Helical Antennas – Significance, Geometry, basic properties; Design considerations for monofilar helical antennas in Axial Mode and Normal Modes (Qualitative Treatment).

UNIT V

VHF, UHF AND MICROWAVE ANTENNAS : Reflector Antennas : Flat Sheet and Corner Reflectors. Paraboloidal Reflectors – Geometry, characteristics, types of feeds, F/D Ratio, Spill Over, Back Lobes, Aperture Blocking, Off-set Feeds, Cassegrain Feeds.

Horn Antennas – Types, Optimum Horns, Design Characteristics of Pyramidal Horns; Lens Antennas – Geometry, Features, Dielectric Lenses and Zoning, Applications, Antenna Measurements – Patterns Required, Set Up, Distance Criterion, Directivity and Gain Measurements (Comparison, Absolute and 3-Antenna Methods).

UNIT VI

WAVE PROPAGATION : Concepts of Propagation – frequency ranges and types of propagations. Ground Wave Propagation–Characteristics, Parameters, Wave Tilt, Flat and Spherical Earth Considerations. Sky Wave Propagation – Formation of Ionospheric Layers and their Characteristics, Mechanism of Reflection and Refraction, Critical Frequency, MUF and Skip Distance – Calculations for flat and spherical earth cases, Optimum Frequency, LUHF, Virtual Height, Ionospheric Abnormalities, Ionospheric Absorption.

Fundamental Equation for Free-Space Propagation, Basic Transmission Loss Calculations. Space Wave Propagation – Mechanism, LOS and Radio Horizon. Tropospheric Wave Propagation – Radius of Curvature of path, Effective Earth's Radius, Effect of Earth's Curvature, Field Strength Calculations, M-curves and Duct Propagation, Tropospheric Scattering.

TEXT BOOKS

- T1. Antennas for All Applications – John D. Kraus and Ronald J. Marhefka, 3rd Edition, TMH, 2003.
- T2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.

REFERENCES

- R1. Antenna Theory - C.A. Balanis, John Wiley and Sons, 2nd Edition, 2001.
- R2. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
- R3. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
- R4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th Edition, 1955.
- R5. Antennas – John D. Kraus, McGraw-Hill, 2nd Edition, 1988.

2. Additional Reference Books, Journals, websites and E-links

- 1. Antennas and Wave Propagation by GSN Raju, Pearson Education Publishers.
- 2. Antennas and Wave Propagation by Bakshi, Technical Publications, Pune

4. Gaps in the Syllabus to Meet Industry Requirements (if any) : NIL

5. Course Handout



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE HANDOUT

Part – A

(Course Description, Course Objectives, Course Outcomes, Course Articulation Matrix)

PROGRAM	: B.Tech ECE
CLASS and SEMESTER	: III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR	: 2020-2021
COURSE NAME & CODE	: Antennas and Wave Propagation
L-T-P STRUCTURE	: 4-0-0
COURSE CREDITS	3
COURSE INSTRUCTOR	: Dr J BABU
COURSE COORDINATOR	: Dr J BABU
PRE-REQUISITE	: EM Fields and Waves, Transmission Lines and wave guides

COURSE DESCRIPTION : This course provides the knowledge on Antennas and Radiation fundamentals. The course will expose different types of Antennas and their applications. The course also gives the complete information regarding Propagation of Radio wave in atmosphere.

COURSE OBJECTIVES

The student will be able to

1. understand the applications of the electromagnetic waves in free space.
2. introduce the working principles of various types of antennas
3. discuss the major applications of antennas with an emphasis on how antennas are employed to meet electronic system requirements.
4. understand the concepts of radio wave propagation in the atmosphere.

COURSE OUTCOMES (COs)

After going through this course the student will be able to

1. Identify basic antenna parameters
2. Quantify the fields radiated by various types of thin Linear wire and loop antennas
3. Analyse and design various Array antennas
4. Analyse and design Long wire, Helical and Microstrip antennas
5. Analyse and design reflector, horn and lens antennas and measure various parameters of antennas
6. Identify the characteristics of radio wave propagation

COURSE ARTICULATION MATRIX (Correlation between Cos & POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	1	1	-
CO2	2	2	2	-	-	-	-	-	-	-	-	2	2	-
CO3	2	2	3	-	-	-	-	-	-	-	-	2	3	-
CO4	1	1	-	-	-	-	-	-	-	-	-	1	2	-
CO5	1	1	-	-	-	-	-	-	-	-	-	1	2	-
CO6	1	1	-	-	-	-	-	-	-	-	-	1	2	-

1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High) - : None



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Part – B

COURSE DELIVERY PLAN

Name of the Course : Antenna and Wave Propagation

Class & Branch : III B.Tech I Sem ECE A

Academic Year : 2020-2021

Regulation : R16

S.No	Topic	No. of periods required	Teaching Learning Method	Proposed date of completion	Actual date of completion	Course Outcomes
UNIT – 1 Antenna Fundamentals						
1.	Syllabus, Course Objectives, Course outcomes	1	TLM1	17-08-20		
2.	Radiation Mechanism, Single wire, Two wire and Dipoles	1	TLM1	18-08-20		
3.	Current Distribution on a thin wire antenna	1	TLM1	19-08-20		
4.	Radiation Pattern, Patterns in Principal Planes	1	TLM1	19-08-20		
5.	Radiation Intensity, Directive gain, Directivity,	1	TLM1	20-08-20		
6.	Beam width, Polarization, Beam Area	1	TLM1	21-08-20		
7.	Beam Efficiency, Gain and Resolution	1	TLM1	24-08-20		
8.	Antenna Apertures, Effective Area	1	TLM1	25-08-20		
9.	Aperture Efficiency, Effective length	1	TLM1	26-08-20		
10.	Tutorial	1	TLM4	26-08-20		
UNIT- 2 Thin Linear Wire Antennas						
11	Antenna Theorems and Applications	1	TLM1	27-08-20		
12	Antenna Theorems and Applications	1	TLM1	28-08-20		
13	Heuristic approach of Retarded Vector Potential	1	TLM1	29-08-20		
14	Maxwell's equation approach of Retarded Vector	1	TLM1	31-08-20		
15	Radiation from a Small current element	1	TLM1	01-09-20		
16	Radiation from a Small current element	1	TLM1	02-09-20		
17	Power Radiated & Radiation resistance of current element	1	TLM1	02-09-20		
18	Power Radiated & Radiation resistance of current element	1	TLM1	03-09-20		
19	Radiation from a Short Dipole, Current Distribution	1	TLM1	04-09-20		
20	Current Distributions of Half wave dipole/Quarter wave	1	TLM1	05-09-20		
21	Radiation from Half wave dipole/Quarter wave Monopole	1	TLM1	07-09-20		
22	Power Radiated & Radiation resistance of Dipole and	1	TLM1	08-09-20		
23	Fields and Patterns of Thin Linear Center fed Antennas	1	TLM1	09-09-20		
24	Loop Antennas, Small Loops - Field Components	1	TLM1	09-09-20		
25	Comparison of far fields of small loop and short dipole	1	TLM1	10-09-20		
26	Short magnetic dipole, D and Rr relations for small loops	1	TLM1	11-09-20		
27	Tutorial	1	TLM4	14-09-20		
UNIT – 3 Antenna Arrays						
28	Two element array– Broad side	1	TLM1	15-09-20		
29	Two element array– End fire	1	TLM1	16-09-20		
30	N element Uniform Linear Arrays – Broad side	1	TLM1	16-09-20		
31	N element Uniform Linear Arrays – End fire	1	TLM1	17-09-20		
32	EFA with Increased Directivity, Derivation of their	1	TLM1	18-09-20		
33	Directivity Relations (no derivations), Principle of Pattern	1	TLM1	19-09-20		
34	Concept of Scanning Arrays, Binomial Arrays	1	TLM1	21-09-20		
35	Effects of Uniform and Non-uniform Amplitude	1	TLM1	22-09-20		
36	Folded Dipoles and their characteristics	1	TLM1	23-09-20		
37	Arrays with Parasitic Elements, Yagi-Uda Arrays	1	TLM1	23-09-20		
38	Tutorial	1	TLM4	24-09-20		

S.No	Topic	No. of periods required	Teaching Learning Method	Proposed date of completion	Actual date of completion	Course Outcomes
UNIT – 4 Non- Resonant Radiators						
39	Travelling wave radiators - basic concepts	1	TLM1	25-09-20		
40	Long wire antennas – field strength calculations and	1	TLM1	26-09-20		
41	Helical Antennas - Geometry, operation	1	TLM1	28-09-20		
42	Helical Antennas - Geometry, operation	1	TLM1	29-09-20		
43	Helical Antennas -design and Tutorial	1	TLM1	30-09-20		
44	Microstrip Antennas-Features, Advantages and Limitations	1	TLM1	30-09-20		
45	Rectangular Patch Antennas –Geometry and Parameters	1	TLM1	01-10-20		
46	Impact of different parameters on characteristics	1	TLM1	03-10-20		
47	Tutorial	1	TLM4	05-10-20		
UNIT – 5 VHF, UHF and Microwave Antennas						
48	Reflector Antennas- Flat Sheet Reflector and Corner	1	TLM1	06-10-20		
49	Paraboloidal Reflector Antenna Geometry, characteristics	1	TLM1	07-10-20		
50	Paraboloidal Reflector feed types, Cassegrain Antenna	1	TLM1	07-10-20		
51	Horn Antennas -Types, Optimum Horns	1	TLM1	08-10-20		
52	Design Characteristics of Pyramidal Horns	1	TLM1	09-10-20		
53	Lens Antennas – Geometry, Features, Applications	1	TLM1	10-10-20		
54	Dielectric Lenses and Zoning	1	TLM1	12-10-20		
55	Antenna Measurements-Set Up, Distance Criterion,	1	TLM1	13-10-20		
56	Gain Measurement (Comparison, Absolute and 3-Antenna	1	TLM1	14-10-20		
57	Tutorial	1	TLM4	15-10-20		
UNIT – 6 Wave Propagation						
58	Fundamental Equation for Free Space Propagation	1	TLM1	16-10-20		
59	Regions of Atmosphere, Structure of Ionosphere	1	TLM1	17-10-20		
60	Ground Wave or Surface wave Propagation: Field strength,	1	TLM1	19-10-20		
61	Flat Earth and Spherical Earth Considerations	1	TLM1	20-10-20		
62	Ionospheric wave Propagation: Ionospheric Layers	1	TLM1	21-10-20		
63	Mechanism of Ionospheric Propagation—Reflection and	1	TLM1	22-10-20		
64	Refractive Index of Ionosphere	1	TLM1	23-10-20		
65	Virtual Height, Critical Frequency	1	TLM1	26-10-20		
66	MUF- Calculations for flat and spherical earth cases	1	TLM1	27-10-20		
67	Skip Distance - Calculations for flat and spherical earth	1	TLM1	28-10-20		
68	Lowest Usable Frequency, Optimum Working Frequency	1	TLM1	29-10-20		
69	Ionospheric Abnormalities	1	TLM1	30-10-20		
70	Ionospheric Abnormalities	1	TLM1	31-10-20		
71	Effect of Earth's Magnetic field, Ionospheric Absorption	1	TLM1	02-11-20		
72	Space Wave Propagation- Mechanism, Field strength of	1	TLM1	03-11-20		
73	Effect of Earth's Curvature	1	TLM1	04-11-20		
74	Radius of Curvature of path, Effective Earth's Radius	1	TLM1	05-11-20		
75	Modified Refractive Index, Duct Propagation, M-curves	1	TLM1	06-11-20		
76	Line of Sight and Radio Horizon	1	TLM1	07-11-20		
77	Tropospheric Scattering	1	TLM1	30-11-20		
78	Tutorial	1	TLM4	01-12-20		

Total No. of classes Required to complete the syllabus:

78

Course Instructor

HOD



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Part – C

Name of the Course : Antenna and Wave Propagation

Class & Branch : III B.Tech I Sem ECE A

Academic Year : 2020-2021

Regulation : R16

Teaching Learning Methods			
TLM1	Chalk and Talk	TLM5	Activity based Learning
TLM2	LCD Projector	TLM6	Flipped//Blended Learning
TLM3	Tutorial (Problem Solving)	TLM7	Experiential Learning
TLM4	Participatory Learning	TLM8	Project Based Learning

EVALUATION PROCESS:

Evaluation Task	COs	Marks
First Mid Examination	1,2,3	M1=15
First Online Examination	1,2,3	OL1=10
First Assignment	1,2,3	A1=5
First Mid Marks Total (X1)=M1+OL1+A1	1,2,3	X1=30
Second Mid Examination	4,5,6	M2=15
Second Online Examination	4,5,6	OL2=10
Second Assignment	4,5,6	A2=5
Second Mid Marks Total (X2) =M2+OL2+A2	4,5,6	X2=30
Cumulative Internal Examination Marks (X): (80% of Highest + 80% of Lowest)	1,2,3,4,5,6	X=30
Semester End Examinations	1,2,3,4,5,6	Y=70
Total Marks: X+Y	1,2,3,4,5,6	100

Course Instructor

HOD

6. PEOs and PO's

Program Educational Objectives

Program Educational Objectives of the UG in Electronics and Communication Engineering are:

- PEO 1.
- PEO 2.
- PEO 3.
- PEO 4
- PEO 5

Programme Outcomes

The Program Outcomes of UG in Electronics and Communication Engineering are:

POs & PSO REFERENCE:

PO1	Engineering Knowledge	PO7	Environment & Sustainability	PSO1	
PO2	Problem Analysis	PO8	Ethics	PSO2	
PO3	Design & Development	PO9	Individual & Team Work		
PO4	Investigations	PO10	Communication Skills		
PO5	Modern Tools	PO11	Project Mgt. & Finance		
PO6	Engineer & Society	PO12	Life Long Learning		

Program Specific outcomes

PSO 1: Apply engineering principles to solve the problems of communications and Signal Processing area.

PSO 2: To use advanced tools to design and analyze the problems of VLSI & Embedded systems

PROGRAM OUTCOMES (POs):

PO 1:	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2:	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3:	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4:	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5:	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6:	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7:	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8:	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

7. List of the Students of the Class with Roll Numbers

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Name of the Course : Antenna and Wave Propagation
Academic Year : 2020-2021

Class & Branch : III B.Tech I Sem ECE A
Regulations : R16

S.No	ROLL NO	NAME
1	18U41A0401	ADARI VASANTHA
2	18U41A0402	ANAPAREDDI RAM JAGAN
3	18U41A0403	VECHALAPU BINDU
4	18U41A0404	BARNIKANA MARAJU
5	18U41A0405	BEJAWADA HARI KRISHNA
6	18U41A0406	BODDEDA REVATHI
7	18U41A0407	BOTTA BALAJI
8	18U41A0408	SAI SANTHOSH KUMAR CHARAKAPU
9	18U41A0409	CHADARAM PRASAD
10	18U41A0412	PIRADULA SURESH
11	18U41A0413	SANDRANA ROOPA
12	18U41A0414	JOGA NAGADEMULLU
13	18U41A0415	KAPU YAMINI
14	18U41A0416	KOILADA CHANAKYA
15	18U41A0417	KONETI KAVYA
16	18U41A0418	KUKKARA VIJAYA MANASA
17	18U41A0419	MADAGALA SOUJANYA
18	18U41A0420	MADDABATTULA PRATYUSHA JYOTHI
19	18U41A0421	MALLA DAKSHAYANI
20	18U41A0422	MALLA MOUNIKA NAGA LAKSHMI
21	18U41A0423	MATHALA MADHAVI
22	18U41A0424	PAKKI SATYA LASWIK
23	18U41A0425	PAMU CHANDRA KALA
24	18U41A0426	PENTAKOTA SWARJAN
25	18U41A0427	PUDI HARISH
26	18U41A0428	RONGALI LATHA
27	18U41A0429	R.LALITHA LAKSHMI S PRAVEENYA
28	18U41A0430	SAKA NAGASAI AMRUTHA
29	18U41A0431	SAMAYAMANTHULA GUNA
30	18U41A0432	SANAPATHI GANESH
31	18U41A0433	SEERAMSETTI TEJASRI
32	18U41A0434	VELURI NAGA SAI ROHINI KUMAR
33	18U41A0435	YANAPARTHI DURGALAKSHMI
34	18U41A0436	DEVADA JESWANTH REDDY
35	18U41A0437	JUTTUKA TALLABABU
36	18U41A0438	SIRASAPALLI HARSHITA
37	18U41A0439	YELAMARTHI SAI SURENDRA
38	18U41A0440	CHENNA HARIKA
39	18U41A0441	PAPPALA NEELIMA
40	18U41A0442	KANDREGULA MANIKANTANAIDU
41	18U41A0443	REDDI SRINIVAS
42	18U41A0444	DUNGALA DEVI
43	18U41A0445	MAREDDY AKHILESH
44	18U41A0446	GANESWARM ABISH
45	18U41A0447	PANASA JHANSI
46	18U41A0448	KOLLI SUMANTH
47	18U41A0449	PENTAKOTA SRIRAMYA
48	18U41A0450	MADAPATI TRINADH
49	18U41A0451	BUDDHA BHANU SREE
50	18U41A0452	GANTA PAVANKUMAR
51	18U41A0453	GORLE MADHAVI
52	18U41A0454	MUMMIDISETY SAI SOWJANYA
53	18U41A0455	MANDAPATI PAVITHRA
54	18U41A0456	SIRASAPALLI ARUNA
55	18U41A0457	RAHUL KUMAR
56	18U41A0458	ADARI BHARGAVI

7. List of the Students of the Class with Roll Numbers

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Name of the Course : Antenna and Wave Propagation Class & Branch : III B.Tech I Sem ECE B

Academic Year : 2020-2021

Regulations : R16

S.No	ROLL NO	NAME
1	17U41A0424	K JAGAN
2	19U45A0401	ALETI SWAMY
3	19U45A0402	ANE LOKESH
4	19U45A0403	BARNIKANA SIRISHA
5	19U45A0404	BERA SRAVANI
6	19U45A0405	BIKKAVILLI RAGHURAM
7	19U45A0406	BOINA PAVANI
8	19U45A0407	BUDDHA KEDHAR SAI
9	19U45A0408	CHEVVETI LATHA
10	19U45A0409	DASU GOWRI
11	19U45A0410	DODDI AJAY KUMAR
12	19U45A0411	GADI MAHA LAKSHMI DEVI
13	19U45A0412	GANTA DURGA BHAVANI
14	19U45A0413	GUNDARAPU TEJA SRI
15	19U45A0414	INDALA DHAANA SREELEKHYA
16	19U45A0415	KADIMISSETTY TEJA
17	19U45A0416	KALINGA THRIVENI
18	19U45A0417	KANDREGULA MOHAN GANESH
19	19U45A0418	KANTAPUREDDI LOKESH
20	19U45A0419	KARRI JAYASRI
21	19U45A0420	KOBBARI RAJESH
22	19U45A0421	KODURU MYTRI
23	19U45A0422	KONAGALLA BHAGYA DHARANI
24	19U45A0423	KOTAPALLI PAVANI ISHWARYA
25	19U45A0424	LANKA VENKATA SAI TEJASWINI
26	19U45A0425	MALLA RAJYA LAKSHMI
27	19U45A0426	M. SAI SHANMUKHA SRINADH
28	19U45A0427	MEDISSETTI MANJU
29	19U45A0428	NEMALA KUSUMA PRIYA
30	19U45A0429	PADALA YAMINI
31	19U45A0430	PEDDADA NIHARIKA
32	19U45A0431	PILLA REVATHI
33	19U45A0433	RAMPILLI INDRAJA
34	19U45A0434	SANAPATI JANAKI
35	19U45A0435	SENAPATHI JYOTHI
36	19U45A0436	SIMHADRI MOUNAVI
37	19U45A0437	TALARI DIVYA
38	19U45A0438	THUTTA VANI
39	19U45A0439	VADALA GEETHA BHUVANA
40	19U45A0440	VELAGA USHA SRI
41	19U45A0441	VILLURI MOULIKA
42	19U45A0442	GOMPA MOUNIKA

8. Time Table

Dr.J Babu

Day/Time	9-9.50	9.50-10.40	10.40-11	11-11.50	11.50-12.40	12.40-1.30	1.30-2.20	2.20-3.10	3.10-4.00	
Monday		RVSP	B R E A K		AWP-B	L U N C H	AWP-A			
Tuesday		AWP-B			AWP-A			RVSP		
Wednesday		RVSP			AWP-A					
Thursday	RVSP				AWP-B					
Friday	AWP-A				RVSP				AWP-B	
Saturday		RVSP			AWP-A				RVSP	

9. Tutorial Questions (Unit wise)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : B.Tech ECE
CLASS AND SEMESTER : III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation -
COURSE INSTRUCTOR : Dr J.BABU, Professor

Date:

TUTORIAL -1 UNIT 1

1. Determine the directivity of a Hertzian Dipole
2. Show that the Directivity of a Halfwave Dipole is 1.64

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : III B.Tech., I-Sem., ECE., Section-A/B

ACADEMIC YEAR : 2020-2021

COURSE NAME & CODE : Antennas and Wave Propagation

COURSE INSTRUCTOR : Dr J.Babu, Professor

TUTORIAL -2

Date:

1. Show that the radiation resistance of Half wave Dipole is 73 ohms
2. Obtain the Power Radiated & Radiation resistance of current element

Signature of Course Instructor



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : III B.Tech., I-Sem., ECE., Section-A/B

ACADEMIC YEAR : 2020-2021

COURSE NAME & CODE : Antennas and Wave Propagation

COURSE INSTRUCTOR : Dr J.Babu, Professor

TUTORIAL –3

Date:

1. Obtain the Maxima, Minima directions, HPBW for the case of a Four Element Uniform Broadside Linear array
2. Obtain the Maxima, Minima directions, HPBW for the case of a Four Element Uniform End Fire Linear array

Signature of Course Instructor



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : III B.Tech., I-Sem., ECE., Section-A/B

ACADEMIC YEAR : 2020-2021

COURSE NAME & CODE : Antennas and Wave Propagation

COURSE INSTRUCTOR : Dr J.Babu, Professor

TUTORIAL -4

Date:

1. Draw the diagram of a Helical Antenna. Discuss its operation.
2. Draw the diagram of a Microstrip Antenna. Discuss its operation.

Signature of Course Instructor



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : III B.Tech., I-Sem., ECE., Section-A/B

ACADEMIC YEAR : 2020-2021

COURSE NAME & CODE : Antennas and Wave Propagation

COURSE INSTRUCTOR : Dr J.Babu, Professor

TUTORIAL -5

Date:

1. Draw the diagram of a E Plane Sectoral Horn Antenna. Discuss its operation.
2. Draw the diagram of a Pyramidal Horn Antenna. Discuss its operation.

Signature of Course Instructor

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : III B.Tech., I-Sem., ECE., Section-A/B

ACADEMIC YEAR : 2020-2021

COURSE NAME & CODE : Antennas and Wave Propagation

COURSE INSTRUCTOR : Dr J.Babu, Professor

TUTORIAL -6

Date:

1. Discuss about the Layers of Ionosphere.
2. Obtain the expression for Space wave Field strength

Signature of Course Instructor

10. Assignment Questions (Unit wise)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : B.Tech ECE
CLASS AND SEMESTER : III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation -
COURSE INSTRUCTOR : Dr J.Babu, Professor

Date:

ASSIGNMENT 1

UNIT-1 : Antenna fundamentals

1. Explain about the Radiation Pattern, Beam width related to antennas
2. Explain about the following terms which are related to antennas
(a) Radiation intensity (b) Directivity
3. Explain about the following terms which are related to antennas
(a) Effective length (b) Effective Aperture
4. Explain about the following terms which are related to antennas
(a) Beam Solid Angle (b) Antenna Bandwidth

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : B.Tech ECE
CLASS AND SEMESTER : III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation -
COURSE INSTRUCTOR : Dr J.Babu, Professor

Date:

ASSIGNMENT 2

UNIT-2 : Thin Linear wire Antennas

1	Obtain the Array factor, Maxima directions, Null directions, Half Power point directions for the case of an antenna array with Two Antennas with currents of equal magnitude and same phase
2	Obtain the Array factor, Maxima directions, Null directions, Half Power point directions for the case of an antenna array with Two Antennas with currents of equal magnitude and opposite phase

11. Quiz Questions/Objective type Questions (Unit wise)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : B.Tech ECE
CLASS AND SEMESTER : III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation -
COURSE INSTRUCTOR : Dr J.BABU, Professor

Date:

Quiz Questions/Objective type Questions
Unit 1

12. Question Bank (Descriptive Questions with BLOOMS Taxonomy)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM : B.Tech ECE
CLASS AND SEMESTER : III B.Tech., I-Sem., ECE, Section-A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation -
COURSE INSTRUCTOR : Dr J.BABU, Professor

Question Number	Question	Blooms Taxonomy Level	Related Course Outcome CO	Marks
1	Determine the radiation resistance of a single turn and eight turn small circular loop antenna when the radius of the loop is $\lambda/25$ and the medium is free space.	Understand (L2)	CO1	10
2	Demonstrate the Helical antenna operation in the Normal mode , Axial mode with a neat sketch .	Understand (L2)	CO2	10
3	A parabolic antenna having a circular mouth is to have a power gain of 1000 at $\lambda=10$ cm. Determine the diameter and HPBW of the antenna.	Analyze (L4)	CO4	10
4	Elaborate the measurement of gain of an antenna by three antenna method.	Evaluating (L5)	CO4	10

CO : Course Outcomes Blooms Taxonomy Levels

L1: Remembering

L2 : Understanding

L3 : Applying

L4 : Analysing

L5 : Evaluating

L6 : Creating



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analysis of Internal Marks and Action Taken Report (Mid 2)

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- B
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU
Date of Mid Exam : 06-03-21

S.No.	% of Internal Marks	Regd. Nos of Students	No. of Students	Suggestions and Action Taken
1	>= 75%	19U45A0403 19U45A0406 19U45A0413 19U45A0418 19U45A0419 19U45A0427 19U45A0428 19U45A0429 19U45A0436 19U45A0437 19U45A0438	11	Students are suggested to solve more number of Problems from each unit.
2	>=50% and < 75%	19U45A0402 19U45A0404 19U45A0409 19U45A0412 19U45A0414 19U45A0415 19U45A0416 19U45A0417 19U45A0421 19U45A0423 19U45A0424 19U45A0425 19U45A0426 19U45A0433 19U45A0434 19U45A0440 19U45A0430 19U45A0435 19U45A0439 19U45A0441 19U45A0442	21	Students are suggested to Practice all the topics of each unit and solve more number of Problems from each unit.
3	< 50%	17U41A0424 19U45A0405 19U45A0407 19U45A0401 19U45A0408 19U45A0420 19U45A0422 19U45A0410 19U45A0411 19U45A0431	10	Mid Question Paper has been given as a Special Assignment. Students have written the Assignment.

Any Other Remarks :

Course Instructor

Course Co-Ordinator

Module Co-Ordinator

Program Co-Ordinator

HOD



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analysis of Internal Marks and Action Taken Report (Mid 1)

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- B
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr B Jagan Mohan Rao
Date of Mid Exam : 01-02-21

S.No.	% of Internal Marks	Regd. Nos of Students	No. of Students	Suggestions and Action Taken
1	>= 75%	19U45A0403 19U45A0405 19U45A0406 19U45A0419 19U45A0423 19U45A0427 19U45A0428 19U45A0435 19U45A0436 19U45A0437 19U45A0438 19U45A0440 19U45A0441	13	Students are suggested to solve more number of Problems from each unit.
2	>=50% and < 75%	19U45A0402 19U45A0409 19U45A0411 19U45A0412 19U45A0414 19U45A0413 19U45A0418 19U45A0422 19U45A0424 19U45A0425 19U45A0429 19U45A0430 19U45A0431 19U45A0433 19U45A0434 19U45A0439	16	Students are suggested to Practice all the topics of each unit and solve more number of Problems from each unit.
3	< 50%	17U41A0424 19U45A0401 19U45A0404 19U45A0407 19U45A0408 19U45A0410 19U45A0415 19U45A0416 19U45A0417 19U45A0420 19U45A0421 19U45A0426 19U45A0442	13	Mid Question Paper has been given as a Special Assignment. Students have written the Assignment. Planning to conduct Remedial Classes for the students who have got Less than 50% Marks

Any Other Remarks :

Course Instructor Course Co-Ordinator Module Co-Ordinator Program Co-Ordinator HOD



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analysis of Internal Marks and Action Taken Report (Mid 2)

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU
Date of Mid Exam :

S.No.	% of Internal Marks	Regd. Nos of Students	No. of Students	Suggestions and Action Taken
1	>= 75%	18U41A0406 18U41A0420 18U41A0425 18U41A0448 18U41A0454 18U41A0457 18U41A0403 18U41A0422 18U41A0428 18U41A0438 18U41A0444 18U41A0446 18U41A0449 18U41A0452 18U41A0458 18U41A0401 18U41A0413 18U41A0421	18	Students are suggested to solve more number of Problems from each unit.
2	>=50% and < 75%	18U41A0407 18U41A0409 18U41A0434 18U41A0435 18U41A0450 18U41A0456 18U41A0402 18U41A0408 18U41A0416 18U41A0433 18U41A0437 18U41A0447 18U41A0414 18U41A0415 18U41A0431 18U41A0404 18U41A0412 18U41A0417 18U41A0418 18U41A0419 18U41A0440 18U41A0455	22	Students are suggested to Practice all the topics of each unit and solve more number of Problems from each unit.
3	< 50%	18U41A0429 18U41A0432 18U41A0441 18U41A0445 18U41A0451 18U41A0453 18U41A0443 18U41A0423 18U41A0424 18U41A0442 18U41A0426 18U41A0405 18U41A0427 18U41A0436 18U41A0430 18U41A0439	16	Mid Question Paper has been given as a Special Assignment. Students have written the Assignment.

Any Other Remarks :

Course Instructor

Course Co-Ordinator

Module Co-Ordinator

Program Co-Ordinator

HOD



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Analysis of Internal Marks and Action Taken Report (Mid 1)

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU
Date of Mid Exam : 01-02-21

S.No.	% of Internal Marks	Regd. Nos of Students	No. of Students	Suggestions and Action Taken
1	>= 75%	18U41A0429 18U41A0437 18U41A0402 18U41A0403 18U41A0408 18U41A0448 18U41A0406 18U41A0409 18U41A0412 18U41A0430 18U41A0432 18U41A0435 18U41A0446 18U41A0447 18U41A0450 18U41A0416 18U41A0423 18U41A0425 18U41A0451 18U41A0454 18U41A0455 18U41A0428 18U41A0438 18U41A0444 18U41A0452 18U41A0457 18U41A0414 18U41A0415 18U41A0431 18U41A0418 18U41A0419 18U41A0422 18U41A0440 18U41A0449 18U41A0401 18U41A0413 18U41A0417 18U41A0420 18U41A0458	39	Students are suggested to solve more number of Problems from each unit.
2	>=50% and < 75%	18U41A0424 18U41A0439 18U41A0456 18U41A0404 18U41A0407 18U41A0426 18U41A0453	07	Students are suggested to Practice all the topics of each unit and solve more number of Problems from each unit.
3	< 50%	18U41A0427 18U41A0441 18U41A0445 18U41A0405 18U41A0436 18U41A0442 18U41A0434 18U41A0421 18U41A0443 18U41A0433	10	Mid Question Paper has been given as a Special Assignment. Students have written the Assignment. Planning to conduct Remedial Classes for the students who have got Less than 50% Marks

Any Other Remarks :

Course Instructor Course Co-Ordinator Module Co-Ordinator Program Co-Ordinator HOD

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Internal Marks for CO-PO attainment Process

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU

S.NO	ROLL NO	AWP MID 1 Marks			
		Q1	Q2	Q3	TOTAL
1	18U41A0401	10	10	10	30
2	18U41A0402	8	8	8	24
3	18U41A0403	6	8	10	24
4	18U41A0404	6	5	10	21
5	18U41A0405	0	0	5	5
6	18U41A0406	7	8	10	25
7	18U41A0407	9	7	5	21
8	18U41A0408	5	9	10	24
9	18U41A0409	9	8	8	25
10	18U41A0412	10	8	7	25
11	18U41A0413	10	10	10	30
12	18U41A0414	8	10	10	28
13	18U41A0415	10	10	8	28
14	18U41A0416	8	8	10	26
15	18U41A0417	10	10	10	30
16	18U41A0418	9	10	10	29
17	18U41A0419	9	10	10	29
18	18U41A0420	10	10	10	30
19	18U41A0421	10	10	10	10
20	18U41A0422	9	10	10	29
21	18U41A0423	10	10	6	26
22	18U41A0424	4	6	10	20
23	18U41A0425	10	10	6	26
24	18U41A0426	3	9	9	21
25	18U41A0427	0	0	0	0
26	18U41A0428	8	9	10	27
27	18U41A0429	4	9	10	23
28	18U41A0430	6	10	9	25
29	18U41A0431	8	10	10	28
30	18U41A0432	8	9	8	25
31	18U41A0433	0	8	7	15
32	18U41A0434	2	0	7	9
33	18U41A0435	6	9	10	25
34	18U41A0436	1	6	0	7
35	18U41A0437	5	8	10	23
36	18U41A0438	7	10	10	27
37	18U41A0439	2	9	9	20
38	18U41A0440	9	10	10	29
39	18U41A0441	0	0	0	0
40	18U41A0442	8	0	0	8
41	18U41A0443	0	6	8	14
42	18U41A0444	8	9	10	27
43	18U41A0445	0	0	0	0
44	18U41A0446	9	8	8	25
45	18U41A0447	6	9	10	25
46	18U41A0448	8	10	6	24
47	18U41A0449	9	10	10	29
48	18U41A0450	7	8	10	25
49	18U41A0451	6	10	10	26
50	18U41A0452	7	10	10	27
51	18U41A0453	7	9	6	22
52	18U41A0454	8	8	10	26
53	18U41A0455	8	8	10	26
54	18U41A0456	2	8	10	20
55	18U41A0457	7	10	10	27
56	18U41A0458	10	10	10	30

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Internal Marks for CO-PO attainment Process

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- B
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU

S.NO	ROLL NO	AWP MID 1 Marks			
		Q1	Q2	Q3	TOTAL
1	19U45A0401	1	0	5	6
2	19U45A0402	8	5	8	21
3	19U45A0403	10	7	10	27
4	19U45A0404	1	0	7	8
5	19U45A0405	8	9	10	27
6	19U45A0406	10	9	8	27
7	19U45A0407	4	5	0	9
8	19U45A0408	8	6	0	14
9	19U45A0409	7	0	9	16
10	19U45A0410	5	0	10	15
11	19U45A0411	3	6	10	19
12	19U45A0412	4	6	8	18
13	19U45A0413	7	7	7	21
14	19U45A0414	6	5	9	20
15	19U45A0415	2	0	9	11
16	19U45A0416	6	6	0	12
17	19U45A0417	6	0	9	15
18	19U45A0418	8	0	10	18
19	19U45A0419	8	8	8	24
20	19U45A0420	6	0	9	15
21	19U45A0421	9	2	4	15
22	19U45A0422	6	6	6	18
23	19U45A0423	10	4	10	24
24	19U45A0424	6	8	7	22
25	19U45A0425	4	9	8	21
26	19U45A0426	6	8	1	15
27	19U45A0427	8	9	10	27
28	19U45A0428	8	8	10	26
29	19U45A0429	5	6	8	19
30	19U45A0430	4	7	10	21
31	19U45A0431	7	8	7	22
32	19U45A0433	6	7	8	21
33	19U45A0434	5	7	7	19
34	19U45A0435	7	7	10	24
35	19U45A0436	7	9	10	26
36	19U45A0437	8	9	10	27
37	19U45A0438	8	9	10	27
38	19U45A0439	6	9	8	23
39	19U45A0440	7	9	8	24
40	19U45A0441	7	9	8	24
41	19U45A0442	5	0	10	15
42	17U41A0424	7	0	6	13

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Internal Marks for CO-PO attainment Process

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- A
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU

S.NO	ROLL NO	AWP MID 2 Marks			
		Q1	Q2	Q3	TOTAL
1	18U41A0401	10	10	10	30
2	18U41A0402	9	0	8	17
3	18U41A0403	8	10	9	17
4	18U41A0404	8	8	7	23
5	18U41A0405	6	2	1	9
6	18U41A0406	9	6	9	25
7	18U41A0407	0	8	8	16
8	18U41A0408	5	6	6	17
9	18U41A0409	8	7	1	16
10	18U41A0412	10	7	6	23
11	18U41A0413	10	10	10	30
12	18U41A0414	9	10	1	20
13	18U41A0415	7	2	10	19
14	18U41A0416	10	7	1	18
15	18U41A0417	8	6	10	24
16	18U41A0418	8	10	6	24
17	18U41A0419	8	5	10	23
18	18U41A0420	9	8	9	26
19	18U41A0421	10	10	10	30
20	18U41A0422	8	9	10	27
21	18U41A0423	0	6	0	6
22	18U41A0424	0	5	0	5
23	18U41A0425	7	8	10	25
24	18U41A0426	3	5	0	8
25	18U41A0427	7	4	0	11
26	18U41A0428	8	9	10	27
27	18U41A0429	AB	AB	AB	0
28	18U41A0430	8	0	6	14
29	18U41A0431	6	6	10	22
30	18U41A0432	AB	AB	AB	0
31	18U41A0433	8	1	9	18
32	18U41A0434	7	9	0	16
33	18U41A0435	8	7	0	15
34	18U41A0436	2	7	2	11
35	18U41A0437	2	6	10	18
36	18U41A0438	8	10	10	28
37	18U41A0439	0	8	5	13
38	18U41A0440	4	10	10	24
39	18U41A0441	AB	AB	AB	0
40	18U41A0442	1	4	0	5
41	18U41A0443	2	0	1	3
42	18U41A0444	9	10	9	28
43	18U41A0445	AB	AB	AB	0
44	18U41A0446	8	9	10	27
45	18U41A0447	10	8	0	18
46	18U41A0448	9	9	7	25
47	18U41A0449	10	10	8	28
48	18U41A0450	1	8	7	16
49	18U41A0451	AB	AB	AB	0
50	18U41A0452	8	10	10	28
51	18U41A0453	AB	AB	AB	0
52	18U41A0454	8	10	7	25
53	18U41A0455	9	8	7	24
54	18U41A0456	8	7	0	15
55	18U41A0457	8	8	9	25
56	18U41A0458	9	8	10	27

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Internal Marks for CO-PO attainment Process

PROGRAM : B.Tech
CLASS : III B.Tech I-Sem., ECE., Section- B
ACADEMIC YEAR : 2020-2021
COURSE NAME & CODE : Antennas and Wave Propagation
COURSE INSTRUCTOR : Dr J BABU

S.NO	ROLL NO	AWP MID 2 Marks			
		Q1	Q2	Q3	TOTAL
57	19U45A0401	1	1	1	3
58	19U45A0402	8	0	10	18
59	19U45A0403	9	10	10	29
60	19U45A0404	8	10	0	18
61	19U45A0405	AB	AB	AB	0
62	19U45A0406	8	9	8	25
63	19U45A0407	1	1	0	2
64	19U45A0408	4	0	0	4
65	19U45A0409	3	4	9	16
66	19U45A0410	1	8	5	14
67	19U45A0411	6	7	1	14
68	19U45A0412	5	1	10	16
69	19U45A0413	8	8	9	25
70	19U45A0414	8	0	7	15
71	19U45A0415	8	4	6	18
72	19U45A0416	8	8	6	22
73	19U45A0417	8	9	6	23
74	19U45A0418	8	9	8	25
75	19U45A0419	8	9	8	25
76	19U45A0420	5	1	3	9
77	19U45A0421	9	10	2	21
78	19U45A0422	9	0	3	12
79	19U45A0423	9	0	7	16
80	19U45A0424	7	3	10	20
81	19U45A0425	8	0	8	16
82	19U45A0426	8	1	8	17
83	19U45A0427	8	9	10	27
84	19U45A0428	9	10	10	29
85	19U45A0429	8	9	8	25
86	19U45A0430	8	7	9	24
87	19U45A0431	0	5	9	14
88	19U45A0433	8	6	7	21
89	19U45A0434	8	6	7	21
90	19U45A0435	8	6	9	23
91	19U45A0436	8	10	9	27
92	19U45A0437	8	10	7	25
93	19U45A0438	8	9	10	27
94	19U45A0439	7	7	6	20
95	19U45A0440	8	8	6	22
96	19U45A0441	7	8	8	23
97	19U45A0442	5	7	7	19
98	17U41A0424	AB	AB	AB	0

Consolidated Marks

Antennas and Wave Propagation (2020-2021 AY)

III B.Tech ECE- B Section

	DES1	QUIZ1	A1	TOTAL1	DES2	QUIZ2	A2	TOTAL2	80% of Highest X	20% of Lowest Y	Total X+Y
19U45A0401	3	4	5	12	2	3.5	5	10.5			
19U45A0402	11	2	5	18	9	5	5	19			
19U45A0403	14	4	5	23	15	5.5	5	25.5			
19U45A0404	4	5	5	14	9	4.5	5	18.5			
19U45A0405	A	A	5	5	AB	AB	0	0			
19U45A0406	14	3	5	22	13	4.5	5	22.5			
19U45A0407	5	3	5	13	1	2	5	8			
19U45A0408	7	4	5	16	2	2.5	5	9.5			
19U45A0409	8	5	5	18	8	3.5	5	16.5			
19U45A0410	8	3	5	16	7	2.5	5	14.5			
19U45A0411	10	5	5	20	7	3	5	15			
19U45A0412	9	4	5	18	8	4	5	17			
19U45A0413	11	3	5	19	13	6	5	24			
19U45A0414	10	3	5	18	8	4.5	5	17.5			
19U45A0415	6	5	5	16	9	2.5	5	16.5			
19U45A0416	6	3	5	14	11	3	5	19			
19U45A0417	8	3	5	16	12	3	5	20			
19U45A0418	9	4	5	18	13	6	5	24			
19U45A0419	12	4	5	21	13	4	5	22			
19U45A0420	8	3	5	16	5	4.5	5	14.5			
19U45A0421	8	5	5	18	11	4.5	5	20.5			
19U45A0422	9	4	5	18	6	2	5	13			
19U45A0423	12	2	5	19	8	1.5	5	14.5			
19U45A0424	11	4	5	20	10	4	5	19			
19U45A0425	11	2	5	18	8	5	5	18			
19U45A0426	8	4	5	17	9	4	5	18			
19U45A0427	14	4	5	23	14	1.5	5	20.5			
19U45A0428	13	6	5	24	15	6	5	26			

19U45A0429	10	3	5	18	13	2.5	5	20.5			
19U45A0430	11	3	5	19	12	2	5	19			
19U45A0431	11	3	5	19	7	4.5	5	16.5			
19U45A0433	11	3	5	19	11	3	5	19			
19U45A0434	10	3	5	18	11	2.5	5	18.5			
19U45A0435	12	2	5	19	12	5	5	22			
19U45A0436	13	2	5	20	14	5	5	24			
19U45A0437	14	3	5	22	13	5	5	23			
19U45A0438	14	4	5	23	14	2.5	5	21.5			
19U45A0439	12	3	5	20	10	4	5	19			
19U45A0440	12	3	5	20	11	3	5	19			
19U45A0441	12	3	5	20	12	2	5	19			
19U45A0442	8	3	5	16	10	3.5	5	18.5			
17U41A0424	7	2	5	14	AB	AB	0	0			

DADI INSTITUTE OF ENGINEERING & TECHNOLOGY

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NH-16, Anakapalle – 531002, Visakhapatnam, A.P.

Phone: 9963981111, www.diet.edu.in, E-mail: info@diet.edu.in

Department of ECE

Subject : Antennas and Wave Propagation **Class & Branch** : III B.Tech I Sem ECE

Department : ECE

Academic Year : 2020-2021

Faculty Name: Dr J BABU

Designation : Professor

Consolidated Marks III B.Tech ECE- A Section

	DES1	QUIZ1	A1	TOTAL1	DES2	QUIZ2	A2	TOTAL2	80% of Highest X	20% of Lowest Y	Total X+Y
18U41A0401	15	4	5	24	15	2.5	5	22.5			
18U41A0402	12	5	5	22	9	1	5	15			
18U41A0403	12	2	5	19	14	3.5	5	22.5			
18U41A0404	11	2	5	18	12	3.5	5	20.5			
18U41A0405	3	4	5	12	5	6	5	16			
18U41A0406	13	2	5	20	13	2.5	5	20.5			
18U41A0407	11	4	5	20	8	2.5	5	15.5			
18U41A0408	12	5	5	22	9	2	5	16			
18U41A0409	13	3	5	21	8	4.5	5	17.5			
18U41A0412	13	4	5	22	12	5	5	22			
18U41A0413	15	5	5	25	15	6	5	26			
18U41A0414	14	5	5	24	10	3.5	5	18.5			
18U41A0415	14	3	5	22	10	5	5	20			
18U41A0416	13	4	5	22	9	4	5	18			
18U41A0417	15	4	5	24	12	4	5	21			
18U41A0418	15	5	5	25	12	4	5	21			
18U41A0419	15	4	5	24	12	3.5	5	20.5			
18U41A0420	15	5	5	25	13	3	5	21			
18U41A0421	15	4	5	24	15	3	5	23			
18U41A0422	15	3	5	23	14	2.5	5	21.5			
18U41A0423	13	5	5	23	3	3.5	5	11.5			
18U41A0424	10	2	5	17	3	3.5	5	11.5			
18U41A0425	13	3	5	21	13	4	5	22			
18U41A0426	11	3	5	19	4	3.5	5	12.5			
18U41A0427	A	A	5	5	6	3.5	5	14.5			
18U41A0428	14	3	5	22	14	4.5	5	23.5			
18U41A0429	12	4	5	21	AB	AB	5	5			
18U41A0430	13	4	5	22	7	4	5	16			
18U41A0431	14	4	5	23	11	6	5	21			
18U41A0432	13	5	5	23	AB	AB	5	5			
18U41A0433	8	4	5	17	9	6	5	20			
18U41A0434	5	4	5	14	8	4.5	5	17.5			
18U41A0435	13	4	5	22	8	3.5	5	16.5			
18U41A0436	4	3	5	12	6	2.5	5	13.5			
18U41A0437	12	3	5	20	9	5.5	5	19.5			

18U41A0438	14	5	5	24	14	5.5	5	24.5			
18U41A0439	10	4	5	19	7	4.5	5	16.5			
18U41A0440	15	4	5	24	12	2.5	5	19.5			
18U41A0441	A	A	5	5	AB	AB	0	0			
18U41A0442	4	2	5	11	3	3.5	5	11.5			
18U41A0443	7	3	5	15	2	2.5	5	9.5			
18U41A0444	14	3	5	22	14	1.5	5	20.5			
18U41A0445	A	A	5	5	AB	AB	0	0			
18U41A0446	13	4	5	22	14	5	5	24			
18U41A0447	13	3	5	21	9	5.5	5	19.5			
18U41A0448	12	3	5	20	13	4	5	22			
18U41A0449	15	3	5	23	14	5.5	5	24.5			
18U41A0450	13	5	5	23	8	4.5	5	17.5			
18U41A0451	13	3	5	21	AB	AB	5	5			
18U41A0452	14	4	5	23	14	5.5	5	24.5			
18U41A0453	11	5	5	21	AB	AB	5	5			
18U41A0454	13	6	5	24	13	5	5	23			
18U41A0455	13	5	5	23	12	2	5	19			
18U41A0456	10	1	5	16	8	3.5	5	16.5			
18U41A0457	14	4	5	23	13	3.5	5	21.5			
18U41A0458	15	8	5	28	14	5	5	24			