YEAR & SEM : III & V **ACADEMIC YEAR: 2022-23**

SUB : ANTENNA WAVES & MICROWAVE ENGINEERIMG

BRANCH : ECE

UNIT-I-(2 MARKS)				
S.NO		**BL**	**CO**	**PO**
1	Write a short note on Radiation Resistance	1,2	1	1,2,3
2	Sketch the Radiation pattern of Dipole antenna and Write a short note on it	1,2	1	1,2,3
3	Write a short note on Principal patterns of Dipole antenna	1,2	1	1,2,3
4	Write a short note on Radiation patterns lobes	1,2	1	1,2,3
5	Distinguish between Bandwidth and Beam width	1,2	1	1,2,3
6	Define polarization and its types	1,2	1	1,2,3
7	Define the Radiation Intensity and Power Density	1,2	1	1,2,3
8	Write a short note on Beam Efficiency	1,2	1	1,2,3
9	Define the Directivity and Gain	1,2	1	1,2,3
10	Write a short note on Effective Height	1,2	1	1,2,3
UNIT-I-(10 MARKS)				
1	Explain the Radiation Mechanism of Single wire, Two wire and Dipole antenna.	1,2,5	1	1,2,3
2	(a) Derive the Expression for Beam Area of Dipole antenna (b) Explain the Radiation pattern of Dipole antenna with neat sketch and derive the expression for its field strength patterns.	1,2,5	1	1,2,3
3	(a) Derive the expression for Directivity and Gain (b) Explain the current Distribution on thin wire antenna.	1,2,5	1	1,2,3
4	Explain the Antenna parameters (a) Radiation Resistance (b) Principal Patterns (c) Radiation Pattern Lobes (d) Antenna Beam width	1,2	1	1,2,3
5	Explain the following Terms : (a) Beam Efficiency (b) Antenna Aperture (c) Effective Height (d) Polarization	1,2	1	1,2,3
6	(a) Derive the Expression for Beam Area of Dipole antenna (a) Derive the expression for Directivity and Gain	1,2	1	1,2,3
7	(a) Explain the Radiation Mechanism of Single wire and Two wire antenna. (b) Explain the current Distribution on thin wire antenna and write the importance of Shape impedance considerations.	1,2	1	1,2,3

UNIT-II-2 MARKS				
S.NO		**BL**	**CO**	**PO**
1	Write a short notes on Loop antenna and its types	1,2,3	2	1,2,3
2	Derive the expression for Radiation Resistance of circular loop antenna	1,2,3	2	1,2,3
3	Comparison of Far fields of small loop and short dipole antenna.	1,2,3	2	1,2,3
4	Write a short notes on Infinite Biconical antenna	1,2,3	2	1,2,3
5	Write a short notes on Finite Biconical antenna	1,2,3	2	1,2,3
6	Write short notes on construction of Yagi-Uda antenna.	1,2,3	2	1,2,3
7	What are the designing elements of Yagi-Uda antenna.	1,2,3	2	1,2,3
8	Write a short notes on folded Dipole antenna	1,2,3	2	1,2,3
9	Write a short note on construction of Helical antenna.	1,2,3	2	1,2,3
10	Write short notes on Helical Geometry.	1,2,3	2	1,2,3
UNIT-II-10 MARKS				
1	(a) Derive the expression for Radiation characteristics, Radiated Power, Radiation Resistance of small loop antenna and Draw its Radiation pattern. (7M) (b) Mention Advantages , Disadvantages , and application of small loop antenna (3M)	1,2,5	2	1,2,3
2	(a) Explain the Infinite and Finite biconical antenna (b) Explain the finite dipole antenna and derive its impedance characteristics	1,2,5	2	1,2,3
3	(a) Explain the construction details of Helical antenna and explain its operation in Axial and Normal Modes. (7M) (b) Mention Advantages , Disadvantages , and application of small loop antenna (3M)	1,2,5	2	1,2,3
4	(a) Explain the construction of Yagi-Uda antenna, operations and derive the expression for voltage and Current relationship. (7M) (b) Mention Advantages , Disadvantages , and application of small loop antenna (3M)	1,2,5	2	1,2,3
5	(a) Explain the construction details of Yagi-Uda antenna and mention its applications (b)) Explain the construction details of Helical antenna and mention its applications	1,2,5	2	1,2,3
6	(a) Explain the small loop antenna and its Radiation characteristics and mention its advantages and applications (b) Explain the finite dipole antenna and mention its advantages and applications	1,2,5	2	1,2,3
7	(a) Derive the expression for voltage and current relationship of Yagi-Uda antenna and Mention its advantages and applications. (b) Explain the operation of Helical antenna in Normal mode and mention its advantages and applications.	1,2,5	2	1,2,3

UNIT-III-2 MARKS				
S.NO		**BL**	**CO**	**PO**
1	Write short notes on Horn antenna and its types.	1,2,3	3	1,2,3
2	Mention salient features of micro strip patch antenna.	1,2,3	3	1,2,3
3	Mention advantages and limitations of micro strip antenna.	1,2,3	3	1,2,3
4	Write short notes on Rectangular micro strip antenna.	1,2,3	3	1,2,3
5	Write short notes on long wire antenna and its types.	1,2,3	3	1,2,3
6	What are the advantages, disadvantages and applications of long wire antenna?	1,2,3	3	1,2,3
7	Write short notes on lens antenna and mention its types.	1,2,3	3	1,2,3
8	Write a short notes on dielectric lens antenna.	1,2,3	3	1,2,3
9	Write a short notes on reflector antenna and its types	1,2,3	3	1,2,3
10	Write a short notes on parabolic reflector antenna.	1,2,3	3	1,2,3
UNIT-III-10 MARKS				
1	(a) Define Horn antenna, its types and Explain the Design characteristics of Horn antenna. (7M) (b) Mention Advantages , Disadvantages , and application of Horn antenna (3M)	1,2,5	3	1,2,3
2	(a) Explain about the features micro strip antenna and mention its advantages, Limitations. (b) Explain the operation of Rectangular Micro strip antenna (RMSA) and discuss about Feed Techniques, advantages and disadvantages .	1,2,5	3	1,2,3
3	(a) Explain the design characteristics of Long wire Resonant and long wire Non-resonant antenna. (7M) (b) Mention Advantages , Disadvantages , and application of long wire antenna (3M)	1,2,5	3	1,2,3
4	(a) Explain the types, construction details and operation of Lens antenna (b) Mention Advantages , Disadvantages , and application of lens antenna (3M)	1,2,5	3	1,2,3
5	(a) Explain the working principle of Parabolic reflector antenna and discuss about disadvantages of parabolic reflector antenna. (b) Discuss the different types of feed system used in reflector antenna and Explain about cassergrain feed system ,its advantages and disadvantages	1,2,5	3	1,2,3
6	(a) Explain the working principle of Parabolic reflector antenna (b) Explain the operation of Rectangular Micro Strip Antenna	1,2,5	3	1,2,3

UNIT-IV-2 MARKS				
S.NO		**BL**	**CO**	**PO**
1	Define the Microwave and mention its frequency band.	1,2,3	4	1,2,3
2	What are the advantages and application of microwaves?	1,2,3	4	1,2,3
3	Write any four parameters of Transmission line.	1,2,3	4	1,2,3
4	Write short notes on types of transmission line.	1,2,3	4	1,2,3
5	Write short notes on modes of propagation.	1,2,3	4	1,2,3
6	Write a short on notes on waveguides and its types	1,2,3	4	1,2,3
7	Write short notes on Directional coupler	1,2,3	4	1,2,3
8	Write short notes on Magic Tee	1,2,3	4	1,2,3
9	Write short notes on attenuators	1,2,3	4	1,2,3
10	Write short notes on Isolators	1,2,3	4	
UNIT-IV-10 MARKS				
1	(a) write about microwaves, mention its frequency range in electromagnetic spectrum and explain its frequency band and applications (b) What are the advantages, disadvantages and applications of microwaves?	1,2,5	4	1,2,3
2	(a) Explain in detail about the parameters of transmission lines (b) Explain in detail about the types of transmission lines.	1,2,5	4	1,2,3
3	(a) Explain the modes of propagation of microwave frequency. (b) write about waveguides and explain the Rectangular waveguide	1,2,5	4	1,2,3
4	Explain the Directional Coupler, its parameters and derive the expression for properties of S-matrix.	1,2,5	4	1,2,3
5	Explain the Magic Tee, its parameters and derive the expression for properties of S-matrix.	1,2,5	4	1,2,3
6	Explain the Term (i) Attenuator (ii) matched terminator (iii) Power Divider and Power Combiner (iv) Isolator	1,2,5	4	1,2,3
7	Explain in detail about Coaxial Cavity Resonators and its turning Methods.	1,2,5	4	1,2,3
8	(a) Explain the basic principles of Directional Coupler and Magic Tee (b) Explain about Attenuator and Coaxial Cavity Resonator	1,2,5	4	1,2,3

UNIT-V-2 MARKS

S.NO		BL	CO	PO
1	What are the types of microwave solid state devices and write about its applications	1,2,3	5	1,2,3
2	Write short notes on crystal diode.	1,2,3	5	1,2,3
3	Write short notes on Schottky Diode.	1,2,3	5	1,2,3
4	Write short notes on PIN diode.	1,2,3	5	1,2,3
5	Write short notes on Gunn Diode.	1,2,3	5	1,2,3
6	Write short notes on IMPATT Diode.	1,2,3	5	1,2,3
7	Write a short notes on Varactor Diode	1,2,3	5	1,2,3
8	Write a short notes on Tunnel Diode.	1,2,3	5	1,2,3
9	Write short notes on Reflex Klystron	1,2,3	5	1,2,3
10	Mention the advantages of Gunn Diode and Reflex Klystron	1,2,3	5	1,2,3

UNIT-V-10 MARKS

1	(a) Explain the basic principles of Crystal Diode and Schottky Diode with neat sketch and mentions its advantages and applications (b) Explain the basic Principles of Varactor Dode and mentions its applications	1,2,5	5	1,2,3
2	(a) Explain the basic principles of PIN Diode with Forward Bias and Reverse Bias. (b) Mention its Advantages, Disadvantages and applications	1,2,5	5	1,2,3
3	(a) Explain the Gunn Diode ,its Characteristics and mention its advantages, applications (b) Explain the Tunnel Diode and its characteristics , Advantages and applications	1,2,5	5	1,2,3
4	(a) Explain the operation of IMPATT Diode and its applications (b) Explain the Esaki Diode and its operations.	1,2,5	5	1,2,3
5	(a) Explain the working principles of Reflex Klystron, its characteristics and mention its applications (b) Explain the Schottky Diode and its applications	1,2,5	5	1,2,3
6	(a) Explain the working principles of Gunn Diode Oscillator. (b) Explain the working principles of Reflex Klystron	1,2,5	5	1,2,3