PVP 23

Code: 23EC3503

III B.Tech - I Semester - Regular Examinations - NOVEMBER 2025

ANTENNAS AND WAVE PROPAGATION
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Define half power beamwidth of antenna.	L1	CO1
1.b)	Define beam efficiency of an antenna.	L1	CO1
1.c)	List out the some applications of helical antenna.	L1	CO2
1.d)	Define radiated power.	L1	CO2
1.e)	Explain three different types of arrays with regard to beam pointing direction.	L2	CO2
1.f)	Write weights of 5 elements binomial array.	L1	CO2
1.g)	What do you mean by F/D ratio?	L1	CO3
1.h)	Differentiate between wire grid reflectors and corner reflectors.	L4	CO3
1.i)	Define critical frequency and LOS.	L1	CO4
1.j)	Explain wave tilt.	L2	CO4

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Discuss the following: (i) Normalized field pattern (ii) Directivity	L2	CO1	5 M
	b)	Explain the radiation mechanism in short dipole.	L2	CO1	5 M
OR					
3	a)	Explain about radiation mechanism in a single wire.	L2	CO1	5 M
	b)	Define polarization. Explain different types of polarization.	L2	CO1	5 M
UNIT-II					
4	a)	Compare monopole antennas and dipole antennas.	L4	CO2	5 M
	b)	Define the terms: i) Radial power flow ii) Radiation resistance for a short dipole iii)Uniform current distribution.	L1	CO2	5 M
OR					
5	a)	Define axial ratio and their significance in helical antenna.	L2	CO2	5 M
	b)	What is the effective area of a half-wave dipole operating at 200 MHz?	L3	CO2	5 M

UNIT-III					
6	a)	What is the purpose of array of radiators? Derive the expression for field strength of two element uniform array.	L3	CO2	5 M
	b)	What are the advantages and disadvantages of binominal array and design 3-element binomial arrays.	L2	CO2	5 M
OR					
7	a)	Estimate the resultant radiation pattern of N=8 element linear uniform distributed array using pattern multiplication.	L4	CO2	5 M
	b)	A uniform linear array is required to produce an end-fire beam when it is operated at a frequency of 10 GHz. It contains 50 radiators and Spaced at 0.5λ. Find the progressive phase shift required to produce the end-fire beam.	L4	CO2	5 M
UNIT-IV					
8	a)	Write the salient features of microstrip antennas.	L1	CO3	5 M
	b)	What is corner reflector? List out the salient features of it.	L1	CO3	5 M
OR					
9	a)	What is the power gain of a paraboloid reflector whose mouth diameter is equal to 8λ?	L3	CO3	5 M

	b)	What is Yagi-Uda Antenna? Explain the construction and operation of Yagi-Uda Antenna. Also explain its general characteristics?	L2	CO3	5 M
		UNIT-V			
10	a)	Briefly explain the following: (i) Roughness of earth (ii) Reflection factors of earth	L2	CO4	5 M
	b)	What is meant by space wave? Discuss about field strength due to space wave.	L2	CO4	5 M
		OR			
11	a)	Explain MUF and skip distance.	L2	CO4	5 M
	b)	In case of ionosphere, Explain the significance of D, E and F layers.	L2	CO4	5 M