PVP 20

Code: 20EC3602

III B.Tech - II Semester – Regular / Supplementary Examinations
APRIL 2024

ANTENNAS AND PROPAGATION
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Discuss the following terms i. Power gain ii. Antenna efficiency iii. Effective area	L2	CO1, CO2	7 M
	b)	Determine the electric field intensity at a distance of 10km from an antenna having directive Gain of 5dB and radiating a total power of 20 KW?	L3	CO1, CO2	7 M
OR					
2	a)	Explain the concept of Polarization in Antennas.	L2	CO1, CO2	7 M
	b)	Demonstrate directional and omnidirectional patterns of Antennas.	L3	CO1, CO2	7 M

UNIT-II					
3	a)	Derive an expression of Radiation resistance of Small current element.	L4	CO2, CO3	7 M
	b)	Explain the working of loop Antenna and how it can be used for direction finding.	L2	CO2, CO3	7 M
OR					
4	a)	Derive the expression for power radiated and radiation resistance by a quarter wave monopole (λ/4) Antenna?	L4	CO2, CO3	7 M
	b)	Draw and explain the operation of axial mode of radiation of Helical antenna.	L2	CO2, CO3	7 M
UNIT-III					
5	a)	Derive maxima, minima half power point directions with two point sources are fed with currents equal in magnitude and opposite in phase.	L4	CO2, CO3	7 M
	b)	An end fire array with elements spaced at λ/2 and with axis of elements at right angles to the line of array is required to have a directivity of 36. Determine array length and width of major lobe?	L3	CO2, CO3	7 M
OR					
6	a)	Explain Binomial array with neat diagram.	L2	CO2, CO3	7 M
	b)	A linear broadside array consists of four equal isotropic in-phase point sources with spacing equal to λ/3. Calculate the directivity and beam width if the total length of the array is λ.	L3	CO2, CO3	7 M

UNIT-IV					
7	a)	Explain the features of Yagi-uda array.	L2	CO2, CO3	7 M
	b)	With suitable diagram explain Microstrip antenna and derive the expression for characteristic impedance and directivity?	L4	CO2, CO3	7 M
OR					
8	a)	Explain different types of reflector antennas with neat diagram.	L2	CO2, CO3	7 M
	b)	A circular parabolic reflector having the directivity of 20 dB, frequency of 10 MHz and effective aperture of 2m. Calculate the mouth diameter and illumination efficiency.	L3	CO2, CO3	7 M
UNIT-V					
9	a)	Explain the terms i. Refraction ii. Lowest Usable Frequency (LUF) iii. Virtual height	L2	CO1, CO4	7 M
	b)	Derive an expression for the refractive index of the ionosphere in terms of 'N' and frequency.	L4	CO1, CO4	7 M
OR					
10	a)	Explain space wave propagation with neat diagram.	L2	CO1, CO4	7 M
	b)	Distinguish between skip distance and virtual height. Give suitable sketches.	L4	CO1, CO4	7 M