



R18 Regulation

Subject code:2P6DA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, December 2024

ANTENNAS AND WAVE PROPAGATION (ECE)

Maximum Marks: 70

Date:10.01.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	Define Isotropic antenna. What is the directivity of isotropic antenna?	1	L1
2	State and explain the concept of Helmholtz theorem.	1	L1
3	List out various types of Horn antennas.	2	L1
4	State Huygen's principle in horn antenna	2	L1
5	Write limitations of Micro strip antenna.	3	L1
6	Define spill over and back lobe radiation in parabolic reflector antenna?	3	L1
7	Define broad side array and end fire array	4	L1
8	Draw the structure of Binomial array and what is the advantage of it.	4	L1
9	Define Wave Tilt.	5	L1
10	Write different layers of Ionosphere	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	A) Discuss about the following antenna parameters. [5M] (i) Radiation intensity (iii) Beam solid angle (ii) Effective aperture B) The radiation resistance is of 72Ω and loss resistance is of 8Ω . What is the directivity in dB if the gain is 16. [5M]	1	L2
	OR		
12	Show that the radiation resistance of short dipole is $80\pi^2 (dl/\lambda)^2$. [10M]	1	L2
13	Explain the constructional details and radiation pattern of Yagi Uda Antenna with a neat diagram. [10M]	2	L2
	OR		
14	A) Explain the design considerations of pyramidal Horn antenna with neat diagram. [5M] B) Calculate directivity of 20 turn helix with $\alpha=12^\circ$ and circumference equal to one wavelength. [5M]	2	L2
15	A) Explain the geometry of Rectangular patch antenna. [5M] B) Evaluate the power gain, directivity and the required diameter of a paraboloid having BWFN of 10° at 3GHz. [5M]	3	L2

	OR		
16	A) Derive gain of square corner reflector antenna using method of images. [5M] B) Explain various feed methods of parabolic reflector antenna. [5M]	3	L2
17	Sketch the radiation pattern of array of 2 point sources for the following cases. A) Two elements fed with currents equal in magnitude and in phase separated by $\lambda/2$ [5M] B) Two elements fed with currents equal in magnitude and opposite in phase separated by $\lambda/2$ [5M]	4	L2
	OR		
18	A) Explain gain measurement using direct method. [5M] B) List the different sources of errors in antenna measurements. [5M]	4	L2
19	A) Explain different layers of Ionosphere. [5M] B) Explain briefly about scattering phenomenon. [5M]	5	L2
	OR		
20	A) Explain different modes of wave propagation. [5M] B) Derive relation between skip distance and MUF. [5M]	5	L2