R20 Regulation *Subject code:3P6DB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, May 2025

ANTENNAS AND WAVE PROPAGATION

(ECE)

Maximum Marks: 70 Date: 18.06.2025 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.
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)		Marks	CO	BTL
1	Write about fields from oscillating dipole	2M	1	L1
2	Define Reciprocity Theorem applicable to Antennas.	2M	1	L1
3	Differentiate normal mode and axial mode in helical antenna	2M	2	L1
4	State Huygen's principle in horn antenna	2M	2	L1
5	Define included angle in corner reflector antenna?	2M	3	L1
6	What are the limitations of Micro strip Antenna .	2M	3	L1
7	Write Hansen and Wood yard's phase shift conditions to increase the directivity of EFA.	2M	4	L1
8	Define Linear array and Uniform linear array.	2M	4	L1
9	Define critical frequency and write relation with MUF.	2M	5	L1
10	Write about Space wave propagation	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Differentiate small loop antenna and large loop antenna? Derive radiation resistance of small loop antenna.	10M	1	L2
	OR			
12	Derive the radiation resistance of Quarter wave Monopole Antenna.	10M	1	L2
13	Discuss the construction and basic principle of operation of Helical Antenna under Normal and Axial mode of operation.	10M	2	L2
	OR			
14	a) Explain various types of horn antennas. b) Explain the Fermat's principle.	5M 5M	2	L2
15	a) Explain the geometry of Rectangular patch antenna. b) Evaluate the power gain, directivity of parabolic reflector antenna.	5M 5M	3	L2
	OR			
16	a) Derive gain of square corner reflector antenna using method of images. b) Explain various feed methods of parabolic reflector antenna.	5M 5M	3	L2
17	a) Compare Broadside array and End fire array.	5M	4	L2

	b) Calculate the directivity of BSA and EFA consisting 8 isotropic elements separated by $\lambda/4$ distance.	5M		
	OR			
18	a) Draw the neat set up for measuring gain of an antenna and discuss its operation. b) List the different sources of errors in antenna measurements.	5M 5M	4	L2
19	a) Explain different modes of wave propagation. b) Derive relation between skip distance and MUF.	5M 5M	5	L2
	OR			
20	a) Explain different layers of Ionosphere. b) Explain briefly about scattering phenomenon.	5M 5M	5	L2