R20 Regulation *Subject code: 3P6DB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, April 2026

ANTENNAS AND WAVE PROPAGATION

(ECE)

Maximum Marks: 70 Date: 16.04.2026 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	Draw Folded dipole antenna and what is its input impedance?	2M	2	L1
5	Write image principle in corner reflector antenna.	2M	3	L1
6	Write applications of Parabolic reflector antenna.	2M	3	L1
7	What are the advantages and disadvantages of binomial arrays?	2M	4	L1
8	Differentiate near field region and far filed region in antenna measurements.	2M	4	L1
9	Write short notes on Ground wave propagation.	2M	5	L1
10	Define Optimum usable frequency of an Ionosphere layer.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Compare small loop antenna and large loop antenna? Derive radiation resistance of small loop antenna.	10M	1	L2
	OR			
12	Calculate the radiation resistance of Quarter wave Monopole Antenna	10M	1	L2
13	Analyze the construction and operational principles of a Helical Antenna under both Normal and Axial modes of operation.	10M	2	L2
	OR			
14	Analyze the constructional details and radiation pattern of Yagi - Uda Antenna with a neat diagram.	10M	2	L2
15	a) Illustrate the geometry of Rectangular patch antenna. b) A parabolic dish provides a power gain of 50dB at 10 MHz with 70% efficiency. Calculate (i) diameter (ii) BWFN	5M 5M	3	L2
	OR			
16	a) Calculate gain of square corner reflector antenna using method of images. b) Classify various feed methods of parabolic reflector antenna.	5M 5M	3	L2

17	a) Compare Broadside array and End fire array. b) Calculate the directivity of BSA and EFA consisting 8 isotropic elements separated by $\lambda/4$ distance.	5M 5M	4	L2
	OR			
18	a) Explain how to Calculate gain by using direct method. b) Classify the different sources of errors in antenna measurements.	5M 5M	4	L2
19	a) Apply the principles of space wave propagation to explain how the field strength varies with distance and height. b) Apply knowledge of electromagnetic wave interactions to describe the scattering phenomenon	5M 5M	5	L2
	OR			
20	a) Build the relation between MUF and skip distance. b) Demonstrate understanding of tropospheric propagation.	5M 5M	5	L2