R20 Regulation *Subject code: 3P6DB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, November 2025

ANTENNAS AND WAVE PROPAGATION

(ECE)

Maximum Marks: 70 Date: 21.11.2025 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 the concept of Helmholtz theorem.	2M	1	L1
2	What is the directivity of isotropic antenna?	2M	1	L1
3	List out various types of Horn antennas.	2M	2	L1
4	Why Folded dipole antenna is used as driven element in Yagi – Uda antenna?	2M	2	L1
5	Define included angle in corner reflector antenna.	2M	3	L1
6	Write limitations of Micro strip antenna.	2M	3	L1
7	Compare Near and Far fields with respect to antenna measurements.	2M	4	L1
8	Differentiate uniform linear array and non-uniform linear array.	2M	4	L1
9	Define critical frequency.	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	Apply the principles of electromagnetics to derive the field components, including electric and magnetic fields, of a half-wave dipole antenna.	10M	1	L2
	OR			
12	Calculate the radiation resistance of Quarter wave Monopole Antenna	10M	1	L2
13	Analyze the constructional details of helical antenna with neat diagram in detail. And also explain the operation of helical antenna under normal mode	10M	2	L2
	OR			
14	a) Analyze Fermat's principle in the context of horn antenna design. b) Draw the Diagram of Yagi uda antenna and explain its operation.	5M 5M	2	L2
15	a) List the features of Micro strip Antenna. b) Illustrate the geometry of Rectangular patch antenna.	5M 5M	3	L2
	OR			
16	a) Classify various types of reflector antennas. b) Compare the various feeds of parabolic reflector antennas.	5M 5M	3	L2

17	a) Sketch and Illustrate radiation pattern of 4 element linear array fed in phase spaced $\lambda/2$ by using principle of pattern multiplication. b) Illustrate about binomial arrays.	5M 5M	4	L2
	OR			
18	a) Illustrate the 3- antenna method for gain measurement in antenna measurements. b) Illustrate about planar arrays.	5M 5M	4	L2
19	a) Apply the principles of sky wave propagation to explain how the field strength varies with distance and height. b) Write the concept of Wave tilt.	7M 3M	5	L2
	OR			
20	a) Build the relation between MUF and skip distance. b) Explain the tropospheric propagation.	5M 5M	5	L2