R18 Regulation *Subject code: 2P5DA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

(ECE)

Maximum Marks: 70 Date: 15.04.2026 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	State Gauss's law.	2M	1	L1
2	Derive the capacitance of a spherical capacitor.	2M	1	L1
3	State Maxwell's equations for a lossless or non-conducting medium.	2M	2	L1
4	State the Ampere's Force Law.	2M	2	L1
5	Give an expression for intrinsic impedance in phasor form.	2M	3	L1
6	Explain in brief significance of loss tangent.	2M	3	L1
7	List any four types of transmission lines.	2M	4	L1
8	How does group velocity vary when compared to phase velocity?	2M	4	L1
9	What are the two families of circles that constitute the Smith Chart?	2M	5	L1
10	What are the advantages and disadvantages of a Single Stub?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Discuss the Maxwell's equations for electrostatic fields.	10M	1	L2
	OR			
12	Derive the "Poisson's and Laplace's" equation and mention their applications?	10M	1	L2
13	a) State the Biot-Savart's law and its properties. b) Discuss the important properties of magnetic lines of forces.	5M 5M	2	L2
	OR			
14	a) Explain the transformer and motional EMFs? b) Explain the magnetic boundary conditions in detailed?	5M 5M	2	L2
15	Explain the wave equation of conducting medium.	10M	3	L2
	OR			
16	a) Derive the relationship between E and H in a uniform plane wave. b) Derive the expression for critical angle.	5M 5M	3	L2

17	a) Write the different types of transmission lines. b) Explain about various types of losses in transmission lines	5M 5M	4	L2
	OR			
18	a) State the conditions that characterize a distortion less line. b) A loss less of 100 ohms is terminated by a load which produces SWR = 3. The first maximum is found to be occurring at 320 cm. If f = 300 MHz determine the load matching.	5M 5M	4	L2
19	a) What are the applications of transmission lines? b) How can ultra-high frequency transmission lines be used as circuit Elements?	5M 5M	5	L2
	OR			
20	Explain the basis for construction of Smith chart. Illustrate as to how it can be used of an Admittance chart.	10M	5	L2