R20 Regulation *Subject code: 3P3BE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, February 2024

ELECTROMAGNETIC FIELDS
(EEE)

Maximum Marks: 70 Date: 26.02.2024 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	BTL
1	Define gradient	1	L1
2	Discuss about three orthogonal co-ordinate system	1	L2
3	State 'Coulomb's law' in electrostatics and write its applications	2	L1
4	Define Electric Potential? Give the relation between V and E?	2	L1
5	Derive Poisson's and Laplace equations?	3	L1
6	Define magnetic vector potential and magnetic scalar potential?	3	L1
7	State Ampere's force law?	4	L1
8	Define inductance? What's the energy stored in an inductor?	4	L1
9	State Faraday's law?	5	L1
10	What is uniform plane wave?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			CO	BTL
11	State and proof divergence theorem.	10M	1	L3
	OR			
12	A. How to transform the vectors from one coordinate system to other. B. Find the divergence and curl of following function $\bar{A} = 2xy\,\overline{a_x} + x^2 z\,\overline{a_y} + z^3\overline{a_z}$	5M 5M	1	L2 L3
13	State and proof gauss law .and explain applications of gauss law.	10M	2	L3
	OR			
14	Derive the expression for energy stored and energy density in static electric field.	10M	2	L3
15	Derive the expressions for magnetic field intensity due to finite and infinite line.	10M	2	L3
	OR			
16	Derive the expressions for magnetic flux intensity due to solenoid of the coil.	10M	3	L3

17	A. Explain about the Force on a straight and a long current carrying conductor in magnetic fields B. Explain the Faradays laws of electromagnetic induction.	5M 5M	4	L3 L2
	OR			
18	Find the force between two straight long and parallel current carrying conductors in the same and opposite directions.	10M	4	L2
19	A. Write the Maxwell's equations in their general integral & point form. B. Explain the concept of displacement current.	5M 5M	5	L2 L2
	OR			
20	Discuss about the plane waves in lossy dielectrics.	10M	5	L2