SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations June-2024
ELECTROMAGNETIC FIELDS
(Electrical and Electronics Engineering)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　　　　　**Max. Marks: 60**

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	Write the equestion for orthogonal coordinatesystems.	CO1	L2	2M
	b	State vector form of coulombs law.	CO1	L1	2M
	c	Define polarization in dielectric materials.	CO1	L1	2M
	d	Define mutual inductance.	CO1	L1	2M
	e	Define skin depth.	CO1	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	The vector from the origin to point A is given as (6,-2,-4), and the unit vector directed from the origin toward point B is (2, -2,1)/3. If points A and B are ten units apart, find the Coordinates of point B.	CO1	L3	10M

OR

3	Given point P(r=0.8, θ=30°, Φ=45°), and E= $1/r^2(\cos\Phi a_r + \sin\Phi/\sin\theta a_\Phi)$; (a) Find E at P; (b) Find $|E|$ at P; (c) Find a unit vector in the direction of E at P.	CO1	L3	10M

UNIT-II

4	a	Derive Laplace and Poisson's equation.	CO2	L3	5M
	b	Find electric potential due to electric dipole.	CO2	L3	5M

OR

5	Four positive point charges 10^{-12} coulomb each are situated in X-Y plane at points (0, 0), (0, 1) (1, 1) and (1, 0) m. Find the electric field and potential at (3/4, 3/4) and (1, 1)?	CO2	L3	10M

UNIT-III

6	Explain the boundary conditions of two perfect dielectrics materials.	CO3	L2	10M

OR

7	a	Derive the expression for parallel plate capacitor.	CO3	L3	5M
	b	What is the energy stored in a capacitor made of two parallel metal plates each of 30 cm^2 area separated by 5 mm in air. ε_o= 8.854x10^{-12}. The capacitor is charged to potential difference of 500v.	CO3	L3	5M

UNIT-IV

8	Derive the expression for torque produced on a closed current carrying when placed in a magnetic field.	CO4	L3	10M

OR

9	Derive the expression for self inductance of solenoid and toroid.	CO4	L3	10M

UNIT-V

10	State and prove poynting theorem.	CO5	L1	10M

OR

11	Explain faradays law of electromagnetic induction and derive the expression for induced e.m.f.	CO5	L2	10M

*** END ***