O.P.Code: 19EE0207	R19	H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations May/June-2024

ELECTROMAGNETIC FIELDS

(Electrical and Electronics Engineering)

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

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Point P and Q are located at (0,2,4) and (-3,1,5) calculated: (1). The Position vector P, (2). The distance vector from P and Q, (3). The distance between P and Q and (4). A vector parallel to PQ with magnitude of 10.	CO1	L3	12M

OR

2		Express vector B in cartesian and cylindrical systems. Given $B= 10/r\ a_r + r\cos\theta\ a + a_\theta$. Find the B at (-3,4,0) and (5, π/2, -2)	CO1	L2	12M

UNIT-II

3		The Electric flux density is given as $D= (r/4)\ a_r$ n C/m^2 in free space. Calculate: The Electric field intensity at r=0.25 m , The total charge within a sphere of r=0.25 m	CO2	L3	12M

OR

4	a	State and explain Coulomb's law indicating clearly the units of quantities in the equation of force?	CO2	L2	6M
	b	Two pint charges 1.5nC at (0,0,0.1) and -1.5nC at (0,0,-0.1) are in free space. Treat the two charges as a dipole at the origin and find the potential at p(0.3,0,0.4)	CO2	L3	6M

UNIT-III

5		Explain the boundary conditions between conductor and free space?	CO3	L2	12M

OR

6		Two parallel conducting disc are separated by distance 5 mm at z=0 and z=5 mm .If V=0 and V=100 v at z=5 mm, find the charge densities on the disc.	CO3	L3	12M

UNIT-IV

7		Evaluate both sides of the stokes theorem for the filed $H=6xy\ a_x - 3y^2\ a_y$ A/m and the rectangular path around the region 2<x<5, -1<y<1 , Z=0 . Let the positive direction of ds be a_z.	CO4	L3	12M

OR

8		Calculate the inductance of a 10 m length of coaxial cable filled with a material for which $\mu_r = 80$ and radii inner and outer conductors are 1 mm and 4 mm respectively.	CO4	L3	12M

UNIT-V

9		Derive expressions for integral and point forms of poynting Theorem?	CO5	L3	12M

OR

10		An area of 0.65 m^2 in the plane Z=0 encloses a filamentary conductor. Find the induced voltage if $B= 0.05 \cos 10^3 t\ (a_y+a_z)/\sqrt{2}$ tesla.	CO5	L3	12M

***** END *****