Q.P. Code: 18EE0203 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations Nov/Dec 2019

ELECTROMAGNETIC FIELDS

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	**a**	What is the coordinate system?	**2M**
	b	Define dipole moment.	**2M**
	c	Define polarization in dielectric materials.	**2M**
	d	State point form of Amperes law.	**2M**
	e	Write Maxwell equations in time varying fields.	**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.	**10M**

OR

3		A circle, centred at the origin with radius of 2 units, lies in the xy plane. Determine the unit vector in rectangular components that lies in the xy plane, is tangent to the circle at ($\sqrt{3}$, 1, 0), and is in the general direction of increasing values of y.	**10M**

UNIT-II

4	**a**	State and explain Coulomb's law indicating clearly the units of quantities in the equation of force.	**5M**
	b	State and prove Gauss's law and write limitations of Gauss's law.	**5M**

OR

5		A charge Q_0 located at the origin in free space, produces a field for which E_2=1kv/m at point P (-2, 1,-1). (a) Find Q_0.	**10M**

UNIT-III

6	**a**	Derive the expression for parallel plate capacitor.	**5M**
	b	What is the energy stored in a capacitor made of two parallel metal plates each of 30-cm2 area separated by 5mm in air? $\varepsilon_o = 8.854 \times 10^{-12}$. The capacitor is charged to potential difference of 500v.	**5M**

OR

7		A parallel plate capacitor consists of two square metal plates with 500mm side and separated by 10mm. a slab of sulphur (ε_r= 4) 6mm thick is placed on the lower plate and air gap of 4mm. find capacitance of capacitor?	**10M**

UNIT-IV

8	**a**	Write down maxwell's third equation in point and integral form.	**5M**
	b	Find magnetic field intensity $\vec{H}$ due to solenoid carrying current I and having length L= 4m?	**5M**

OR

9		Using Biot-savart's law. Find $\vec{H}$ *and* $\vec{B}$ due conductor of finite length?	**10M**

UNIT-V

10 **a** A copper wire carries current of 1A. Determine displacement current in the wire at 1 MHz for copper $\varepsilon=\varepsilon_o$ and $\sigma=5.8x10^7$? **5M**

b Explain pointing vector and its significance. **5M**

OR

11 What is displacement current? Explain physical significance of displacement current. **10M**

END