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

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations November 2020

ELECTROMAGNETIC FIELDS

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 60

PART-A

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

1	**a**	Define Vector Algebra?	**2M**
	b	Write the condition for Laplace equation?	**2M**
	c	Write the relation between current I and current density J?	**2M**
	d	Define Magnetic dipole moment?	**2M**
	e	State Faraday's law of electromagnetic induction	**2M**

PART-B

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

UNIT-I

2	**a**	Express the field $D= (x^2+y^2)^{-1}(xa_x+ya_y)$ in cylindrical components and cylindrical variables.	**5M**
	b	Evaluate D at the point where $\rho=2$, $\Phi=0.2\pi$, and $z=5$, expressing the result in cylindrical and rectangular components.	**5M**

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**	Derive the expression for electric field intensity at a point due to electric dipole.	**5M**
	b	Derive an expression for electric potential due to point charge.	**5M**

OR

5		Derive electrical field intensity due to charged circular ring.	**10M**

UNIT-III

6	**a**	Derive the continuity equation. What is its physical significance.	**5M**
	b	Derive the point form of ohms law.	**5M**

OR

7		Explain the phenomenon of polarization when a dielectric slab is subjected to an electric field.	**10M**

UNIT-IV

8	**a**	Explain relationship between magnetic torque and moment.	**5M**
	b	Derive an expression for the force between two current carrying wires.	**5M**

OR

9		Derive the expression for torque produced on a closed current carrying when placed in a magnetic field.	**10M**

UNIT-V

10		Write Maxwell's equation in good conductors for time varying fields and static fields both in differential and integral form.	**10M**

OR

11		Explain faradays law of electromagnetic induction and there from derive maxwell's equation in differential and integral form.	**10M**

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