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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Regular and Supplementary Examinations May 2019
ELECTROMAGNETIC FIELDS
(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

- 1 The three vertices of a triangle are located at A (-1, 2, 5), B (-6,-2,-4), and C (2, 4,-2).
 (a) Find the length of the perimeter of the triangle.
 (b) Find a unit vector that is directed from the midpoint of the side AB to the midpoint of the side BC. 12M
 (c) Show that this unit vector multiplied by a scalar is equal to the vector from A to C and that the unit vector is therefore parallel to AC.

OR

- 2 Express in cylindrical components; (a) the vector from C(3,2,-7) to D(-1,-4,2);
 (b) a unit vector at D directed toward C; 12M
 (c) a unit vector at D directed toward the origin.

UNIT-II

- 3 a State and explain Coulomb's law indicating clearly the units of quantities in the equation of force? 6M
 b State and Prove Gauss's law and write limitations of Gauss's law. 6M

OR

- 4 a Derive the expression for Potential due to an Electric Dipole. 6M
 b Derive Laplace and Poisson's equation. 6M

UNIT-III

- 5 Derive the electrostatic boundary conditions at the interface of two dielectrics. 12M

OR

- 6 a Derive the expression for capacitance of a parallel plate capacitor. 6M
 b What is the energy stored in a capacitor made of two parallel metal plates each of 20 cm² area separated by 8 mm in air. $\epsilon_0 = 8.854 \times 10^{-12}$. The capacitor is charged to potential difference of 600 V? 6M

UNIT-IV

- 7 a State and explain Biot-savart's law. 7M
 b Find magnetic field intensity \vec{H} due to solenoid carrying current I and having length L= 12 m. 5M

OR

- 8 a Explain relationship between magnetic torque and moment. 6M
 b Derive an expression for the force between two current carrying wires. 6M

UNIT-V

- 9 a Derive the expression for self inductance of solenoid. 6M
 b A toroid has air core and has a cross sectional area of 20mm² it has 800 turns and its mean radius is 8mm. find its inductance. 6M

OR

- 10 Explain Faradays law of electromagnetic induction and there from derive Maxwell's equation in differential and integral form. 12M

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