

KARPAGAM COLLEGE OF ENGINEERING
(Autonomous)
Coimbatore – 32

END SEMESTER EXAMINATIONS – NOVEMBER 2013

B.E (EEE) - Semester III

12E303 – ELECTROMAGNETIC THEORY

Time: 3 hrs

Max. Marks: 100

Answer ALL questions

PART - A

(10x2 = 20 marks)

1. What is meant by Scalar and Vector?
2. State Coulomb's Law.
3. Name a few applications of Gauss's Law in electrostatics.
4. Define dipole and dipole moment.
5. Define current density.
6. Write the Poissons's equation and Laplace equation
7. Define magnetic Scalar potential.
8. What is torque on a solenoid?
9. State Faraday's law of electromagnetic induction.
10. Define Poynting vector.

PART - B

(5x16 = 80 marks)

11. a) i) Show that the vector $\vec{E} = (3x^2 + 2y^2 + 1) ax + (4xy - 3y^2z - 3) az$ is irrotational and find its scalar potential. (10)
- ii) Write short notes on Dot product and cross product. (6)
- (OR)**
- b) State and explain Coulomb's law. (16)
12. a) State and prove Gauss's law. (16)
- (OR)**
- b) Derive an expression for energy and energy density in the static electric field. (16)
13. a) State and explain the boundary conditions of electric field at dielectric and conductor. (16)
- (OR)**
- b) Derive an expression for capacitance between two parallel wires. (16)
14. a) i) State and explain Biot-Savart's Law. (8)
- ii) Derive an expression for magnetic field intensity at any point on the axis of circular coil carrying current. (8)
- (OR)**
- b) State and prove stokes theorem. (16)
15. a) State and prove boundary conditions by the application of maxwell's equations. (16)
- (OR)**
- b) Derive the wave equation for magnetic field and electric field in phasor form. (16)
