

Code: 9A10503

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

ELECTROMAGNETIC THEORY

(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) State and explain Coulomb's law.
(b) Show that the torque acting on a dipole of moment $\vec{P}$ due to an electric field $\vec{E}$ is $\vec{P} \times \vec{E}$.
- 2 (a) Define Biot - Savart law and discuss the forces due to magnetic fields.
(b) Write short notes on inductances and magnetic energy.
- 3 (a) Verify that the potential field given below satisfies Laplace's equation.
$$V = 4x^2 - 6y^2 + 2z^2.$$

(b) Discuss the properties and boundary condition of dielectric materials.
- 4 (a) Calculate field using Ampere's circuital law for infinitely long solenoid.
(b) Discuss the properties of wave propagation in conducting media.
- 5 (a) Explain reflection and refraction of plane wave.
(b) Discuss Poynting vector and applications of Poynting theorem.
- 6 (a) Distinguish between transverse electric and transverse magnetic waves.
(b) Derive the attenuation factor for TEM case.
- 7 (a) Write explanatory notes on man-made EMI sources and how they can be minimized.
(b) Discuss the process of electro static discharge.
- 8 Explain the following:
(a) Principles and practice of earthing.
(b) Electrical bonding.
