PVP 12

Code: EE3T2

II B.Tech - I Semester – Regular Examinations - January 2014

ELECTROMAGNETIC FIELDS
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. Derive an expression for electric field intensity due to an infinite sheet of charge applying Gauss's law. 14 M

2. Derive the Laplace's and Poisson's equations for steady magnetic field. 14 M

3. a) What is a dipole? Derive expression for Torque experienced by a dipole. 7 M

   b) Derive expression for capacitance of a parallel plate capacitor with two dielectrics? 7 M

4. a) State and prove conditions at a boundary between two dielectrics. 7 M

   b) Explain the concept of polarization. 7 M

5. a) Derive Maxwell's second equation for magneto statics. 7 M

b) A wire carrying a current of 100 A is bent into a square of 10 cms sides. Calculate the field at the center of the coil. 7 M

6. a) Derive an expression for the magnetic field intensity at a point P in a medium of permeability due to an infinitely long current carrying conductor at a distance r from the point? 7 M

b) Two narrow circular coils A and B have a common axis and are placed 10 cm apart. Coil A has 10 turns of radius 5cm with a current of 1 A passing through it. Coil B has a single turn of radius 7.5 cm. If the magnetic field at the center of coil A is to be zero, what current should be passed through coil B? 7 M

7. a) Distinguish between self and mutual inductance. 7 M

b) Derive the expression for coefficient of coupling between two circuits. 7 M

8. a) State and prove Poynting theorem. 7 M

b) Write Maxwell's Fourth equation in differential form and word form. 7 M