Exam.Code:0935
Sub. Code: 6984

1078
B.E. (Electrical and Electronics Engineering)
Fifth Semester
EE-508: Electromagnetic Fields Theory

Time allowed: 3 Hours   Max. Marks: 50

NOTE: Attempt <u>five</u> questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

   a) State Gauss's law for electric field.

   b) State Ampere's circuit law.

   c) Write Laplace and Poisson's equations.

   d) Write the point form of continuity equation.

   e) A parallel plate capacitor with d = 1m and plate area 0.8 m^2 and a dielectric relative permittivity of 2.8. A dc volt of 500V is applied between the plates. Find the capacitance and energy stored.   (5x2)

UNIT – I

II. a) Derive the Stoke's theorem and give one application of the theorem in electromagnetic fields.

   b) Determine the curl of the following vector field:
      $A = \rho z \sin\varphi a_\rho + 3\rho z \cos\varphi a_\varphi$ (6,4)

III. a) Derive continuity equation for current.

   b) Derive the expression for capacitance between two co-axial cylinders of radii 'a' (inner) and 'b' (outer) respectively.   (5,5)

IV. a) Given point p (-2,6,3) and A = yi + (x+z)j, express p and A in cylindrical coordinates.

   b) State the divergence theorem.   (8,2)

UNIT – II

V.   a) Derive magnetic flux density and field intensity at any point along the axis of circular coil.

P.T.O.

b) State Biot-Savart's law. (8,2)

VI.   Derive the Poynting theorem and give its significance. (10)

VII. a) Derive H due to a circular current loop and extend the same to compute H due to a long solenoid.

b) Explain the need of displacement current in Maxwell's equations. (6,4)

x-x-x