SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E - E&C/ECE/ETCE
Title of the paper: Engineering Electromagnetics
Semester: III Max.Marks: 80
Sub.Code: 513304-517304-525304-6C0036(2006-2007) Time: 3 Hours
Date: 05-05-2009 Session: AN

PART – A (10 x 2 = 20)

Answer ALL the Questions

1. Define electric field intensity.
2. State Divergence theorem.
3. Write Poisson's equation in vector notation.
4. Define Biot-Savart law.
5. Mention the boundary conditions for current density.
6. Define Ampere's circuital law.
7. State Faraday's law of electromagnetic induction.
8. Write down Maxwell's equations derived from Ampere's law.
9. What are all the conditions to be satisfied for a linearly polarized uniform plane wave.
10. What is Poynting vector?

PART – B (5 x 12 = 60)

Answer All the Questions

11. Define Divergence, Gradient, curl in spherical co-ordinate system with mathematical expression.

(or)

12. (a) State and prove Guass's law

(b) Describe any one application of Guass's law.

13. (a) Explain Poisson's and Laplace equations. (4)
(b) Establish Kirchoff's voltage law, starting from field equations and point form of Ohms law. (8)

(or)

14. (a) Derive an expression for the capacitance of a spherical capacitor consisting of two concentric spheres of radii a and b.
(b) The radii of 2 spheres differ by 4 cm and the capacity of the spherical condenser is 53.33 pf. If the outer sphere is earthed, calculate the radii assuming air as dielectric.

15. (a) Find an expression for torque acting on a square lop carrying current I. (9)
(b) What is a scalar magnetic potential? (3)

(or)

16. (a) Derive the magnetic boundary condition at the interface between two magnetic medium with neat sketches. (10)
(b) Define magnetic field intensity. (2)

17. Derive Maxwell's equations derived from Faraday's law in integral and point forms.

(or)

18. Derive Maxwell's equations in both differential and integral form from Ampere's law.

19. (a) State and prove Poynting theorem.
(b) Derive the general wave equation.

(or)

20. (a) Discuss about the plane wave in a good dielectric.
(b) Briefly explain the wave incident normally on a perfect conductor.