Register Number | | | | | | | |

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :B.E - E&C/ECE/ETCE
Title of the Paper :Engineering Electromagnetics Max. Marks :80
Sub. Code :513304-517304-525304-6C0036 Time : 3 Hours
Date :12/11/2009 Session :FN

PART - A (10 x 2 = 20)

Answer ALL the Questions

1. What is electric field intensity?
2. State Divergence theorem.
3. What is the difference between emf and potential difference?
4. What is Jouls's law?
5. State Ampere's circuital law.
6. Brief about Biot-savart law.
7. Write down Maxwell's equations of electrostatics.
8. State Faraday's law of induction.
9. State the differences between a plane wave and a uniform plane wave.
10. What is meant by linear polarization?

PART – B (5 x 12 = 60)

Answer All the Questions

11. (a) Obtain the expression for $\vec{D}$ and $\vec{E}$ using Gauss law.
(b) Two point charges of 20nC and -20nC are situated at (1,0,0) and (0,1,0) in free space. Determine the electric field intensity at (0,0,1).

(or)

12. (a) If $\vec{F} = (2z+5)\vec{a}_x + (3x-2)\vec{a}_y + (4x-1)\vec{a}_z$, verify stokes theorem over the hemisphere $x^2 + y^2 + z^2 = 4$ and $z \geq 0$ (8)

(b) A vector $\vec{F} = 3x\vec{a}_x + 0.5y^2\vec{a}_y + 0.25x^2y^2\vec{a}_z$ is given at a point P (3,4,12) in the rectangular coordinate system. Express this vector in the spherical coordinate system. (4)

13. Explain the following
    (a) Laplace equation
    (b) Poisson equation
    (c) Electromotive force.

(or)

14. Explain briefly about boundary conditions for current density.

15. Explain briefly about Magnetic Materials.

(or)

16. With neat sketches, derive the boundary conditions for two different media in the magnetic field.

17. Explain briefly about the motional emf and derive an expression for it.

(or)

18. Derive the Maxwell's equations in both point form and integral form.

19. Derive the Poynting theorem from the Maxwell's equation for the general case.

(or)

20. Derive wave equation in phasor form and obtain the equations of α, β, γ and η