ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : DECEMBER 2009

REGULATIONS : 2007

THIRD SEMESTER : ELECTRICAL AND ELECTRONICS ENGG.

070280010 - ELECTROMAGNETIC THEORY

TIME : 3 HOURS Max.Marks : 100

PART - A

(20 x 2 = 40 Marks)

ANSWER ALL QUESTIONS

1. What is a unit vector?
2. State Coulombs law?
3. Define electric field intensity
4. Given $\vec{A} = 2i + 3j + k$. $\vec{B} = 3i - 3j - k$, $\vec{c} = 4j - 3j - k$ evaluate
   a) $\vec{A} (\vec{B} \times \vec{C})$
   b) $\vec{C} (\vec{A} \times \vec{B})$
5. State Gauss law
6. Prove that the divergence of the electric field and electric flux density and charge free region is zero.
7. What id electric flux.
8. State the divergence theorem
9. State poison and Laplace equation
10. List different charge distribution
11. List the properties of conductor
12. What is relaxation time?
13. State Boit –savarts law

14. Define curl
15. What is magnetic torque?
16. What is magnetization?
17. Define Maxwell's equation
18. Compare field theory and circuit theory
19. What is displacement current?
20. Define poynting vector?

PART- B

(5 x 12 = 60 Marks)

ANSWER ANY FIVE QUESTIONS

21. State coulomb's law of force between any two point charges and the units of force

22. a) Give the Cartesian coordinates of the vector field $\vec{H} = 20a_r - 10a_\varphi + 3a_z$ at point p(x=5, y=2, z=-1) (8)

    b) Write the properties of cross product (4)

23 a) State and prove gauss law. (4)

    b) Define divergence theorem prove the same. (8)

24. Derive electrostatic boundary conditions at the interface of two dielectric media. If one of the medium is the conductor. Discuss the field pattern.

25 a) prove that the energy required to charge a capacitor C by a voltage v is $w = \frac{1}{2} cv^2$ (8)

    b) Explain about multiple dielectric capacitors (4)

26. Derive expression for the flux in a co-axial cable

27. Derive Maxwell's equation in point form and integral form

28. Compare electric and magnetic circuits (8)

Explain the depth of penetration with relevant diagram (4)

***** THE END *****