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Anna University, B.E Degree Exam Apr/May2014
EC 271 ELECTROMAGNETIC FIELDS AND WAVES
III Semester Electronics and Communication Engineering (R 2004)

Answer All Questions

DURATION: 3 HRS **MAX. MARKS: 100**

PART A (10X2=20)

1.State Coulombs law of force between charges.

2.Define Electric field Intensity and specify its unit

3.Why cannot isolated magnetic charge exist ?

4.State Ampere's circuital law.

5.What are the applications of Poisson's and Laplace equation ?

6.Give the significance Lenz's law

7. Specify the boundary condition required for tangential component of Electric and magnetic field at the interface between two conducting medium

8.Differentiuate: field and circuit quantities

9.Outline the properties of a uniform plane wave

10.Define skin depth

PART B (5X16=80)

11.Derive the vector wave equation from maxwells equation and give its physical interpretation

12a)i)Obtain the expression for the magnetic vector potential and explain its significance (10)

ii)State and explain the Amperes law of force (6)

(or)

12b)i)State and prove Stokes theorem (6)

ii)Describe the principle of superposition of electric field due to continuous distribution of charges (10)

13a) The current element $I_1 dl_1$ is given by $I_1 dz \bar{az}$ located at (0,0,1) and another current element $I_2 dx \bar{ax}$ located at (0,1,0). Find a)$\bar{dF_1}$ and b)$\bar{dF_2}$

(or)

13b) Derive the expression for capacitance of a parallel plate and coaxial capacitors using Gauss law

14a) State and prove poynting theorem. Give its physical significance and explain its application

(or)

14b) Determine the self-inductance of a co axial cable of inner radius **a** and outer radius **b**.

15.a). State and prove Maxwells equation .Give their physical interpretation

(or)

15.b). Explain the reflection phenomena when a plane wave is incident obliquely on the interface between two dielectrics.. Derive the expression for reflection and transmission coefficient