Roll No. ....

Total Pages : 2

BT-I/D-19   **31036**

INTRODUCTION TO ELECTROMAGNETIC THEORY
Paper–BS–119A
Opt. (I)

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt any *five* questions, selecting atleast *one* question from each unit.

UNIT–I

1. Use Gauss's theorem to find the expression for Electric field

   (a) For infinitely long straight line charge and   8

   (b) At different regions for uniformly charged sphere.   7

2. (a) Prove that energy density (energy/volume) in a region of a uniform electric field 'E' in vacuum is given by

   $\frac{1}{2}\epsilon_0 E^2$.   8

   (b) Explain mathematically the curl of a vector field and its significance.   7

UNIT–II

3. Write short notes on:

   (a) Susceptibility.   5

   (b) Permittivity.   5

   (c) Dielectric constant.   5

31036/500/KD/1076   [P.T.O.

4. (a) Define polarization. Explain how a dielectric acquires polarization.   9

   (b) Differentiate between E and D with their proper definitions.   6

UNIT–III

5. (a) Explain the concept of vector magnetic potential. What is its unit? Explain, why being potential, it is a vector quantity.   10

   (b) Explain curl of magnetic field.   5

6. Write short notes on :

   (a) Bound currents.   5

   (b) Deceptive Parallel.   5

   (c) Ferromagnetism.   5

UNIT–IV

7. (a) Prove that energy density (energy /volume) in a region of a uniform magnetic field of density 'B' in vacuum is given by $B^2/2\mu_0$. http://www.kuonline.in   10

   (b) Draw a neat and labelled diagram of a plane electromagnetic wave.   5

8. Write down the Maxwell's equations in differential and integral forms for time varying fields and discuss the point wise physical significance/circuit relations or concept possessed by each equation.   15

31036/500/KD/1076   2