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B.Tech. (EE-2011 Batch) (Sem.–4th)

ELECTROMAGNETIC FIELDS

Subject Code : BTEE-403
Paper ID : [A1206]

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Define electric flux density. What is its physical significance?

   b. In a ring of eight equal charges, q, placed equally in a circle of radius R if one charge is removed, what is the magnitude of electric potential at point P located in the center of circle?

   c. How is Gauss's law useful in determining the E field intensity of a charge distribution?

   d. What is the fundamental difference between static electric and magnetic field lines?

   e. Write Laplace's equation in cylindrical coordinates.

   f. How is the H field immediately outside a perfect conducting surface determined?

   g. What do you understand by equipotential surfaces?

   h. What is the physical significance of poynting vector?

   i. What are the properties associated with an electromagnetic wave travelling through free space?

   j. Define surface impedance.

SECTION-B

2. Obtain the expression of electrostatic potenti outside a uniformly charged sphere of radius 'a'.

3. State and prove Poisson's and Laplace's equatio

4. An EM wave is travelling in a medium charact $\varepsilon = 4\varepsilon_0$ and E = $20\sin(108t - \beta z)\,\hat{a}_y$ V/m. Calc

5. State Gauss's law and give its physical inter applications of Gauss law in electrostatics.

6. Define velocity of propagation of energy and plane travelling wave it is equal to its phase velo

SECTION-C

7. State and explain the Maxwell's equation for ti differential and integral form.

8. Discuss the wave propagation in a conducting m equation.

9. Explain vertical polarization when a plane wave the interface of perfect dielectric by defining e expression of reflection coefficient.

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