R

11092/NJ

D–21/2111

ELECTROMAGNETIC FIELD THEORY

Paper–203

Semester–III

Time Allowed : 3 Hours]   [Maximum Marks : 50

Note : The candidates are required to attempt **three** questions each from Sections A and B carrying 5 marks each and the entire Section C consisting of 10 short answer type questions carrying 2 marks each.

SECTION—A

1. What do you understand by divergence of a Vector? State and prove divergence theorem.   5

2. Discuss in detail the boundary condition at the magnetic interface.   5

3. Derive the expression for the energy stored in the electric field.   5

4. Explain the effect of the dielectric on the capacitance.   5

5. State and explain Coulomb's law.   5

SECTION—B

6. State and explain the Poynting theorem. Explain the significance of each term.   5

7. Derive Maxwell's field equations in differential form and explain their significance.   5

8. Derive relation between E and H in uniform plane wave propagation.   5

9. Discuss the propagation constant and primary constants in a transmission line.   5

10. Discuss the propagation of uniform plane wave in good conductor. 5

SECTION—C

11. Answer the following questions : 10×2=20

   (i)   Write the difference between Laplacian and Poisson equation.

   (ii) Write the applications of Smith Chart.

   (iii) What is the significance of Stoke's theorem?

   (iv) What is Polarization? What are the types of polarization?

   (v)   What is the physical significance of Divergence?

   (vi) What are equipotential surfaces?

   (vii) Write a short note on characteristic impedance.

   (viii) What are uniform plane waves? Discuss its properties.

   (ix) Write down the condition for a line to be distortionless.

   (x)   What is the mathematically equation for the material to be perfect conductor.