Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 08

B.Sc. (CS) (2013 & Onwards) (Sem.–1)

ELECTRODYNAMICS

Subject Code : BCS-104

M.Code : 70881

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

Write briefly :

1. Define gradient of scalar field. What is its physical significance?
2. What do you meant by irrotational field? Give one example.
3. State Gauss divergence theorem.
4. Why two electric lines of force do not cross each other?
5. What is differential form of Gauss's law?
6. Differentiate between current and current density.
7. What is vector form of Ohm's law?
8. Why a charge in motion cannot be measured directly by Coulomb's law?
9. What do you understand by conservation of charge?
10. Show that diamagnetic susceptibility is independent of temperature.

SECTION-B

11. Derive an expression for the electric field due to an infinite sheet charge using Coulomb's law.

12. Using Gauss's theorem calculate the electric field due to a uniformly charged non-conducting solid sphere at a point (i) outside the sphere and (ii) inside the sphere.

13. What is an electric dipole? Prove that electric potential at a point due to quadrupole varies as $\frac{1}{r^2}$.

14. From the differential form of Gauss's law, develop the Poisson's and Laplace's equation and Laplacian operator.

15. Derive and discuss the equation of continuity $\vec{\nabla}.\vec{J}+\frac{\partial \rho}{\partial t}=0,$ where $\vec{J}$ is the current density and ρ is the charge density.

16. Find an expression for the field of a point charge moving with uniform velocity. How does it differ from the field due to a stationary charge? Show that the field is not spherically symmetric.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.