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

Total No. of Questions : 07

B.Sc.(CS) (2013 & Onwards) (Sem.–1)

ELECTRODYNAMICS

Subject Code : BCS-104

Paper ID : [A2184]

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

1. Answer briefly :

(a) What do you mean by irrotational vector field? Give one example.

(b) Why two electric lines of force cannot cross each other?

(c) Define curl of a vector field and give its physical significance.

(d) Write the differential form of Gauss Law.

(e) How is potential difference between two points related to work?

(f) What do you mean by Uniqueness theorem?

(g) Derive relation between current and current density.

(h) A wire is carrying current. Is it charged?

(i) Why does resistivity of a good conductor increase with increase in temperature?

(j) What is the force experienced by a stationary charge in an electric field and a magnetic field?

SECTION-B

2. State and prove Stoke's theorem. Give its importance.

3. What is an electric dipole? What is dipole moment? Calculate the electric field due to a dipole at a point on the equitorial line.

4. What is a quadrupole? Prove that electric potential at a point due to quadrupole varies as $1/r^3$.

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

6. Discuss the validity of Ohm's law from atomic viewpoint and derive the microscopic form of Ohm's law from consideration of motion of free electrons in a conductor.

7. Derive an expression for the force acting on a small current element placed in an uniform magnetic field. Hence find the force on a long straight conductor carrying current and on a loop.