

[This question paper contains 3 printed pages.]

1002

Your Roll No.

B.Sc. (Hons.) / I

C

ELECTRONIC SCIENCE – Paper 1.2 (II)

(Electricity and Magnetism)

Time : 3 Hours

Maximum Marks : 38

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Answer five questions in all including
Q. No. 1 which is compulsory.
Only non-programmable scientific
calculator is to be used.*

1. Attempt any five questions : (2×5=10)
- (a) Define Faraday's law and express it in differential form.
- (b) How is Peltier effect different from Joule's effect ?
- (c) Prove that the line integral of E for any path taken between two points is constant.

P.T.O.

- (d) Give the physical significance of $\text{div.}B = 0$.
- (e) Give the condition when a moving coil galvanometer will behave as (i) Dead beat (ii) ballistic galvanometer.
- (f) Derive Ampere's circuital law from Biot-Savart's law.
2. (a) Calculate the Electric field intensity at a distance r from the origin due to uniformly charged disc. (4)
- (b) Calculate the magnetic field at a point lying on the axis of symmetry of a circular coil carrying current and obtain the magnetic field for a long solenoid. (3)
3. Derive Claussius – Mossoti equation for dielectrics. (7)
4. (a) Obtain an expression for the capacitance of a spherical condenser when
- (i) Outer sphere is earthed
- (ii) Inner sphere is earthed (4)
- (b) State and prove Reciprocity theorem. (3)

5. (a) Give the construction, working and theory of ballistic galvanometer. What is meant by error due to damping and how is the corresponding correction applied ? (5)
- (b) Derive the expression of coefficient of coupling. (2)
6. (a) State and explain Maxwell's equations. (4)
- (b) Explain the Curie-Weiss law of ferromagnetism. (3)
7. Write short notes (any **two**) :
- (a) Piezoelectricity
- (b) B-H hysteresis
- (c) Thermoelectricity
- (d) Displacement current (3.5×2=7)