SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - IV
20UPHCT4008 - Electricity and Magnetism

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. State Gauss's law and hence establish the differential form of it.
2. Give the principle of a potentiometer. How it is used to calibrate a low range voltmeter?
3. Discuss the measurement of high resistance by leakage.
4. Describe how would you determine the Peltier coefficient of a junction experimentally.
5. Define the following,
   i. Magnetic induction ii. Intensity of magnetization
   iii. Magnetic susceptibility iv. Magnetic permeability
6. State and prove Coulomb's theorem for the electric field of a conductor.
7. Explain the determination of low resistance using Kelvin Double Bridge.
8. Explain the importance of hysteresis curves.

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Use Gauss's law to find the electric intensity due to a uniformly charged sphere at points,
   i. Outside the sphere ii. At the surface of the sphere iii. Inside the sphere.
10. With a neat diagram describe a Carey Foster's bridge. Discuss the determination of resistance of a wire using Carey Foster's bridge.
11. Derive an expression for the growth of charge in LCR circuit.
12. What are thermo-electric diagrams? Show how Peltier and Thomson emf's, neutral tempera-ture and temperature of inversion can all be represented in thermo-electric diagrams.
13. Discuss the Langevin's theory of paramagnetism. What are the limitations?

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