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.Physics - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - IV
22UPHCT4008 - Electricity and Magnetism

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

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

1. Apply Gauss law in the following systems and find it's electric field
   (i) A long cylinder carries a charge density that is proportional to the distance from the axis $(\rho) = kx$, for some constant K.
   (ii) An infinite plane carries a uniform surface charge σ.
2. Derive an expression for the growth of charge in CR circuit.
3. Explain electric field intensity due to a point charge.
4. Explain the theory of Helmholtz Galvanometer.
5. Describe about the CareyFoster's bridge.
6. Illustrate the measurement of high resistance by leakage.
7. Discuss about thermoelectric effect in PN junction.
8. Derive an expression for the Biot- Savart's law and, give it's applications.

Section C

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

9. Explain briefly electric field due to uniformly charged sphere (conducting and non conducting).
10. Write the principle and theory of potentiometer. Describe the method of measuring thermo emf using potentiometer.
11. Derive an expression for growth and decay of current in a circuit containing resistance and inductance.
12. Discuss the experimental methods of Determine Thermo electric diagrams and it's application.
13. Obtain an equation for the magnetic induction at a point on the axis of a circular coil carrying current.

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