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.
M.Sc. (Physics) - END SEMESTER EXAMINATIONS APRIL - 2023
SEMESTER - II

20PPHCT2006 - Electromagnetic Theory and Plasma Physics

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

Section B

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

1. State and prove the uniqueness theorem.
2. State and prove Biot – Savart's law.
3. Find out the magnetic induction in a uniformly magnetized sphere.
4. Discuss Faraday's Laws of Induction with suitable experiments.
5. Define vector and scalar potentials that describe a magnetic field.
6. Determine the equation of motion of an electromagnetic wave in a conducting media.
7. Give a brief account on plasma and its occurrence with examples.
8. Describe the magnetic mirror effect with necessary theory.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Obtain the Laplace equation and derive the solution in spherical polar coordinates.
10. Obtain the expression for B due to a current flowing in a straight segment of wire.
11. Discuss in detail with necessary equations the propagation of electromagnetic wave in a rectangular wave guide.
12. Describe on Debye shielding effect with necessary equations.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Express Maxwell's electrodynamic relations in both differential and integral form and interpret each one of them.

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