

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 2025

SEMESTER - II

20PPHCT2006 - Electro Magnetic 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. Discuss about Boundary conditions and uniqueness theorem.
2. State Biot-Savart law and derive an expression for magnetic field of a localized current distribution.
3. State Faraday's laws of Induction and derive an expression for Maxwell's displacement current.
4. Explain in detail about reflection and refraction at a plane interface.
5. Discuss about Debye shielding effect.
6. Derive an expression for electrostatic energy in the presence of dielectric.
7. Derive the wave equation and arrive plane wave solution.
8. Illustrate about Linear and circular polarization.

Section C

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

9. Write Laplace equation in three dimensions and obtain its solution in spherical polar coordinates.
10. Discuss in detail about magnetic induction and magnetic field in macroscopic media.
11. Obtain Poynting theorem for the conservation of energy in an electromagnetic field.
12. Discuss the propagation of electromagnetic waves in a rectangular wave guide.

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

13. Explain in detail about Magneto-hydrodynamic waves.
