

FACULTY OF SCIENCE**M.Sc. II-Semester Examination, May / June 2018****Subject: Physics & Applied Electronics
Paper- I
Electromagnetic Theory****Time : 3 Hours****Max. Marks: 80****PART – A (8X4= 32 Marks)
(Short Answer Type)**

1. What is Poynting theorem? Explain.
2. What are scalar and vector potentials?
3. Explain about skin effect.
4. Write the Maxwell's equations for isotropic dielectric medium and explain.
5. What is total internal reflection? Explain in detail.
6. Write the expressions for reflection and transmission coefficients and explain.
7. What are retarded potentials.
8. What is meant by Lienard Wiechert Potentials?

**PART – B (4x12= 48 Marks)
(Essay Answer Type)**

9. (a) Derive Maxwell's electromagnetic field equations in homogeneous isotropic dielectric medium and explain their significance.
OR
(b) Obtain the solutions for Laplace's equations for electrostatic potential in Cartesian Co-Ordinates.
10. (a) Discuss the propagation of electromagnetic waves in isotropic dielectric medium.
OR
(b) Describe how the energy is transmitted by a plane electromagnetic wave.
11. (a) Derive Fresnel equation. Discuss the amplitude variation of electromagnetic waves on reflection and refraction at the boundary of a dielectric interface.
OR
(b) What is metallic reflection? Explain its applications in detail.
12. (a) Derive an expression for the radiation from an oscillating dipole. Show that the flux of the sum $(\mathbf{J} + \partial\mathbf{D}/\partial t)$ through any closed surface is zero.
OR
(b) Discuss in detail about Lienard-Wiechert potentials of a moving point charge. Distinguish between uniaxial crystals and biaxial crystals from the wave vector Surfaces.