

**PART A**

(10 x 2=20)

Answer any **TEN** questions

1. What is dielectric polarization?
2. Define electric images.
3. State Biot-Savart law
4. What is magnetostatic energy?
5. Write down the Maxwell's equations in integral form.
6. Define scalar potential.
7. Give an account of wave guide.
8. What is meant by transverse magnetic (TM) mode?
9. What are magnetosonic waves?
10. Write a note on Boltzmann equation.
11. What is Lorentz gauge?
12. What is an oscillating electric dipole?

**PART B**

(2 x 5=10)

Answer any **TWO** questions

13. State and prove Uniqueness theorem in electrostatics.
14. Derive an expression for magnetic field of a localized current distribution.
15. Explain the physical significance of Maxwell's equation.
16. Solve the Maxwell's equation to deduce the electromagnetic wave equation and determine the velocity of light in free space.
17. Describe the simplified magneto-hydrodynamics equation.
18. Discuss about the magnetostatic boundary condition.
19. Explain the non-uniqueness of electromagnetic potentials.
20. Derive an expression for radiative power.

**PART C**

(2x10=20)

Answer any **TWO** questions

21. Write down the Laplace's equation in spherical coordinates and obtain its solutions.
22. Explain the concept of magnetic vector potential. Give a suitable example where it can be used.  
Obtain an expression for magnetic vector potential
23. State and explain the Poynting's theorem and discuss the various energies in electromagnetic fields.
24. Derive an expression for the propagation of electromagnetic wave in linear isotropic dielectric medium.
25. What is meant by plasma frequency and give a detail about the electron plasma oscillation.