2025(Backlog)

Time : 3 hours

Full Marks : 60

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Very Short-answer Type Questions)

(Compulsory)

1. Answer **all** questions of the following : 1×10 = 10

   (a) The magnetic fied lines are _____ and forming closed loop.

   (b) The flux through any closed surface is _____.

   (c) Define displacement current.

(d) The general formula of numerical Aperture is _____.

(e) Define refractive index.

(f) What is formula for plasma frequency ?

(g) Define skin depth.

(h) What is the expression of Poynting vector ?

(i) Bounded media is also known as _____.

(j) Give an example of Total Internal Reflection.

2. Write the differences between single mode fiber and multi mode fiber with their diagram. 5

OR

Define Biot's law for Rotatory Polarisation.

Group – B

(Long-answer Type Questions)

Answer any **three** questions of the following : 15×3 = 45

3. Define optical rotation. Explain its significance and application.

4. Write the four Maxwell's equation. Discuss boundary condition at interface between two media.

5. What are retardation plates ? Discuss Babinet compensation and mention its uses.

6. What is Brewster's law ? Derive the formula for Brewster angle.

7. Write short notes on any **two** of the following :
   (a) Displacement Current
   (b) Plane EM (Electromagnetic) waves through Vaccum
   (c) Isotropic Dielectric medium
   (d) Lorentz and Coulomb Gauge