D3BPH2301 **Reg. No.....**

Name: .....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(Regular/improvement/Supplementary)

PHYSICS

GPHY3B03T: ELECTRODYNAMICS - I

Time: 2 Hours **Maximum Marks: 60**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 marks)

1. State the principle of capacitors.
2. What are linear dielectrics?
3. Comment on electric displacement.
4. What do you mean by Biot Savart law?
5. State the Gauss divergence theorem.
6. Give an account on magnetic permeability.
7. Write a note on cyclotron motion.
8. Comment on equipotential surfaces.
9. Explain Helmholtz theorem.
10. List out the basic properties of conductors.
11. What is ferromagnetism?
12. Give the expression for torque on a magnetic dipole kept in a magnetic field.

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 marks)

13. Find the magnetic field of a toroidal coil.
14. Find the magnetic field at a distance “s” from a long straight wire carrying a current I.
15. Prove that divergence of a curl is always zero.
16. Find the potential inside and outside a spherical shell of radius R, which carries uniform surface charge.
17. Obtain Ampere’s law in magnetized materials.
18. Find the field produced by a uniformly polarized sphere of radius R.
19. A long copper rod of radius R carries a uniformly distributed current I. Find the H inside and outside the rod.

SECTION C: Answer any *one* question. The question carries *ten* marks.

20. State and explain Gauss’s law. Give two applications of the law.
21. Obtain expressions for divergence and curl of B, magnetic field. Why are magnetic monopoles absent?

(1 × 10 = 10 Marks)