K18U 0132

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS – Reg./Suppl./Imp.) Examination, May 2018
(2014 Admn. Onwards)
CORE COURSE IN PHYSICS
6B11 PHY : Electrodynamics – II

Time : 3 Hours

Max. Marks : 40

SECTION – A

Answer **all** questions. Very short answer type, **each** question carries **1** mark :

1. Magnetic susceptibility is _____ for paramagnetic material.
2. Divergence of magnetic field is always _____
3. Ampere's circuital law is modified by _____
4. Cyclotron uses _____ to bend particle path into circle. **(1×4=4)**

SECTION – B

Answer **any seven** questions. Short answer type, **each** question carries **2** marks :

5. Show that divergence of bound current density is zero.
6. What is Ampere's circuital law inside a magnetized material ?
7. Obtain an expression for current density in terms of electric field.
8. Newton's 3rd law is not valid in electrodynamics. Why ?
9. What is magnetic charge ?
10. Show that polarization current density obeys equation of continuity.
11. Write down three dimensional wave equation.
12. What is monochromatic plane wave ?
13. How electrostatic generator works ?
14. What is the working principle of electrostatic voltmeter ? **(2×7=14)**

P.T.O.

SECTION – C

Answer **any four** questions. Short essay/problem type, **each** question carries **3** marks :

15. What is the torque experienced on a magnetic dipole in a magnetic field ?

16. A long copper rod of radius R carries a uniform free current I_f and bound current I_b. Find H inside the rod.

17. Derive Newmann's formula for mutual inductance. How can we say that mutual inductance is a geometrical quantity ?

18. The intensity of sunlight is 1300 W/m^3. Find the amplitude of electric field and magnetic field. For a perfect reflector what will be the radiation pressure exert by it ?

19. Derive the relation between refractive index and dielectric constant of a medium. Refractive index of water is 1.33. Find out dielectric constant of it.

20. Explain Hall effect. What is hall coefficient. **(3×4=12)**

SECTION – D

Answer **any two** questions. Long essay type, **each** question carries **5** marks :

21. Explain the terms :
    1) Diamagnetism
    2) Magnetization
    3) Linear media
    4) Domain of Ferro magnetic material
    5) Hysteresis loop.

22. Explain Faradays law of electromagnetic induction. What was the importance of Faraday's law in electrodynamics ?

23. Explain energy, momentum, pointing vector, intensity and radiation pressure of electromagnetic waves.

24. Discuss working of :
    1) CRO
    2) Mass spectrometer. **(5×2=10)**
