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K22U 0138

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS – Supple./Improv.) Examination, April 2022
(2016 – 2018 Admissions)
CORE COURSE IN PHYSICS
6B11PHY : Electrodynamics – II

Time : 3 Hours Max. Marks : 40

SECTION – A

Answer **all** questions (very short answer type, **each** question carries **1** mark).

1. Above Curie point, iron is _____
2. A changing electric field induces _____
3. Write velocity of light in terms of permittivity and permeability.
4. Betatron are used to accelerate _____

SECTION – B

Answer **any seven** questions (short answer type, **each** question carries **2** marks).

5. Write a brief note on magnetization.
6. Distinguish between paramagnetic, diamagnetic and Ferro magnetic materials, in the presence of external magnetic field.
7. What are Coulomb gauge and Lorentz gauge ?
8. State and explain Ohm's law.
9. Derive a relation connecting D,E and P.
10. Prove that normal components of electric field is discontinuous through the boundary.
11. What are the possible current densities inside a matter ?
12. Define Intensity of an electromagnetic wave.
13. Comment on the statement 'cyclotrons can accelerate neutrons'.
14. What is Hall effect ?

P.T.O.

SECTION – C

Answer **any four** questions (short essay/problem type, **each** question carries **3** marks).

15. A long copper wire of radius 2mm carries a uniformly distributed current 2mA. Find magnitude and direction of H at a loop of radius 1mm inside the wire.
16. Describe the effect of magnetic field on Atomic orbital.
17. Derive Neummann's formula.
18. Find self inductance per unit length of a solenoid of radius R, carrying N number of urns per unit length.
19. The intensity of sunlight hitting on the surface of earth is about 1300W/m^2. If it strikes on a perfect reflector, what pressure does it exert ?
20. Find angular frequency of proton of mass 1.667×10^{-27}kg through the cyclotron with a magnetic field of 2T.

SECTION – D

Answer **any two** questions (long essay type, **each** question carries **5** marks).

21. Explain bound currents and their physical significance in magnetic materials.
22. Explain Faraday's law of electromagnetic induction. How it lead to the concept of electrodynamics.
23. Define plane waves. Derive wave equations in three dimension for electromagnetic waves.
24. Explain the working of
    1) auto transformer
    2) mass spectrometer
    3) betatron.
