K22U 0433

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS-OBE - Regular) Examination, April 2022
(2019 Admission)
CORE COURSE IN PHYSICS
Discipline Specific Elective
6B14PHY(5) : Plasma Physics

Time : 3 Hours

Max. Marks : 40

SECTION – A

Short answer questions. **Six** questions, answer **all** questions. **Each** question carries **1** mark.

1. The existence of plasma was discovered by **6**
2. One of the plasma criteria is
3. Temperature raised degree of ionization remains
4. Plasma is the fluid consisting of and neutral atom or molecules.
5. Plasma density increases, Debye length
6. 1 eV plasma corresponds to a temperature _____ K.

SECTION – B

Short answer questions. **Eight** questions, answer **any six**. **Each** carries **2** marks. **12**

7. Write short notes on polarization drift.
8. Write short notes on concept of temperature in plasma.
9. Write down the definition of plasma.
10. What is Larmor radius ?

P.T.O.

11. Write short notes on Debye Shielding.

12. Mention the different plasma parameters.

13. Write notes on equation of States.

14. Write short notes on Maxwell's equation.

SECTION – C

Problem **six** questions, Answer **any four, Each** question carries **3** marks. **12**

15. Discuss how energy is conserved in plasma.

16. Show that for a slowly time - varying magnetic field, the magnetic moment of a particle is conserved.

17. Compute λD and ND for a glow discharge with $n = 10^{16} m^{-3}$ KTe = 2eV.

18. Discuss the gravitational instability.

19. Compute Larmor radius a 10 KeV electron in the earth's magnetic field of $5*10^{-5}T$. If v parallel is negligible.

20. Prove that plasma is diamagnetic.

SECTION – D

Long essay questions. **Four** questions, answer **any two**. **Each** question carries **5** marks. **10**

21. Derive an expression for drift velocity for a plasma placed in a sinusoidal electric field along with a uniform magnetic field.

22. Define plasma. Briefly explain it's applications.

23. Discuss about the fluid equations. By obtaining equation of continuity and equation of state.

24. Briefly explain grad-B drift.
