VP & RPTP Science College-Vallabh Vidyanagar

Internal Test: 2018

T Y BSc [Semester-VI]

Subject-Physics US06CPHY04

Date: 15/03/2018 Thursday Time: 11.00 am to 12.30 pm Total Marks-25

Q-1 Multiple Choice Questions: [Attempt all] **3**

(i) The electric displacement is given as _____.

(a) $\boldsymbol{D} = -\boldsymbol{\nabla} \times \boldsymbol{E}$ (b) $\boldsymbol{D} = -\boldsymbol{\nabla} \times \boldsymbol{E} + \boldsymbol{V}$

(c) $\boldsymbol{D} = \boldsymbol{P} - \epsilon_0 \boldsymbol{V}$ (d) $\boldsymbol{D} = \epsilon_0 \boldsymbol{E} + \boldsymbol{P}$

(ii) The trajectory of a charged particle in space is, in general, a _____.

(a) Circular (b) Linear

(c) Helix (d) Elliptical

(iii) The neutral fluid will interact with the ions and electrons only through _____.

(a) Collision (b) Pressure

(c) Mixing (d) Reaction

Q-2 **Answer the following questions in short [Attempt any two].** **4**

(a) Explain Polarization.

(b) Enlist the applications of plasma physics.

(c) Enlist the assumptions to derive an expression for plasma frequency.

Q-3 Define conductor and discuss basic properties of conductor in detail. **6**

OR

Q-3 Discuss bound charges and show that total potential $V(r) = \frac{1}{4\pi\epsilon_0}\oint \frac{\sigma_b}{r} da' + \frac{1}{4\pi\epsilon_0}\oint \frac{\rho_b}{r} d\tau'$. **6**

Q-4 What is inhomogeneous magnetic field? Obtain the expression for Grad B drift. **6**

OR

Q-4 Discuss motion of a single particle moving in the uniform magnetic field B. Obtain the expression for the Larmor radius. **6**

Q-5 Deduce an equation of diamagnetic drifts when fluid drifts perpendicular to B. **6**

OR

Q-5 Discuss plasma oscillations and derive expression for plasma frequency ω_p. **6**