

Dr. Navneet Singh Physics 66  
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**National Institute of Technology, Hamirpur (HP)**

End Semester Examination - December, 2022

Course - B.Tech. Engineering Physics

Semester - 5<sup>th</sup>

Subject Code - PH-312

Subject Name - Plasma Physics

Maximum Marks: 50

Time: 3 Hours

All questions are compulsory. (Carry equal marks)

Q 1: Which factors affects the transport phenomena in plasma. How the mobility and electrical conductivity varies for weakly ionized plasma?

Q 2: Explain the behavior of transverse electromagnetic waves in cold field free plasma.

Q 3: How the magnetic flux varies through any open surface moving with highly conducting plasma fluid?

Q 4: Discuss the behavior of charge particle in a magnetic field varying as Grad-B.

Q 5: How charge particle in plasma responses to the uniform magnetostatic field?

Q 6: Write the necessary condition for existence of plasma and discuss plasma oscillation frequency.

Q 7: Describe the motion of charge particle in uniform magnetic field with a slow time varying electric field acting right angle to the magnetic field.

Q 8: How fluid drifts are different from the drifts experience by the individual particles?

Q 9: Calculate the electron diamagnetic drift as function of  $x$ , for isothermal plasma confined between the planes  $x = \pm d$  in magnetic field  $\vec{B} = B\hat{k}$  with a density distribution  $n(x) = n_0 \left(1 - \frac{x^2}{d^2}\right)$ .

Q 10: How the variation in plasma frequency affects the electron plasma waves in a warm plasma?

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