Course Code: PGP 5425
Course Title: Statistical Physics

Time: 3 hours
Max. Marks: 75

I. Answer **ANY FIVE** questions. $(5 \times 15 = 75)$

1. Describe quantum distribution function and derive an expression for Fermi Dirac statistics.

2. What is Bose Einstein statistics? Derive an expression to find the distribution of particles in this statistics.

3. Derive Boltzmann equation in the absence of collision.

4. Derive an expression for electrical conductivity using path integral formulation.

5. Derive Langevin equation for a particle undergoing Brownian motion under the influence of an externally applied field.

6. Derive an expression for the equilibrium constant of a chemical reaction and thereby deduce Saha's ionization formula.

7. Discuss the Bragg-Williams model for explaining order-disorder phenomena in alloys.