M.Sc. PHYSICS, I SEMESTER (ATKT.)

PAPER-I, II, III, IV

QUANTUM MECHANICS-11

STATISTICAL MECHANICS

ELECTRODYNAMICS AND PLASMA PHYSICS

ATOMIC AND MOLECULAR PHYSICS

Paper code: 017,018,019,020

Max. Marks= 85x4=340

Note: Attempt all the questions.

Each question carry equal marks.

1) Explain the W.K.B. method?

2) Discuss adiabatic approximation?

3) Explain Pauli's spin matrices.

4) Explain Born approximation.

5) Obtain Dirac- relativistic equation for *fr*ee-electron?

6) What do you mean by Ensemble and Canonical ensemble?

7) Describe the properties of Ideal- Bose Gas.

8) Explain main features of Langevin's theory.

9) Describe the Bose-Einstein condensation?

10) Derive law of equipartition of energy from statistics.

11) Explain angular-distribution of radiated power?

12) **Write notes on magneto**-hydrodynamic equation.

13) Establish Larmour- formula and write down its application.

14) Explain the various types of plasma oscillations.

15) What is pinch-effect? Explain plasm**a confinement pinch effect** instability.

16) Explain four main series of alkali spectra.

17)Explain Thomas Fermi Statistical model.

18) Describe Non-rigid rotator and explain its spectrum
.

19) Describe in detail the Morse potential energy diagram.

20) Explain pure vibrational Raman-spectra.