FPYC503 STATISTICAL MECHANICS - I

UNIT-I

Classical probabilities: Binomial distribution of probabilities, variance, mean value;Poisson's distribution, fluctuation,variance, mean value; Gaussian distribution, variance, mean value and applications. (10)

UNIT-II

Classical statistical mechanics:

Basic principles and application of classical statistical mechanics, micro canonical ensemble , Density distribution function, Liouvilles theorem Review of thermodynamics, , classical ideal gas in microcanonical ensemble, Gibbs paradox and its resolution, Sakur-Tetrode equation equipartition theorem (15)

UNIT-III

Canonical ensemble. partition function in canonical ensemble , Energy fluctuation in canonical ensemble ,Ideal gases in canonical ensemble, Concept of Grand canonical ensemble and its partition function , density fluctuation and Equivalence of Canonical and grand canonical ensemble.

UNIT-IV

Quantum statistical mechanics:

The density matrix, ensembles in quantum statistical mechanics.

Books:

1. Statistical physics - K. Huang
2. Statistical physics - R.K. Pathria
3. Statistical physics - F. Mohling
4. Elementary Statistical physics - C.Kittel
5. Statistical physics - Landau and Lifsitz
6. Physics Transitions & Critical Phonomena H.E. Stanly
7. Thermal Physics C. Kittel
8. Fundamental of statistical & Thermal physics- F. Reif
9. Statistical physics –B.B Laud