

Roll.No.

25PPHCT3008

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

M.Sc.Physics - END SEMESTER EXAMINATIONS - NOVEMBER 2025

SEMESTER - III

25PPHCT3008 - Statistical Mechanics

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Explain Gibbs paradox.
2. Compare the First order and second order Phase transitions.
3. Define ensembles. Explain different types of ensembles.
4. Compare the three statistics.
5. Give a brief account of one dimensional Ising model.
6. State and prove Nernst heat theorem.
7. What is meant by partition function? Obtain an expression for molecular partition function.
8. Derive an expression for Maxwell-Boltzmann distribution of energy.

Section C

I - Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Deduce the Maxwell's thermodynamical relations.
10. Describe Landau theory of phase transitions.
11. State and prove Liouville's theorem.
12. Discuss Langevin's theory of Brownian motion.

II - Compulsory question ($1 \times 10 = 10$ Marks)

13. Derive the Bose-Einstein statistic function for distribution of energy.
