

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. - END SEMESTER EXAMINATIONS NOVEMBER - 2022

SEMESTER - III

20PPHCT3008 - Statistical Mechanics

Total Duration : 2 Hrs 30 Mins.

Total Marks : 60

Section A

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

1. Discuss Gibb's phase rule.
2. Write a short note on Microcanonical ensemble.
3. Explain about Gibb's paradox.
4. Derive the expression for mean values and fluctuations in canonical ensemble.
5. Explain Equipartition theorem.
6. Describe about ideal fermi gas.
7. Briefly explain the theory of Bose-Einstein condensation
8. Discuss the thermal fluctuations in Brownian motion.

Section B

Part A

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

9. Explain the Landau's theory of phase transition.
10. State and explain the density distribution in phase space.
11. Discuss briefly the Bose-Einstein statistics and derive an expression for distribution of elements among various energy levels.
12. Give a brief account on one dimensional Ising model.

Part B

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

13. State and prove Liouville's theorem.

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