

M.SC.(Physics) Semester - 2 (CBCS) Examination
May/June-2021 (NEW COURSE)
Quantum Mechanics–II and Statistical Mechanics

Time: 1:30 Hours**Marks: 42****Instructions:**

1. Figures to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any three of the following questions.
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Que-1 Answer The Following Questions. (14)

A. Write a note on Gibb's Paradox.

B. In the grand canonical ensemble, derive the following relation:

$$\rho(p, q, N) = \frac{Z^N \exp[-\beta VP - \beta H(P, q)]}{N! h^{3N}}$$

Que-2 Answer The Following Questions. (14)

A. Write a note on Density Matrix.

B. Explain canonical ensemble in quantum statistics. What is Boltzmann factor?

Que-3 Answer The Following Questions. (14)

A. Write a note on Ising model.

B. Explain in detail why helium does not solidify.

Que-4 Answer The Following Questions. (14)

A. Write a note on Born Series.

B. Explain in detail the eikonal approximation.

Que-5 Answer The Following Questions. (14)

A. Write a note on optical theorem.

B. Discuss in detail the λ -transition.
