

7. Define Stefan's law. Derive it from Planck's law. 5
8. Derive Maxwell's Boltzmann law of distribution of velocities of an ideal gas. 5

SECTION—C

9. Do any *five* :
- (i) Define Macrostate and Microstate.
 - (ii) What is the effect of constraints on the system ?
 - (iii) Define Phase Space.
 - (iv) What do you mean by the principle of equal a priori probability ?
 - (v) Give the differences between classical and quantum statistics.
 - (vi) What is the size of the cell in quantum statistics ?
 - (vii) Define dependent and independent events. 5×2

Roll No.

Total No. of Pages : 2

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BS/2111

STATISTICAL PHYSICS AND THERMODYNAMICS—I

Semester—III

Time Allowed : Three Hours]

[Maximum Marks : 30

Note :- Attempt any *two* questions from Sections A and B each.

SECTION—A

- 1. Derive the expression for the deviation from the state of maximum probability. 5
- 2. Discuss the distribution of four distinguishable particles in two compartments of equal size. 5
- 3. Discuss the fraction of time spent by a dynamic system in a particular macrostate and its relation with the probability of that macrostate. 5
- 4. Calculate the percentage error made in using Stirling formula for $n = 4$. 5

SECTION—B

- 5. Give the comparison between Maxwell Boltzmann, Bose Einstein and Fermi Dirac Statistics. 5
- 6. Discuss the experimental verification of Maxwell Boltzmann law of distribution of molecular speeds. 5