

2. Attempt any one :

(a) Obtain an expression for total probability of distribution of N number of particles in a box which is divided into K number of cells. 10

(b) State Maxwell-Boltzmann's distribution law and evaluate $e^{-\alpha}$. 10

3. Attempt any one :

(a) (i) Show that :

$$\vec{A} \times (\vec{B} \times \vec{C}) = \vec{B} (\vec{A} \cdot \vec{C}) - \vec{C} (\vec{A} \cdot \vec{B}) \quad 5$$

(ii) Find complementary function of the second order differential equation :

$$\frac{d^2y}{dx^2} - 6 \frac{dy}{dx} + 9y = 0 \quad 5$$

(b) (i) Write a short note on phase space. 5

(ii) In a system of 8 distinguishable particles distributed in two equal sized compartments. Calculate probability of macrostate (3, 5). 5