Government General Degree College, Chapra

Internal Assessment- 2nd Semester, 2022

Physics- General

Paper: PHY-G-CC-T-02

Total Marks: 15 Time: 45 minutes

Answer any three questions only:

1. Write down the second law of thermodynamics. State the difference between isothermal change and adiabatic change. Does the gas work in case of adiabatic expansion? If so, what is its source? 1+2+1+1

2. Define Thermal Conductivity and Thermometric conductivity. What will be the change in entropy if 5g of ice at 0^oC is converted completely into water at 0^oC? (Latent heat of fution 80 cal/g). 2+3

3. What is meant by internal energy of a gas? Is this a state function? Under what conditions a process will be reversible? When will the efficiency of Carnot Engine be 100%? 1+ 1+1+2

4. Define average velocity and r.m.s velocity of gas molecules. Keeping pressure unchanged, at what temperature the r.m.s. speed of nitrogen will be double of its r.m.s. speed at N.T.P.? 2+3

5. Write Maxwell's law of distribution of molecular speeds. Draw the distribution graph. Write down the van der Waals' equation for 'n' gm-moles of a real gas. 2+1+2

6. State the principal of equipartition of energy. Define degrees of freedom. For a diatomic gas, how many transitional degrees of freedom are there? What is Boyel temperature? 2+2+1

7. Prove that the ratio of two specific heats of a gas is $\gamma = 1 + \frac{2}{n}$, where n is the number of degrees of freedom. Explain, how water remains under ice slab in polar region. 3+2

8. Establish $C_p - C_v = R$ where the symbols are of usual meanings. 5