Government General Degree College, Chapra

Internal Assessment- 3rd Semester, 2019-20

Physics- General

Paper: PHY-G-CC-T-03

Total Marks: 15 Time: 40 minutes

Answer any three questions only:

1. What is a perfect black body? Draw the energy distribution curve of black body radiation for two different temperatures. Draw Fermi-Dirac distribution function at temperature T = 0K and T ≠ 0K. What do you mean by phase-space? 1+1+2+1

2. 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

3. Define entropy. What is its physical significance? A Carnot's engine works between two sources at 127 ^{O}C and 27 ^{O}C. In a complete cycle it rejects 1260 Joule of heat. How much work is obtained in complete cycle? 1+1+3

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. 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

6. 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