# XI Physics Worksheet

**Time: 30 min**     <u>**Chapter#13: Kinetic Theory-01**</u>     **Full Marks: 20**

**Instructions:**
**1. All questions are compulsory.**
**2. Please give the explanation for the answer where applicable.**

Q1 - The rms speed of the molecules of a gas in a vessel is 400m/sec. If half of the gas leaks out at constant temperature, find the rms speed of the remaining molecule?

(1 Mark)

Q2 - When a gas behaves more closely as an ideal gas?

(1 Mark)

Q3 - What is degree of freedom?

(1 Mark)

Q4 - Calculate the kinetic energy of a gram molecule of oxygen at $127^0$C. Value of Boltzmann constant=$1.381 \times 10^{-23}$ $JK^{-1}$. Avogadro's no=$6.022 \times 10^{23}$ gm-mole.

(2 Marks)

Q5 - Find the temperature at which oxygen molecules have the same rms speed as $N_2$ molecules at $7^0$C?

(2 Marks)

Q6 - Calculate the rms speed of nitrogen at STP (Pressure=1 atm and temperature = $0^0$C, Density of nitrogen is 1.25 kg/m$^3$ )

(2 Marks)

Q7 - Find the temperature at which average translational kinetic energy of a molecule is equal to the kinetic energy of an electron accelerated from rest through a potential difference of 1V

(3 Marks)

Q8 - A vessel of volume 2000cm$^3$ contains 0.1mole of oxygen and 0.2mole of carbon dioxide. If the temperature of the mixture is 300K, find its pressure.

(3 Marks)

Q9 - One mole of a monatomic ideal gas is mixed with one mole of a diatomic ideal gas. What is the molar specific heat of the mixture at constant volume?

(5 Marks)