St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 2nd

Solution of Work Sheet – 40

Class – XI | Subject – Physics | Date – 08.02.21

Chapter – Kinetic theory of gas

Choose the correct option for the following questions. $1 \times 15 = 15$

1. At what temperature is the rms speed of the molecules of hydrogen twice that at STP?
   a. 273K b. 546K c. 819K d. 1092K
2. The temperature of an ideal gas is increased from 120K to 480K. If at 120K, the rms velocity of gas molecules is v, at 480K it becomes
   a. 4v
   b. 2v
   c. v/2
   d. v/4
3. if an oxygen atom and hydrogen atom are having same temperature, then the ratio of their average kinetic energy is
   a. 1:1
   b. 2:1
   c. 4:1
   d. 1:4
4. A given amount of gas at 20℃ has a pressure P. The temperature at which the pressure will be 2P (at constant volume) is approximately
   a. 113℃
   b. 40℃
   c. 213℃
   d. 313℃
5. At constant pressure x and y are the volumes of a given mass at temperature 27℃ and 54℃ respetively. The ratio x/y is
   a. 54/27
   b. 27/54
   c. 100/109
   d. $\sqrt{\frac{100}{109}}$
6. The rms velocity of nitrogen molecules at STP is
   a. 33m/s
   b. 493m/s
   c. 517m/s
   d. 546m/s
7. Rms velocity of a molecule is c at pressure P. If pressure is increased two times, the rms velocity becomes
   a. 0.5c
   b. C
   c. 2c
   d. 3c

8. A vessel contains 1mole of O_2 gas at temp T. The pressure of the gas is P. An identical vessel containing one mole of He at a temp 2T has pressure
   a. P/8
   b. P
   c. 8P
   d. 2P
9. The kinetic energy of 10^{-3}Kg hydrogen gas at 27℃ will be
   a. $1.87 \times 10^3 J$
   b. $1.57 \times 10^3 J$
   c. $1.81 \times 10^3 J$
   d. $1.73 \times 10^3 J$
10. An electric fan is switched on in a closed room. The air in the room
   a. Is cooled
   b. Is heated
   c. Maintains its temp
   d. Depends on atmospheric pressure
11. When the temp of a gas filled in a closed vessel is increased by 1℃, its pressure increases by 0.4%. the initial temperature of the gas was
   a. 25℃
   b. 250K
   c. 250℃
   d. 25K
12. A gas at certain volume and temperature has a pressure equal to 0.75m of Hg. If the mass of the gas is doubled at the same volume and temperature, its new pressure will be
   a. 0.75m
   b. 2m
   c. 1.5m
   d. 0.375m
13. The speeds of 5molecules of a gas are 2, 3, 4, 5 and 6 in arbitrary unit. The rms speed for these molecule is
   a. 2.91
   b. 3.52
   c. 4
   d. 4.24
14. The average kinetic energy per molecule of He gas at temp T is E. the Avogadro number is .
   a. 3RT/E
   b. 3RT/2E
   c. E/2RT
   d. RT/2E
15. A vessel containing 10 lit of air at 1atm pressure is connected with an evacuated vessel of capacity 9lit. The resultant air pressure will be
   a. 0.180m
   b. 0.760m
   c. 0.400m
   d. 40m

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