

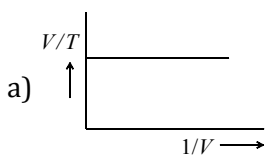
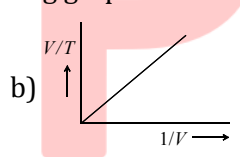
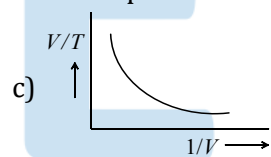
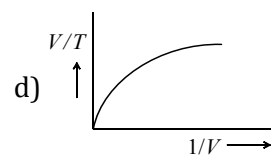
DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
Date :

SUBJECT : PHYSICS
DPP No. : 6

Topic :- KINETIC THEORY

- A gas is filled in a cylinder, its temperature is increased by 20% on kelvin scale and volume is reduced by 10%. How much percentage of the gas will leak out
a) 30% b) 40% c) 15% d) 25%
- The degrees of freedom of a molecule of a triatomic gas are
a) 2 b) 4 c) 6 d) 8
- Six molecules speeds 2 unit, 5 unit, 3 unit, 6 unit, 3 unit, and 5 unit respectively. The rms speed is
a) 4 unit b) 1.7 unit c) 4.2 unit d) 5 unit
- Which one of the following graph is correct at constant pressure
a)  b)  c)  d) 
- The tyre of a motor car contains air at 15°C . If the temperature increases to 35°C , the approximate percentage increase is (ignore to expansion of tyre)
a) 7 b) 9 c) 11 d) 13
- The temperature of the hydrogen at which the average speed of its molecules is equal to that of oxygen molecules at a temperature of 31°C, is
a) -216°C b) -235°C c) -254°C d) -264°C
- The kinetic energy of one gram molecule of a gas at normal temperature and pressure is ($R = 8.31 \text{ J/mol} \cdot \text{K}$)
a) $0.56 \times 10^4 \text{ J}$ b) $1.3 \times 10^2 \text{ J}$ c) $2.7 \times 10^2 \text{ J}$ d) $3.4 \times 10^3 \text{ J}$
- The temperature of a gas contained in a closed vessel of constant volume increases by 1°C when the pressure of the gas is increased by 1%. The initial temperature of the gas is
a) 100 K b) 273°C c) 100°C d) 200 K

9. 70 cal of heat is required to raise the temperature of 2 moles of an ideal gas from 30 °C to 35°C while the pressure of the gas is kept constant. The amount of the heat required to raise the temperature of the same gas through the same temperature range at constant volume is (gas constant $R = 2 \text{ cal mol}^{-1} \cdot \text{K}^{-1}$)
- a) 70 cal b) 60 cal c) 50 cal d) 30 cal
10. A sample of gas is at 0°C. To what temperature it must be raised in order to double the *r.m.s* . speed of the molecule
- a) 270°C b) 819°C c) 1090°C d) 100°C
11. If p is the pressure, V the volume, R the gas constant, k the Boltzmann's constant and T the absolute temperature, then the number of molecules in the given mass of the gas is given by
- a) $\frac{pV}{RT}$ b) $\frac{pV}{kT}$ c) $\frac{pR}{T}$ d) pV
12. The pressure is P , volume V and temperature T of a gas in the jar A and the other gas in the jar B is at pressure $2P$, volume $V/4$ and temperature $2T$, then the ratio of the number of molecules in the jar A and B will be
- a) 1 : 1 b) 1 : 2 c) 2 : 1 d) 4 : 1
13. Suppose ideal gas equation follows $VP^3 = \text{constant}$. Initial temperature and volume of the gas are T and V respectively. If gas expands to $27V$ then its temperature will become
- a) T b) $9T$ c) $27T$ d) $T/9$
14. For ideal gas, which statement is not true
- a) It obeys Boyle's law b) It follows $PV = RT$
c) Internal energy depends on temperature only d) It follows Vander-Waal's equation
15. $\frac{1}{2}$ mole of helium gas is contained in a container at S.T.P. The heat energy needed to double the pressure of the gas, keeping the volume constant (specific heat of the gas = $3 \text{ J gm}^{-1}\text{K}^{-1}$) is
- a) 3276 J b) 1638 J c) 819 J d) 409.5 J
16. A vertical column 50 cm long at 50°C balances another column of liquid 60 cm long at 100 °C. The coefficient of absolute expansion of the liquid is
- a) 0.005°C^{-1} b) $0.0005^\circ\text{C}^{-1}$ c) 0.002°C^{-1} d) $0.0002^\circ\text{C}^{-1}$
17. The diameter of oxygen molecule is $2.94 \times 10^{-10} \text{ m}$. The Vander Waal's gas constant ' b ' in m^3 / mol will be
- a) 3.2 b) 16 c) 32×10^{-4} d) 32×10^{-6}

18. In a certain region of space there are only 5 molecules per cm^2 on an average. The temperature there is 3 K. The pressure of this dilute gas is ($k = 1.38 \times 10^{-23} \text{ JK}^{-1}$)
a) $20.7 \times 10^{-17} \text{ Nm}^{-1}$ b) $15.3 \times 10^{-13} \text{ Nm}^{-1}$ c) $2.3 \times 10^{-10} \text{ Nm}^{-1}$ d) $5.3 \times 10^{-5} \text{ Nm}^{-1}$
19. The temperature at which the *r.m.s.* speed of hydrogen molecules is equal to escape velocity on earth surface, will be
a) 1060 K b) 5030 K c) 8270 K d) 10063 K
20. What is the velocity of wave in monoatomic gas having pressure 1 *kilopascal* and density 2.6 kg/m^3
a) 3.6 m/s b) $8.9 \times 10^3 \text{ m/s}$ c) Zero d) None of these

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