

DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth

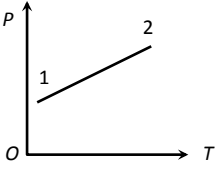
Date :

SUBJECT : PHYSICS

DPP No. : 10

Topic :- KINETIC THEORY

- The *r.m.s.* velocity of a gas at a certain temperature is $\sqrt{2}$ times than that of the oxygen molecules at that temperature. The gas can be
a) H_2 b) He c) CH_4 d) SO_2
- The equation of state for 5g of oxygen at a pressure p and temperature T , when occupying a volume V , will be
a) $pV = (5/32)RT$ b) $pV = 5RT$ c) $pV = (5/2)RT$ d) $pV = (5/16)RT$
- At NTP, sample of equal volume of chlorine and oxygen is taken. Now ratio of no. of molecules is
a) 1 : 1 b) 32 : 27 c) 2 : 1 d) 16 : 14
- 125 ml of gas A at 0.60 atmosphere and 150 ml of gas B at 0.80 atmospheric pressure at same temperature is filled in a vessel of 1 litre volume. What will be the total pressure of mixture at the same temperature
a) 0.140 atmosphere b) 0.120 atmosphere c) 0.195 atmosphere d) 0.212 atmosphere
- The gas having average speed four times as that of SO_2 (molecular mass 64) is
a) He (molecular mass 4) b) O_2 (molecular mass 32)
c) H_2 (molecular mass 2) d) CH_4 (molecular mass 16)
- A bubble of 8 mole of helium is submerged at a certain depth in water. The temperature of water increases by $30^\circ C$. How much heat is added approximately to helium during expansion?
a) 4000 J b) 3000 J c) 3500 J d) 4500 J
- In Vander Waal's equation a and b represent $(P + \frac{a}{V^2})(V - b) = RT$
a) Both a and b represent correction in volume
b) Both a and b represent adhesive force between molecules
c) a represents adhesive force between molecules and b correction in volume
d) a represents correction in volume and b represents adhesive force between molecules

8. The molar specific heat at constant pressure for a monoatomic gas is
 a) $\frac{3}{2}R$ b) $\frac{5}{2}R$ c) $\frac{7}{2}R$ d) $4R$
9. The rate of diffusion is
 a) Faster in solids than in liquids and gases b) Faster in liquids than in solids and gases
 c) Equal to solids, liquids and gases d) Faster in gases than in liquids and solids
10. At what temperature the kinetic energy of gas molecule is half of the value at 27°C ?
 a) 13.5°C b) 150°C c) 75 K d) -123°C
11. A horizontal uniform glass tube of 100 cm length sealed at both ends contains 10 cm mercury column in the middle. The temperature and pressure of air on either side of mercury column are respectively 31°C and 76 cm of mercury. If the air column at one end is kept at 0°C and the other end at 273°C , the pressure of air which is at 0°C is (in cm of Hg)
 a) 76 b) 88.2 c) 102.4 d) 12.2
12. A pressure P -absolute temperature T diagram was obtained when a given mass of gas was heated. During the heating process from the state 1 to state 2 the volume


 a) Remained constant b) Decreased c) Increased d) Changed erratically
13. If mass of He atom is 4 times that of hydrogen atom then mean velocity of He is
 a) 2 times of H -mean value b) $1/2$ times of H -mean value
 c) 4 times of H -mean value d) Same as H -mean value
14. $r.m.s.$ velocity of nitrogen molecules at NTP is
 a) 492 m/s b) 517 m/s c) 546 m/s d) 33 m/s
15. Two gases of equal mass are in thermal equilibrium. If P_a, P_b and V_a and V_b are their respective pressure and volumes, then which relation is true
 a) $P_a \neq P_b; V_a = V_b$ b) $P_a = P_b; V_a \neq V_b$ c) $\frac{P_a}{V_a} = \frac{P_b}{V_b}$ d) $P_a V_a = P_b V_b$

16. The ratio of the molar heat capacities of a diatomic gas at constant pressure to that at constant volume is

- a) $\frac{7}{2}$ b) $\frac{3}{2}$ c) $\frac{3}{5}$ d) $\frac{7}{5}$

17. It is seen that in proper ventilation of building, windows must be opened near the bottom and the top of the walls, so as to let pass

- a) In hot near the roof and cool air out
b) Out hot air near the roof near the bottom
c) In cool air near the bottom and hot air out
d) In more air near the roof

18. A vessel is partitioned in two equal halves by a fixed diathermic separator. Two different ideal gases are filled in left (L) and right (R) halves. The rms speed of the molecules in L part is equal to the mean speed of molecules in the R part. Then the ratio of the mass of a molecule in L part to that of a molecule in R part is



- a) $\sqrt{\frac{3}{2}}$ b) $\sqrt{\pi/4}$ c) $\sqrt{2/3}$ d) $3\pi/8$

19. An ideal gas is filled in a vessel, then

- a) If it is placed inside a moving train, its temperature increases
b) Its centre of mass moves randomly
c) Its temperature remains constant in a moving car
d) None of these

20. If one mole of a monoatomic gas ($\gamma = \frac{5}{3}$) is mixed with one mole of a diatomic gas ($\gamma = \frac{7}{5}$), the value of γ for the mixture is

- a) 1.40 b) 1.50 c) 1.53 d) 3.07