PREVIOUS YEAR QUESTIONS (NEET, AIIMS, AIPMT, JIPMER)

1. Equal moles of hydrogen and oxygen gases are placed in a container with a pin-hole through which both can escape. What fraction of the oxygen escapes in the time required for one-half of the hydrogen to escape ? **[NEET-2016]**

(1) $\frac{1}{2}$ (2) $\frac{1}{8}$ (3) $\frac{1}{4}$ (4) $\frac{3}{8}$

Ans. **(2)**

2. A gas such as carbon monoxide would be most likely to obey the ideal gas law at **[Re-AIPMT-2015]**

(1) High temperatures and high pressures (2) Low temperatures and low pressures

(3) High temperatures and low pressures (4) Low temperatures and high pressures

Ans. **(3)**

3. Equal masses of H_2, O_2 and methane have been taken in a container of volume V at temperature 27°C in identical conditions. The ratio of the volumes of gases H_2 : O_2 : methane would be **[AIPMT - 2014]**

(1) 8 : 16 : 1 (2) 16 : 8 : 1 (3) 16 : 1 : 2 (4) 8 : 1 : 2

Ans. **(3)**

4. The temperature at which intermolecular attraction force balance the intermolecular repulsion force is known as : **[AIIMS - 2014]**

(1) Boyle temperature (2) Critical temperature (3) Boiling temperature (4) Equilibrium temperature

Ans. **(3)**

5. Maximum deviation from ideal gas is expected from **[AIPMT - 2013]**

(1) $N_2(g)$ (2) $CH_4(g)$ (3) $NH_3(g)$ (4) $H_2(g)$

Ans. **(3)**

6. A certain gas takes three times as long to effuse out as helium. Its molecular mass will be **[AIPMT (Mains) –2012]**

(1) 27 u (2) 36 u (3) 64 u (4) 9 u

Ans. **(2)**

7. 50 mL of each gas A and of gas B takes 150 and 200 seconds respectively for effusing through a pin hole under the similar condition. If molecular mass of gas B is 36, the molecular mass of gas A will be: **[AIPMT Pre. 2012]**

(1) 20.25 (2) 64 (3) 96 (4) 128

Ans. **(1)**

8. For real gases vander Walls equation is written as $\left(p + \frac{an^2}{V^2}\right)(V - nb) = nRT$ **[AIPMT Mains 2012]**

Where 'a' and 'b' are vander W ls constant. Two sets of gases are :

(I) O_2, CO_2, H_2 and He (II) CH_4, O_2 and H_2

The gases given in set-I in increasing order of 'b' and gases given in set-II in decreasing order of 'a', are arranged below. Select the correct order from the following :

(1) (I) $H_2 < He < O_2 < CO_2$ (II) $CH_4 > O_2 > H_2$ (2) (I) $H_2 < O_2 < He < CO_2$ (II) $O_2 > CH_4 > H_2$

(3) (I) $He < H_2 < CO_2 < O_2$ (II) $CH_4 > H_2 > O_2$ (4) (I) $O_2 < He < H_2 < CO_2$ (II) $H_2 > O_2 > CH_4$

Ans. **(1)**

9. By what factor does the average velocity of a gaseous molecules increase when the temperature (in kelvin) is doubled?

[AIPMT (Prelims) –2011]

(1) 1.4 (2) 2.0 (3) 2.8 (4) 4.0

Ans. **(1)**

10. A gaseous mixture was prepared by taking equal mole of CO and N_2. If the total pressure of the mixture was found 1 atmosphere, the partial pressure of nitrogen (N_2) in the mixture is **[AIPMT (Prelims) –2011]**

(1) 1 atm (2) 0.5 atm (3) 0.8 atm (4) 0.98 atm

Ans. **(2)**

11. Two gases A and B having the same volume diffuse through a porous partition in 20 and 10 seconds respectively. The molecular mass of A is 49 u. Molecular mass of B will be **[AIPMT (Prelims) –2011]**

(1) 25.00 u (2) 50.00 u (3) 12.25 u (4) 6.50 u

Ans. **(3)**

12. A bubble of air is underwater at temperature 15°C and the pressure 1.5 bar. If the bubble rises to the surface where the temperature is 25°C and the pressure is 1.0 bar what will happen to the volume of the bubble ?

[AIPMT (Mains) –2011]

(1) Volume will become smaller by a factor of 0.70
(2) Volume will become greater by a factor of 2.5
(3) Volume will become greater by a factor of 1.6
(4) Volume will become greater by a factor of 1.1

Ans. **(3)**

13. The pressure exerted by 6.0 g of methane gas in a 0.03 m^3 vessel at 129°C is (Atomic masses : C = 12.01, H = 1.01 and R = 8.314 JK^{-1} mol^{-1}) **[AIPMT (Mains)–2010]**

(1) 215216 Pa (2) 13409 Pa (3) 41648 Pa (4) 31684 Pa

Ans. **(3)**

14. If a gas expands at constant temperature, it indicates that **[AIPMT (Prelims)–2008]**

(1) Number of the molecules of gas increases
(2) Kinetic energy of molecules decreases
(3) Pressure of the gas increases
(4) Kinetic energy of molecules remains the same

Ans. **(4)**

Question asked Prior to Medical Ent. Exams. 2005

15. What is the density of N_2 gas at 227°C and 5.00 atm pressure ? (R = 0.0821 atm K^{-1} mol^{-1})

(1) 0.29 g/ml (2) 1.40 g/ml (3) 2.81 g / ml (4) 3.41 g/ml

Ans. **(4)**

16. Equal weight of CH_4 and H_2 are mixed in a container at 25°C. Fraction of total pressure exerted by methane is

(1) $\frac{1}{2}$ (2) $\frac{1}{3}$ (3) $\frac{1}{9}$ (4) $\frac{8}{9}$

Ans. **(3)**

17. 50 ml of hydrogen diffuse out through a small hole of a vessel, in 20 minutes. The time taken by 40 ml of oxygen to diffuse out is

(1) 32 minutes (2) 64 minutes (3) 8 minutes (4) 12 minutes

Ans. **(2)**

18. The temperature of a gas is raised from 27°C to 927°C. The root mean square speed of the gas

(1) Remains same (2) Gets $\sqrt{\frac{927}{27}}$ times

(3) Gets halved (4) Gets doubled

Ans. **(4)**

19. An ideal gas, obeying kinetic energy of gases can not be liquefied, because

(1) It solidifies before becoming a liquid

(2) Forces acting between its molecules are negligible

(3) Its critical temperature is above 0°C

(4) Its molecules are relatively small in size

Ans. **(2)**

20. Which of the following mixture of gases does not obey Dalton's law of partial pressure ?

(1) Cl_2 and SO_2 (2) CO_2 and He (3) O_2 and CO_2 (4) N_2 and O_2

Ans. **(1)**

21. 0.24 g of a volatile substance, upon vapourisation, gives 45 ml vapour at NTP. What will be the vapour density of the substance ?

(1) 95.93 (2) 59.73 (3) 95.39 (4) 5.993

Ans. **(2)**

22. The average kinetic energy of an ideal gas, per molecule in S.I. units, at 25°C will be

(1) 6.17×10^{-20} J (2) 7.16×10^{-20} J (3) 61.7×10^{-21} J (4) 6.17×10^{-21} J

Ans. **(4)**

23. At 25°C and 730 mm pressure, 380 ml of dry oxygen was collected. If the temperature is constant, what volume will the oxygen occupy at 760 mm pressure ?

(1) 569 ml (2) 365 ml (3) 265 ml (4) 621 ml

Ans. **(2)**

24. Which of the following statements is wrong for gases ?

(1) Confined gas exerts uniform pressure on the walls of its container in all directions

(2) Volume of the gas is equal to volume of container confining the gas

(3) Gases do not have a definite shape and volume

(4) Mass of gas cannot be determined by weighing a container in which it is enclosed

Ans. **(4)**

25. Average molar kinetic energy of CO and N_2 at same temperature is

(1) $KE_1 = KE_2$ (2) $KE_1 > KE_2$

(3) $KE_1 < KE_2$ (4) Can't say any thing. Both volumes are not given

Ans. **(1)**

26. van der Wall's real gas acts as an ideal gas, at which conditions ?

(1) High temperature, low pressure

(2) Low temperature, low pressure

(3) High temperature, high pressure

(4) Low temperature, low pressure

Ans. **(1)**