Date Planned : __ / __ / __	Daily Tutorial Sheet-2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration :_____

16. The expression of average speed of molecules of a gas is given as :

(A) $u_{av} = \sqrt{\frac{8RT}{\pi m}}$ **(B)** $u_{av} = \sqrt{\frac{8RT}{\pi M}}$ **(C)** $u_{av} = \sqrt{\frac{8kT}{\pi M}}$ **(D)** $u_{av} = \sqrt{\frac{8RT}{M}}$

17. For a given gas, which of the following relationships is correct at a given temperature ?

(A) $u_{rms} > u_{av} > u_{mp}$ **(B)** $u_{rms} < u_{av} < u_{mp}$

(C) $u_{rms} > u_{av} < u_{mp}$ **(D)** $u_{rms} < u_{av} > u_{mp}$

18. Which of the following is expected to possess the largest root mean square speed at the same temperature?

(A) H_2S **(B)** NH_3 **(C)** SO_2 **(D)** CO_2

19. The rms speed of hydrogen is $\sqrt{7}$ times the rms speed to nitrogen. If T is the temperature of the gas, then :

(A) $T(H_2) = T(N_2)$ **(B)** $T(H_2) > T(N_2)$

(C) $T(H_2) < T(N_2)$ **(D)** $T(H_2) = \sqrt{7}T(N_2)$

20. The density of a gas at 27°C and 1 atm is d. At what temperature would its density be 0.75d, if the pressure is kept constant?

(A) 20°C **(B)** 30°C **(C)** 400 K **(D)** 300 K

21. A certain gas effuses through a small opening of a vessel at a rate which is exactly one-fifth the rate at which helium does the same. Thus, the molecular weight of the gas is :

(A) 100 **(B)** 75 **(C)** 50 **(D)** 25

22. The weight of CH_4 in a 9L cylinder at 27°C temperature and 16 atm pressure is (R = 0.08 L atm $K^{-1}mol^{-1}$)

(A) 9.6g **(B)** 96.0 g **(C)** 4.8 g **(D)** 48.0 g

23. The ratio of the most probable speed, average speed and root-mean-square speed of a gas molecule is :

(A) 1 : 1.128 : 1.224 **(B)** 1 : 1.128 : 1.424

(C) 1 : 2.128 : 1.224 **(D)** 1 : 1.428 : 1.442

24. Equal masses of methane and hydrogen are mixed in an empty container at 25°C. The fraction of the total pressure exerted by hydrogen is :

(A) 1/12 **(B)** 8/9 **(C)** 1/6 **(D)** 16/17

25. A gas cylinder containing cooking gas can withstand a pressure of 14.9 atm. The pressure gauge of cylinder indicates 12 atm at 27°C. Due to sudden fire in the building the temperature starts rising. The temperature at which cylinder will explode is:

(A) 87.5°C **(B)** 99.5°C **(C)** 115.5°C **(D)** 135.5°C

26. At what temperature do the average speed of $CH_4(g)$ molecules equal the average speed of O_2 molecules at 300 K ?

(A) 150 K **(B)** 900 K **(C)** 600 K **(D)** 300 K

27. Which of the following expressions is correct ?

(A) $v_{rms} = \sqrt{\frac{3RT}{M}}$ **(B)** $v_{rms} = \sqrt{\frac{3p}{\rho}}$ **(C)** $PV = \frac{1}{3}mV_{rms}^2$ **(D)** All of these

28. Consider the reaction $2Al(s) + 3Cl_2(g) \longrightarrow 2AlCl_3(s)$. The approximate volume of chlorine that would react with 324 g of aluminium at STP is :

(A) 121 L **(B)** 134 L **(C)** 260 L **(D)** 403 L

29. In a classroom, there are 13 rows of students. A teacher releases laughing gas (N_2O) from the front and tear gas (molar mass 176) from the rear of the classroom simultaneously. Students of which row from the front will have a tendency to weep and smile simultaneously?

(A) 9^{th} row **(B)** 12^{th} row **(C)** 7^{th} row **(D)** 10^{th} row

30. The vapour density of a mixture containing $N_2(g)$ and $O_2(g)$ is 14.4. The percentage of N_2 in the mixture is :

(A) 20% **(B)** 80% **(C)** 60% **(D)** 50%