31.(B) $PM_0 = dRT \Rightarrow M_0 = \dfrac{1.15 \times 0.08 \times 373}{0.8} = 44$

32.(A) $PV = nRT \Rightarrow P = \dfrac{\rho RT}{M_o}$ or $M_o = \dfrac{\rho RT}{P}$

33.(A) When temp is constant, K.E is constant the pressure will fall when expansion of gas occurs at constant T

34.(B) K.E depends only on temperature and not the nature of gas.

35.(C) All the molecules of heavier gas will move at a slower speed as compared to any molecule of a lighter gas

36.(C) $\dfrac{(C_{rms})_{O_3}}{(C_{rms})_{O_2}} = \sqrt{\dfrac{M_{O_2}}{M_{O_3}}} = \sqrt{\dfrac{32}{48}} = \sqrt{\dfrac{2}{3}}$

37.(B) $\mu_{rms} = \sqrt{\dfrac{3RT}{M_o}}$

38.(A) At same temperature, K.E will be same

39.(C) $\dfrac{r_A}{r_B} = \dfrac{P_A}{P_B}\sqrt{\dfrac{M_B}{M_A}}$

40.(D) $d = 0.001293 \text{ g / ml} = 1.293 \text{g / lt}$.

Now $(M_0)_{air} = \dfrac{d \times R \times T}{P} = 1.293 \times 224 = 28.96$

$\text{V.D.} = \dfrac{(M_0)_{air}}{2} = \dfrac{28.96}{2} = 14.48$

41.(B) 3.2 g of O_2, No. of moles contain are $\Rightarrow \dfrac{3.2}{32} = 0.1$ mole of O_2 gas

$O_2(g) \longrightarrow 2O(g)$

at t = 0 0.1 –

at t = t_1 $0.1 - 0.1 \times \dfrac{60}{100}$ $2 \times 0.1 \times \dfrac{60}{100}$

0.04 moles 0. 12 mole

Initial moles ni = 0.1 mole
Final moles nf = 0.04 + 0.12 = 0.16 moles
Volume = 10 lt.
Temperature = 1000 k
Using ideal gas equation.
PV = nRT

$P = \dfrac{nRT}{V} = \dfrac{0.16 \times 0.0821 \times 1000}{10}$

$P = 1.31 \text{atm}$

42.(B) $C_{rms} = \sqrt{\dfrac{3RT}{M_0}}$

43.(A) $u_{rms} > u_{avg} > u_{mp}$

44.(D) Suppose initially, pressure of $C_6H_6(g) = P_1$ mm and that of $H_2(g) = P_2$ mm .

$\therefore \quad P_1 + P_2 = 60 \text{ mm}$ **... (1)**

After the reaction

Pressure of $C_6H_6(g) = 0$

Pressure of $H_2(g) = P_2 - 3P_1$

Pressure of $C_6H_{12}(g) = P_1$

Total pressure $= P_2 - 3P_1 + P_1 = 30\,mm$

Or, $P_2 - 2P_1 = 30\,mm$ **... (2)**

Solving (1) & (2) we get : $P_1 = 10\,mm$; $P_2 = 50\,mm$

Fraction of $C_6H_6(g)$ by volume = Fraction of moles = Fraction of pressures $= \frac{10}{60} = \frac{1}{6}$

45.(D) Root means square speed depends on Temperature only