16.(B) $C_{avg} = \sqrt{\frac{8RT}{\pi M}}$

17.(A) At a given temperature, $u_{rms} > u_{av} > u_{mp}$

$$\sqrt{\frac{3RT}{M}} > \sqrt{\frac{8RT}{\pi M}} > \sqrt{\frac{2RT}{M}}$$

18.(B) $\mu_{rms} = \sqrt{\frac{3RT}{M_o}}$

Since M_o of NH_3 is the least among the given options. μ_{rms} is the most.

19.(C) $\Rightarrow \quad (C_{rms})_{H_2} = \sqrt{7}(C_{rms})_{N_2} \quad \Rightarrow \quad \sqrt{\frac{3RT_{H_2}}{2\times10^{-3}}} = \sqrt{7}\sqrt{\frac{3RT_{N_2}}{28\times10^{-3}}}$

$$\Rightarrow \quad \frac{T_{H_2}}{1} = 7\times\frac{T_{N_2}}{14} \Rightarrow T_{H_2} = \frac{T_{N_2}}{2} \Rightarrow T_{H_2} < T_{N_2}$$

20.(C) $1 \times M_0 = d \times R \times 300$, Now $1 \times M_0 = 0.75d \times R \times T$

$$\Rightarrow \quad d \times 300 = 0.75d \times T \quad \Rightarrow \quad T = \frac{300}{0.75} = 400K$$

21.(A) $\frac{r_{gas}}{r_{He}} = \sqrt{\frac{M_{He}}{M_{gas}}}$ (assuming $P_{gas} = P_{He}$),

Now $r_{gas} = \frac{1}{5}r_{He} \Rightarrow \frac{1}{5} = \sqrt{\frac{4}{M_{gas}}} \Rightarrow M_{gas} = 25 \times 4 = 100$

22.(B) $n_{CH_4} = \frac{PV}{RT} = \frac{16\times9}{0.08\times300} = 6 \quad \Rightarrow \quad g_{CH_4} = n_{CH_4} \times (M_0)_{CH_4} = 6 \times 16 = 96g$

23.(A) $u_{mp}; u_{avg} : u_{rms}$

$$\sqrt{\frac{2RT}{M}} : \sqrt{\frac{8RT}{\pi M}} : \sqrt{\frac{3RT}{M}}$$

24.(B) $\frac{P_{CH_4}}{P_{H_2}} = \frac{n_{CH_4}}{n_{H_2}} = \frac{g_{CH_4}/(M_0)_{CH_4}}{g_{H_2}/(M_0)_{H_2}} = \frac{2}{16} = \frac{1}{8} \quad \Rightarrow \quad \frac{P_{H_2}}{P_{H_2}+P_{CH_4}} = \frac{8}{9}$

25.(B) For a gas cylinder V = constant

$\Rightarrow \quad P \propto T$

$$\frac{P_1}{P_2} = \frac{T_1}{T_2}$$

$$\frac{14.9}{12} = \frac{T_1}{300} \quad \Rightarrow \quad T_1 = 300 \times \frac{14.9}{12} = \frac{25}{4}$$

$T_1 = 372 = 372.5$ K or 99.5° C

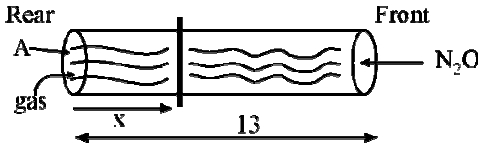
26.(A) $C_{avg} \propto \sqrt{\frac{T}{M}}$ for C_{avg} to be same

$$\frac{T_{CH_4}}{M_{CH_4}} = \frac{T_{O_2}}{MO_2} \Rightarrow T_{CH_4} = \frac{300}{32} \times 16 = 150\,K$$

27.(D) Learn the formulas

28.(D) $324\,g\,A\ell \equiv \frac{324}{27} = 12 mol\ A\ell \equiv \frac{12\times 3}{2} mol\,Cl_2 = 18\,mol\,Cl_2 \equiv 18 \times 22.4$ lt of Cl_2 at S.T.P = 403.2 lt

29.(A) $\frac{r_{gas}}{r_{N_2O}} = \sqrt{\frac{M_{N_2O}}{M_{gas}}}$ (assuming $P_{N_2O} = P_{gas}$)



$$\Rightarrow \quad \frac{Ax/t}{A(\ell - x)/t} = \sqrt{\frac{44}{176}} = \frac{1}{2} \Rightarrow \frac{x}{\ell - x} = \frac{1}{2}$$

$$\Rightarrow \quad 2x = \ell - x \quad \Rightarrow \quad 3x = \ell = 13$$

$$x = \frac{13}{3} = 4.33 \quad \Rightarrow \quad \ell - x = 13 - 4.33 = 8.66 \quad \Rightarrow \quad 9^{th} \text{ row from front.}$$

30.(B) $M_{eff} = 2 \times V.D = 2 \times 14.4 = 28.8 = \chi_{N_2} M_{N_2} + \chi_{O_2} \times M_0$

$$= \chi_{N_2} \times 28 + (1 - \chi_{N_2}) \times 32 \quad \Rightarrow \quad 28.8 = 32 - 4\,\chi_{N_2}$$

$$\Rightarrow \chi_{N_2} = \frac{3.2}{4} = 0.8 \Rightarrow \%N_2 = \chi_{N_2} \times 100 = 80\%$$