

SOLUTION**1. NTA Ans. (4)**

Sol. $v_{mp} \left(= \sqrt{\frac{2RT}{M}} \right) < v_{av} \left(= \sqrt{\frac{8RT}{\pi M}} \right) < v_{rms} \left(= \sqrt{\frac{3RT}{M}} \right)$

2. Official Ans. by NTA (3)**Sol.** According to Dalton's law of partial pressure

$$p_i = x_i \times P_T$$

 p_i = partial pressure of the i^{th} component x_i = mole fraction of the i^{th} component p_T = total pressure of mixture

$$\Rightarrow 2 \text{ atm} = \left(\frac{n_{H_2}}{n_{H_2} + n_{H_e} + n_{O_2}} \right) \times p_T$$

$$\Rightarrow p_T = 2 \text{ atm} \times \frac{3}{1} = 6 \text{ atm}$$

3. Official Ans. by NTA (1)

Sol. $PM = dRT \Rightarrow d \propto \frac{1}{T}$

4. Official Ans. by NTA (750.00)