

JEE MAIN KINETIC THEORY — MEAN FREE PATH — PYQS
Max. Marks: 12
Questions: 3
Section A (MCQ) — 3 questions

- Q.1** The mean free path of a molecule of diameter 5×10^{-10} m at the temperature 41°C and pressure 1.38×10^5 Pa, is given as _____ m. (Given $k_B = 1.38 \times 10^{-23}$ J/K).

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) $2\sqrt{2} \times 10^{-10}$ (2) $10\sqrt{2} \times 10^{-8}$
 (3) $2\sqrt{2} \times 10^{-8}$ (4) 2×10^{-8}

 Scan or tap for the
full solution


- Q.2** Consider two boxes containing ideal gases A and B such that their temperatures, pressures and number densities are same. The molecular size of A is half of that of B and mass of molecule A is four times that of B. If the collision frequency in gas B is 32×10^{18} /s then collision frequency in gas A is _____ /s.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 8×10^{18} (2) 2×10^{18}
 (3) 32×10^{18} (4) 4×10^{18}

 Scan or tap for the
full solution


- Q.3** The mean free path and the average speed of oxygen molecules at 300 K and 1 atm are 3×10^{-7} m and 600 m/s, respectively. Find the frequency of its collisions.

[JEE Main 2025 (Online) 4th April Morning Shift]

- (1) $5 \times 10^8/\text{s}$ (2) $9 \times 10^5/\text{s}$
 (3) $2 \times 10^{10}/\text{s}$ (4) $2 \times 10^9/\text{s}$

 Scan or tap for the
full solution

ANSWER KEY

Ques.	1	2	3								
Ans.	3	4	4								