

JEE MAIN MECHANICAL PROPERTIES OF FLUIDS — PRESSURE, PASCAL'S LAW, VARIATION OF PRESSURE WITH DEPTH — PYQS

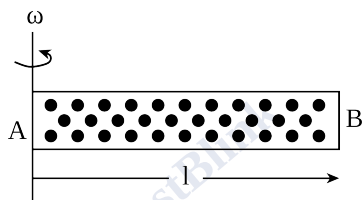
Max. Marks: 8

Questions: 2

Section A (MCQ) — 1 question

- Q.1** A cylindrical tube AB of length l , closed at both ends contains an ideal gas of 1 mol having molecular weight M . The tube is rotated in a horizontal plane with constant angular velocity ω about an axis perpendicular to AB and passing through the edge at end A, as shown in the figure. If P_A and P_B are the pressures at A and B respectively, then (Consider the temperature is same at all points in the tube)

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



$$(1) P_B = P_A e^{\left(\frac{M\omega^2 l^2}{3RT}\right)}$$

(2) $P_B = P_A$

$$(3) P_B = P_A e^{\left(\frac{M\omega^2 l^2}{2RT}\right)}$$

$$(4) P_B = P_A e^{\left(\frac{M\omega^2 l^2}{RT}\right)}$$

Scan or tap for the full solution



Section B (Numerical) — 1 question

- Q.2** A vessel with square cross-section and height of 6 m is vertically partitioned. A small window of 100 cm² with hinged door is fitted at a depth of 3 m in the partition wall. One part of the vessel is filled completely with water and the other side is filled with the liquid having density $1.5 \times 10^3 \text{ kg/m}^3$. What force one needs to apply on the hinged door so that it does not get opened?

(Acceleration due to gravity = 10 m/s^2)

[JEE Main 2025 (Online) 2nd April Morning Shift]

Scan or tap for the full solution



ANSWER KEY

Section A (MCQ) — 1 question

[illegible]

Section B (Numerical) — 1 question

Ques.	2						
Ans.	150						