

JEE MAIN THERMODYNAMICS (PHYSICS) — FIRST LAW OF THERMODYNAMICS — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 4 questions

- Q.1** One mole of diatomic gas having rotational modes only is kept in a cylinder with a piston system. The cross-section area of the cylinder is 4 cm^2 . The gas is heated slowly to raise the temperature by 1.2°C during which the piston moves by 25 mm . The amount of heat supplied to the gas is _____. J. (Atmospheric pressure = 100 kPa , $R = 8.3 \text{ J/mol. K}$) (Neglect mass of the piston)

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) 24.8 (2) 10.96 (3) 15.04 (4) 29.98

Scan or tap for the full solution



- Q.2** Densities of water at 4°C and 20°C are 1000 kg/m^3 and 998 kg/m^3 respectively. The increase in internal energy of 4 kg of water when it is heated from 4°C to 20°C is _____. J. (specific heat capacity of water = 4.2 kJ/kg K and $1 \text{ atmospheric pressure} = 10^5 \text{ Pa}$)

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 268799.2 (2) 315826.2
(3) 234699.2 (4) 258700.8

Scan or tap for the full solution



- Q.3** The internal energy of a monoatomic gas is $3nRT$. One mole of helium is kept in a cylinder having internal cross section area of 17 cm^2 and fitted with a light movable frictionless piston. The gas is heated slowly by supplying 126 J heat. If the temperature rises by 4°C , then the piston will move _____. cm. (atmospheric pressure = 10^5 Pa)

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) 1.55 (2) 14.5 (3) 15.5 (4) 1.45

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- Q.4** During the melting of a slab of ice at 273 K at atmospheric pressure :

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) Internal energy of ice-water system remains unchanged.
- (2) Positive work is done by the ice-water system on the atmosphere.
- (3) Positive work is done on the ice-water system by the atmosphere.
- (4) Internal energy of the ice-water system decreases.

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4										
Ans.	2	1	3	3										