

JEE MAIN THERMODYNAMICS — FIRST LAW OF THERMODYNAMICS — PYQS

Max. Marks: 20

Questions: 5

Section A (MCQ) — 5 questions

- Q.1** Gas 'A' undergoes change from state 'X' to state 'Y'. In this process, the heat absorbed and work done by the gas is 10 J and 18 J respectively. Now gas is brought back to state 'X' by another process during which 6 J of heat is evolved. In the reverse process of 'Y' to 'X',

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) 18 J of the work is done by the gas 'A'.
- (2) 2 J of the work is done by the gas 'A'.
- (3) 12 J of the work is done on the gas 'A' by the surrounding.
- (4) 14 J of the work is done on the gas 'A' by the surrounding.

Scan or tap for the full solution



- Q.2** A cup of water at 5°C (system) is placed in a microwave oven and the oven is turned on for one minute during which the water begins to boil. Which of the following options is true?

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

- (1) $q = +ve$, $w = -ve$, $\Delta U = +ve$
- (2) $q = +ve$, $w = 0$, $\Delta U = -ve$
- (3) $q = +ve$, $w = -ve$, $\Delta U = -ve$
- (4) $q = -ve$, $w = -ve$, $\Delta U = -ve$

Scan or tap for the full solution



- Q.3** 500 J of energy is transferred as heat to 0.5 mol of Argon gas at 298 K and 1.00 atm. The final temperature and the change in internal energy respectively are: Given: $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$

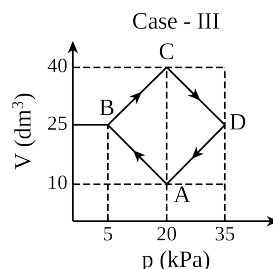
[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) 368 K and 500 J (2) 348 K and 300 J
- (3) 378 K and 300 J (4) 378 K and 500 J

Scan or tap for the full solution



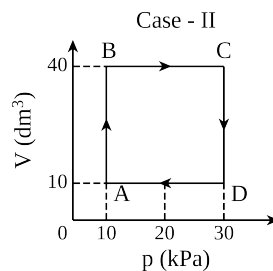
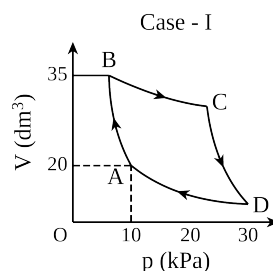
Q.4



An ideal gas undergoes a cyclic transformation starting from the point A and coming back to the same point by tracing the path $A \rightarrow B \rightarrow C \rightarrow D \rightarrow A$ as shown in the three cases above.

Choose the correct option regarding ΔU :

[JEE Main 2025 (Online) 28th January Evening Shift]



- (1) $\Delta U(\text{Case-III}) > \Delta U(\text{Case-II}) > \Delta U(\text{Case-I})$
- (2) $\Delta U(\text{Case-I}) > \Delta U(\text{Case-II}) > \Delta U(\text{Case-III})$
- (3) $\Delta U(\text{Case-I}) = \Delta U(\text{Case-II}) = \Delta U(\text{Case-III})$
- (4) $\Delta U(\text{Case-I}) > \Delta U(\text{Case-III}) > \Delta U(\text{Case-II})$

Scan or tap for the full solution



Q.5

A liquid when kept inside a thermally insulated closed vessel at 25°C was mechanically stirred from outside. What will be the correct option for the following thermodynamic parameters ?

[JEE Main 2025 (Online) 22nd January Morning Shift]

- (1) $\Delta U = 0$, $q < 0$, $w > 0$ (2) $\Delta U > 0$, $q = 0$, $w > 0$
- (3) $\Delta U = 0$, $q = 0$, $w = 0$ (4) $\Delta U < 0$, $q = 0$, $w > 0$

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5						
Ans.	4	1	2	3	2						