

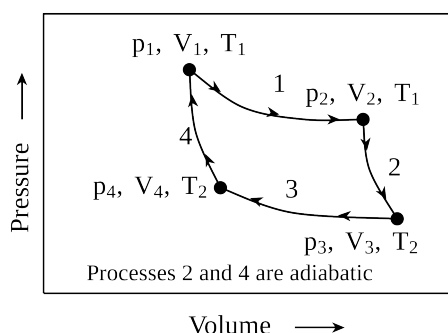
NEET THERMODYNAMICS — WORK DONE IN THERMODYNAMIC PROCESSES (REVERSIBLE, IRREVERSIBLE, FREE EXPANSION) — PYQS

Max. Marks: 36

Questions: 9

Section A (MCQ) — 9 questions

- Q.1** Consider the reversible processes for 1.0 mol of an ideal gas as shown in the figure.



w_1, w_2, w_3 and w_4 represent work done (in calories) in the processes 1, 2, 3 and 4, respectively; ΔU_2 and ΔU_4 are changes in the internal energy for the processes 2 and 4, respectively.

[use $R = 2 \text{ cal K}^{-1} \text{ mol}^{-1}$]

The correct option is [RE-NEET (UG) 2026]

- (1) $w_1 + w_2 + w_3 + w_4 = 0$
- (2) $w_1 + w_3 = -2T_1 \ln \frac{V_2}{V_1} - 2T_2 \ln \frac{V_4}{V_3}$
- (3) $w_2 + w_4 = \Delta U_2 - \Delta U_4$
- (4) $w_1 + w_2 = 2T_1 \ln \frac{V_2}{V_1}$

Scan or tap for the full solution



- Q.2** The work done during reversible isothermal expansion of one mole of hydrogen gas at 25°C from pressure of 20 atmosphere to 10 atmosphere is (Given $R = 2.0 \text{ cal K}^{-1} \text{ mol}^{-1}$) [NEET (UG) 2024]

- (1) 0 calorie
- (2) -413.14 calories
- (3) 413.14 calories
- (4) 100 calories

Scan or tap for the full solution



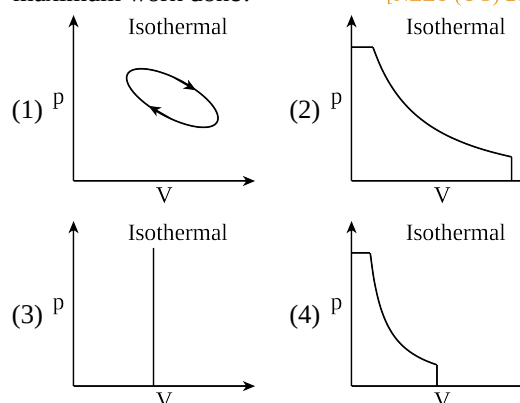
- Q.3** Choose the correct statement for the work done in the expansion and heat absorbed or released when 5 litres of an ideal gas at 10 atmospheric pressure isothermally expands into vacuum until volume is 15 litres : [RE-NEET (UG) 2024]

- (1) Both the heat and work done will be greater than zero
- (2) Heat absorbed will be less than zero and work done will be positive
- (3) Work done will be zero and heat will also be zero
- (4) Work done will be greater than zero and heat will remain zero

Scan or tap for the full solution



- Q.4** Which of the following p-V curve represents maximum work done? [NEET (UG) 2022]



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- Q.5** The correct option for free expansion of an ideal gas under adiabatic condition is : [NEET (UG) 2020]

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

Scan or tap for the full solution



- Q.6** Under isothermal condition, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is [Given that 1 L bar = 100 J] [NEET (UG) 2019]

- (1) 25 J
- (2) 30 J
- (3) -30 J
- (4) 5 kJ

Scan or tap for the full solution



Q.7 Which of the following is correct option for free expansion of an ideal gas under adiabatic condition ?

[AIPMT 2011 (Prelims)]

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

Scan or tap for the
full solution



Q.8 Three moles of an ideal gas expanded spontaneously into vacuum. The work done will be

[AIPMT 2010 (Mains)]

- (1) infinite (2) 3 Joules (3) 9 Joules (4) zero

Scan or tap for the
full solution



Q.9 The work done during the expansion of a gas from a volume of 4 dm^3 to 6 dm^3 against a constant external pressure of 3 atm is (1 L atm = 101.32 J)

[AIPMT 2004]

- (1) -6 J (2) -608 J (3) +304 J (4) -304 J

Scan or tap for the
full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9		
Ans.	2	2	3	2	4	3	3	4	2		