Yakeen NEET 2.0 2026

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Thermodynamics & Thermochemistry

DPP: 4

Q1 One mole of an ideal gas at $25^{\circ}\mathrm{C}$ expands in volume from $1.0\ \mathrm{L}$ to $4.0\ \mathrm{L}$ at constant temperature. What work (in J) is done if the gas expands against vacuum ?
(A) -4.0×10^{2}
(B) -3.0×10^{2}
(C) -1.0×10^{2}
(D) Zero

Q2 The maximum work obtained by an isothermal reversible expansion of 1 mole of an ideal gas at $27^{\circ}\mathrm{C}$ from 2.24 L to 22.4 L is:
$(\mathrm{R} = 2\ \text{cal}\ \mathrm{K}^{-1}\ \mathrm{mol}^{-1})$
(A) –1381.8 cal
(B) $-600\ \text{cal}$
(C) $-138.18\ \text{cal}$
(D) $-690.9\ \text{cal}$

Q3 2 mole of an ideal gas at $27^{\circ}\mathrm{C}$ expands isothermally and reversibly from a volume of 4 litres to 40 litres. The work done (in kJ) is:
(A) $w = -28.72\ \mathrm{kJ}$
(B) $w = -11.488\ \mathrm{kJ}$
(C) $w = -5.736\ \mathrm{kJ}$
(D) $w = -4.988\ \mathrm{kJ}$

Q4 The work done on the system when one mole of an ideal gas at $500\ \mathrm{K}$ is compressed isothermally and reversibly to $\frac{1}{10}$ th of its original volume $(R = 2\mathrm{cal})$
(A) 500 kcal
(B) 15.1 kcal
(C) 25.03 kcal
(D) 2.303 kcal

Q5 The maximum work done in expanding $16\ \mathrm{g}$ oxygen at $300\ \mathrm{K}$ and occupying a volume of $5\mathrm{dm}^3$ isothermally until the volume becomes $25\mathrm{dm}^3$ is:
(A) $-2.01 \times 10^{3}\ \mathrm{J}$
(B) $2.81 \times 10^{-3}\ \mathrm{J}$
(C) $2.01 \times 10^{-6}\ \mathrm{J}$
(D) $-2.01 \times 10^{-6}\ \mathrm{J}$

Q6 Isothermal free expansion of an ideal gas correspond to
(A) $q = 0$
(B) $\mathrm{W} = 0$
(C) None of these
(D) Both (A) and (B)

Q7 The temperature of 1 mole of a gas is increased by $1^{\circ}\mathrm{C}$ at constant pressure. The work done is:
(A) $-\mathrm{R}$
(B) $2\mathrm{R}$
(C) $\mathrm{R}/2$
(D) $3\mathrm{R}$

Q8 The relation of internal energy, enthalpy and work done can be represented by
(A) $\Delta\mathrm{E} = \Delta\mathrm{H} + \mathrm{W}$
(B) $\Delta\mathrm{E} = \mathrm{W} - \Delta\mathrm{H}$
(C) $\Delta\mathrm{H} = \Delta\mathrm{E} + \mathrm{W}$
(D) $\mathrm{W} = \Delta\mathrm{E} + \Delta\mathrm{H}$

Q9 A gas expands isothermally against a constant external pressure of $1\ \mathrm{atm}$ from a volume of $10\ \mathrm{dm}^3$ to a volume of $20\ \mathrm{dm}^3$. It absorbs $800\ \mathrm{J}$ of thermal energy from its surroundings. The $\Delta\mathrm{U}$ is:
(A) $-312\ \mathrm{J}$
(B) $+123\ \mathrm{J}$
(C) $-213\ \mathrm{J}$
(D) $+231\ \mathrm{J}$

Q10 A system absorb $20\ \mathrm{kJ}$ heat and does $10\ \mathrm{kJ}$ work then internal energy of system will be-

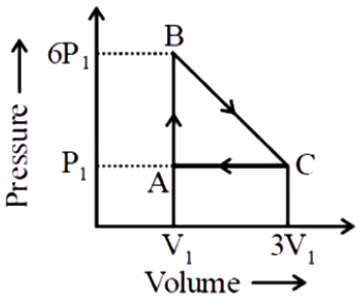
(A) Decreases by $10\ \text{kJ}$
(B) Increases by $10\ \text{kJ}$
(C) Increases by $30\ \text{kJ}$
(D) Decreases by $30\ \text{kJ}$

Q11 5 mol of ideal gas expands isothermally and irreversibly from a pressure of 10 atm to $1\ \text{atm}$ against constant external pressure of 1 atm work at $300\ \text{K}$ will be
(A) $-15.921\ \text{kJ}$
(B) $-11.224\ \text{kJ}$
(C) $-110.83\ \text{kJ}$
(D) None of these

Q12 Which of the following is correct for free expansion of ideal gas under isothermal condition:
(A) $\text{q} = 0, \Delta\text{T} < 0, \text{w} < 0$
(B) $\text{q} = 0, \Delta\text{T} = 0, \text{w} = 0$
(C) $\text{q} \neq 0, \Delta\text{T} = 0, \text{w} = 0$
(D) $\text{q} \neq 0, \Delta\text{T} = 0, \text{w} \neq 0$

Q13 Net work done by the system in a cyclic process is equal to:
(A) Zero
(B) $\triangle\text{U}$
(C) ΔH
(D) q

Q14 An ideal gas is taken around the cycle ABCA as shown in $\text{P} - \text{V}$ diagram. The net work done during the cycle is equal to:



(A) $12\text{P}_1\ \text{V}_1$
(B) $6\text{P}_1\ \text{V}_1$
(C) $5\text{P}_1\ \text{V}_1$
(D) $\text{P}_1\ \text{V}_1$

Q15 For monoatomic ideal gas, the exact value of the ratio of $C_{p,\,m}$ and $C_{v,\,m}$ is:
(A) $\frac{5}{3}$
(B) $\frac{7}{5}$
(C) $\frac{9}{7}$
(D) $\frac{9}{11}$

Q16 Molar heat capacity of water in equilibrium with ice at constant pressure is:
(A) Zero
(B) Infinity
(C) $40.45\ \text{kJ}\ \text{K}^{-1}\ \text{mol}^{-1}$
(D) $75.48\text{JK}^{-1}\ \text{mol}^{-1}$

Q17 How many calories are required to heat 40 grams of argon from 40 to 100°C at constant volume? $(\text{R} = 2\text{cal/molK})$
(A) 120 cal
(B) 2400 cal
(C) 1200 cal
(D) 180 cal

Q18 $4.48\ \text{L}$ of an ideal gas at STP requires 12.0 calories to raise its temperature by 15°C at constant volume. The C_p of the gas is:
(A) $3\ \text{cal}$
(B) $4\ \text{cal}$
(C) $7\ \text{cal}$
(D) $6\ \text{cal}$

Q19 Calculate the amount of heat required to raise the temperature of $5\ \text{g}$ of iron from 25°C to 75°C. The specific heat capacity of iron is $0.45\ \text{J/g}$.
(A) 112.1
(B) 112.5
(C) 112.9
(D) 112

Q20 For two mole of an ideal gas
(A) $\text{C}_\text{v} - \text{C}_\text{p} = \text{R}$
(B) $\text{C}_\text{p} - \text{C}_\text{v} = 2\text{R}$
(C) $\text{C}_\text{p} - \text{C}_\text{v} = \text{R}$
(D) $\text{C}_\text{v} - \text{C}_\text{p} = 2\text{R}$

Answer Key

Q1	(D)
Q2	(A)
Q3	(B)
Q4	(D)
Q5	(A)
Q6	(D)
Q7	(A)
Q8	(A)
Q9	(C)
Q10	(B)
Q11	(B)
Q12	(B)
Q13	(D)
Q14	(C)
Q15	(A)
Q16	(B)
Q17	(D)
Q18	(D)
Q19	(B)
Q20	(B)