

SINGLE CORRECT OPTION TYPE

- Mathematical representation of 1st law of thermodynamics
(A) $Q = \Delta E + W$ (B) $\Delta H = \Delta E + p\Delta V$ (C) $W = Q \times \Delta E$ (D) $\Delta E = \Delta H + V\Delta P$
- In a closed insulated container, a liquid is stirred with a paddle to increase the temperature, which of the following is true?
(A) $\Delta U = W \neq 0, q = 0$ (B) $\Delta U = W = 0, q \neq 0$
(C) $\Delta U = 0, W = q \neq 0$ (D) $W = 0, \Delta U = q \neq 0$
- Which is an extensive property of the system?
(A) viscosity (B) number of moles (C) temperature (D) refractive index
- In which of the following pairs, all properties belong to same category (all extensive or all intensive)?
(A) mass, volume, specific heat (B) temperature, concentration, volume
(C) Heat capacity, concentration, volume (D) Enthalpy, entropy, volume
- For an endothermic reaction, if ΔS is positive, then reaction is _____,
(A) feasible when $T\Delta S > \Delta H$ (B) feasible when $\Delta H > T\Delta S$
(C) feasible at all temperatures (D) not feasible at all
- $\Delta U = 0$, for
(A) cyclic process, adiabatic process (B) isothermal, adiabatic process
(C) cyclic process, isothermal process (D) isochoric process, isothermal process
- The work done in heating 1 mole of an ideal gas at constant pressure from 15°C to 25°C is _____.
(A) 1.987 cal (B) 198.7 cal (C) 19.87 cal (D) 9.935 cal
- C_v values of monoatomic and diatomic gases respectively are
(A) $\frac{1}{2}R, \frac{3}{2}R$ (B) $\frac{3}{2}R, \frac{5}{2}R$ (C) $\frac{5}{2}R, \frac{7}{2}R$ (D) $\frac{3}{2}R, \frac{3}{2}R$
- For the reaction,
 $C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(l)$
 $\Delta E = -1415$ KJ. The ΔH at 27°C is
(A) -1415 KJ (B) -1420 KJ (C) +1420 KJ (D) +1410 KJ
- Which of the following is an endothermic reaction.
(A) $N_{2(g)} + 3H_{2(g)} - 92KJ \rightarrow 2NH_{3(g)}$ (B) $N_{2(g)} + O_{2(g)} + 180.8KJ \rightarrow 2NO_{(g)}$
(C) $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)} + 184.6KJ$ (D) $C(\text{graphite}) + 2H_{2(g)} \rightarrow CH_{4(g)} + 74.8KJ$
- When 10 grams of methane is completely burnt in oxygen, the heat evolved is 560 KJ. What is the heat of combustion of methane (in $KJ mol^{-1}$)
(A) -1120 (B) -968 (C) -896 (D) -560
- If ΔH_{vap} of pure water at 100°C is 40.627 KJ/mol. The value of ΔS_{vap} is
(A) 208.91 KJ/mol (B) $108.91J \cdot K^{-1} \cdot mol^{-1}$
(C) $606.27J \cdot K^{-1} \cdot mol^{-1}$ (D) $808.27J \cdot K^{-1} \cdot mol^{-1}$

13. The following data is known about the melting of a compound AB. $\Delta H = 9.2 \text{KJ}\cdot\text{mol}^{-1}$, $\Delta S = 0.008 \text{KJ}\cdot\text{K}^{-1}\cdot\text{mol}^{-1}$. Its melting point is
 (A) 736 K (B) 1050 K (C) 1150 K (D) 1050°C
14. Given that

$$\text{Zn} + \frac{1}{2}\text{O}_2 \rightarrow \text{ZnO} + 35.25 \text{KJ}$$

$$\text{HgO} \rightarrow \text{Hg} + \frac{1}{2}\text{O}_2 - 9.11 \text{KJ}$$
 The heat of the reaction. $\text{Zn} + \text{HgO} \rightarrow \text{ZnO} + \text{Hg}$ is
 (A) - 26.14 KJ (B) 44.39 KJ (C) - 44.39 KJ (D) 26.14 KJ
15. The energy evolved when 3.9 grams benzene is burnt in the air is 163.2 KJ. The heat of combustion of benzene is
 (A) 32.46 KJ (B) 16.32 KJ (C) 326.4 KJ (D) - 3264 KJ
16. The standard Gibb's free energy change, ΔG° is related to equilibrium constant, k_{eq} is
 (A) $k_{\text{eq}} = -RT \ln \Delta G^\circ$ (B) $k_{\text{eq}} = \left[\frac{e}{RT} \right]^{\Delta G^\circ}$ (C) $k_{\text{eq}} = -\frac{\Delta G}{RT}$ (D) $k_{\text{eq}} = e^{-(\Delta G^\circ/RT)}$
17. The relationship between ΔH and ΔE for the reaction $\text{PCl}_{3(g)} + \text{Cl}_{2(g)} \rightarrow \text{PCl}_{5(g)}$ is given as
 (A) $\Delta H = \Delta E + RT$ (B) $\Delta H = \Delta E - RT$ (C) $\Delta H = \Delta E - 2RT$ (D) $\Delta H = \Delta E + 2RT$
18. For the system $\text{S}_{(s)} + \text{O}_{2(g)} \rightarrow \text{SO}_{2(g)}$
 (A) $\Delta H > \Delta E$ (B) $\Delta E > \Delta H$ (C) $\Delta H = 0$ (D) $\Delta H = \Delta E$
19. In order to decompose 9 grams of water 142.5 KJ heat is required. Hence the enthalpy of formation of water is
 (A) +142.5 KJ (B) -142.5 KJ (C) +285 KJ (D) -285 KJ
20. The ' γ ' for inert gas is
 (A) 1.33 (B) 1.66 (C) 2.33 (D) 1.99

INTEGER TYPE

21. If the enthalpy of neutralisation by HCl by NaOH is - 57 KJ/mol and with NH_4OH is -50KJ/mol. Calculate the enthalpy of ionisation of NH_4OH ?
22. The number of moles of O_2 required for the complete combustion of 32 grams methane gas _____
23. The number of extensive properties from the following is _____.
 (a) molar entropy (b) specific heat (c) heat capacity (d) volume
 (e) number of moles (f) refractive index
24. For 1 mole of an ideal gas: $C_p - C_v = \text{____} R$
25. For the reaction $\frac{1}{2}\text{N}_2 + \frac{3}{2}\text{H}_2 \longrightarrow \text{NH}_3$; $\Delta E = \Delta H + xRT$; O_2 what is the value of x _____.

KEY

1. A	2. A	3. B	4. D	5. A
6. C	7. C	8. B	9. B	10. B
11. C	12. B	13. C	14. A	15. D
16. D	17. B	18. D	19. D	20. B
21. 7	22. 4	23. 3	24. 1	25. 1

* *Wish You^{est} all the Best* *