

QB365 Question Bank Software Study Materials

Thermodynamics 50 Important 1 Marks Questions With Answers (Book Back and Creative)

11th Standard

Chemistry

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

- 1) The amount of heat exchanged with surrounding at constant temperature pressure is given by the quantity _____
(a) ΔE **(b) ΔH** (c) ΔS (d) ΔG
- 2) All the naturally occurring processes proceed spontaneously in a direction which leads to _____
(a) decrease in entropy (b) increase in enthalpy (c) increase in free energy **(d) decrease in free energy**
- 3) In an adiabatic process, which of the following is true ?
(a) $q = w$ **(b) $q = 0$** (c) $\Delta E = q$ (d) $P\Delta V = 0$
- 4) In a reversible process, the change in entropy of the universe is _____.
(a) > 0 (b) > 0 (c) < 0 **(d) $= 0$**
- 5) In an adiabatic expansion of an ideal gas _____
(a) $w = -\Delta U$ (b) $w = \Delta U + \Delta H$ (c) $\Delta U = 0$ (d) $w = 0$
- 6) The intensive property among the quantities below is _____
(a) mass (b) volume (c) enthalpy **(d) $\frac{mass}{volume}$**
- 7) An ideal gas expands from the volume of $1 \times 10^{-3} \text{ m}^3$ to $1 \times 10^{-2} \text{ m}^3$ at 300 K against a constant pressure at $1 \times 10^5 \text{ Nm}^{-2}$. The work done is _____
(a) - 900 J (b) 900 kJ (c) 270 kJ (d) -900 kJ
- 8) Heat of combustion is always _____
(a) positive **(b) negative** (c) zero (d) either positive or negative
- 9) The heat of formation of CO and CO₂ are - 26.4 kcal and - 94 kcal, respectively. Heat of combustion of carbon monoxide will be _____
(a) + 26.4 kcal **(b) - 67.6 kcal** (c) - 120.6 kcal (d) + 52.8 kcal
- 10) $\text{C(diamond)} \rightarrow \text{C(graphite)}$, $\Delta H = -ve$, this indicates that _____
(a) graphite is more stable than diamond (b) graphite has more energy than diamond (c) both are equally stable
(d) stability cannot be predicted
- 11) The enthalpies of formation of Al₂O₃ and Cr₂O₃ are -1596 kJ and -1134 kJ, respectively. ΔH for the reaction $2\text{Al} + \text{Cr}_2\text{O}_3 \rightarrow 2\text{Cr} + \text{Al}_2\text{O}_3$ is _____
(a) - 1365 kJ (b) 2730 kJ (c) - 2730 kJ **(d) - 462 kJ**
- 12) Which of the following is not a thermodynamic function ?
(a) internal energy (b) enthalpy (c) entropy **(d) frictional energy**
- 13) If one mole of ammonia and one mole of hydrogen chloride are mixed in a closed container to form ammonium chloride gas, then _____
(a) $\Delta H > \Delta H^\ddagger$ (b) $\Delta H - \Delta H^\ddagger = 0$ (c) $\Delta H + \Delta H^\ddagger = 0$ **(d) $\Delta H < \Delta H^\ddagger$**

- 14) Change in internal energy, when 4 kJ of work is done on the system and 1 kJ of heat is given out by the system is _____
 (a) +1 kJ (b) - 5 kJ **(c) +3 kJ** (d) - 3 kJ
- 15) The work done by the liberated gas when 55.85 g of iron (molar mass 55.85 g mol⁻¹) reacts with hydrochloric acid in an open beaker at 25°C _____
(a) - 2.48 kJ (b) -2.22 kJ (c) +2.22 kJ (d) + 2.48 kJ
- 16) The value of ΔH for cooling 2 moles of an ideal monatomic gas from 125° C to 25° C at constant pressure will be [given $C_p = \frac{5}{2}R$] _____
 (a) - 250 R **(b) - 500 R** (c) 500 R (d) + 250 R
- 17) Given that $C_{(g)} + O_{2(g)} \rightarrow CO_{2(g)} \Delta H^\circ = -akJ$; $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)} \Delta H^\circ = -bkJ$; Calculate the ΔH° for the reaction $C_{(g)} + 1/2O_{2(g)} \rightarrow CO_{(g)}$ _____
 (a) $\frac{b+2a}{2}$ (b) 2a-b (c) $\frac{2a-b}{2}$ **(d) $\frac{b-2a}{2}$**
- 18) When 15.68 litres of a gas mixture of methane and propane are fully combusted at 0° C and 1 atmosphere, 32 litres of oxygen at the same temperature and pressure are consumed. The amount of heat of released from this combustion in KJ is _____ (ΔH_c (CH₄) = - 890 KJ mol⁻¹ and ΔH_c (C₃H₈) = - 2220 KJ mol⁻¹)
 (a) - 889 kJ mol⁻¹ (b) - 1390 kJ mol⁻¹ (c) - 3180 kJ mol⁻¹ **(d) - 635.47 kJ mol⁻¹**
- 19) The bond dissociation energy of methane and ethane are 360 kJ mol⁻¹ and 620 kJ mol⁻¹ respectively. Then, the bond dissociation energy of C-C bond is _____
 (a) 170 kJ mol⁻¹ (b) 50 kJ mol⁻¹ **(c) 80 kJ mol⁻¹** (d) 220 kJ mol⁻¹
- 20) The correct thermodynamic conditions for the spontaneous reaction at all temperature is _____
(a) $\Delta H < 0$ and $\Delta S > 0$ (b) $\Delta H < 0$ and $\Delta S < 0$ (c) $\Delta H > 0$ and $\Delta S = 0$ (d) $\Delta H > 0$ and $\Delta S > 0$
- 21) The temperature of the system, decreases in an _____
 (a) Isothermal expansion (b) Isothermal Compression **(c) adiabatic expansion** (d) adiabatic compression
- 22) In an isothermal reversible compression of an ideal gas the sign of q, ΔS and w are respectively _____
 (a) +, -, - (b) -, +, - (c) +, -, + **(d) -, -, +**
- 23) Molar heat of vapourization of a liquid is 4.8 kJ mol⁻¹. If the entropy change is 16 J mol⁻¹ K⁻¹, the boiling point of the liquid is _____
 (a) 323 K **(b) 27° C** (c) 164 K (d) 0.3 K
- 24) ΔS is expected to be maximum for the reaction _____
 (a) $Ca_{(s)} + 1/2O_{2(g)} \rightarrow CaO_{(s)}$ (b) $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ (c) $N_{2(g)} + O_{2(g)} \rightarrow 2NO_{(g)}$ **(d) $CaCO_{3(s)} \rightarrow CaO_{(s)} + CO_{2(g)}$**
- 25) The values of ΔH and ΔS for a reaction are respectively 30 kJ mol⁻¹ and 100 JK⁻¹ mol⁻¹. Then the temperature above which the reaction will become spontaneous is _____
(a) 300 K (b) 30 K (c) 100 K (d) 200 C
- 26) For a cyclic process involving isothermal expansion of an ideal gas.
(a) $\Delta U = qV$ (b) $\Delta U = w$ (c) $\Delta U = q + w$ (d) $\Delta U = 0$
- 27) SI unit of molar heat capacity is _____
 (a) J mol⁻¹ (b) KJ mol⁻¹ **(c) JK⁻¹ mol⁻¹** (d) JK⁻¹
- 28) Hess's law can be applied to calculate _____ of reactions.
(a) enthalpy (b) entropy (c) free energy (d) internal energy

- 29) Change in enthalpy is _____
- (a) **Heat absorbed at constant pressure** (b) The total energy change at constant pressure and temperature
(c) Equal to change in internal energy at constant volume (d) All the above
- 30) The change in enthalpy of $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ is called _____
- (a) Heat of reaction (b) **Heat of neutralization** (c) Heat of formation (d) Heat of liquid
- 31) % efficiency can be calculated using the formula _____
- (a) $\frac{\text{output}}{\text{input}}$ (b) $\frac{\text{input}}{\text{output}} \times 100$ (c) $\frac{\text{input}}{\text{output}}$ (d) **$\frac{\text{output}}{\text{input}} \times 100$**
- 32) Thermodynamics does not deal with _____
- (a) the feasibility of a chemical reaction (b) energy changes involved in chemical reaction
(c) the extent to which a chemical reaction process (d) **the rate at which a reaction occurs**
- 33) What is correct about ΔG _____
- (a) **It is zero for reversible reaction** (b) It is positive for spontaneous reactions
(c) It is negative for non-spontaneous reaction (d) It is zero for non-spontaneous reaction
- 34) Identify the incorrect statement among the following _____
- (a) Entropy $ds = dq_{\text{rev}}/T$ (b) **ΔS is maximum for a reversible process** (c) Entropy is a measure of randomness
(d) Entropy of pure crystal is zero
- 35) Calculate the entropy change during the melting of one mole of ice into water at 0°C and 1 atm pressure. Enthalpy of fusion of ice is 6008J mole^{-1} .
- (a) **$22.007\text{ J K}^{-1}\text{ mole}^{-1}$** (b) 22.007 J K mole (c) $220.07\text{ J K}^{-1}\text{ mole}^{-1}$ (d) $2.2007\text{ J K}^{-1}\text{ mole}$
- 36) Heat of neutralization of a strong acid by a strong base is a constant value because:
- (a) **only H^+ and OH^- ions react in every case** (b) the strong base and strong acid react completely
(c) the strong base and strong acid react in aqueous solution (d) salt formed does not hydrolyse
- 37) If ΔU_f° of formation of $\text{CH}_4(\text{g})$ at a certain temperature is -393 kJ mol^{-1} , then, the value of ΔH_f° is _____
- (a) zero (b) **$< \Delta U_f^\circ$** (c) $> \Delta U_f$ (d) equal to U_f°
- 38) Calorific value of hydrogen gas is -143 kJ mol^{-1} . The standard enthalpy of formation of H_2O will be _____
- (a) -143 kJ mol^{-1} (b) $+143\text{ kJ mol}^{-1}$ (c) **-286 kJ mol^{-1}** (d) $+286\text{ kJ mol}^{-1}$
- 39) The following two reactions are known:
- (i) $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{Co}(\text{g}) \rightarrow 2\text{Fe}(\text{s}) + 3\text{CO}_2(\text{g}); \Delta H = -26.8\text{ kJ}$
(ii) $\text{FeO}(\text{s}) + \text{Cp}(\text{g}) \rightarrow \text{Fe}(\text{s}) + \text{CO}_2(\text{g}); \Delta H = -16.5\text{ kJ}$
The value for ΔH for the following reaction is
 $\text{Fe}_2\text{O}_3(\text{s}) + \text{Co}(\text{g}) \rightarrow 2\text{FeO}(\text{s}) + \text{CO}_2(\text{g})$ is _____
- (a) $+10.3\text{ kJ}$ (b) -43.3 kJ (c) -10.3 kJ (d) **6.2 kJ**
- 40) Consider the following reactions:
- (i) $\text{O}_2(\text{g}) + 2\text{SO}_2(\text{g}) \rightarrow 2\text{SO}_3(\text{g})$
(ii) $\text{CaC}_2\text{O}_4(\text{s}) \rightarrow \text{CaCO}_3(\text{s}) + \text{CO}(\text{g})$
(iii) $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{g})$
Choose the correct statement:
- (a) In all the reaction's entropy increases (b) **In (i) and (iii) entropy decreases while in (ii) entropy increases**
(c) In (i) and (ii) entropy decreases while in (iii) entropy increases
(d) In (i) and (iii) entropy decreases while in (i) entropy increases.

- 41) The first law of thermodynamics states that _____
 (a) $\Delta U = q - w$ **(b) $\Delta U = q + w$** (c) $\Delta U + q = w$ (d) $\Delta U = w - q$
- 42) Anything which separates the system from its surroundings is called _____
(a) Boundary (b) Partition (c) Universe (d) Outer layer
- 43) Hot water in a thermos flask is an example of _____
 (a) closed system (b) open system **(c) isolated system** (d) isochoric system
- 44) Which one of the following is not an extensive property?
 (a) Density (b) Molarity (c) Molality **(d) Mole**
- 45) The heat of neutralization of a strong acid and strong base is around _____
 (a) +57.32 kJ **(b) -57.32 kJ** (c) -3227 kJ mol⁻¹ (d) +3227 kJ mol⁻¹
- 46) An adiabatic expansion of an ideal gas always has _____.
 (a) increase in temperature **(b) $q = 0$** (c) $W = 0$ (d) $\Delta E = 0$
- 47) Volume is an example of a/an _____.
 (a) chemical property (b) intensive property **(c) extensive property** (d) none
- 48) $-W = ?$
(a) $F \times x$ (b) $Z \times x$ (c) $Z^2 x$ (d) $F^2 x$
- 49) The amount of heat absorbed by one mole of the substance to raise its temperature by 1 Kelvin is called _____.
 (a) C_r **(b) C_m** (c) C_d (d) C_α
- 50) The enthalpies of reactions are calculated using _____.
 (a) < div >Gay lussac's law< /div > **(b) < div >Hess's law< /div >** (c) < div >Dalton's law< /div >
 (d) < div >Charle's law< /div >