



Dnyansagar Coaching Classes, A'nagar

MHT-CET - UNIT TEST

Sub- Chemistry I

Unit - Thermodynamics and Chemical Energetics

Time - 45 min.

Max Marks - 50

- 1) 3 moles of an ideal gas ($C_v = 5 \text{ cal k}^{-1} \text{ mol}^{-1}$) at 10 atm and 0°C are converted to 2.0 at 50°C . The ΔE for the process is:
a) 150 cal. b) 300 cal.
c) 750 cal. d) 1500 cal.
- 2) Heat of neutralisation of an acid and a base is highest when :
a) Both the acid and base are weak
b) Both the acid and base are strong
c) The acid is strong and base is weak
d) The acid is weak and base is strong
- 3) The workdone when 1 mole of a gas expands reversibly and isothermally from 5 atm to 1 atm at 300K is ;
a) - 4050 J b) + 4015 J
c) Zero d) 150 J
- 4) An extensive property becomes intensive by
a) Specifying its position
b) Specifying its temperature
c) Specifying it in unit amount of matter
d) Any of these
- 5) When the total energy change in isothermal cycle is zero it represents.
a) A reversible cycle
b) A thermodynamic equilibrium
c) An adiabatic change
d) An irreversible cycle
- 6) A process during which there is no heat change is called :
a) An adiabatic process
b) Reversible process
c) Irreversible process
d) None of these
- 7) For an adiabatic process, according to first law of thermodynamics,
a) $\Delta E = -W$ b) $\Delta E = W$
c) $\Delta E = q - W$ d) None of these
- 8) Isochoric process is carried out at constant
a) Volume
b) Pressure
c) Both a) and b)
d) None of these
- 9) A thermos flask is an example of
a) Isolated system
b) Closed system
c) Open system
d) Heterogeneous system
- 10) Fusion of ice is the example of an
a) Adiabatic process
b) Isothermal process
c) Irreversible process
d) None of these
- 11) Which of the following is a state function
a) q
b) w
c) Heat capacity
d) Specific heat capacity
- 12) In which of the following reactions, the enthalpy is always negative ?
a) Formation reaction
b) Sublimation reaction
c) Combustion reaction
d) Heat of a reaction

- 13) ($\Delta H - \Delta U$) for the formation of CO form its element of 298k is ($R = 8.31 \text{ \&J K}^{-1} \text{ mol}^{-1}$)
- 1238.78 J mol⁻¹
 - 2477.57 J mol⁻¹
 - 2477.57 J mol⁻¹
 - 1238.78 J mol⁻¹
- 14) For the reversible reaction $A + B + \text{heat} \rightleftharpoons C + D$, which of the following statements is true?
- Forward reaction is endothermic
 - Forward reaction is exothermic
 - Forward and backward reactions are endothermic
 - Backward reaction is endothermic
- 15) Which of the following explains heat of reaction as a state function?
- Avogadro's law
 - Kirchoff's law
 - Hess's law
 - Charles's law
- 16) In decomposition reactions, enthalpy of products is always :
- Greater than the enthalpy of reactants
 - Less than the enthalpy of reactants
 - Same that the enthalpy of reactants
 - Infinite
- 17) For n moles of an ideal gas
- $C_p - C_v = R$
 - $C_p - C_v = R/n$
 - $C_v - C_p = -nR$
 - $C_p - C_v = 0$
- 18) The heat of neutralization is maximum for the reaction :
- NaOH and HCl
 - NaOH and CH₃COOH
 - HCl and NH₄OH
 - NH₄OH and CH₃COOH
- 19) Calculate ΔH for the reaction
- $$\text{H}_2\text{O(l)} \rightarrow \text{H}_2\text{(g)} + \frac{1}{2} \text{O}_2\text{(g)}$$
- 571.6 kJ
 - 571.6 kJ
 - 285.8 kJ
 - 285.8 kJ
- 20) Calorific values of food and fuel are determined by -
- Bunsen's ice calorimeter
 - Bomb calorimeter
 - Beckmann's thermometer
 - Spectrophotometer
- 21) Which of the following gases has highest heat of combustion?
- Acetylene
 - Ethylene
 - Ethane
 - Methane
- 22) Flow of the heat occurs from :
- Higher temperature to lower temperature side
 - Lower temperature to lower temperature side
 - Higher pressure to lower pressure side
 - Lower pressure
- 23) For an adiabatic compression of a gas
- $q = +ve$
 - $\Delta E = -ve$
 - $W = +ve$
 - $dT = +ve$
- 24) In a process, a system does 140 J or work on the surrounding and only 40 J of heat is added to the system, hence change in internal energy is :
- 180 J
 - 180 J
 - 100 J
 - 100 J
- 25) Which represents larger amount of energy?
- Calorie
 - Erg
 - Joule
 - Electron - volt
- 26) Thermodynamics deals with
- Inter-conversion of different forms of energy
 - Conversion of all forms energy into heat energy
 - Conversion of heat into work
 - None of these

- 27) **The enthalpy change for the process :**
 $C_{(s)} \longrightarrow C_{(g)}$ **corresponds to enthalpy of**
 a) Fusion b) Sublimation
 c) Combustion d) Vaporisation
- 28) **The heat of formation of compounds :**
 a) Is always positive
 b) Is always negative
 c) May be positive or negative
 d) Is zero in standard state
- 29) **Which of the following pairs has heat of Neutralisation equal to -57.1 kJ ?**
 a) $HNO_3 \cdot KOH$
 b) $HCl \cdot NH_4OH$
 c) $H_2SO_4 \cdot NH_4OH$
 d) $CH_3COOH \cdot NaOH$
- 30) **The enthalpy change for the reaction**
 $\frac{1}{2} H_2(g) \longrightarrow H(g)$ **is known as**
 a) Enthalpy of formation of H(g)
 b) Enthalpy of hydration
 c) Enthalpy of neutralisation
 d) Ionisation energy
- 31) **Which of the following is an extensive property**
 a) Entropy b) Pressure
 c) Surface tension d) Viscosity
- 32) **Identify the intensive quantities from the following :**
 a) Enthalpy
 b) Temperature
 c) Volume
 d) Refractive index
- 33) **The evaporation of water is**
 a) Exothermic reaction
 b) Endothermic reaction
 c) A process in which there is no heat change
 d) A process in which there is a chemical reaction
- 34) **A monoatomic neon molecule possesses**
 a) Only potential energy
 b) Potential as well as vibrational energy
 c) Translational as well as potential energy
 d) Vibrational as well as translational energy
- 35) **A system absorbs 640J of heat and does work. The change in internal energy (ΔU) for the process is 380J. The workdone by the system is**
 a) 260 J b) -360 J
 c) 1020 J d) 380 J
- 36) **Which of the following is path function as well as extensive property ?**
 a) Molar heat capacity
 b) Internal energy
 c) Temperature
 d) All of these
- 37) **First law of thermodynamics is the law of :**
 a) Entropy
 b) Free energy
 c) Conservation of energy
 d) None of these
- 38) **When a solid melts there is -**
 a) An increase in enthalpy
 b) A decrease in enthalpy
 c) No change in enthalpy
 d) A decrease in internal energy
- 39) **For reaction**
 $H_2(g) + \frac{1}{2} O_2(g) \longrightarrow H_2O_{(l)} \Delta H = -68kCal.$
The heat change for the decomposition of 7.2 gm of water is
 a) 13.6 kCal b) 27.2 kCal
 c) 54.4 kCal d) -34 kCal

- 40). In the process of evaporation of a liquid
- Enthalpy increses
 - Entropy decreases
 - There is no change in free energy
 - Entropy increases
- 41) Given,
- $$\text{C} + 2\text{S} \rightarrow \text{CS}_2; \Delta \text{H} = 117 \text{ kJ}$$
- $$\text{C} + \text{O}_2 \rightarrow \text{CO}_2; \Delta \text{H} = -393 \text{ kJ}$$
- $$\text{S} + \text{O}_2 \rightarrow \text{SO}_2; \Delta \text{H} = -297 \text{ kJ}$$
- 1104 kJ
 - 807 kJ
 - +807 kJ
 - +1104 kJ
- 42) Crystallisation is
- Spontaneous
 - Non spontaneous
 - At equilibrium
 - Dissolution
- 43) Hess's law is an application of :
- Third law of thermodynamics
 - Zeroth law of thermodynamics
 - First law of thermodynamics
 - None of these
- 44) Which of the following type of energy is not included in the internal energy ?
- Vibrational energy
 - Nuclear energy
 - Gravitational energy
 - Rotational energy
- 45) The enthalpy change for a reaction does not depend upon the :
- Physical state of reactants and products
 - Use of different reactants for the same products
 - Nature of intermediate reaction steps
 - Difference in initial or final temperature of involved substances
- 46) The reversible process is
- Spontaneous process
 - Natural process
 - Fast process
 - Extremely slow process
- 47) Cohesive force between the molecules of solid or liquid is also called as force.
- Mechanical
 - Wander Waal's
 - Molecular
 - Tetra atomic molecules
- 48) An axis of rotation and the line joining the two nuclei of a molecule are :
- Parallel to each other
 - Perpendicular to each other
 - Inclined to each other
 - Overlapped on each other
- 49) Ammonium chloride when dissolved in water leads to cooling sensation. It is accompanied by-
- Increase in enthalpy
 - Decrease in enthalpy
 - No change in enthalpy
 - Both a) or b)
- 50) Hess's law is an application of-
- Third law of thermodynamics
 - Zeroth law of thermodynamics
 - First law of thermodynamics
 - None of these

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Time - 45 min.

Answersheet

Max Marks - 50

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