

## NEET : CHAPTER WISE TEST-5

**SUBJECT :- CHEMISTRY**

**CLASS :- 11<sup>th</sup>**

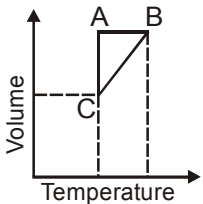
**CHAPTER :- THERMODYNAMICS & THERMOCHEMISTRY**

**DATE.....**

**NAME.....**

**SECTION.....**

### (SECTION-A)

1. Warming ammonium chloride with sodium hydroxide in a test tube is an example of :  
 (A) Closed system  
 (B) Isolated system  
 (C) Open system  
 (D) None of these
2. Which of the following is an intensive property ?  
 (A) Temperature (B) Viscosity  
 (C) Surface tension (D) All of these
3. The internal energy of a substance :  
 (A) increases with increase in temperature  
 (B) decreases with increase in temperature  
 (C) remains constant  
 (D) calculated by  $E = mc^2$
4. In a laboratory, liquid in a thermally insulated container is stirred for one hr, by a mechanical linkage to a in surrounding, for this process :  
 (A)  $W < 0; q = 0$  (B)  $W < 0; q > 0$   
 (C)  $W < 0; q > 0$  (D)  $W > 0; q = 0$
5. A thermodynamic system goes from states (i)  $P_1, V$  to  $2P_1, V$  (ii)  $P, V_1$  to  $P, 2V_1$ . Then work done in the two cases is  
 (A) Zero, Zero (B) Zero,  $-PV_1$   
 (C)  $-PV_1, Zero$  (D)  $-PV_1, -P_1V_1$
6. Five moles of a gas is put through a series of changes as shown graphically in a cyclic process the  $A \rightarrow B, B \rightarrow C$  and  $C \rightarrow A$  respectively are  
  
 (A) Isochoric, Isobaric, Isothermal  
 (B) Isobaric, Isochoric, Isothermal  
 (C) Isothermal, Isobaric, Isochoric  
 (D) Isochoric, Isothermal, Isobaric
7. The first law of thermodynamics is represented by the equation :  
 (A)  $\Delta E = q - W$  (B)  $\Delta E = q + W$   
 (C)  $W = q + \Delta E$  (D)  $q = W + \Delta E$
8. A system absorb 600J of heat and work equivalent to 300J on its surroundings. The change in internal energy is  
 (A) 300 J (B) 400 J  
 (C) 500 J (D) 600 J
9. In an isochoric process the increase in internal energy is  
 (A) Equal to the heat absorbed  
 (B) Equal to the heat evolved  
 (C) Equal to the work done  
 (D) Equal to the sum of the heat absorbed and work done
10. The internal energy change when a system goes from state A to B is 40 kJ/mol. If the system goes from A to B by a reversible path and returns to state A by an irreversible path, what would be the net change in internal energy ?  
 (A) 40 kJ (B)  $> 40$  kJ  
 (C)  $< 40$  kJ (D) Zero
11. Heat exchanged in a chemical reaction at the constant temperature and pressure is known as :  
 (A) Internal energy (B) entropy  
 (C) enthalpy (D) free energy
12. For the isothermal expansion of an ideal gas  
 (A) U and H increases  
 (B) U increases but H decreases  
 (C) H increases but U decreases  
 (D) U and H are unaltered
13. A gas expands isothermally against a constant external pressure of 1 atm from a volume of  $10 \text{ dm}^3$  to a volume of  $20 \text{ dm}^3$ . It absorbs 800 J of thermal energy from its surroundings. The  $\Delta U$  is :  
 (A)  $-312$  J (B)  $+123$  J  
 (C)  $-213$  J (D)  $+231$  J

14. A vessel contains 100 litres of a liquid X. Heat is supplied to the liquid in such a fashion that, Heat given = change in enthalpy. The volume of the liquid increases by 2 litres. If the external pressure is one atm, and 202.6 Joules of heat were supplied then,  
[U - total internal energy]  
(A)  $\Delta U = 0$ ,  $\Delta H = 0$   
(B)  $\Delta U = + 202.6 \text{ J}$ ,  $\Delta H = + 202.6 \text{ J}$   
(C)  $\Delta U = - 202.6 \text{ J}$ ,  $\Delta H = - 202.6 \text{ J}$   
(D)  $\Delta U = 0$ ,  $\Delta H = + 202.6 \text{ J}$
15. The work done in adiabatic process on ideal gas by a constant external pressure would be equal to :  
(A) Zero (B)  $\Delta E$  (C)  $\Delta H$  (D)  $\Delta G$
16. An ideal gas filled at pressure of 2 atm and temp of 300 K, in a balloon is kept in vacuum with in a large insulated container wall of balloon is punctured then container temperature :  
(A) Decreases (B) Increases  
(C) Remain constant (D) Unpredictable
17. If 1 mole of an ideal gas expands isothermally at  $37^\circ\text{C}$  from 15 litres to 25 litres, the maximum work (approximate) obtained is :  
(A) 1303.73 J (B) 1603.26 J  
(C) 1235.30 J (D) 1396.26 J
18. Two moles of Helium gas undergo a reversible cyclic process as shown in figure. Assuming gas to be ideal. What is the work for the process C to D?
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- (A)  $- 800 R \ln 2$  (B) zero  
(C)  $+ 200 R \ln 2$  (D)  $- 600 R \ln 2$
19. The temperature of the system decreases in an  
(A) Adiabatic compression  
(B) Isothermal compression  
(C) Isothermal expansion  
(D) Adiabatic expansion
20.  $\text{NH}_4 \text{Cl} (\text{s}) \longrightarrow \text{NH}_3 (\text{g}) + \text{HCl} (\text{g})$  when the above reaction occurs, the entropy  
(A) remains same  
(B) decrease  
(C) increases  
(D) none of the above
21. Which of the following reactions is associated with negative change in entropy ?  
(A)  $2\text{SO}_3 (\text{g}) \longrightarrow 2\text{SO}_2 (\text{g}) + \text{O}_2 (\text{g})$   
(B)  $\text{C}_2\text{H}_6 (\text{g}) \longrightarrow \text{C}_2\text{H}_4 (\text{g}) + \text{H}_2 (\text{g})$   
(C)  $2\text{C} (\text{s, graphite}) + \text{O}_2 (\text{g}) \longrightarrow 2\text{CO} (\text{g})$   
(D)  $3\text{C}_2\text{H}_2 (\text{g}) \longrightarrow \text{C}_6\text{H}_6 (\text{l})$
22. Which one of the following has  $\Delta S^\circ$  greater than zero ?  
(A)  $\text{CaO} (\text{s}) + \text{CO}_2 (\text{g}) \rightleftharpoons \text{CaCO}_3 (\text{s})$   
(B)  $\text{NaCl} (\text{aq}) \rightleftharpoons \text{NaCl} (\text{s})$   
(C)  $\text{NaNO}_3 (\text{s}) \rightleftharpoons \text{Na}^+ (\text{aq}) + \text{NO}_3^- (\text{aq})$   
(D)  $\text{N}_2 (\text{g}) + 3\text{H}_2 (\text{g}) \rightleftharpoons 2\text{NH}_3 (\text{g})$
23. For the gas - phase decomposition,  $\text{PCl}_5 (\text{g}) \xrightarrow{\Delta} \text{PCl}_3 (\text{g}) + \text{Cl}_2 (\text{g})$  :  
(A)  $\Delta H < 0$ ,  $\Delta S < 0$   
(B)  $\Delta H > 0$ ,  $\Delta S > 0$   
(C)  $\Delta H > 0$ ,  $\Delta S < 0$   
(D)  $\Delta H < 0$ ,  $\Delta S > 0$
24. When two mole of an ideal gas ( $C_{p,m} = \frac{5}{2}R$ ) heated from 300 K to 600 K at constant pressure. The change in entropy of gas ( $\Delta S$ ) is :  
(A)  $\frac{3}{2} R \ln 2$  (B)  $-\frac{3}{2} R \ln 2$   
(C)  $5R \ln 2$  (D)  $\frac{5}{2} R \ln 2$
25. In an irreversible process taking place at constant T and P and in which only pressure-volume work is being done, the change in Gibbs free energy ( $dG$ ) and change in entropy ( $dS$ ), satisfy the criteria :  
(A)  $(dS)_V, E < 0$ ,  $(dG)_T, P < 0$   
(B)  $(dS)_V, E > 0$ ,  $(dG)_T, P < 0$   
(C)  $(dS)_V, E = 0$ ,  $(dG)_T, P = 0$   
(D)  $(dS)_V, E = 0$ ,  $(dG)_T, P > 0$

26. Consider the  $\Delta G^\circ_f$  and  $\Delta H^\circ_f$  (kJ/mol) for the following oxides. Which oxide can be most easily decomposed to form the metal and oxygen gas ?  
 (A) ZnO ( $\Delta G^\circ = -318.4$ ,  $\Delta H^\circ = -348.3$ )  
 (B) Cu<sub>2</sub>O ( $\Delta G^\circ = -146.0$ ,  $\Delta H^\circ = -168.8$ )  
 (C) HgO ( $\Delta G^\circ = -58.5$ ,  $\Delta H^\circ = -90.8$ )  
 (D) PbO ( $\Delta G^\circ = -187.9$ ,  $\Delta H^\circ = -217.3$ )
27. A reaction has  $\Delta H = -33$  kJ and  $\Delta S = -58$  J/K. This reaction would be :  
 (A) spontaneous at all temperatures  
 (B) non-spontaneous at all temperatures  
 (C) spontaneous above a certain temperature  
 (D) spontaneous below a certain temperature
28. For which of the following change  $\Delta H \neq \Delta E$  ?  
 (A)  $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \longrightarrow 2\text{HI}(\text{g})$   
 (B)  $\text{HCl}(\text{aq}) + \text{NaOH}(\text{aq}) \longrightarrow \text{NaCl}(\text{aq}) + \text{H}_2\text{O}(\text{l})$   
 (C)  $\text{C}(\text{s}) + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$   
 (D)  $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$
29.  $2\text{C} + \text{O}_2 \rightarrow 2\text{CO}$ ;  $\Delta H = -220$  kJ Which of the following statement is correct for this reaction  
 (A) Reaction is endothermic  
 (B) Reaction is exothermic  
 (C) Reaction needs no initiation  
 (D) All of these are correct
30. In the exothermic reaction the enthalpy of reaction is always :  
 (A) zero (B) positive  
 (C) negative (D) none of these
31. The enthalpy change for the reaction of 5 liter of ethylene with 5 liter of H<sub>2</sub> gas at 1.5 atm pressure is  $\Delta H = -0.5$  kJ. The value of  $\Delta U$  will be : (1 atm Lt = 100 J)  
 (A) - 1.25 kJ (B) + 1.25 kJ  
 (C) 0.25 kJ (D) - 0.25 kJ
32. The species which by definition has zero standard molar enthalpy of formation at 298 K is :  
 (A) Br<sub>2</sub>(g) (B) Cl<sub>2</sub>(g)  
 (C) H<sub>2</sub>O(g) (D) CH<sub>4</sub>(g)
33. Thermodynamically, most stable form of phosphorus is :  
 (A) Red (B) Black  
 (C) White (D) Yellow
34. The heat of formation of CO(g) and CO<sub>2</sub>(g) are  $\Delta H = -110$  and  $\Delta H = -393$  kJ mol<sup>-1</sup> respectively. What is the heat of reaction ( $\Delta H$ ) (in kJ mol<sup>-1</sup>) for the following reaction ?  

$$\text{CO}(\text{g}) + \frac{1}{2} \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$$
  
 (A) - 504 (B) - 142.5  
 (C) - 283 (D) 504
35. The standard heat of combustion of solid boron is equal to :  
 (A)  $\Delta H^\circ_f(\text{B}_2\text{O}_3)$   
 (B)  $\frac{1}{2} \Delta H^\circ_f(\text{B}_2\text{O}_3)$   
 (C)  $2\Delta H^\circ_f(\text{B}_2\text{O}_3)$   
 (D)  $\frac{1}{3} \Delta H^\circ_f(\text{B}_2\text{O}_3)$

#### (SECTION-B)

36. For the following reaction,  
 $\text{C}(\text{diamond}) + \text{O}_2 \longrightarrow \text{CO}_2(\text{g})$ ;  $\Delta H = -94.3$  kcal/mol  
 $\text{C}(\text{graphite}) + \text{O}_2 \longrightarrow \text{CO}_2(\text{g})$ ;  $\Delta H = -97.6$  kcal/mol  
 The heat required to change 1 g of C (diamond)  $\longrightarrow$  C (graphite) is  
 (A) 1.59 kcal (B) 0.1375 kcal  
 (C) 0.55 kcal (D) 0.275 kcal
37. The values of heat of combustion of ethane (C<sub>2</sub>H<sub>6</sub>) and ethyne (C<sub>2</sub>H<sub>2</sub>) are - 341 and - 310 Kcal respectively. Then which of the following is better fuel on mass basis :  
 (A) C<sub>2</sub>H<sub>2</sub> (B) C<sub>2</sub>H<sub>6</sub>  
 (C) Both (A) & (B) (D) None of these
38. The difference between  $\Delta H$  and  $\Delta E$  on a molar basis for the combustion of Methane gas at T K (kelvin) would be :  
 (A) zero (B) -RT  
 (C) -2RT (D) -3RT
39. The enthalpy of solution of NaOH (s) in water is - 41.6 kJ/mole when NaOH is dissolved in water then the temperature of water :  
 (A) Increase (B) Decrease  
 (C) Does not change (D) Fluctuates

40. The enthalpy of neutralization of which of the following acid & base is nearly  $-13.6$  kcal.  
 (A) HCN and NaOH  
 (B)  $\text{CH}_3\text{COOH}$  and  $\text{NH}_4\text{OH}$   
 (C) HCl and KOH  
 (D) HCl and  $\text{NH}_4\text{OH}$
41. If heat of dissociation of  $\text{CHCl}_2\text{COOH}$  is  $0.7$  kcal/mole then  $\Delta H$  for the reaction :  
 $\text{CHCl}_2\text{COOH} + \text{KOH} \longrightarrow \text{CHCl}_2\text{COOK} + \text{H}_2\text{O}$   
 (A)  $-13$  kcal (B)  $+13$  kcal  
 (C)  $-14.4$  kcal (D)  $-13.7$  kcal
42. Enthalpy of neutralisation of  $\text{CH}_3\text{COOH}$  by NaOH is  $-50.6$  kJ/mol and the heat of neutralisation of a strong acid with NaOH is  $-55.9$  kJ/mol. The value of  $\Delta H$  for the ionisation of  $\text{CH}_3\text{COOH}$  is :  
 (A)  $3.5$  kJ / mol (B)  $4.6$  kJ / mol  
 (C)  $5.3$  kJ / mol (D)  $6.4$  kJ / mol
43. For which one of the following reaction does the molar enthalpy change of a reaction corresponds to Lattice energy of KBr ?  
 (A)  $\text{KBr(s)} \longrightarrow \text{K(s)} + \frac{1}{2}\text{Br}_2(\text{g})$   
 (B)  $\text{KBr(g)} \longrightarrow \text{K(g)} + \text{Br(g)}$   
 (C)  $\text{KBr(s)} \longrightarrow \text{K}^+(\text{g}) + \text{Br}^-(\text{g})$   
 (D)  $\text{KBr(g)} \longrightarrow \text{K}^+(\text{g}) + \text{Br}^-(\text{g})$
44. Calculate the lattice energy for the reaction  
 $\text{Li}^+(\text{g}) + \text{Cl}^-(\text{g}) \longrightarrow \text{LiCl(s)}$   
 given that  
 $\Delta H_{\text{sub}}(\text{Li}) = 160$  ;  $\Delta H_{\text{diss}}(\text{Cl}_2) = 244$   
 ;  $\text{IP}(\text{Li}) = 520$  ;  
 $E_{\text{A}}(\text{Cl}) = -365$  and  $\Delta H_{\text{f}}(\text{LiCl}) = -400$  (all in  $\text{kJ mole}^{-1}$ )  
 (A)  $-837$  (B)  $-959$   
 (C)  $-1567$  (D)  $-37$
45. If enthalpy of dissociation of  $\text{CH}_4(\text{g})$  and  $\text{C}_2\text{H}_6(\text{g})$  into gaseous atoms are  $320$  and  $600$  calories respectively then bond energy of C-C bond is :  
 (A)  $80$  cal (B)  $40$  cal  
 (C)  $60$  cal (D)  $120$  cal
46. AB,  $\text{A}_2$  and  $\text{B}_2$  are diatomic molecules. If the bond enthalpies of  $\text{A}_2$ , AB &  $\text{B}_2$  are in the ratio  $1 : 1 : 0.5$  and enthalpy of formation of AB from  $\text{A}_2$  and  $\text{B}_2$  is  $-100$   $\text{kJ/mol}^{-1}$ . What is the bond enthalpy of  $\text{A}_2$ .  
 (A)  $400$  kJ/mol (B)  $200$  kJ/mol  
 (C)  $100$  kJ/mol (D)  $300$  kJ/mol
47. Heat of hydrogenation of ethene is  $x_1$  and that of benzene is  $x_2$ . Hence resonance energy is -  
 (A)  $x_1 - x_2$  (B)  $x_1 + x_2$   
 (C)  $3x_1 - x_2$  (D)  $x_1 - 3x_2$
48. **A** : For an isothermal reversible process  $Q = -w$  i.e. work done by the system equals the heat absorbed by the system.  
**R** : Enthalpy change ( $\Delta H$ ) is zero for isothermal process.  
**(A)** Assertion is true, Reason is true and Reason is correct explanation for Assertion.  
**(B)** Assertion is true, Reason is true and Reason is not correct explanation for Assertion.  
**(C)** Assertion is true, Reason is false.  
**(D)** Assertion is false, Reason is true.  
 (A) A (B) B (C) C (D) D
49. **A** : If a refrigerator's door is kept open room gets cooled.  
**R** : Material kept inside the refrigerator remains cool.  
**(A)** Assertion is true, Reason is true and Reason is correct explanation for Assertion.  
**(B)** Assertion is true, Reason is true and Reason is not correct explanation for Assertion.  
**(C)** Assertion is true, Reason is false.  
**(D)** Assertion is false, Reason is true.  
 (A) A (B) B (C) C (D) D
50. **A** : Internal energy is an extensive property.  
**R** : Internal energy depends upon the amount of the system.  
**(A)** Assertion is true, Reason is true and Reason is correct explanation for Assertion.  
**(B)** Assertion is true, Reason is true and Reason is not correct explanation for Assertion.  
**(C)** Assertion is true, Reason is false.  
**(D)** Assertion is false, Reason is true.  
 (A) A (B) B (C) C (D) D