DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : CHEMISTRY**
DATE : **DPP No. : 4**

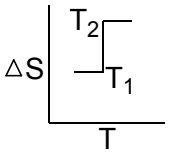
Topic :- THERMODYNAMICS

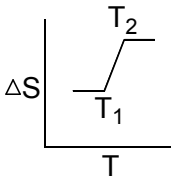
1. Which is an extensive property of the system?
   a) Temperature b) Volume c) Refractive index d) Viscosity
2. For the reaction; $C_2H_5OH(l) + 3O_2(g) \longrightarrow 2CO_2(g) + 3H_2O(l)$ which one is true?
   a) $\Delta H = \Delta U - RT$
   b) $\Delta H = \Delta U + RT$
   c) $\Delta H = \Delta U + 2RT$
   d) $\Delta H = \Delta U - 2RT$
3. The heat atomisation of $PH_3(g)$ is 228 kcal per mol and that of $P_2H_4(g)$is 335 kcal per mol. The energy of P — P bond is
   a) 102 kcal/mol b) 31 kcal/mol c) 26 kcal/mol d) 204 kcal/mol
4. If, $H_2(g) + Cl_2(g) \rightarrow 2HCl$; $\Delta H^\circ = -44$ kcal
   $2Na(s) + 2HCl(g) \rightarrow 2NaCl(s) + H_2(g)$;
   $\Delta H = -152$ kcal then,
   $Na(s) + 0.5\ Cl_2(g) \rightarrow NaCl(s)$; $\Delta H^\circ = ?$
   a) 108 kcal
   b) 196 kcal
   c) −98 kcal
   d) 54 kcal
5. From the reaction, $P_{(white)} \longrightarrow P_{(red)}$; $\Delta H = -18.4$ kJ it following that :
   a) Red P is readily formed from white P
   b) White P is readily formed from red P
   c) White P cannot be converted to red P
   d) White P can be converted into red P and red P is more stable
6. If $H^+ + OH^- \longrightarrow H_2O + 13.7$ kcal then the heat of neutralization for complete neutralization of one mole of H_2SO_4 by a base will be :
   a) − 13.7 kcal b) − 27.4 kcal c) − 6.85 kcal d) − 3.425 kcal
7. Assuming that water vapours are ideal gas. The change in internal energy (ΔU) when 1 mol of water is vaporized at 1 bar pressure and 100°C. (Given molar enthalpy of vaporization at 1 bar and 373 K is 41 kJ mol^{-1} and $R = 8.3$ J mol^{-1} K^{-1}) will be:
   a) 41.00 kJ mol^{-1} b) 4.100 kJ mol^{-1} c) 3.7904 kJ mol^{-1} d) 37.904 kJ mol^{-1}
8. Change in entropy for a reaction is given by:

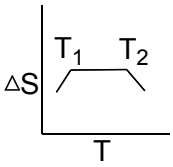
a) $2.303\ nR \log_{10} \frac{V_2}{V_1}$ b) $nR \log_e \frac{V_2}{V_1}$ c) $nR \log_e \frac{P_1}{P_2}$ d) All of these

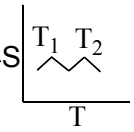
9. At constant pressure and temperature, the direction of any chemical reaction is one where, the … decrease.
   a) Entropy b) Enthalpy c) Gibbs energy d) None of these
10. Which of the following conditions will always lead to a non spontaneous change?
    a) Positive ΔH and positive ΔS b) Negative ΔH and negative ΔS
    c) Positive ΔH and negative ΔS d) Negative ΔS and positive ΔS
11. Equal volume of two monoatomic gases, A and B, at same temperature and pressure are mixed. The ratio of specific heats (C_P/C_V) of the mixture will be:
    a) 0.83 b) 1.50 c) 3.3 d) 1.67
12. Two atoms of hydrogen combine to form a molecule of hydrogen gas, the energy of the H_2 molecule is :
    a) Greater than that of separate atoms
    b) Equal to that of separate atoms
    c) Lower than that of separate atoms
    d) Sometimes lower and sometimes higher
13. The heats of neutralization of four acids A,B,C and D are – 13.7, –9.4, –11.2 and –12.4 kcal respectively when they are neutralized by a common base. The acidic character obeys the order :
    a) $A > B > C > D$ b) $A > D > C > B$ c) $D > C > B > A$ d) $D > B > C > A$
14. $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$; $\Delta H = -68$ kcal. The heat change, for the decomposition of 3.6 g of water is :
    a) 136 kcal b) 13.6 kcal c) 1.36 kcal d) 68 kcal
15. When 500 J heat is given to the gas X in an isobaric process its work done comes out as 142.8 J. The gas X is
    a) O_2 b) NH_3 c) He d) SO_2
16. Diborane is a potential rocket fuel which undergoes combustion according to the equation
    $B_2H_6(g) + 3O_2(g) \rightarrow B_2O_3(g) + 3H_2O(g)$
    Calculate the enthalpy change for the combustion of diborane. Given
    (i) $2B(s) + \frac{3}{2}O_2(g) \rightarrow B_2O_3(s)$; $\Delta H = -1273$ kJ per mol
    (ii) $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$; $\Delta H = -286$ kJ per mol
    (iii) $H_2O(l) \rightarrow H_2O(g)$; $\Delta H = 44$ kJ per mol
    (iv) $2B(s) + 3H_2(g) \rightarrow B_2H_6(g)$; $\Delta H = 36$ kJ per mol
    a) $+2035$ kJ per mol b) -2035 kJ per mol c) $+2167$ kJ per mol d) -2167 kJ per mol
17. To calculate the amount of work done in joules during reversible isothermal expansion of an ideal gas, the volume must be expressed in
    a) m^3 only b) dm^3 only c) cm^3 only d) Any of these
18. Calorific value of carbohydrates is approximately:
    a) 4.0 kcal/g b) 16.0 kcal/g c) 20 kcal/g d) 9.0 kcal/g

19. For a given substance T_1 and T_2 are freezing point and melting point of a substance. Which of the graph represents correctly, the variation of ΔS with temperature?

a) 

b) 

c) 

d) 

20. Which is correct for an endothermic reaction?

a) ΔH is positive b) ΔH is negative c) ΔE is negative d) $\Delta H = 0$