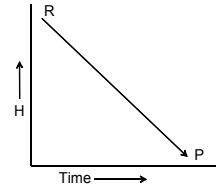
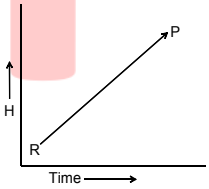
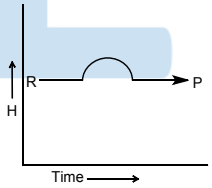
DPP
DAILY PRACTICE PROBLEMS

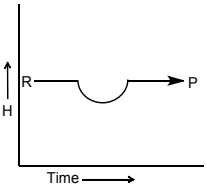
CLASS : XIth **SUBJECT : CHEMISTRY**
DATE : **DPP No. : 2**

Topic :- THERMODYNAMICS

1. The enthalpy of formation of water from hydrogen and oxygen is -286 kJ mol^{-1}. The enthalpy of decomposition of water into hydrogen and oxygen is:
   a) -286 kJ mol^{-1} b) -143 kJ mol^{-1} c) $+286$ kJ mol^{-1} d) $+143$ kJ mol^{-1}
2. An ideal gas is allowed to expand both reversibly and irreversibly in an isolated system. If T_i is the initial temperature and T_f is the final temperature, which of the following statements is correct?
   a) $(T_f)_{\text{irrev}} > (T_f)_{\text{rev}}$
   b) $T_f > T_i$ for reversible process but $T_f = T_i$ for irreversible process
   c) $(T_f)_{\text{rev}} = (T_f)_{\text{irrev}}$
   d) $T_f = T_i$ for both reversible and irreversible processes
3. Heat of fusion of a molecular solid is :
   a) Very high b) High c) Low d) None of these
4. Which plot represents for an exothermic reaction?
   a) 

   b) 

   c) 

   d) 

5. For a spontaneous chemical change the Gibbs energy change is:
   a) Positive
   b) Negative
   c) Zero
   d) Depends whether the reaction is exothermic or endothermic
6. An ideal gas undergoing expansion in vacuum shows:
   a) $\Delta U = 0$ b) $W = 0$ c) $q = 0$ d) All of these
7. Select the incorrect statement
   a) PV work is usually negligible for solid and liquid
   b) For a closed system with $P - V$ work only, an isobaric process that has $q =$ +ve must have $\Delta T = +$ ve.
   c) For a cyclic process $q = 0$
   d) Black phosphorus is most stable form of P but $H^\circ_f = 0$ for white phosphorus.

8. Entropy decreases during:
   a) Crystallization of sucrose from solution
   b) Rusting of iron
   c) Melting of ice
   d) Vaporization of camphor
9. At 27°C latent heat of I fusion of a compound is 2930 J/mol. Entropy change during fusion is:
   a) 9.77 J/mol K b) 10.77 J/mol K c) 9.07 J/mol K d) 0.977 J/mol K
10. The values of ΔH and ΔS for the reaction.
    $C_{(\text{graphite})} + CO_2(g) \rightarrow 2CO(g)$
    Are 170 kJ and 170 JK^{-1} respectively. this reaction will be spontaneous at:
    a) 510 K b) 710 K c) 910 K d) 1110 K
11. The temperature of 5 mL of a strong acid increases by 5°C when 5 mL of strong base is added to it. If 10 mL of each is mixed and complete neutralisation takes place then rise in temperature will be
    a) 20°C b) 10°C c) 5°C d) 2°C
12. When an ideal gas is compressed adiabatically and reversibly, the final temperature is:
    a) Higher than the initial temperature
    b) Lower than the initial temperature
    c) The same as the initial temperature
    d) Dependent on the rate of compression
13. In a closed insulated container, a liquid is stirred with a paddle to increase its temperature. In this process, which of the following is true
    a) $\Delta E = W \neq 0, Q = 0$ b) $\Delta E \neq 0, Q = W = 0$
    c) $\Delta E = W = Q = 0$ d) $\Delta E = 0, Q \neq 0, W = 0$
14. If the bond dissociation energies of XY, X_2 and Y_2 (all diatomic molecules) are in the ratio of 1: 1: 05 and ΔH for the formation of $XY$is -200 kJ mol^{-1}. The bond dissociation energy of X_2 will be
    a) 100 kJ mol^{-1} b) 800 kJ mol^{-1} c) 300 kJ mol^{-1} d) 400 kJ mol^{-1}
15. The dissociation energy of CH_4 and C_2H_6 are respectively 360 and 620 kcal/mol. The bond energy of C — C bond is:
    a) 260 kcal/mol b) 180 kcal/mol c) 130 kcal/mol d) 80 kcal/mol
16. In a calorimeter, the temperature of the calorimeter increases by 6.12 K, the heat capacity of the system is 1.23 kJ/g deg. What is the molar heat of decomposition for NH_4NO_3?
    a) -7.53 kJ/mol b) -398.1 kJ/mol c) -16.1 kJ/mol d) -602 kJ/mol
17. The bond energies of F_2, Cl_2, Br_2 and I_2 are 155.4, 243.6, 193.2 and 151.2 kJ mol^{-1} respectively. The strongest bond is :
    a) F — F b) Cl — Cl c) Br — Br d) I — I
18. The enthalpy changes of formation of the gaseous oxides of nitrogen (N_2O and NO) are positive because of:
    a) The high bond energy of the nitrogen molecule
    b) The high electron affinity of oxygen atoms
    c) The high electron affinity of nitrogen atoms
    d) The tendency of oxygen to form O^{2-}

19. If 900 J/g of heat is exchanged at boiling point of water then increase in entropy
    a) 43.4 J/mol b) 87.2 J/mol c) 900 J/mol d) Zero
20. A reaction occurs spontaneously if:
    a) $T\Delta S = \Delta H$ and both ΔH and ΔS are positive
    b) $T\Delta S > \Delta H$ and both ΔH and ΔS are positive
    c) $T\Delta S < \Delta H$ and both ΔH and ΔS are positive
    d) $T\Delta S > \Delta H$ and ΔH is positive and ΔS are negative