Equilibrium state

1. In any chemical reaction, equilibrium is supposed to be establish when
   (a) Mutual opposite reactions undergo
   (b) Concentration of reactants and resulting products are equal
   (c) Velocity of mutual reactions become equal
   (d) The temperature of mutual opposite reactions become equal

2. Which of the following conditions represents an equilibrium
   (a) Freezing of ice in a open vessel, temperature of ice is constant
   (b) Few drops of water is present along with air in a balloon, temperature of balloon is constant
   (c) Water is boiling in an open vessel over stove, temperature of water is constant
   (d) All the statements (a), (b) and (c) are correct for the equilibrium

3. When rate of forward reaction becomes equal to backward reaction, this state is termed as
   (a) Chemical equilibrium
   (b) Reversible state
   (c) Equilibrium
   (d) All of these

4. In chemical reaction $A \rightleftharpoons B$, the system will be known in equilibrium when
   (a) A completely changes to *B*
   (b) 50% of *A* changes to *B*
   (c) The rate of change of *A* to *B* and *B* to *A* on both the sides are same
   (d) Only 10% of *A* changes to *B*

5. A chemical reaction is at equilibrium when
   (a) Reactants are completely transformed into products
   (b) The rates of forward and backward reactions are equal
   (c) Formation of products is minimised
   (d) Equal amounts of reactants and products are present

6. In the chemical reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ at equilibrium point, state whether
   (a) Equal volumes of N_2 and H_2 are reacting
   (b) Equal masses of N_2 and H_2 are reacting
   (c) The reaction has stopped
   (d) The same amount of ammonia is formed as is decomposed into N_2 and H_2

7. For the reaction $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ the position of equilibrium can be shifted to the right by
   (a) Increasing the temperature
   (b) Doubling the volume
   (c) Addition of Cl_2 at constant volume
   (d) Addition of equimolar quantities of $PCl_3$and PCl_5

8. If a system is at equilibrium the rate of forward to the reverse reaction is
   (a) Less
   (b) Equal
   (c) High
   (d) At equilibrium

9. Chemical equilibrium is dynamic in nature because
   (a) Equilibrium is maintained rapidly
   (b) The concentration of reactants and products become same at equilibrium
   (c) The concentration of reactants and products are constant but different
   (d) Both forward and backward reactions occur at all times with same speed

10. The number of gram molecules of a substance present in unit volume is termed as
    (a) Activity
    (b) Normal solution
    (c) Molar concentration
    (d) Active mass