**Q.1 Short answer questions.**

**1] Rate of reaction.**

Ans: The rate of reaction refers to the speed at which the products are formed from the

 reactants in a chemical reaction. It gives some insight into the time frame under which a reaction can be completed. For example, the reaction rate of the combustion of cellulose in fire is very high and the reaction is completed in less than a second. The rate of reaction or reaction rate is the speed at which reactants are converted into products. When we talk about chemical reactions, it is a given fact that rate at which they occur varies by a great deal. Some chemical reactions are nearly instantaneous, while others usually take some time to reach the final equilibrium.

**2] Order of reaction.**

Ans: The Order of reaction refers to the relationship between the rate of a chemical reaction and the concentration of the species taking part in it. In order to obtain the reaction order, the rate expression (or the rate equation) of the reaction in question must be obtained. The order of reaction can be defined as the power dependence of rate on the concentration of all reactants. For example, the rate of a first-order reaction is dependent solely on the concentration of one species in the reaction. Some characteristics of the reaction order for a chemical reaction are listed below. Reaction order represents the number of species whose concentration directly affects the rate of reaction. It can be obtained by adding all the exponents of the concentration terms in the rate expression. The order of reaction does not depend on the stoichiometric coefficients corresponding to each species in the balanced reaction

**3] Molecularity of reaction.**

Ans: The number of reacting particles (molecules, atoms, or ions) that collide simultaneously in a rate determining step to form a product is called molecularity of a reaction. In general, the molecularity of simple reactions is equal to the sum of the number of molecules of reactants involved in the balanced stoichiometric equation Examples:

1. PCl5 → PCl3 + Cl2 (Unimolecular reaction)
2. 2SO2 + O2→2SO3(Trimolecular reaction)
3. NO + O3→NO2+ O2(Bimolecular reaction)

Molecularity of a reaction is always in the whole number. It is never fractional. Molecularity is a theoretical concept. Molecularity cannot be greater than three because more than three molecules may not mutually collide with each other.

**Q. Answer in one sentence.**

1. Enlist any two factors that influence the rate of a reaction.

Ans: Temperature, Concentration of reactants.

2. Define the order of a reaction.

Ans: The number of atoms or molecules whose concentration changes during the course of reaction is known as order of reaction.

3. What is the molecularity of a chemical reaction?

Ans: The number of atoms or molecules taking part in to chemical reaction.

4. What is the molecularity of the following chemical reaction?

N₂ + 2H₂O NH4NO2

Ans: Molecularity is 3

5. Define zero order reaction.

Ans: A zero-order reaction is a chemical reaction in which the rate is independent of the concentration of reactants.

6. What is first order reaction?

Ans: A first-order reaction is a reaction in which the rate is directly proportional to the concentration of a single reactant.

7. Define the half-life period of a reaction.

Ans: The half-life period of a reaction is the time required for the concentration of a reactant to reduce to half of its initial value.

8. What is chemical kinetics?

Ans: Chemical kinetics is the branch of chemistry that studies the rates of chemical reactions and the factors affecting them.

9. Give the kinetic equation for first order reaction.

Ans: 

10. Define rate of reaction.

Ans: The rate of reaction is the change in concentration of reactants or products per unit time during a chemical reaction.