Standardized Test Prep

Answer the following items on a separate piece of paper.

MULTIPLE CHOICE

1. The sequence of steps that occurs in a reaction process is called the
- **A.** order of the reaction.
- **B.** rate law.
- **C.** overall reaction.
- **D.** reaction mechanism.

2. To be effective, a collision requires
- **A.** enough energy only.
- **B.** favorable orientation only.
- **C.** enough energy and a favorable orientation.
- **D.** a reaction mechanism.

3. How does the energy of the activated complex compare with the energies of the reactants and products?
- **A.** It is lower than both the energy of the reactants and the energy of the products.
- **B.** It is lower than the energy of the reactants but higher than the energy of the products.
- **C.** It is higher than the energy of the reactants but lower than the energy of the products.
- **D.** It is higher than both the energy of the reactants and the energy of the products.

4. If a collision between molecules is very gentle, the molecules are
- **A.** more likely to be oriented favorably.
- **B.** less likely to be oriented favorably.
- **C.** likely to react.
- **D.** likely to rebound without reacting.

5. A species that changes the rate of a reaction but is neither consumed nor changed is
- **A.** a catalyst.
- **B.** an activated complex.
- **C.** an intermediate.
- **D.** a reactant.

6. A rate law relates
- **A.** reaction rate and temperature.
- **B.** reaction rate and concentration.
- **C.** temperature and concentration.
- **D.** energy and concentration.

7. In a graph of how energy changes with reaction progress, the activated complex appears at the
- **A.** left end of the curve.
- **B.** right end of the curve.
- **C.** bottom of the curve.
- **D.** peak of the curve.

8. The slowest step in a mechanism is called
- **A.** the rate-determining step.
- **B.** the uncatalyzed reaction.
- **C.** the activation step.
- **D.** None of the above

9. A certain reaction is zero order in reactant A and second order in reactant B. What happens to the reaction rate when the concentrations of both reactants are doubled?
- **A.** The reaction rate remains the same.
- **B.** The reaction increases by a factor of two.
- **C.** The reaction rate increases by a factor of four.
- **D.** The reaction rate increases by a factor of eight.

SHORT ANSWER

10. Two molecules collide but bounce apart unchanged. What two reasons could account for their failure to react?

11. Sketch a diagram that shows how the energy changes with the progress of an endothermic reaction. Label the curve "Reactants," "Products," and "Activated complex." On the same diagram, sketch a second curve to show the change caused by a catalyst.

EXTENDED RESPONSE

12. Suggest ways of measuring the concentration of a reactant or product in a reaction mixture.

13. Why are reaction orders not always equal to the coefficients in a balanced chemical equation?

Test TIP Sometimes, only one part of a graph or table is needed to answer a question. In such cases, focus on only the information that is required to answer the question.