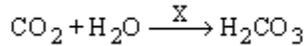


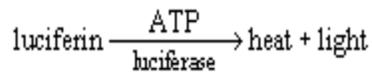
## Enzymes: Practice Questions #1

1. Compound X increases the rate of the reaction below.



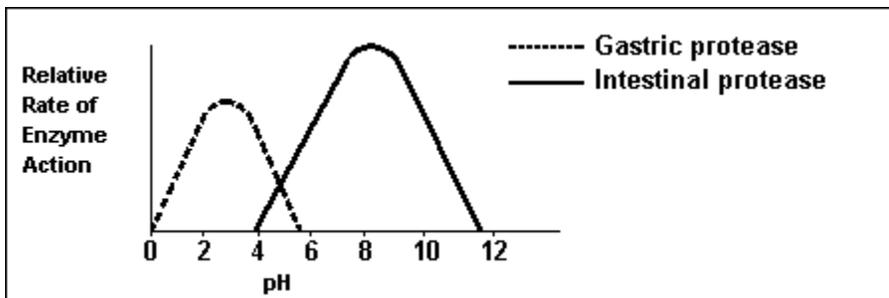
Compound X is most likely

- A. an enzyme
  - B. a lipid molecule
  - C. an indicator
  - D. an ADP molecule
2. The equation below summarizes the process that produces the flashing light of a firefly.



The molecule luciferin is broken down, and energy is released in the form of heat and light. In this process, luciferase functions as

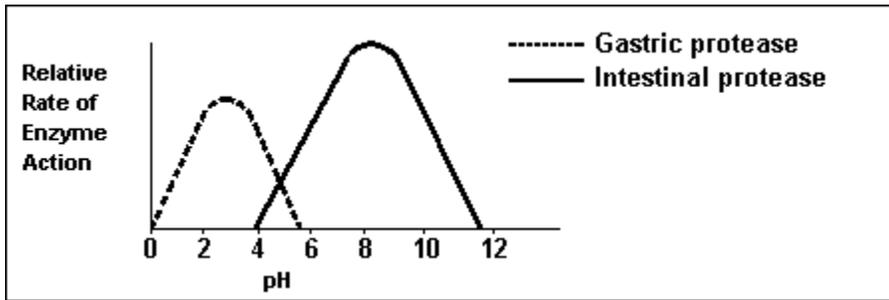
- A. a reactant
  - B. a product
  - C. a starch
  - D. an enzyme
- 3.



Base your answer on the graph and on your knowledge of biology. The most likely result of mixing both enzymes with their substrates in a single test tube is that

- A. only gastric protease would be active if the pH of the mixture was basic
- B. intestinal protease would be more active than gastric protease at pH 4.
- C. both enzymes would exhibit some activity at pH 5.
- D. gastric protease would be more active than intestinal protease at pH 6

4.



Base your answer on the graph and on your knowledge of biology. Which is a true statement about the relationship between pH and enzyme action?

- A. All enzymes work best at a neutral pH.
- B. Adding more acid does not affect the rate of activity of an enzyme.
- C. Enzymes function only in a pH range of 4.0 to 5.5.
- D. The activity of an enzyme is affected by pH.

5.

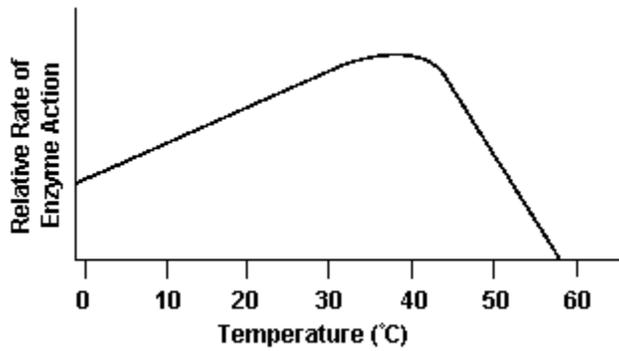
*Reactions*

- (1)  $\text{glucose} \xrightarrow{X} \text{lactic acid} + 2 \text{ ATP}$
- (2)  $\text{glucose} \xrightarrow{X} \text{alcohol} + \text{carbon dioxide} + 2 \text{ ATP}$
- (3)  $\text{glucose} + \text{oxygen} \xrightarrow{X} \text{carbon dioxide} + \text{water} + 36 \text{ ATP}$
- (4)  $\text{carbon dioxide} + \text{water} \xrightarrow{X} \text{glucose} + \text{water} + \text{oxygen}$

Base your answer on the reactions shown in the graphic. The X in each reaction represents various

- A. energy sources
- B. final products
- C. reactants
- D. enzymes

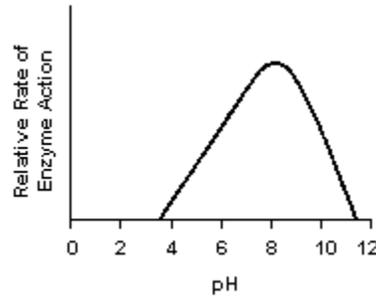
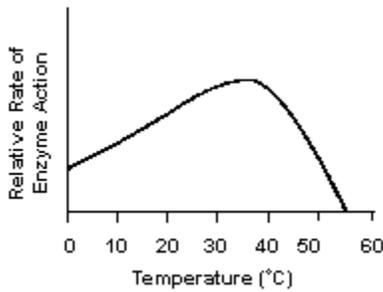
6. The effect of temperature on the relative rate of action of an enzyme is represented in the graph.



The optimum temperature for the action of this enzyme is approximately

- A. 15°C
- B. 22°C
- C. 37°C
- D. 50°C

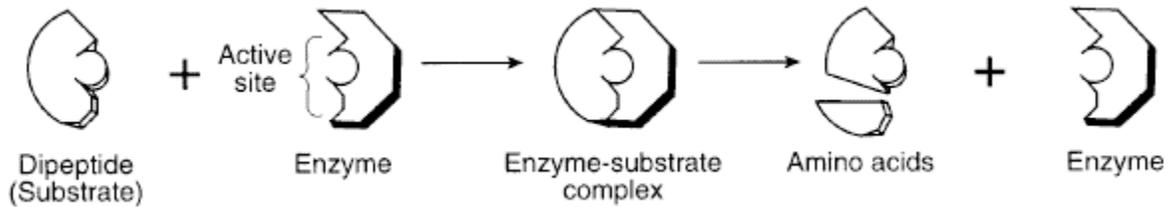
7.



Which statement best describes the enzyme represented in the graphs?

- A. This enzyme works best at a temperature of 35°C and a pH of 8.
- B. This enzyme works best at a temperature of 50°C and a pH of 12.
- C. Temperature and pH have no effect on the action of this enzyme.
- D. This enzyme works best at a temperature above 50°C and a pH above 12.

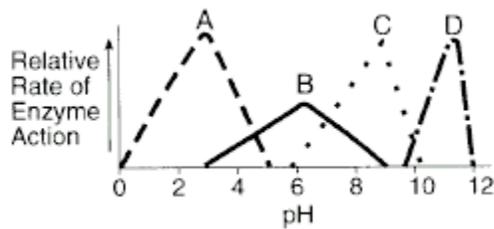
8.



A process that occurs in the human body is shown in the diagram. What would happen if a temperature change caused the shape of the active site to be altered?

- A. The dipeptide would digest faster.
- B. The dipeptide would digest slower or not at all.
- C. The amino acids would combine faster.
- D. The amino acids would combine slower or not at all.

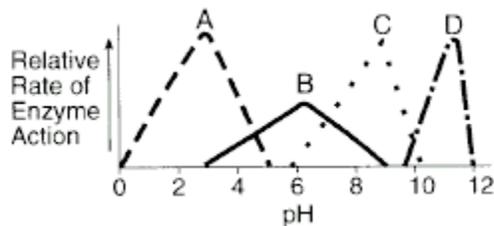
9.



The graph shows the relative rates of action of four enzymes, *A*, *B*, *C*, and *D*. Which enzyme shows the greatest change in its rate of action with the least change in pH?

- A. enzyme *A*
- B. enzyme *B*
- C. enzyme *C*
- D. enzyme *D*

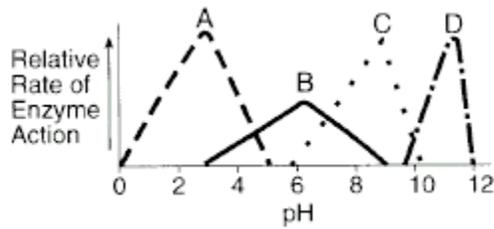
10.



The graph shows the relative rates of action of four enzymes, *A*, *B*, *C*, and *D*. A solution with a pH of 6 contains enzyme *C* and its substrate. If a base is gradually added to this solution, the rate of action of enzyme *C* would most likely

- A. remain constant
- B. increase, then decrease
- C. decrease, then increase
- D. decrease constantly

11.



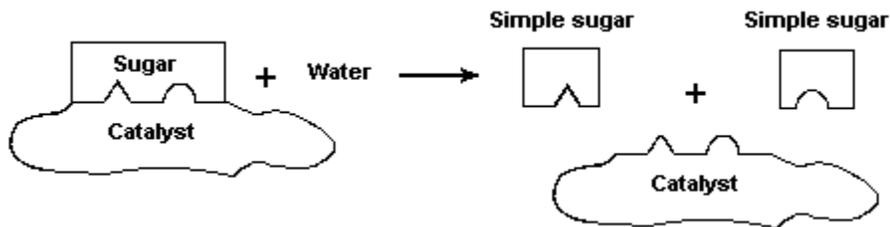
The graph shows the relative rates of action of four enzymes, *A*, *B*, *C*, and *D*. Which two enzymes would function in a region of the human body having a neutral pH?

- A. enzymes *A* and *B*
- B. enzymes *B* and *C*
- C. enzymes *C* and *D*
- D. enzymes *B* and *D*

12. Which characteristic allows enzymes to function in a specific way?

- A. Enzymes are complex compounds composed of starch.
- B. Each enzyme has a characteristic shape.
- C. Enzymes are long, complex fats.
- D. Each enzyme is made up of four subunits.

13.



The diagram illustrates a biochemical process that occurs in organisms. The substance labeled “catalyst” is also known as

- A. a hormone
- B. an enzyme
- C. an antibody
- D. an inorganic compound

14. Base your answer to the question on the information below and on your knowledge of biology.

A student completed a series of experiments and found that a protein-digesting enzyme (intestinal protease) functions best when the pH is 8.0 and the temperature is 37°C. During an experiment, the student used some of the procedures listed below.

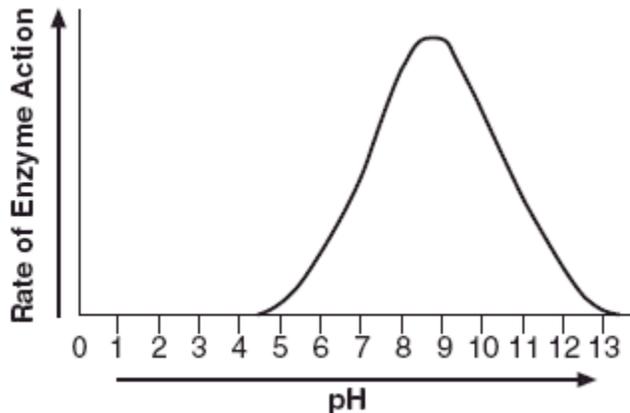
*Procedures*

- (A) Adding more protease
- (B) Adding more protein
- (C) Decreasing the pH to 6.0
- (D) Increasing the temperature to 45°C
- (E) Decreasing the amount of light

Which procedure would have the least effect on the rate of protein digestion?

- A. procedure A
- B. procedure E
- C. procedure C
- D. procedure D

15. The effect of pH on a certain enzyme is shown in the graph.



At what pH would the enzyme be most effective?

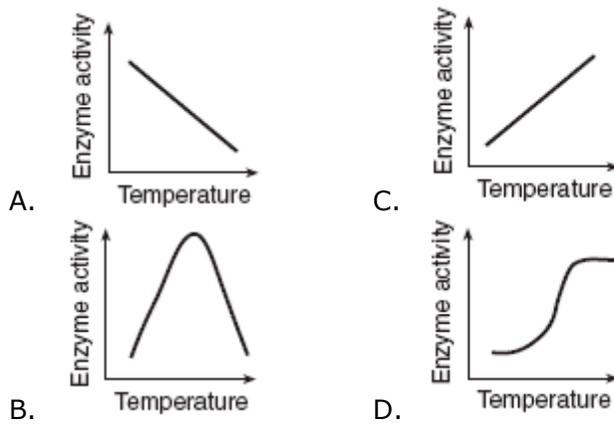
- A. above 10
- B. between 8 and 10
- C. between 5 and 7
- D. below 5

16. A colony of bacteria growing on a culture medium is successfully synthesizing an organic compound. Which procedure would be *least* likely to have an effect on this synthesis?

- A. adding more subunits of the organic compound to the medium
- B. lowering the pH of the medium
- C. raising the temperature of the colony from 20°C to 30°C
- D. increasing the number of hormone molecules in the colony

17.

Enzymes have an optimum temperature at which they work best. Temperatures above and below this optimum will decrease enzyme activity. Which graph best illustrates the effect of temperature on enzyme activity?



18. All chemical breakdown processes in cells directly involve

- A. reactions that are controlled by catalysts
- B. enzymes that are stored in mitochondria
- C. the production of catalysts in vacuoles
- D. enzymes that have the same genetic base sequence

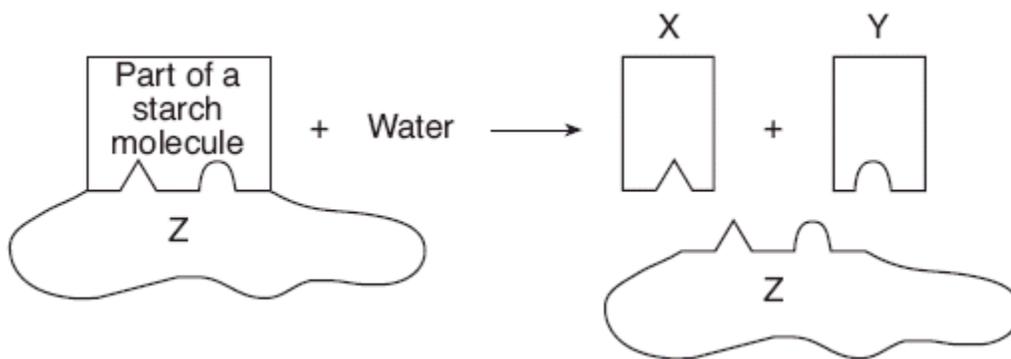
19. Meat tenderizer contains an enzyme that interacts with meat. If meat is coated with tenderizer and then placed in a refrigerator for a short time, how would the enzyme be affected?

- A. It would be broken down.
- B. Its activity would slow down.
- C. Its shape would change.
- D. It would no longer act as an enzyme.

20. Plants such as the Venus flytrap produce chemical compounds that break down insects into substances that are usable by the plant. The chemical compounds that break down the insects are most likely

- A. fats
- B. minerals
- C. biological catalysts
- D. complex carbohydrates

21. Base your answer to the question on the diagram below, which represents a chemical reaction that occurs in the human body, and on your knowledge of biology.

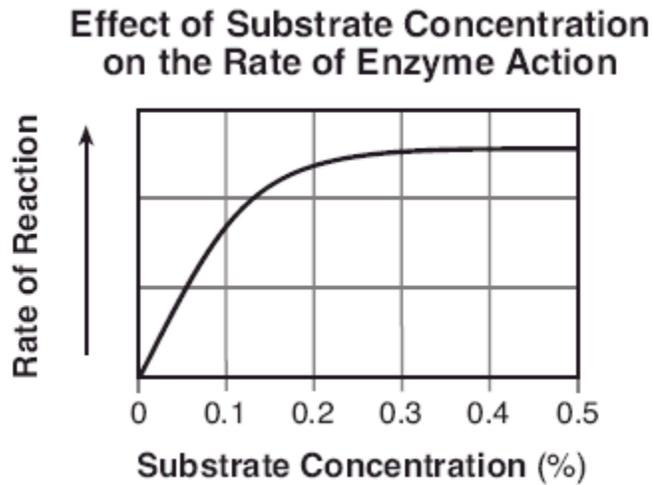


Substances *X* and *Y* are examples of which kind of molecule?

- A. simple sugar
- B. amino acid
- C. fat
- D. hormone

22. Base your answer to the question on the information below and on your knowledge of biology.

The graph below shows the effect of substrate concentration on the action of enzyme X. This enzyme is functioning at its optimal temperature, 36°C, and at its optimal pH, 5.5.



When the substrate concentration increases from 0.4% to 0.5%, the rate of the reaction

- A. decreases
- B. increases
- C. remains the same
- D. increases, then decreases

## Answer Key: Enzymes

1. A            14. B

2. D            15. B

3. C            16. D

4. D            17. B

5. D            18. A

6. C            19. B

7. A            20. C

8. B            21. A

9. D            22. C

10. B

11. B

12. B

13. B