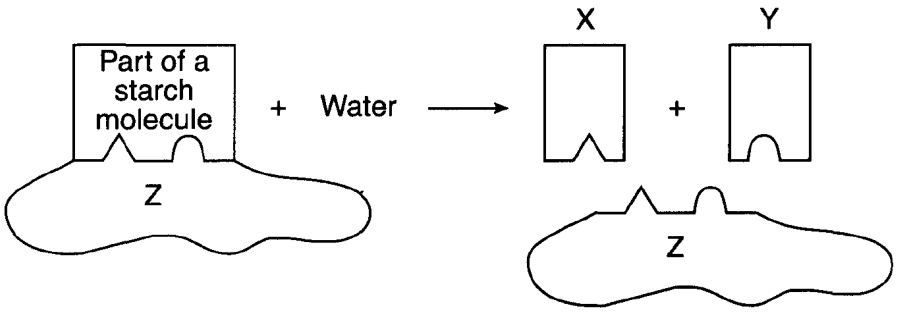
1. Base your answer to the following question on the diagram below, which represents a chemical reaction that occurs in the human body, and on your knowledge of biology.



Which statement describes a characteristic of molecule Z?

A) Molecule Z will function at any temperature above 20°C.
B) Molecule Z is composed of a string of molecular bases represented by A, T, G, and
C) Molecule Z will function best at a specific pH.
D) Molecule Z is not specific, so this reaction can be controlled by any other chemical in the body.

2. Luciferin is a molecule that, when broken down in fireflies, produces heat and light. The rate at which luciferin is broken down in cells is controlled by

A) a carbohydrate B) a simple sugar
C) an enzyme D) a complex fat

3. Lipase, maltase, and protease are members of a group of catalysts known as

A) enzymes B) hormones
C) carbohydrates D) fats

4. Although a certain molecule is involved in a specific reaction, its structure and chemical composition are exactly the same after the reaction as before the reaction. This molecule is most likely classified as

A) an enzyme B) a salt
C) a sugar D) an acid

5. Compound *X* increases the rate of the reaction shown below.

$$CO_2 + H_2O \xrightarrow{X} H_2CO_3$$

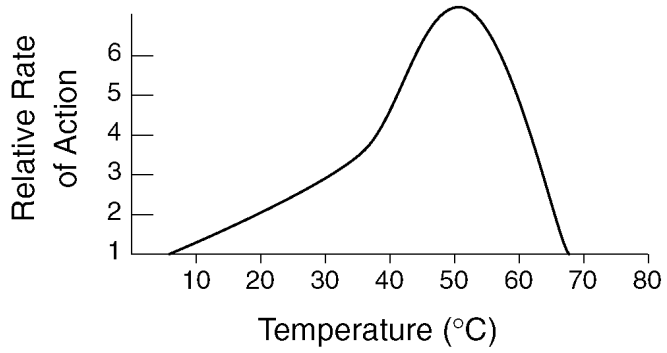
Compound *X* is most likely

A) an enzyme B) a lipid molecule
C) an indicator D) an ADP molecule

6. 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.

7. The graph below shows the effect of temperature on the relative rate of action of enzyme *X* on a protein.



Which change would *not* affect the relative rate of action of enzyme *X*?

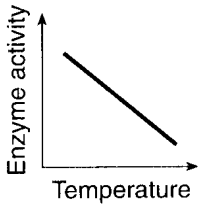
A) the addition of cold water when the reaction is at 50°C

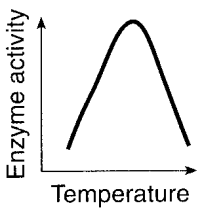
B) an increase in temperature from 70°C to 80°C

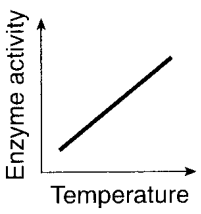
C) the removal of the protein when the reaction is at 30°C

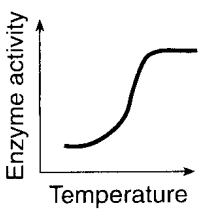
D) a decrease in temperature from 40°C to 10°C

8. 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?

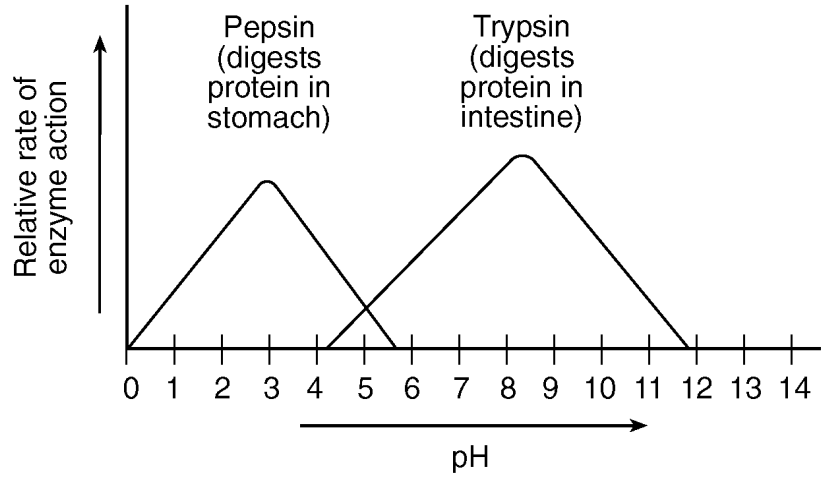
A) 

B) 

C) 

D) 

Base your answers to questions **9** and **10** on the graph below and your knowledge of biology.



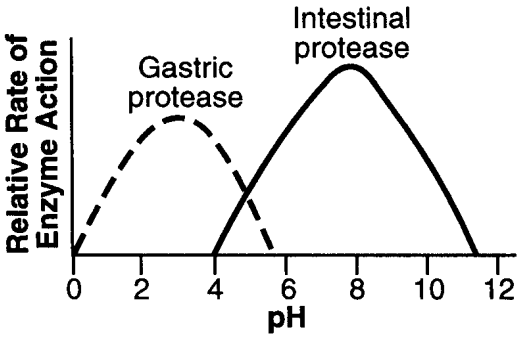
9. Pepsin works best in which type of environment?

A) acidic, only
B) basic, only
C) neutral
D) sometimes acidic, sometimes basic

10. Neither enzyme works at a pH of

A) 1 B) 5 C) 3 **D) 13**

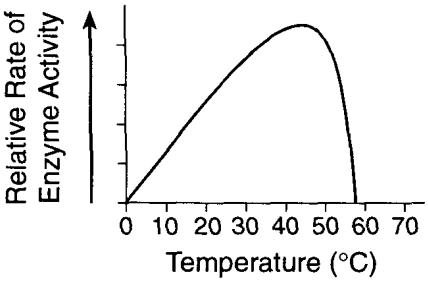
11. Base your answer to the following question on the graph below and on your knowledge of biology.



What is the optimum pH for the action of intestinal protease?

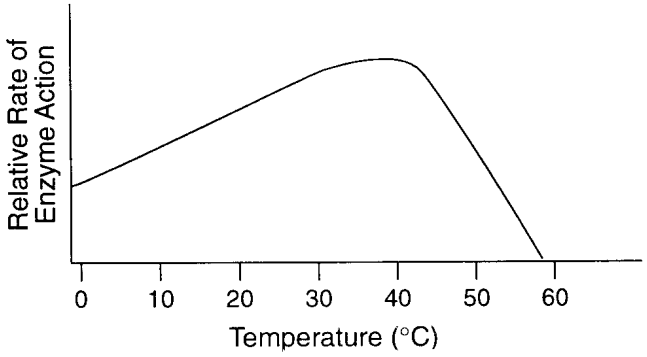
A) 5 **B) 8** C) 10 D) 12

12. Which statement is a valid conclusion based on the information in the graph below?



A) The maximum rate of human digestion occurs at about 45° C.
B) The maximum rate of human respiration occurs at about 57° C.
C) Temperature can influence the action of an enzyme.
D) Growth can be controlled by enzyme action.

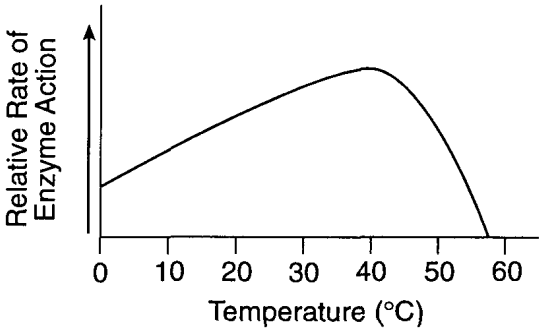
13. The effect of temperature on the relative rate of action of an enzyme is represented in the graph below.



The optimum temperature for the action of this enzyme is approximately

A) 15°C B) 22°C **C) 37°C** D) 50°C

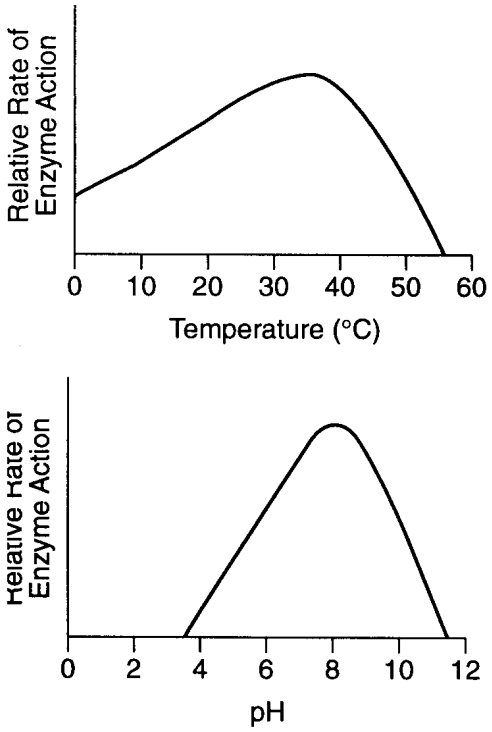
14. Base your answer to the following question on the graph below and on your knowledge of biology.



Which factor most likely accounts for the change in the rate of enzyme action as the temperature increases from 40°C to 58°C?

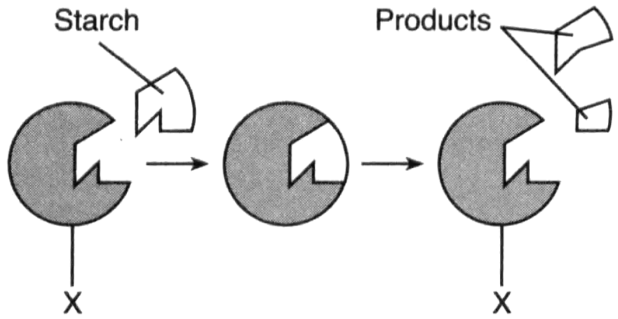
A) Excess acids have been building up, causing the enzyme to become fatigued.
B) Too much substrate is present at these high temperatures.
C) Not enough substrate is present at these high temperatures.
D) The high temperature causes the shape of the enzyme to be altered.

15. Which statement best describes the enzyme represented in the graphs below?



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.

16. Base your answer to the following question on the diagram below, which represents stages in the digestion of a starch, and on your knowledge of biology.



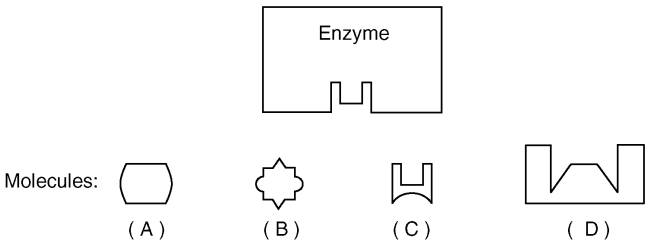
The structure labeled *X* most likely represents

A) an antibody
B) a receptor molecule
C) an enzyme
D) a hormone

17. Which condition is necessary for enzymes and hormones to function properly in the human body?

A) These chemicals must have a specific shape.
B) These chemicals must be able to replicate.
C) Body temperature must be above 40°C.
D) Body pH must be above 10.

18. An enzyme and four different molecules are shown in the diagram below.



Which molecules would this enzyme most likely affect in a reaction?

A) molecule *A*, only
B) molecule *C*, only
C) molecules *B* and *D*
D) molecules *A* and *C*

19. Which activity might lead to damage of a microscope and specimen?

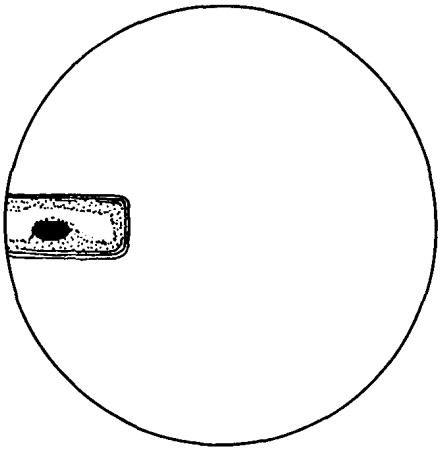
A) cleaning the ocular and objectives with lens paper
B) focusing with low power first before moving the high power into position
C) using the coarse adjustment to focus the specimen under high power
D) adjusting the diaphragm to obtain more light under high powe

20. After switching from the high-power to the low-power objective lens of a compound light microscope, the area of the low-power field will appear

A) larger and brighter
B) smaller and brighter
C) larger and darker
D) smaller and darker

21. Base your answer to the following question on the information and diagram below and on your knowledge of biology.

The diagram below represents a specimen on a slide as seen with the low-power objective of a compound light microscope.



Using one or more complete sentences, explain how the slide should be moved to observe the entire specimen.

Answer Key
Enzymes

1. **C**
2. **C**
3. **A**
4. **A**
5. **A**
6. **B**
7. **B**
8. **B**
9. **A**
10. **D**
11. **B**
12. **C**
13. **C**
14. **D**
15. **A**
16. **C**
17. **A**
18. **B**
19. **C**
20. **A**
21. The slide should be moved to the left.