



Base your answers to questions 11 and 12 on the information below and on your knowledge of biology.

Hydrogen peroxide ( $H_2O_2$ ) is a toxic compound that is produced by plant and animal cells. These cells also produce the enzyme catalase, which converts  $H_2O_2$  into water and oxygen gas, preventing the buildup of  $H_2O_2$ .

A student designed an experiment to test the effect of an acidic pH on the rate of the reaction of  $H_2O_2$  with catalase. The data below summarize the outcome of the experiment.

pH Level	7 (neutral)	6	5	3
Reaction Rate (mL of oxygen/minute)	1.5	1.3	1.0	.55

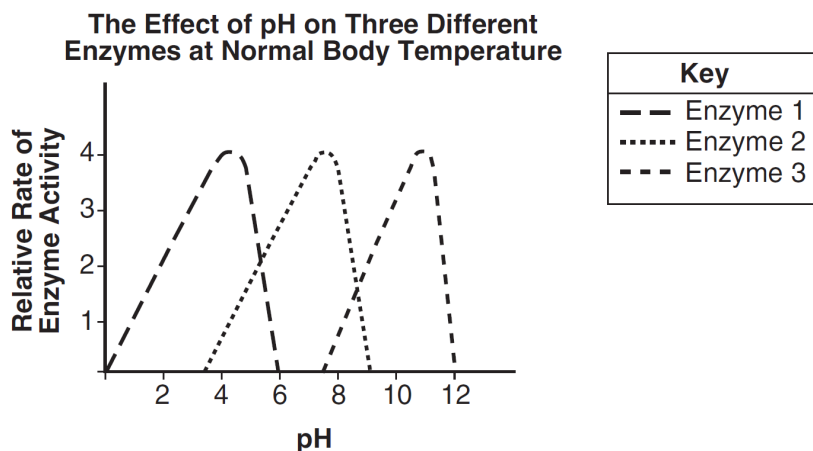
11. The best explanation for the change in catalase activity as the pH changed from 7 to 3 is that

- A) strong acid digests the catalase, causing the reaction rate to increase
- B) the student most likely cooled the  $H_2O_2$  solution, causing the reaction rate to increase
- C) **in acidic solutions, the shape of catalase changes, causing the reaction rate to decrease**
- D) decreased oxygen production causes catalase to increase the rate of reaction

12. Which conclusion is valid based upon the data collected by the student?

- A) The change in pH prevents catalase from breaking down water.
- B) **Catalase has the greatest activity at a pH of 7.**
- C) Oxygen production will increase if more water is added to the reaction.
- D) Catalase caused the greatest production of oxygen at a pH of 3.

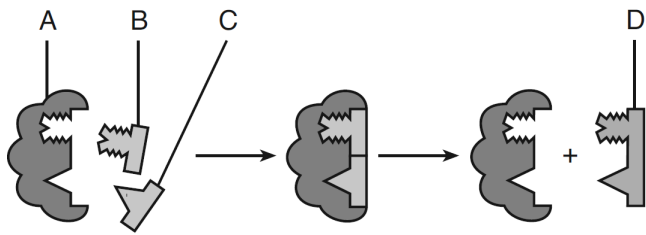
13. The graph below represents the effect of pH on three different enzymes at normal body temperature.



The graph illustrates that enzymes 1, 2, and 3

- A) are not affected by pH
- B) **work best at different pH levels**
- C) work best in an acidic environment
- D) work best in a basic environment

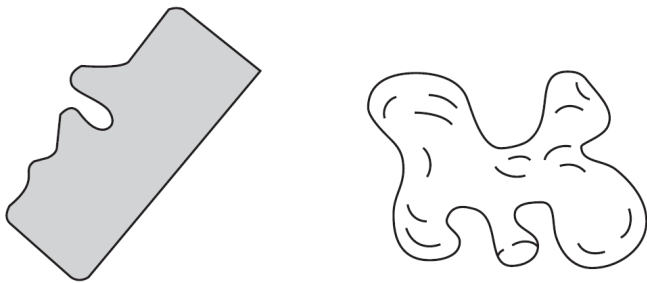
14. The diagram below represents a model of a biological process that occurs in humans at normal body temperature, 37°C.



Increasing body temperature to 40°C would interfere most directly with the rate of function of structure

- A) *A*                      B) *B*                      C) *C*                      D) *D*

15. The diagrams below represent two molecules that are involved in metabolic activities in some living cells.

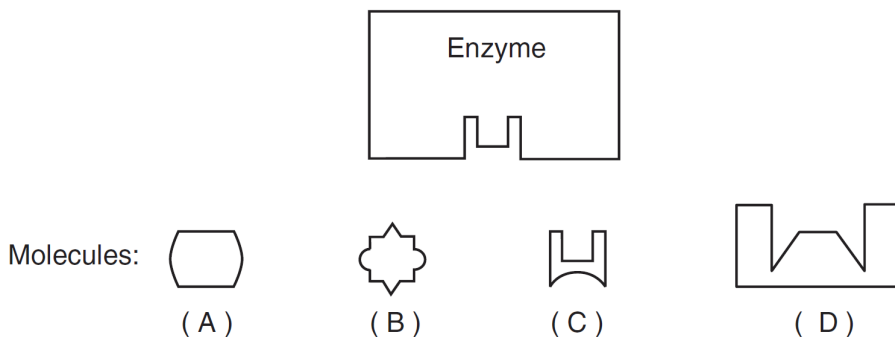


The shape of each of the molecules is important because

- A) molecules having different shapes are always found in different organisms  
**B) the shape of a molecule determines how it functions in chemical reactions**  
 C) the shape of a molecule determines the age of an organism  
 D) if the shape of any molecule in an organism changes, the DNA in that organism will also change

16. Base your answer to the following question on the information below.

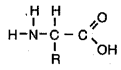
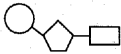
An enzyme and four different molecules are shown in the diagram below.



The enzyme would most likely affect reactions involving

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

17. Base your answer to the following question on on the chart below and your knowledge of Biology.

Class of Substance	Basic Unit of Structure	One Possible Function	Examples
A		B	C
Carbohydrate	D	Structural component of cell walls	E
F	G	Structural component of cell membranes	Fats, waxes
H		Protein synthesis	I

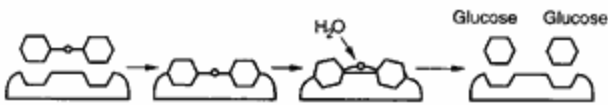
In which section of the chart do the substances starch and glycogen belong?

- A) A                      B) E                      C) C                      D) I

18. The process by which glucose is converted to starch is known as

- A) protein hydrolysis  
**B) dehydration synthesis**  
 C) chemical digestion  
 D) cellular respiration

19. Which chemical reaction is represented by the diagram below?

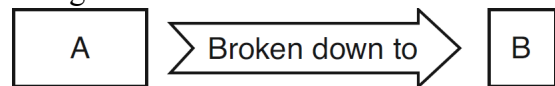


- A) dehydration synthesis of a dipeptide  
 B) hydrolysis of a polypeptide  
 C) dehydration synthesis of a lipid  
**D) hydrolysis of a disaccharide**

20. What are the building blocks of lipids?

- A) Glucose  
 B) Amino acids  
**C) Fatty acids and glycerol**  
 D) Nucleic acids

21. The diagram below represents a process that occurs in organisms.



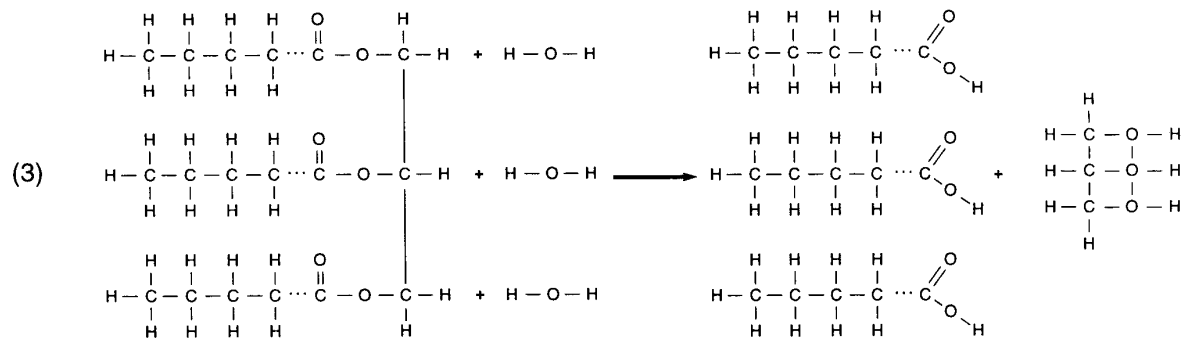
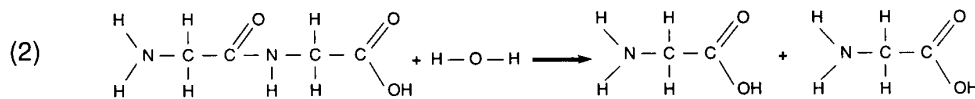
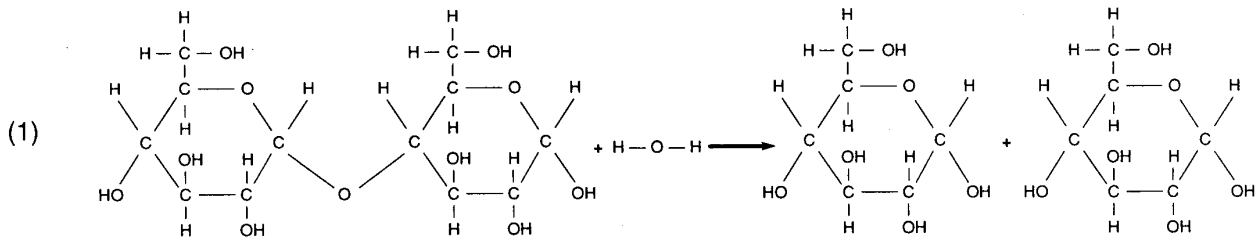
Which row in the chart indicates what A and B in the boxes could represent?

Row	A	B
(1)	starch	proteins
(2)	starch	amino acids
(3)	protein	amino acids
(4)	protein	simple sugars

- A) 1                      B) 2                      C) 3                      D) 4

22. Base your answer to the following question on the list of three equations below. Select the equation that is most closely associated with that statement.

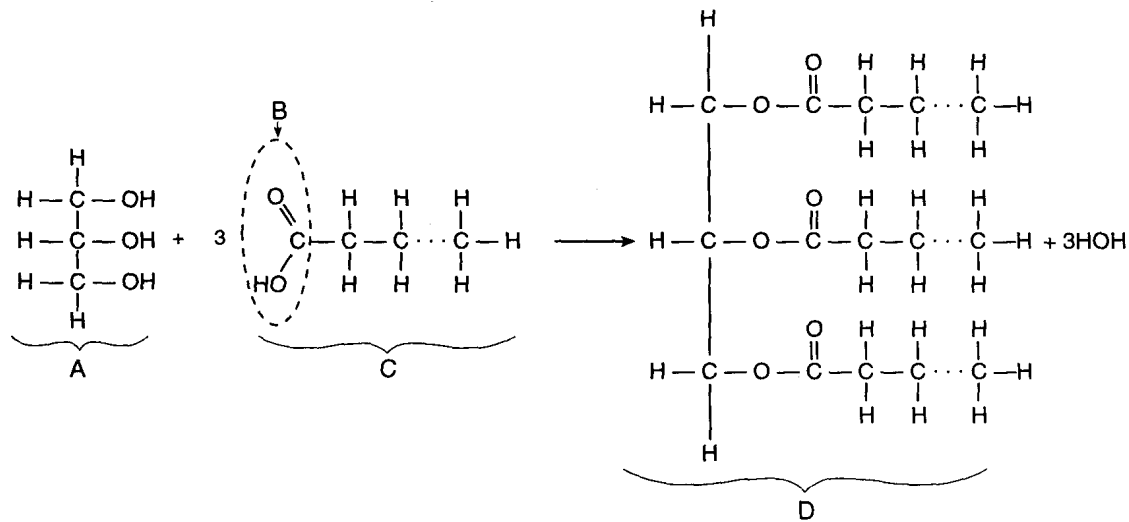
*Equations*



This equation represents a process that results in the formation of amino acids.

- A) 1                      B) 2                      C) 3

23. Base your answer to the following question on the reaction below and on your knowledge of biology.

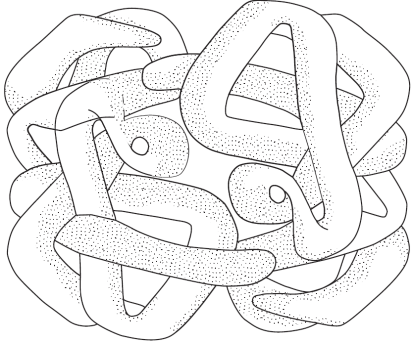


This chemical reaction is known as

- A) enzymatic hydrolysis                      B) photolysis  
 C) dehydration synthesis                      D) deamination

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24. The diagram below represents a protein molecule present in some living things.



This type of molecule is composed of a sequence of

- A) **amino acids arranged in a specific order**
- B) simple sugars alternating with starches arranged in a folded pattern
- C) large inorganic subunits that form chains that interlock with each other
- D) four bases that make up the folded structure

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25. Mad cow disease is a fatal disease that destroys brain tissue. Researchers have found that a prion protein, which is an abnormally constructed molecule, is responsible. Which statement best describes the characteristics a protein must have to function correctly?

- A) **A protein is a long chain of amino acids folded into a specific shape.**
  - B) A protein is a long chain of simple sugars folded into a specific shape.
  - C) A protein is made of amino acids synthesized into a short, circular chain.
  - D) A protein is made of simple sugars synthesized into a short, circular chain.
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**Answer Key**  
**Biochemistry Review #1**

1. **B**
  2. **A**
  3. **C**
  4. **A**
  5. **D**
  6. **D**
  7. **C**
  8. **B**
  9. **B**
  10. **B**
  11. **C**
  12. **B**
  13. **B**
  14. **A**
  15. **B**
  16. **B**
  17. **B**
  18. **B**
  19. **D**
  20. **C**
  21. **C**
  22. **B**
  23. **C**
  24. **A**
  25. **A**
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