

8th Living Environment

Biochem Review #1

1. Which group consists entirely of organic molecules?

- A) protein, oxygen, fat
 B) protein, starch, fat
 C) water, carbon dioxide, oxygen
 D) water, starch, protein

2. Which statement describes a similarity between all enzymes, antibodies, and hormones?

- A) Their chemical structure is critical to their ability to function.
 B) Their ability to replicate identical copies ensures continuation of the species.
 C) They work better at 100°C than 37°C.
 D) They are made by and carried by the blood.

3. Which substance is an inorganic molecule?

- A) starch
 B) DNA
 C) water
 D) fat

4. The chart below indicates the elements contained in four different molecules and the number of atoms of each element in those molecules.

Element	Number of Atoms			
	Molecule A	Molecule B	Molecule C	Molecule D
Hydrogen	12	0	3	0
Carbon	6	1	0	1
Nitrogen	0	0	1	0
Oxygen	6	2	0	3
Calcium	0	0	0	1

Which molecule can be classified as organic?

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

5. Chemicals that help chemical reactions occur at faster rates in living organisms are known as

- A) biotic resources B) simple sugars
 C) oxygen molecules D) organic catalysts

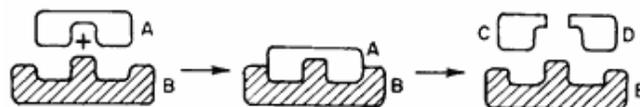
6. In plants, a storage product that results from the dehydration synthesis of many glucose molecules is

- A) protein B) a phosphate
 C) an oil D) starch

7. As temperature increases, the rate of a reaction will

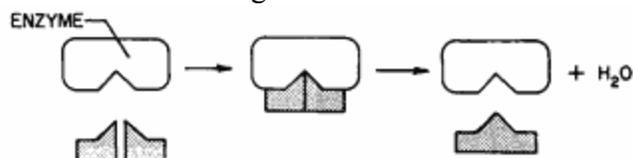
- A) Decrease
 B) Remain the same
 C) Increase
 D) You can not determine the effect of increasing temperature on the rate of the reaction.

8. In the reaction illustrated in the diagram below, which structure represents the enzyme?



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

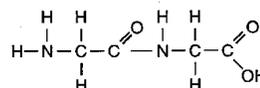
9. Which process is represented by the reactions illustrated in the diagram below?



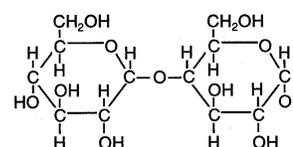
- A) hydrolysis
 B) dehydration synthesis
 C) chemical digestion
 D) absorption

10. Which structural formula represents a substance that is synthesized with the help of a disaccharidase?

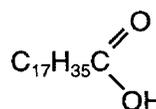
A)



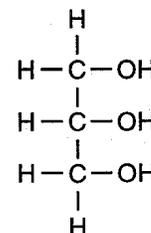
B)



C)



D)



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

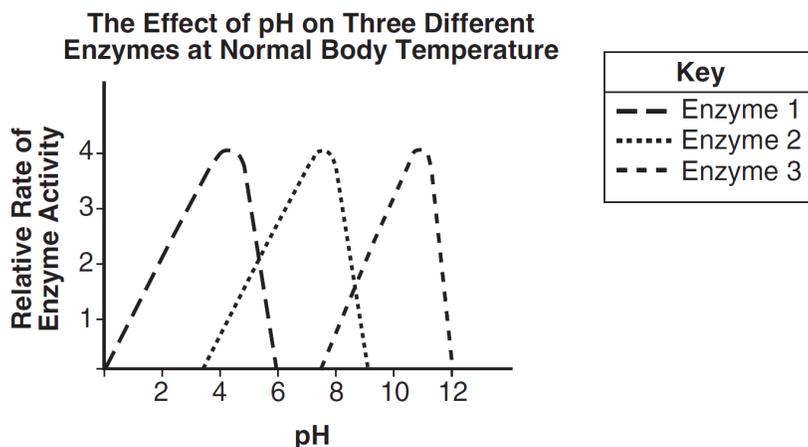
11. The best explanation for the change in catalase activity as the pH changed from 7 to 3 is that

- 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.

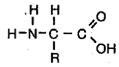
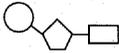
13. The graph below represents the effect of pH on three different enzymes at normal body temperature.



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

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

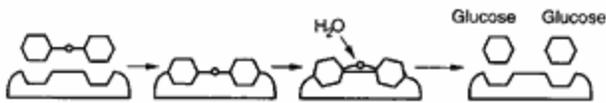
In which section of the chart do the substances starch and glycogen belong?

- 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?

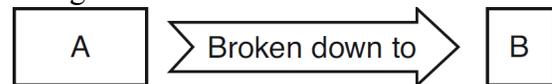


- A) dehydration synthesis of a dipeptide
 B) hydrolysis of a polypeptide
 C) dehydration synthesis of a lipid
 D) hydrolysis of a disaccharide

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.



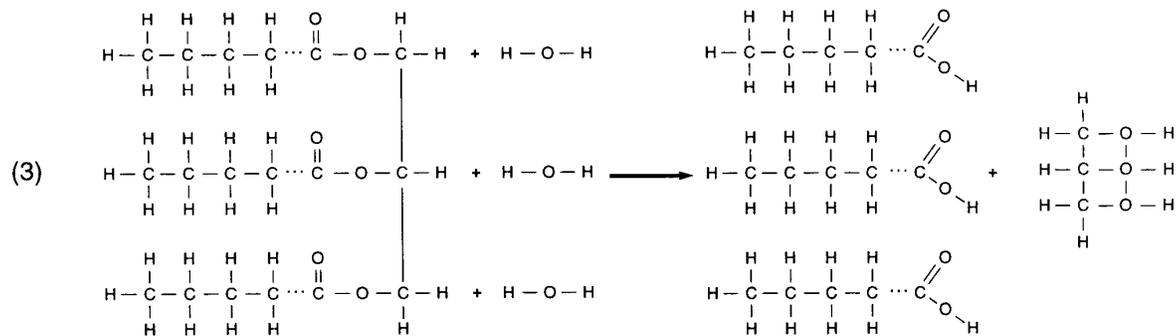
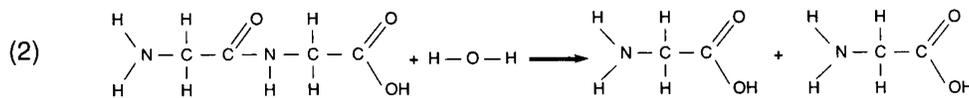
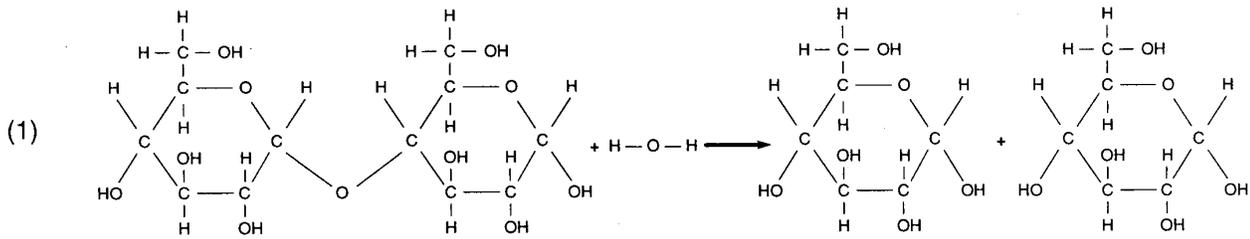
Which row in the chart indicates what A and B in the boxes could represent?

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.

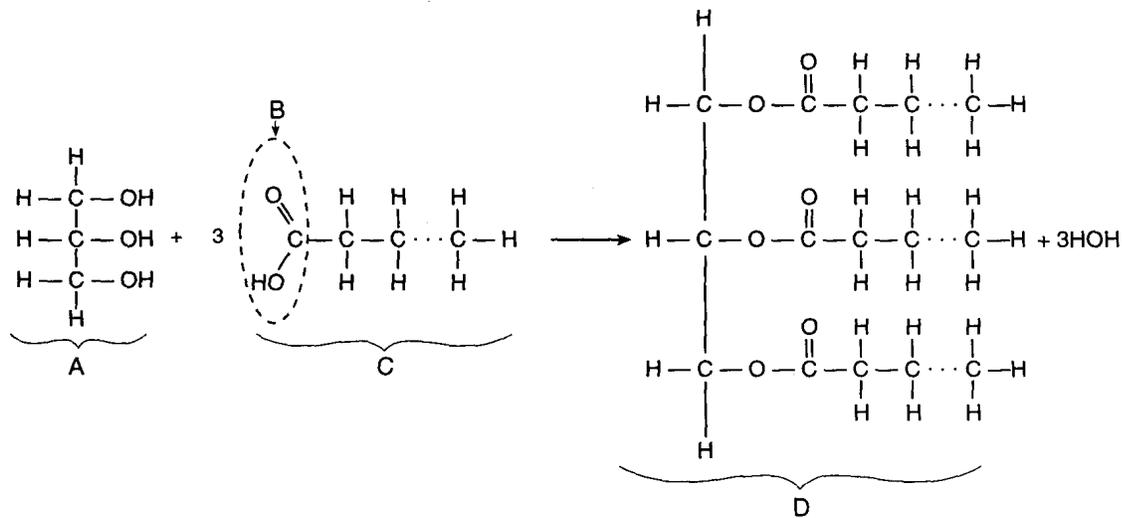
Equations



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

- A) 1 B) 2 C) 3

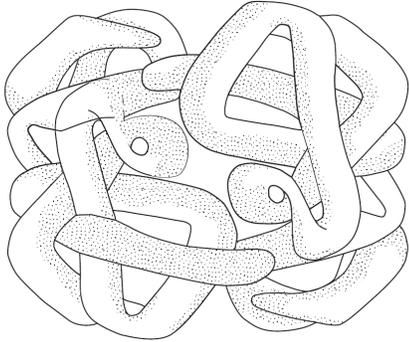
23. Base your answer to the following question on the reaction below and on your knowledge of biology.



This chemical reaction is known as

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

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

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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