

1. Which of the following statements about enzymes is NOT true?

- A Enzymes work best at a specified pH
- B All enzymes work inside cells
- C Enzymes are proteins
- D Enzymes are organic catalysts

2. A substance that accelerates the rate of a chemical reaction is called a(an)

- A catalyst
- B lipid
- C molecule
- D element

3. At high temperatures, the rate of enzyme action decreases because the increased heat

- A changes the pH of the system
- B alters the shape of the enzyme
- C neutralizes the acids and bases in the system
- D increases the concentration of the enzyme

4. Any substance that is acted upon by an enzyme is called a(n)

- A coenzyme
- B substrate
- C vitamin
- D polypeptide

5. Which group of organic compounds includes the enzymes?

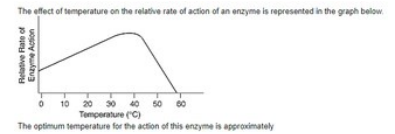
- A lipids
- B carbohydrates
- C proteins
- D nucleic acids

6. Salivary amylase is an enzyme in humans that breaks down starch. The optimum pH for this reaction is 6.7. The rate of this reaction would not be affected by

- (A) maintaining the pH of the reaction at 6.7
- (B) substrate concentration
- (C) enzyme concentration
- (D) decreasing the temperature of the reaction by 5 degrees C

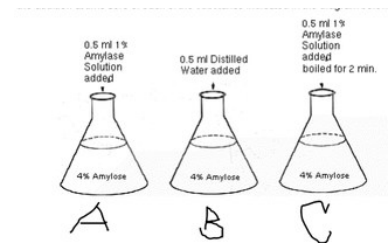
7. The effect of temperature on the relative rate of action of an enzyme is represented in the graph below. The optimum temperature for the action of this enzyme is approximately

- (A) 15 C
- (B) 22 C
- (C) 37 C
- (D) 50 C



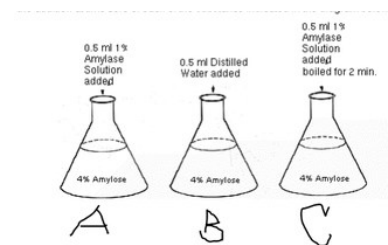
8. Amylase is an enzyme that breaks down starch into smaller sugar molecules (monosaccharides). In an experiment to test the effect of amylase on starch, the control would be

- (A) flask A only
- (B) flask B only
- (C) flask C only
- (D) flasks A and B
- (E) flasks A and C



9. Amylase is an enzyme that breaks down starch into smaller sugar molecules (monosaccharides). After 2 minutes, a positive test for sugar would most likely be observed in

- (A) flask A only
- (B) flask B only
- (C) flask C only
- (D) flasks A and B
- (E) flasks A and C



10. Which of the following is NOT an organic compound?

- (A) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
- (B) H<sub>2</sub>O
- (C) CH<sub>4</sub>
- (D) C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>

**11. Proteins are made up of chains of**

- A Monosaccharides
- B Nucleotides
- C Amino acids
- D Fatty acids

**12. Nucleotides are the building blocks for**

- A Nucleic Acids
- B Carbohydrates
- C Proteins
- D Lipids

**13. Which three elements are often found in organic compounds?**

- A carbon, hydrogen, and oxygen
- B carbon, hydrogen, and neon
- C nitrogen, hydrogen, and oxygen
- D nitrogen, chlorine, and phosphorus

**14. Small insects can walk across the surface of calm water. Their feet push the surface of the water down slightly, somewhat like a person walking across a trampoline, but they do not break the surface.**

**What is the best explanation for why this happens?**

- A The insects are light enough so that they do not break the hydrogen bonds holding the water molecules together
- B The insects actually use their wings to hover slightly above the water's surface and they only skim it with their feet
- C The insects' feet are non-polar, so they are repelled by the polar water molecules and are pushed away from the water's surface
- D The insects are small enough to see the individual water molecules, so they are able to step carefully from one molecule to the next

**15. A florist places a bouquet of white carnations in water containing blue dye. After a time, the flowers turn blue. What process helped the carnations to change color?**

- A Specific heat
- B Surface tension
- C Cohesion and adhesion of water molecules
- D Formation of covalent bonds between hydrogen and oxygen molecules

16. Maria, after finding no cold sodas in the refrigerator, placed a can of soda in the freezer. She then proceeded to check her social networking site and forgot about the soda. Later that evening her brother went to get some ice and it was brown. Maria's soda can had split open. What is the best explanation for what happened?

- (A) As the water cooled, it adhered to the can, causing it to split
- (B) When the water froze, the space between hydrogen molecules expanded
- (C) When the water froze, it weakened the molecular bonds in the aluminum can
- (D) As the water cooled, the surface tension of the water decreased and the can collapsed

17. Water is often called the "universal solvent" because many substances can be dissolved in water.

What property of water allows it to be such a versatile solvent?

- (A) purity
- (B) polarity and cohesion
- (C) high heat capacity
- (D) expansion upon freezing

18. Two of the four principle classes of organic compounds are proteins and nucleic acids. What is the relationship between proteins and nucleic acids?

- (A) Nucleic acids use proteins for energy
- (B) Nucleic acids are a subset of proteins
- (C) Proteins are long polymers of nucleic acids
- (D) Nucleic acids contain the information to make proteins

19. In living organisms, lipids function mainly as:

- (A) Sources of stored energy and transmitters of genetic information
- (B) Sources of stored energy and components of cellular membranes
- (C) Transmitters of genetic information and catalysts of chemical reactions
- (D) Catalysts of chemical reactions and components of cellular membranes

20. The table shows chemical tests for a positive control and an unknown food item. The unknown food item would contain which macromolecules?

- (A) sugar and starch only
- (B) sugar, starch, protein, and lipids
- (C) lipids only
- (D) protein and sugar only
- (E) sugar, starch, and protein

	Control	Unknown
Benedict's Test	orange	red-orange
Lugol's Test	dark blue	amber
Biuret Test	purple	purple
Sudan III Test	pink	clear

21. A yellow-brown indicator that turns blue-black when it comes in contact with starch.

- A Benedict's Solution
- B Biuret
- C Sudan IV
- D Iodine Solution

22. A chemical indicator that, when added to a solution and heated, changes from blue to light green to red in the presence of increasing concentrations of sugar.

- A Benedict's Solution
- B Sudan IV
- C Biuret
- D Iodine