1. Carbohydrates are more easily metabolized than lipids. However, on a gram-for-gram basis lipids provide cells with more —

A nitrogen 
B proteins 
C structure 
D energy

2. Which of the following biomolecules typically contains both nitrogen and phosphorus?

A Lipid 
B Protein 
C Nucleic acid 
D Carbohydrate

3. Enzymes are proteins that help increase the rate of chemical reactions inside cells. These proteins are composed of many simpler molecules called amino acids. Which of the following suggests that the shape of an enzyme determines the enzyme’s function?

A Enzymes are specific to a substrate. 
B Enzymes can operate in a wide range of conditions. 
C Enzymes are activated by neighboring molecules. 
D Enzymes can be found in all life-forms.

4. Proteins and polysaccharides are polymers. These polymers are formed by dehydration synthesis. Which statement correctly identifies a difference in the structure of proteins and polysaccharides?

A Only polysaccharides are comprised of repeating units of cytosine, adenine, guanine, and thymine. 
B Only proteins are formed from amino acids joined by peptide bonds. 
C Only polysaccharides can be folded and twisted to very specific shapes. 
D Only proteins can be large molecules with thousands of subunits.

5. Which of these best represents a fatty-acid molecule?

A F 
B G 
C H 
D J
6. How does DNA in cells determine an organism's complex traits?
   A DNA contains codes for proteins, which are necessary for the growth and functioning of an organism.
   B DNA separates into long single strands that make up each part of an organism.
   C DNA produces the energy an organism needs in order to grow.
   D DNA folds into the nucleus of each of the cells of an organism.

7. Proteins are used to enable movement, provide structure and support, and carry out important chemical reactions inside the body. What is required in order for the human body to synthesize proteins?
   A A diet rich in amino acids
   B Sufficient sunlight and water
   C 1,200 calories of nutrients per day
   D Minerals and fats in sufficient amounts

8. The enzyme catalase is involved in the breakdown of hydrogen peroxide into water and oxygen. During this reaction, the catalase-
   A is used up.
   B is unchanged.
   C is changed into a product.
   D is formed into a new enzyme.

9. What is a cell membrane predominantly composed of?
   A Proteins
   B Nucleic acids
   C Carbohydrates
   D Phospholipids

10. Which of these correctly complements the molecule with its function?
    A Lipid—stores genetic information
    B Nucleic acid—supplies energy to cells
    C Enzyme—speeds up chemical reactions
    D Carbohydrate—manufactures cell membranes

11. Which of the following macromolecules are a prominent part of animal tissues that function in insulation, helping animals conserve heat?
    A Lipids
    B Proteins
    C Nucleic acids
12. Which of the following are the building blocks of the protein catalase?
A. Vitamins  
B. Amino acids  
C. Nucleic acids  
D. Monosaccharides

13. The differences between two molecules include the type of sugar that forms a section of the molecules and the identity of one of the four nitrogenous bases that make up another section of the molecules. These two molecules are...
A. proteins  
B. lipids  
C. nucleic acids  
D. complex carbohydrates

14. Individuals who lack lactase are unable to break down the sugar lactose. Which term best describes lactase?
A. enzyme  
B. fatty acid  
C. lipid  
D. starch

15. What are the most abundant elements found in biomolecules?
A. Carbon, Oxygen, Sulfur  
B. Carbon, Oxygen, Iron  
C. Carbon, Oxygen, Helium  
D. Carbon, Oxygen, Hydrogen

16. The diagram represents one way an enzyme can be inhibited. Which statement explains the effect of an inhibitor on an enzyme?
A. A substrate will be able to bond with the enzyme  
B. The enzyme will likely be attacked by the immune cells  
C. The enzyme will be unable to produce enzymes  
D. A substrate will be unable to attach to the enzyme

17. The complex carbohydrates pictured are made by linking molecules of glucose. In all three complex carbohydrates, the subunits of glucose are bonded together differently. Because they have different structures, they most likely --
A. contained different chemical elements
B. form different proteins
C. carry different nucleotides
D. perform different functions

18. Like complex carbohydrates, proteins are biomolecules that serve many functions and can be chemically broken down and restricted. Both proteins and complex carbohydrates are which of the following?
A. Polymers of smaller subunits
B. Sequence of sugars
C. Lipids of large molecules
D. Nucleotides of DNA

19. Fireflies emit light. The production of light by an organism is called bioluminescence. To generate visible light, cells in a firefly's tail produce thousands of luciferase enzymes. Luciferase binds to a chemical called luciferin. Once bound, the luciferase enzymes speeds up a chemical reaction that combines an oxygen molecule and a luciferin to produce oxyluciferin. This reaction requires energy and releases light. Which of the following best describes how the luciferase enzyme speeds up the chemical reaction?
A. Luciferase increases the amount of time the light is visible
B. Luciferase decreases the amount of energy required for the reaction to start
C. Luciferase increases the number of sites of luciferin that must bind to oxygen
D. Luciferase decreases the temperature of the environment inside the body of a firefly

20. Lactose is found in milk products. It is converted by the body into a usable form in a series of chemical reactions. The diagram shows the series of reactions that convert lactose into a usable form. If Enzyme 2 is denatured, the levels of which substrate will increase?
A. Lactose
B. Galactose
C. Galactose-1-phosphate
D. Glucose-6-phosphate

21. Four different nucleotides are used as building blocks of DNA. Which of the following can be used to distinguish one nucleotide from another?
A. The nitrogenous base
B. The shape of the deoxyribose sugar
C. The length of the phosphate group
D. The type of fatty acid