

Proteins & Nucleic Acids MCAS Practice

Name: _____

Date: _____

- Although there are a limited number of amino acids, many different types of proteins exist because the
 - size of a given amino acid can vary.
 - chemical composition of a given amino acid can vary.
 - sequence and number of amino acids is different.
 - same amino acid can have many different properties.
- The clear protein of an egg white becomes opaque and firm when cooked because the heat
 - mutates the DNA.
 - turns the protein into carbohydrates.
 - stops protein formation.
 - changes the protein structure.
- Proteins are large macromolecules composed of thousands of subunits. The structure of the protein depends on the sequence of
 - lipids.
 - monosaccharides.
 - amino acids.
 - nucleosides.
- What types of monomers form proteins?
 - Glucose
 - Nucleotides
 - Amino acids
 - Polyatomic ions

- Use the pictures below to answer the question.



cell



organ



tissue

Which shows the correct order from simplest to most complex?

- Cell → Tissue → Organ
 - Organ → Tissue → Cell
 - Cell → Organ → Tissue
 - Tissue → Organ → Cell
- Which of the following is a primary function of carbohydrates?
 - storage of energy
 - transmission of genetic material
 - acceleration of chemical reactions
 - transport of molecules across membranes
 - Many plants have waxy coatings on some surfaces. This coating reduces water loss because it is not water-permeable. This waxy coating is which of the following types of organic molecule?
 - carbohydrate
 - lipid
 - nucleic acid
 - protein

8. Ovalbumin is a protein found in eggs. Which of the following *best* describes the molecular structure of ovalbumin?
- a group of six carbon atoms joined in a ring
 - a chain of amino acids folded and twisted into a molecule
 - a set of three fatty acids attached to a molecule of glycerol
 - a sequence of nitrogenous bases attached to a sugar-phosphate backbone
9. Which of the following categories of organic molecules is correctly paired with one of its functions?
- nucleic acids—digest dead cells
 - lipids—give quick energy to cells
 - carbohydrates—store genetic information
 - proteins—provide structure in skin, hair, and nails
10. Which of the following *best* describes the composition of a nucleotide?
- a pair of six-carbon rings attached to each other
 - a carbon atom joined to hydrogen and three functional groups
 - a chain of carbon atoms with a carboxyl group bonded to one end
 - a five-carbon sugar attached to a phosphate group and a nitrogenous base
11. Fatty acids are one of the products that result from the action of lipase in the digestive system. What is one way that fatty acids are used in the body?
- for storing energy
 - for encoding genetic information
 - as the building blocks of antibodies
 - as the building blocks of hemoglobin

12. Resistance to antibiotics results from variations in the genetic code of *Streptococcus pneumoniae*. Which type of molecule encodes genetic information in *Streptococcus pneumoniae*?

- carbohydrate
- fatty acid
- nucleic acid
- protein

13. Which of the following statements describes a DNA molecule?

- It contains the base uracil.
- It has a double helix shape.
- It contains five phosphate groups per nucleotide.
- It has a backbone of twenty different nucleotides.

14. The diagram below shows a pair of DNA nucleotides. The nitrogenous base guanine (G) is labeled.



Which nitrogenous base pairs with guanine?

- adenine (A)
- cytosine (C)
- thymine (T)
- uracil (U)

15. A student is preparing to run in a school track competition. For the quickest source of energy, the student should eat a food that contains a high percentage of

- carbohydrates.
- fat.
- proteins.
- sodium.

16. Vitamin D is an organic molecule that regulates the absorption of calcium by the body. Which of the following elements is most common in a molecule of vitamin D?

- aluminum
- carbon
- magnesium
- sodium

17. In the 1940s and 1950s, scientists did experiments to determine the molecule responsible for heredity.

Their experiments demonstrated that the molecule that encodes and transmits information in organisms is

- A. DNA. B. glucosamine.
C. insulin. D. vitamin D.
18. Which group of organic compounds contains fatty acids?
- A. carbohydrates B. lipids
C. nucleic acids D. proteins
19. A single nucleotide of DNA is composed of which of the following substances?
- A. adenine, guanine, and cytosine
B. hydrogen, a phosphate group, and adenine
C. ribose sugar, deoxyribose sugar, and thymine
D. deoxyribose sugar, a phosphate group, and a nitrogenous base
20. Which of the following is a lipid?
- A. Cholesterol B. Cellulose
C. Glucose D. Protein
21. Proteins are made of long chains of—
- A. lipids. B. monosaccharides.
C. amino acids. D. enzymes.
22. All carbohydrates are made of—
- A. carbon, hydrogen, and oxygen.
B. glucose, sucrose, and fructose.
C. cellulose, glycogen, and starch.
D. guanine, alanine, and cytosine.

23. The glucose produced during photosynthesis is an example of a—

- A. lipid. B. monosaccharide.
C. protein. D. nucleic acid.
24. Protein synthesis is a major function of living cells. The type of protein synthesized by a cell is determined by the sequence of—
- A. carbohydrates. B. amino acids.
C. lipids. D. enzymes.
25. A molecule with a structure composed primarily of amino acids would be classified in which of the following groups?
- A. Lipids B. Proteins
C. Nucleic acids D. Carbohydrates
26. RNA and DNA are which type of organic compound?
- A. carbohydrate B. lipid
C. nucleic acid D. protein
27. Which statement *best* describes the relationship that exists among proteins, DNA, and cells?
- A. Proteins combine to produce cells, which produce DNA.
B. Proteins are made up of DNA, which determines the cells that are produced.
C. DNA is made up of proteins, which tell a cell how to function.
D. Cells contain DNA, which controls the production of proteins.

Proteins & Nucleic Acids MCAS Practice 10/06/2016

1.
Answer: C
2.
Answer: D
3.
Answer: C
4.
Answer: C
5.
Answer: A
6.
Answer: A
7.
Answer: B
8.
Answer: B
9.
Answer: D
10.
Answer: D
11.
Answer: A
12.
Answer: C
13.
Answer: B
14.
Answer: B
15.
Answer: A
16.
Answer: B
17.
Answer: A
18.
Answer: B
19.
Answer: D
20.
Answer: A

21.
Answer: C
22.
Answer: A
23.
Answer: B
24.
Answer: B
25.
Answer: B
26.
Answer: C
27.
Answer: D