

Nanobiotechnology

Part 1-1. Test 1-1.

Please select one or several correct answers to each question.

1. Hydrogen bonding is characterized by interaction of the following atoms:
 - A. Oxygen
 - B. Hydrogen
 - C. Sodium
 - D. Nitrogen

2. Specify which biological molecules are polymers:
 - A. Simple proteins
 - B. Neutral fat
 - C. DNA
 - D. Glycogen

3. What chemical bond is hydrolyzed in the decay of proteins?
 - A. Hydrogen bond
 - B. Ester bond
 - C. Peptide bond
 - D. Hydrophobic bond

5. How the =NH functional group is named:
 - A. Alcohol
 - B. Amino-
 - C. Aldehyde
 - D. Imino-

6. Primary protein structure is:
 - A. Configuration of polypeptide chain
 - B. Polypeptide chain packing in certain volume
 - C. Order of amino acids in the polypeptide chain
 - D. Quantitative composition of amino acids in the polypeptide chain

7. Secondary structure is:
 - A. Alpha-helix, beta-sheet and amorphous sites
 - B. Configuration of polypeptide chain
 - C. Formation of protomer
 - D. Way of spatial interaction of several protomers

8. What is the role of biological membrane?
 - A. Potential formation
 - B. Cell elasticity
 - C. Ionic transport
 - D. Regulation of cyclosis

9. Within a cell, energy is stored in the form of:
 - A. ATP
 - B. GTP
 - C. AMP

- D. cAMP
10. Eukaryotic genes are located in:
- A. Plasmids
 - B. Heterochromatin
 - C. Euchromatin
 - D. Telomeres
11. Non-membranous cell components include:
- A. Lysosomes
 - B. Ribosomes
 - C. Peroxisomes
 - D. Mitochondria
12. Of the blood cells, the following cells are of most stable and uniform shape:
- A. Thrombocytes
 - B. Erythrocytes
 - C. Phagocytes
 - D. Lymphocytes
13. Adrenalin is secreted in:
- A. The thyroid
 - B. The pancreas
 - C. The hypophysis
 - D. The adrenal glands
15. Population comprises individuals:
- A. Of various species
 - B. Related to same food chain
 - C. Of same species
 - D. Having same ecological niches
16. Chromosomes segregate to the cell poles in:
- A. Metaphase
 - B. Prophase
 - C. Interphase
 - D. Telophase

Part 1-2.

Please provide free-form answers:

1. Algae. General characteristics. Cell and thallus structure. Pigments of algae, their role in the adaptation to the environment and in taxonomy. Distribution and the role of algae in nature
2. Lung structure in various groups of organisms. Mechanisms of pulmonary respiration.
5. The metabolism of microorganisms. Types of how microorganisms feed. Types of ATP formation in microorganisms. Microbial electron transport chains.
3. The role of light in the biosphere formation.
6. Structural organization of biological membranes.
7. Ion channel transport.