

Part I - Multiple choice - Circle the **one** most correct choice in each of the following. 1 pt each.

1. A type of lipid often used for energy storage is : A) glycogen B) carotenoid
C) steroid D) phospholipid E) triglyceride
2. The energy storage molecule in question 1 is most likely found in the kingdom:
A) animalia B) plantae C) monera D) fungi E) protista
3. Of the following choices, which taxon is highest (most inclusive) in its hierarchy?
A) tissue B) family C) population D) class E) system
4. Adaptation is directly due to changes in the: A) genetic information of an organism
B) genetic information of a population C) physiology of an organism D) body
structure of an organism E) physiology of a population
5. The adaptation as described above is the result of a process known as: A)
acclimatization B) homeostasis C) immediate response D) natural selection E)
none of the above
6. Sugar and phosphate are found in the structure of: A) fats B) nucleic acids
C) steroids D) protein E) all of the above
7. The diagram at left represents the
structure of a(n) _____ group. A)
amino B) carboxyl C) hydroxyl D)
sulfhydryl E) carbonyl
8. A molecule that may contain the group in question 7 is a(n): A) glycerol
B) fatty acid C) simple sugar D) steroid E) nucleic acid base
9. Similar or interacting systems can be grouped to form a(n): A) organ B) population
C) organism D) cell E) class
10. Similar orders can be grouped to form a(n): A) class B) division C) family
D) system E) population
11. The molecule at left is a(n): A) sugar
B) glycerol C) nucleic acid base
D) fatty acid E) amino acid

12. All else being equal, in an endergonic reaction, a larger energy change will mean a(n) _____ in the reaction rate. A) increase B) decrease C) lack of change D) unpredictable change
13. A valid hypothesis is: A) well controlled B) the result of repeated experimentation C) consistent with all known data D) able to generate testable predictions E) more than one of the above
14. An atom has the atomic number 6. It will likely form ____ covalent bonds with other atoms. A) 1 B) 2 C) 3 D) 4 E) 5
15. The mass number of an atom minus the atomic number: A) equals the number of electrons B) equals the number of neutrons C) equals the number of protons D) equals the number of protons and neutrons E) none of the above
16. Atoms of the same element that differ in mass number are termed: A) ions B) isomers C) atomic numbers D) molecules E) isotopes

Part II - Fill-in - Write an appropriate word or phrase in each blank space. 1 pt. each blank.

1. A _____ pattern of folds in a protein is termed the secondary structure of that protein. Such a folding pattern is caused by _____. This is usually the highest structural level possessed by proteins that have a _____ function. Only if a protein possesses _____ will it have a quaternary structure.
2. Two amino acids with chemical formula $C_3H_8O_3N$ are linked together with a peptide bond. The resulting small peptide chain will have _____ nitrogen atoms, _____ oxygen atoms, and _____ hydrogen atoms.
3. Chitin is commonly found as a structural component in _____ and _____. Chemically, chitin would be classed as a(n) _____ carbohydrate.
4. Possession of a phosphate group in a molecule would typically make that molecule _____ (acidic/ alkaline/ neutral)
5. In order for the results of an experiment to be considered valid, the experiment must be _____ and _____.
6. Even though water and ammonia would both be useful as a basis for life, water is the basis for Earth life because it is _____ at typical Earth temperatures.

7. _____ are biological catalysts. These macromolecules are _____ that typically have a globular tertiary structure. The activity of these catalysts can be altered by changing their shapes, a process known as _____. These catalysts speed up chemical reaction rates by _____ activation energies.
8. If a species of life has procaryotic cells, it might be classed in the kingdom _____. Eucaryotes, if they are single-celled, would be in the kingdom _____. A multicellular eucaryote lacking cell walls would be classified in the kingdom _____. If the multicellular eucaryote had cell walls, it would be classed in the kingdom _____ if it were found to be heterotrophic; if not, it would be in the kingdom _____.

Part III - True-false - Indicate validity of each statement by placing a "T" or "F" in the margin to the **left** of each. 1 pt. each.

1. Baltimore orioles inhabit the eastern U.S. Bullock's orioles are a similar species in the west. Recently scientists found both types mating and producing fertile offspring in the great plains of the U.S. They thus lumped the two together into one species that they called the northern oriole. They were correct in doing so.
2. The schematic structure drawn at right represents that of a typical carotenoid.
3. ATP is a nucleotide.
4. The fatty acids in a phospholipid are usually found in the interior of a membrane formed by these molecules.
5. The correct manner for writing the scientific name for humans would be: Homo sapiens.
6. A solution with a pH of 7 would have an $[H^+]$ 100 times lower than that of a solution with a pH of 9.
7. A schematic structural drawing for the base adenine would be _____
8. Covalent bonds involve the sharing of two electrons between two atoms.
9. If used in taxonomy, a tribe would be a collection of similar genuses.
10. A phylum is the term for a collection of similar classes typically used by plant biologists.

Part IV - Short answer - Write an appropriate answer in the space provided. Pts. as indicated.

1. Define: (3 pts each)
 - A. acclimatization

Short answer #1 cont.

B. natural selection

C. theory

D. competitive inhibition

E. community

F. receptor protein

G. steroid

H. a useful hypothesis

2. Describe how the amino acids proline and cysteine can have major effects on the tertiary structure of a protein. Where in such a structure would you expect to most likely find amino acids containing nonpolar side chains? Why? (13 pts)

3. Outline the basic steps in the scientific method. (6 pts)

4. List in order the levels of organization that have any direct biological relevance. (# of pts in question = # items in the list) (9 pts)

THE END
YOU MAY LEAVE WHEN YOU ARE FINISHED