13. Glucose is a classic example of a:
- **a.** protein.
- **b.** lipid.
- **c.** carbohydrate.
- **d.** nucleotide.
- **e.** fatty acid.

14. The four kinds of organic macromolecules are:
- **a.** DNA, RNA, sugars, and amino acids.
- **b.** hydroxyls, carboxyls, phosphates, and lipids.
- **c.** proteins, carbohydrates, lipids, and nucleic acids.
- **d.** carbon, phosphorus, oxygen, and hydrogen.
- **e.** nucleic acids, amino acids, phospholipids, and sugars.

15. How are large organic molecules (macromolecules) formed?
- **a.** by hydrolysis of monomers
- **b.** by hydrolysis of polymers
- **c.** by a dehydration reaction using monomers
- **d.** by a dehydration reaction using polymers
- **e.** by a process of rehydration

16. Proteins are macromolecules that can perform many different functions within an organism. This diversity of function for this macromolecule is due to the unique nature of one of its four functional groups that is bound to a central carbon atom. Which functional group is responsible for the wide diversity of function attributed to proteins?
- **a.** the carboxyl group
- **b.** the amino group
- **c.** the hydrogen group
- **d.** the R group
- **e.** the carbon group

17. The chemical properties of an element are determined by the number of _____ its atoms contain.
- **a.** protons
- **b.** neutrons
- **c.** electrons
- **d.** subatomic particles
- **e.** ions

18. The first electron shell is considered full when it contains two electrons. The second electron shell is considered full when it contains _____ electrons.
- **a.** 2
- **b.** 4
- **c.** 6
- **d.** 8
- **e.** 16

19. A molecule is composed of:
- **a.** a single atom.
- **b.** two or more atoms of different elements.
- **c.** two or more atoms of the same element.
- **d.** two or more atoms of the same or different elements bound by their outermost electron shells.
- **e.** two or more atoms of the same or different elements bound by their innermost electron shells.

20. An *inert* atom is one which:
- **a.** will not react with another atom only when its outermost shell is empty.
- **b.** will not react with another atom only when its outermost shell is completely full.
- **c.** will not react with another atom because its outermost shell is either empty or completely full.
- **d.** will react with another atom when its outermost shell is only partially full.
- **e.** will react with another atom when its outermost shell is empty.

21. Which of the following is an isotope of an oxygen atom?
- **a.** 8 electrons, 8 protons, 9 neutrons
- **b.** 7 electrons, 8 protons, 8 neutrons
- **c.** 8 electrons, 7 protons, 8 neutrons
- **d.** 7 electrons, 7 protons, 7 neutrons
- **e.** 9 electrons, 7 protons, 8 neutrons

22. Which of the following is NOT an element?
- **a.** sodium
- **b.** hydrogen
- **c.** carbon
- **d.** chlorine
- **e.** water

23. Which of the following is an organic molecule?
- **a.** CO_2
- **b.** H_2O
- **c.** $C_6H_{12}O_6$
- **d.** O_2
- **e.** a and c

24. What subatomic particles are atoms composed of?
- **a.** protons
- **b.** protons and neutrons
- **c.** protons, neutrons, and electrons
- **d.** protons and electrons
- **e.** electrons and neutrons

25. Covalent bonding is:
- **a.** the most common type of bond used by biological molecules.
- **b.** the least common type of bond used by biological molecules.
- **c.** never used by biological molecules.
- **d.** always used by biological molecules.
- **e.** only used with hydrogen and oxygen in the formation of water.

26. The attraction of water molecules to each other is known as:
- **a.** capillary action.
- **b.** solubility.
- **c.** cohesion.
- **d.** adhesion.
- **e.** tension.

27. Which feature of water explains why it has a high surface tension?
- **a.** the high heat at which water evaporates
- **b.** water's resistance to temperature changes
- **c.** the fact that water is a polar molecule
- **d.** water's ability to expand when it freezes
- **e.** water's ability to contract when the temperature increases

ANSWER KEY

1. a
2. b
3. a
4. b
5. e
6. d
7. c
8. c
9. e
10. b
11. d
12. e
13. c
14. c
15. c
16. d
17. c
18. d
19. d
20. c
21. a
22. e
23. c
24. c
25. a
26. c
27. c
28. b
29. a
30. b
31. c
32. b
33. d
34. c
35. a
36. a
37. d
38. c
39. b
40. e
41. isotopes
42. chemical bonds
43. ions
44. 7
45. ATP
46. surface tension
47. ionic
48. covalent
49. element
50. reactive