MULTIPLE CHOICE

1. An element that represents less than 0.01 percent of body weight is known as a(n)
   a. compound.
   b. trace element.
   c. molecule.
   d. isotope.
   e. analog.

   ANS: B PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

2. Which is the smallest portion of a substance that retains the properties of an element?
   a. atom
   b. compound
   c. ion
   d. molecule
   e. mixture

   ANS: A PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

3. How many natural elements exist on Earth?
   a. 100
   b. 112
   c. 88
   d. 96
   e. 110

   ANS: D PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

4. Which subatomic particle has a positive charge?
   a. electron
   b. neutron
   c. photon
   d. neutrino
   e. proton

   ANS: E PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

5. Which two subatomic particles are almost always equal in number?
   a. electrons and neutrons
   b. protons and neutrons
   c. protons and electrons
   d. photons and electrons
   e. neutrons and neutrinos

   ANS: C PTS: 1 DIF: Easy REF: 2.1

OBJ: Knowledge TOP: ATOMS AND ELEMENTS

6. Organisms consist mostly of four elements. They are carbon, hydrogen, oxygen, and
   a. iron.
   b. chlorine.
   c. silicon.
   d. nitrogen.
   e. phosphorous.

   ANS: D PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

7. The atomic number refers to the
   a. mass of an atom.
   b. number of protons in an atom.
   c. number of both protons and neutrons in an atom.
   d. number of neutrons in an atom.
   e. number of electrons in an atom.

   ANS: B PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

8. An element's mass number is equal to the sum of its
   a. protons and electrons.
   b. protons and neutrons.
   c. electrons and neutrons.
   d. protons only.
   e. electrons only.

   ANS: B PTS: 1 DIF: Easy REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

9. Isotopes
   a. are identical in mass number to the "standard" element.
   b. contain a different number of electrons than the "standard" element.
   c. contain a different number of protons than the "standard" element.
   d. contain the same number of protons but a different number of neutrons than the "standard" element.
   e. are actually a different element than the "standard" element.

   ANS: D PTS: 1 DIF: Moderate REF: 2.1
   OBJ: Knowledge TOP: ATOMS AND ELEMENTS

10. Radioisotopes
    a. are unstable and emit energy and particles to stabilize themselves.
    b. are different elements from the "standard" elements.
    c. are very stable and do not change over time.
    d. contain more electrons than the "standard" element.
    e. contain less electrons than the "standard" element.

    ANS: A PTS: 1 DIF: Moderate REF: 2.1
    OBJ: Comprehension TOP: ATOMS AND ELEMENTS

11. The negative subatomic particle is (are) the
    a. neutron.
    b. proton.
    c. electron.
    d. neutron and proton.
    e. proton and electron.

    ANS: C PTS: 1 DIF: Easy REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

12. The neutral subatomic particle is (are) the
    a. neutron.
    b. proton.
    c. electron.
    d. neutron and proton.
    e. proton and electron.

    ANS: A PTS: 1 DIF: Easy REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

13. The nucleus of an atom contains
    a. neutrons and protons.
    b. neutrons and electrons.
    c. protons and electrons.
    d. protons only.
    e. neutrons only.

    ANS: A PTS: 1 DIF: Easy REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

14. Which element does not contain a neutron in its nucleus?
    a. helium
    b. carbon
    c. oxygen
    d. hydrogen
    e. nitrogen

    ANS: D PTS: 1 DIF: Difficult REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

15. Transmutation of an element (the change of an element into a different element) occurs due to
    a. exposure to strong sunlight.
    b. exposure to certain chemicals.
    c. natural aging of the element.
    d. combining with another element.
    e. radioactive decay.

    ANS: E PTS: 1 DIF: Difficult REF: 2.1
    OBJ: Comprehension TOP: ATOMS AND ELEMENTS

16. Examples of isotopes include:
    a. oxygen 8 and oxygen 16.
    b. carbon 12 and nitrogen 14.
    c. hydrogen 1 and helium 1.
    d. sodium 23 and potassium 23.
    e. carbon 12 and carbon 14.

    ANS: B PTS: 1 DIF: Difficult REF: 2.1
    OBJ: Comprehension TOP: ATOMS AND ELEMENTS

17. All atoms of an element have the same number of
    a. ions.
    b. protons.
    c. neutrons.
    d. electrons.
    e. protons and neutrons.

    ANS: B PTS: 1 DIF: Easy REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

18. A sugar or other molecule in which radioisotopes have been substituted for some atoms is a(n)
    a. enzyme.
    b. reactant.
    c. tracer.
    d. subatomic particle.
    e. quark.

    ANS: C PTS: 1 DIF: Moderate REF: 2.2
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

19. Positron Emission Tomography utilizes ____ to yield results of a scan.
    a. tracers
    b. x-rays
    c. neutrinos
    d. photons
    e. mesons

    ANS: A PTS: 1 DIF: Easy REF: 2.2
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

20. The time it takes for half of a quantity of a radioisotope to decay into a more stable isotope is
    a. the same for all elements.
    b. decay time.
    c. half-life.
    d. disintegration time.
    e. dependent on temperature.

    ANS: C PTS: 1 DIF: Moderate REF: 2.1
    OBJ: Comprehension TOP: ATOMS AND ELEMENTS

21. A tracer is a substance with what attached to it?
    a. water
    b. carbon
    c. a radioisotope
    d. an ion
    e. a positron

    ANS: C PTS: 1 DIF: Easy REF: 2.2
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

22. PET (positron-emission tomography) scans use radioisotopes attached to what substances to detect abnormalities?
    a. other radioisotopes
    b. subatomic particles
    c. carbon atoms
    d. glucose or other biological molecules
    e. plutonium

    ANS: D PTS: 1 DIF: Difficult REF: 2.2
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

23. The time it takes for half of a quantity of a radioisotope to decay into a more stable isotope is
    a. the same for all elements.
    b. decay time.
    c. half-life.
    d. disintegration time.
    e. dependent on temperature.

    ANS: C PTS: 1 DIF: Moderate REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

24. The element in the body with the greatest number of atoms is
    a. phosphorus.
    b. oxygen.
    c. hydrogen.
    d. calcium.
    e. carbon.

    ANS: C PTS: 1 DIF: Moderate REF: 2.1
    OBJ: Comprehension TOP: HOW MUCH ARE YOU WORTH?

25. Which of the following is NOT a compound?
    a. salt
    b. sugar
    c. carbon
    d. oxygen gas
    e. water

    ANS: C PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Comprehension
    TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

26. Electrons move around the atomic nucleus in
    a. zigzag patterns.
    b. straight paths.
    c. shells.
    d. two dimensions.
    e. one dimension.

    ANS: C PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

27. Electrons inside a shell travel in
    a. straight paths.
    b. orbitals
    c. zigzag patterns
    d. two dimensions
    e. one dimension

    ANS: B PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

28. The maximum number of electrons in a shell is
    a. two.
    b. four.
    c. six.
    d. eight.
    e. ten.

    ANS: D PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

29. A union between the electron structures of atoms is a(n)
    a. chemical bond.
    b. hydrogen bond.
    c. isotopic bond.
    d. physical bond.
    e. atomic bond.

    ANS: A PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

30. When an atom's outer shell is filled it is
    a. unstable.
    b. an ion.
    c. most stable.
    d. polarized.
    e. negatively charged.

    ANS: C PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

31. Which of the following is not one of the four most abundant elements in the body?
    a. carbon
    b. hydrogen
    c. oxygen
    d. nitrogen
    e. calcium

    ANS: E PTS: 1 DIF: Easy REF: 2.1
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

32. The bonding of two or more atoms creates a(n)
    a. ion.
    b. molecule.
    c. mixture.
    d. suspension.
    e. particle.

    ANS: B PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

33. Atoms without vacancies are considered to be
    a. ions.
    b. negatively charged.
    c. positively charged.
    d. inert.
    e. highly active.

    ANS: D PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

34. Choose the correct formula for the reaction that takes place between hydrogen and oxygen to produce water.
    a. $H_2 + O_2 \rightarrow H_2O$
    b. $H + O \rightarrow H_2O$
    c. $2H_2 + O_2 \rightarrow 2H_2O$
    d. $2H_2O + O_2 \rightarrow 4H_2O$
    e. $2H_2 + 2O_2 \rightarrow 2H_2O$

    ANS: C PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Comprehension
    TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

35. A(n) ____ consists of two or more bonded elements in proportions that never vary.
    a. ion
    b. mixture
    c. compound
    d. network solid
    e. satisfied orbital

    ANS: C PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

36. When two or more molecules simply mingle, a(n) ____ is created.
    a. compound
    b. mixture
    c. molecule
    d. ionic compound
    e. suspension

    ANS: B PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

37. An atom that is considered *inert* is
    a. oxygen.
    b. hydrogen.
    c. nitrogen.
    d. carbon.
    e. helium.

    ANS: E PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

38. Water is an example of a(n)
    a. atom.
    b. ion.
    c. compound.
    d. mixture.
    e. element.

    ANS: C PTS: 1 DIF: Easy REF: 2.3
    OBJ: Comprehension
    TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

39. Which of the following answers include all the others?
    a. atoms
    b. molecules
    c. electrons
    d. elements
    e. protons

    ANS: B PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Comprehension
    TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

40. Which of the following is NOT an element?
    a. water
    b. oxygen
    c. carbon
    d. chlorine
    e. hydrogen

    ANS: A PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Comprehension
    TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

41. A molecule is
    a. a combination of two or more atoms.
    b. less stable than its constituent atoms separated.
    c. electrically charged.
    d. a carrier of one or more extra neutrons.
    e. one atom.

    ANS: A PTS: 1 DIF: Moderate REF: 2.3
    OBJ: Knowledge TOP: CHEMICAL BONDS: HOW ATOMS INTERACT

42. A bond that joins atoms that have opposite charges is a(n)
    a. covalent bond.
    b. hydrogen bond.
    c. ionic bond.
    d. coordinate covalent bond.
    e. polar covalent bond.

    ANS: C PTS: 1 DIF: Easy REF: 2.4
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

43. What is formed when an atom loses or gains an electron?
    a. a molecule
    b. an ion
    c. a compound
    d. a mixture
    e. a solvent

    ANS: B PTS: 1 DIF: Easy REF: 2.4
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

44. Generally, an atom carries no charge because it has as many electrons as
    a. neutrons.
    b. orbitals.
    c. shells.
    d. protons.
    e. neutrinos.

    ANS: D PTS: 1 DIF: Easy REF: 2.4
    OBJ: Comprehension
    TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

45. The bond in table salt (NaCl) is
    a. polar.
    b. ionic.
    c. covalent.
    d. double.
    e. nonpolar.

    ANS: B PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

46. The bond formed when atoms share electrons is a(n) ____ bond.
    a. hydrogen
    b. ionic
    c. covalent
    d. crystalline
    e. network

    ANS: C PTS: 1 DIF: Easy REF: 2.4
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

47. A hydrogen bond is
    a. a sharing of a pair of electrons between a hydrogen and an oxygen nucleus.
    b. a sharing of a pair of electrons between a hydrogen nucleus and either an oxygen or a nitrogen nucleus.
    c. an attractive force that involves a hydrogen atom and an oxygen or a nitrogen atom that are either in two different molecules or within the same molecule.
    d. found only in water molecules.
    e. is the strongest form of chemical bond.

    ANS: C PTS: 1 DIF: Difficult REF: 2.4
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

48. A water molecule is an example of which type of molecule?
    a. polar covalent
    b. nonpolar covalent
    c. ionic
    d. coordinate covalent
    e. network

    ANS: A PTS: 1 DIF: Moderate REF: 2.4
    OBJ: Comprehension
    TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

49. Molecular hydrogen is an example of which type of molecule?
    a. polar covalent
    b. nonpolar covalent
    c. ionic
    d. coordinate covalent
    e. network

    ANS: B PTS: 1 DIF: Moderate REF: 2.4
    OBJ: Comprehension
    TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

50. In a polar covalent bond, the atoms of the different elements do not share electrons equally because
    a. one is a metal and one is a non-metal.
    b. both are metals.
    c. both are non-metals.
    d. one element has more neutrons.
    e. one element has more protons.

    ANS: E PTS: 1 DIF: Moderate REF: 2.4
    OBJ: Comprehension
    TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

51. Which type of bond holds the two strands of DNA together?
    a. ionic
    b. network
    c. polar covalent
    d. hydrogen
    e. non-polar covalent

    ANS: D PTS: 1 DIF: Easy REF: 2.4
    OBJ: Knowledge TOP: IMPORTANT BONDS IN BIOLOGICAL MOLECULES

52. Which type of bond makes water liquid?
    a. ionic
    b. covalent
    c. polar covalent
    d. nonpolar covalent
    e. hydrogen

    ANS: E PTS: 1 DIF: Easy REF: 2.5
    OBJ: Knowledge TOP: WATER: INDISPENSABLE FOR LIFE

53. How do hydrophobic molecules interact with water?
    a. attracted to
    b. absorbed by
    c. repelled by
    d. mixed with
    e. polarized bond

    ANS: C PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Comprehension TOP: WATER: INDISPENSABLE FOR LIFE

54. Why does water have a high heat capacity?
    a. because it has covalent bonds
    b. because it has ionic bonds
    c. because it has hydrogen bonds
    d. because it has a high boiling point
    e. because it has a low freezing point

    ANS: C PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Knowledge TOP: WATER: INDISPENSABLE FOR LIFE

55. What makes water a solvent?
    a. Fats dissolve in it.
    b. Ions and polar molecules dissolve in it.
    c. It mixes well with alcohol.
    d. It evaporates easily.
    e. It contains no minerals.

    ANS: B PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Comprehension TOP: WATER: INDISPENSABLE FOR LIFE

56. Water stabilizes body temperature and dissolves many substances because
    a. it evaporates easily.
    b. its molecules are covalent.
    c. its molecules are ionic.
    d. it contains hydrogen bonds.
    e. it is free of minerals.

    ANS: D PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Comprehension TOP: WATER: INDISPENSABLE FOR LIFE

57. A salt will dissolve in water to form
    a. acids.
    b. gases.
    c. ions.
    d. bases.
    e. polar solvents.

    ANS: C PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Knowledge TOP: WATER: INDISPENSABLE FOR LIFE

58. The process in which an atom or molecule loses one or more electrons to another atom or molecule is called
    a. reduction.
    b. dehydration.
    c. oxidation.
    d. condensation.
    e. hydrolysis.

    ANS: C PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

59. The many oxidation reactions that take place in our bodies cause the formation of
    a. free radicals.
    b. antioxidants.
    c. covalent molecules.
    d. ionic molecules.
    e. hydrogen bonds.

    ANS: A PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

60. A free radical will "steal" what particle from a stable molecule?
    a. a proton
    b. a neutron
    c. an atom
    d. an electron
    e. a positron

    ANS: D PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

61. Substances that give up an electron to a free radical are called
    a. reducing agents.
    b. oxidizing agents.
    c. neutralizing agents.
    d. antibiotics.
    e. antioxidants.

    ANS: E PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

62. Antioxidant-rich foods are typically
    a. low in fat and high in fiber.
    b. high in fat and low in fiber.
    c. high in sugars and low in fat.
    d. high in fiber and high in fat.
    e. low in sugars and high in fiber.

    ANS: A PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

63. Natural sources of antioxidants do not include
    a. vitamin C.
    b. vitamin E.
    c. orange vegetables.
    d. green leafy vegetables.
    e. O_2^-.

    ANS: E PTS: 1 DIF: Easy REF: 2.6
    OBJ: Knowledge TOP: HOW ANTIOXIDANTS PROTECT CELLS

64. The pH scale measures the
    a. hydroxide ion concentration.
    b. concentration of a water-based solution.
    c. hydrogen ion concentration.
    d. number of water molecules in a solution.
    e. concentration of dissolved solute.

    ANS: C PTS: 1 DIF: Easy REF: 2.7
    OBJ: Knowledge TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

65. A reaction of a strong acid and a strong base will produce water and
    a. a buffer.
    b. a salt.
    c. gas.
    d. solid precipitate.
    e. solute.

    ANS: B PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

66. Which of the following would NOT be used in connection with the word *acid*?
    a. excess hydrogen ions
    b. contents of the stomach
    c. magnesium hydroxide
    d. pH less than 7
    e. HCl

    ANS: C PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

67. Fluid inside most human cells is about
    a. pH 7.
    b. pH 9.
    c. pH 4.
    d. pH 11.
    e. pH 2.

    ANS: A PTS: 1 DIF: Easy REF: 2.7
    OBJ: Knowledge TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

68. Smoke from fossil fuels, motor vehicle exhaust, and nitrogen fertilizers can lead to
    a. greater cloud formation.
    b. acid rain.
    c. basic rain.
    d. rain with high mineral content.
    e. salted rain.

    ANS: B PTS: 1 DIF: Easy REF: 2.7
    OBJ: Knowledge TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

69. Cellular pH is kept near a value of 7 because of
    a. salts.
    b. buffers.
    c. acids.
    d. bases.
    e. water.

    ANS: B PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

70. H_2CO_3 is
    a. sulfuric acid.
    b. carbonic acid.
    c. carbolic acid.
    d. hydrochloric acid.
    e. nitric acid.

    ANS: B PTS: 1 DIF: Easy REF: 2.7
    OBJ: Knowledge TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

71. HCl in the stomach acts to
    a. neutralize buffers.
    b. kill harmful bacteria.
    c. switch off certain digestive enzymes.
    d. produce trypsin.
    e. prevent breakdown of protein.

    ANS: B PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

72. A buffer system
    a. makes new hydrogen ions.
    b. eliminates hydrogen ions already present.
    c. binds carbon ions.
    d. releases hydrogen ions.
    e. produce excess acid.

    ANS: D PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Knowledge TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

73. A pH of 10 is how many times as basic as a pH of 7?
    a. 2
    b. 3
    c. 10
    d. 100
    e. 1000

    ANS: E PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Application TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

74. A buildup of H_2CO_3 in the blood will lead to
    a. alkalosis.
    b. calcium buildup.
    c. acidosis.
    d. hydroxide ion increase.
    e. HCO_3^- increase.

    ANS: C PTS: 1 DIF: Moderate REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

75. What substances will release hydrogen ions when their concentration is low and accept them when their concentration is high?
    a. salts
    b. acids
    c. bases
    d. buffers
    e. alkalines

    ANS: D PTS: 1 DIF: Easy REF: 2.7
    OBJ: Comprehension
    TOP: ACIDS, BASES, AND BUFFERS: BODY FLUIDS IN FLUX

76. If a molecule contains carbon and at least one atom of hydrogen, it is referred to as being
    a. inorganic.
    b. acidic.
    c. basic.
    d. organic.
    e. crystalline.

    ANS: D PTS: 1 DIF: Easy REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

77. Each carbon atom can share pairs of electrons with as many as ____ other atoms.
    a. 2
    b. 3
    c. 4
    d. 5
    e. 6

    ANS: C PTS: 1 DIF: Easy REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

78. Atoms or clusters of atoms that are covalently bonded to carbon and influence the behavior of organic compounds are known as
    a. functional groups.
    b. ions.
    c. acids.
    d. network solids.
    e. anhydrides.

    ANS: A PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

79. Proteins that speed up reactions are known as
    a. salts.
    b. buffers.
    c. monomers.
    d. polymers.
    e. enzymes.

    ANS: E PTS: 1 DIF: Easy REF: 2.3
    OBJ: Knowledge TOP: MOLECULES OF LIFE

80. Which element makes up more than half of the human body?
    a. calcium
    b. hydrogen
    c. oxygen
    d. carbon
    e. nitrogen

    ANS: D PTS: 1 DIF: Easy REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

81. Condensation reactions are also referred to as
    a. hydrolysis.
    b. dehydration synthesis.
    c. lytic reactions.
    d. recombination.
    e. transmutation.

    ANS: B PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Comprehension TOP: MOLECULES OF LIFE

82. The three most common atoms in your body are
    a. hydrogen, oxygen, and carbon.
    b. carbon, hydrogen, and nitrogen.
    c. carbon, nitrogen, and oxygen.
    d. nitrogen, hydrogen, and oxygen.
    e. carbon, oxygen, and sulfur.

    ANS: A PTS: 1 DIF: Easy REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

83. A large molecule built of three to millions of subunits is a(n)
    a. monomer.
    b. ion.
    c. polymer.
    d. enzyme.
    e. functional unit.

    ANS: C PTS: 1 DIF: Easy REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

84. The process by which two molecules covalently bond into a larger one is
    a. condensation.
    b. cleavage.
    c. functional group transfer.
    d. electron transfer.
    e. rearrangement.

    ANS: A PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Comprehension TOP: MOLECULES OF LIFE

85. The process by which a molecule splits into two smaller ones is
    a. condensation.
    b. cleavage.
    c. functional group transfer.
    d. electron transfer.
    e. rearrangement.

    ANS: B PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

86. The process by which one or more electrons from one molecule are donated to another molecule is
    a. condensation.
    b. cleavage.
    c. functional group transfer.
    d. electron transfer.
    e. rearrangement.

    ANS: D PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

87. The process by which a molecule gives up a functional group, and a different molecule immediately accepts it, is
    a. condensation.
    b. cleavage.
    c. functional group transfer.
    d. electron transfer.
    e. rearrangement.

    ANS: C PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

88. The process by which the movement of internal bonds converts one type of organic compound to another is
    a. condensation.
    b. cleavage.
    c. functional group transfer.
    d. electron transfer.
    e. rearrangement.

    ANS: E PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Knowledge TOP: MOLECULES OF LIFE

89. The insertion of water (H^+ and OH^-) into an enzymatically split molecule is
    a. hydrolysis.
    b. dehydration synthesis.
    c. condensation.
    d. cleavage.
    e. polymerization.

    ANS: A PTS: 1 DIF: Easy REF: 2.8
    OBJ: Comprehension TOP: MOLECULES OF LIFE

90. Which of the following includes all of the others?
    a. sucrose
    b. glucose
    c. cellulose
    d. glycogen
    e. carbohydrate

    ANS: E PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Comprehension
    TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

91. Which of the following is a building block of carbohydrates?
    a. glycerol
    b. nucleotide
    c. simple sugar
    d. monosaccharide
    e. glucose

    ANS: E PTS: 1 DIF: Easy REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

92. Which of the following is composed of a 1:2:1 ratio of carbon to hydrogen to oxygen?
    a. carbohydrate
    b. protein
    c. lipid
    d. nucleic acid
    e. steroid

    ANS: A PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

93. Which vitamin is derived from sugar monomers?
    a. vitamin D
    b. vitamin E
    c. vitamin C
    d. vitamin A
    e. vitamin B_{12}

    ANS: C PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

94. Which simple sugar is the main energy source for body cells?
    a. fructose
    b. sucrose
    c. lactose
    d. glucose
    e. galactose

    ANS: D PTS: 1 DIF: Easy REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

95. Which of the following is not a monosaccharide?
    a. glucose
    b. fructose
    c. deoxyribose
    d. starch
    e. ribose

    ANS: D PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

96. The most plentiful sugar in nature is
    a. glucose.
    b. fructose.
    c. sucrose.
    d. lactose.
    e. glycogen.

    ANS: C PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

97. Most of the carbohydrates eaten by humans are in the form of
    a. monosaccharides.
    b. polysaccharides.
    c. oligosaccharides.
    d. disaccharides.
    e. five carbon sugars.

    ANS: B PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Comprehension
    TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

98. Fructose and glucose are
    a. isotopes.
    b. monosaccharides.
    c. disaccharides.
    d. six-carbon sugars.
    e. monosaccharides and six-carbon sugars.

    ANS: E PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

99. Sucrose is composed of
    a. two molecules of fructose.
    b. two molecules of glucose.
    c. a molecule of fructose and a molecule of glucose.
    d. a molecule of fructose and a molecule of galactose.
    e. two molecules of glucose

    ANS: C PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

100. Plants store a large amount of glucose in the form of
    a. starch.
    b. glycogen.
    c. glucose.
    d. cellulose.
    e. fats.

    ANS: D PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

101. Stored sugar in animal muscles and liver is in the form of
    a. starch.
    b. glycogen.
    c. glucose.
    d. cellulose.
    e. fats.

    ANS: B PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Knowledge TOP: CARBOHYDRATES: PLENTIFUL AND VARIED

102. A lipid is a
    a. polar hydrocarbon.
    b. polar peptide.
    c. nonpolar hydrocarbon.
    d. nonpolar peptide.
    e. coordinate covalent molecule.

    ANS: C PTS: 1 DIF: Difficult REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

103. A saturated hydrocarbon molecule has
    a. three double bonds.
    b. one double bond.
    c. one double and one triple bond.
    d. all single bonds.
    e. all triple bonds.

    ANS: D PTS: 1 DIF: Difficult REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

104. A molecule consisting of three fatty acid tails attached to glycerol is a(n)
    a. carbohydrate.
    b. nucleic acid.
    c. triglyceride.
    d. amino acid.
    e. oil.

    ANS: C PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

105. Which of the following are lipids?
    a. steroids
    b. triglycerides
    c. oils
    d. waxes
    e. all of these

    ANS: E PTS: 1 DIF: Easy REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

106. The most abundant lipids in the body are
    a. oils.
    b. waxes.
    c. steroids.
    d. triglycerides.
    e. fatty acids.

    ANS: D PTS: 1 DIF: Easy REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

107. Which type of fat, often the main ingredient in margarine, has been implicated in the development of certain heart diseases?
    a. triglycerides
    b. trans fatty acids
    c. cholesterol
    d. oils
    e. waxes

    ANS: B PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Comprehension TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

108. Triglycerides yield how much more energy, gram for gram, than carbohydrates?
    a. twice as much
    b. three times as much
    c. four times as much
    d. one half as much
    e. about the same amount

    ANS: A PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

109. Which is the main material of cell membranes?
    a. lipids
    b. proteins
    c. phospholipids
    d. triglycerides
    e. fatty acids

    ANS: C PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

110. Why do triglycerides yield more energy than carbohydrates?
    a. they have fewer removable electrons
    b. they have double bonds
    c. they contain glycerol
    d. they have more removable electrons
    e. fatty acids

    ANS: D PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Comprehension TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

111. Which sterol, often associated with heart disease, is a crucial component to the structure and function of cells?
    a. cholesterol
    b. triglycerides
    c. phospholipids
    d. cortisol
    e. estrogen

    ANS: A PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

112. Which of the following is not a derivative of cholesterol is
    a. vitamin D
    b. bile salts
    c. estrogen
    d. testosterone
    e. amino acid

    ANS: E PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Knowledge TOP: LIPIDS: FATS AND THEIR CHEMICAL KIN

113. Which element is NOT characteristic of the primary structure of proteins?
    a. carbon
    b. hydrogen
    c. phosphorus
    d. sulfur
    e. nitrogen

    ANS: C PTS: 1 DIF: Difficult REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

114. Amino acids are the building blocks for
    a. proteins.
    b. carbohydrates.
    c. nucleic acids.
    d. fats.
    e. steroids.

    ANS: A PTS: 1 DIF: Easy REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

115. What kind of bond exists between two amino acids?
    a. hydrogen
    b. glycosidic
    c. peptide
    d. ionic
    e. sulfhydroxyl

    ANS: C PTS: 1 DIF: Easy REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

116. The sequence of amino acids is the ____ structure of a protein.
    a. primary
    b. secondary
    c. tertiary
    d. quaternary
    e. isomeric

    ANS: A PTS: 1 DIF: Easy REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

117. How many amino acids are known to exist?
    a. 100
    b. 50
    c. 25
    d. 20
    e. 10

    ANS: D PTS: 1 DIF: Easy REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

118. Proteins that speed up chemical reactions are
    a. substrates.
    b. reactants.
    c. enzymes.
    d. amino acids.
    e. carboxyl groups.

    ANS: C PTS: 1 DIF: Easy REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

119. Which part of the amino acid helps to determine its chemical properties?
    a. the amino group
    b. the carboxyl group
    c. the covalent bonds
    d. the peptide bond
    e. the R group

    ANS: E PTS: 1 DIF: Moderate REF: 2.11
    OBJ: Knowledge TOP: PROTEINS: BIOLOGICAL MOLECULES WITH MANY ROLES

120. What type of bond forms at regular, short intervals along a new polypeptide chain?
    a. ionic
    b. covalent
    c. glycosidic
    d. hydrogen
    e. coordinate covalent

    ANS: D PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

121. Which structure makes a protein a molecule that can perform a particular function?
    a. primary
    b. secondary
    c. tertiary
    d. quaternary
    e. isomeric

    ANS: C PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Comprehension TOP: A PROTEIN'S SHAPE AND FUNCTION

122. Which of the following exhibits fourth level (quaternary) structure?
    a. amino acids
    b. lipids
    c. glycogen
    d. hemoglobin
    e. complex carbohydrate

    ANS: D PTS: 1 DIF: Easy REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

123. Which is the most common protein in the body?
    a. muscle
    b. collagen
    c. hemoglobin
    d. bone matrix
    e. insulin

    ANS: B PTS: 1 DIF: Easy REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

124. The disruption of a protein's three-dimensional structure is called
    a. condensation.
    b. hydrolysis.
    c. ionization.
    d. oxidation.
    e. denaturation.

    ANS: E PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

125. A glycoprotein is a combination of a protein and
    a. heme.
    b. oligosaccharides.
    c. collagen.
    d. fatty acids.
    e. nucleic acids.

    ANS: B PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

126. In addition to hydrogen bonding, what type of bonds may exist in the quaternary structure of a protein?
    a. ionic
    b. coordinate
    c. disulfide
    d. network
    e. diphosphate

    ANS: C PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

127. A lipoprotein is a combination of a protein and
    a. cholesterol, triglycerides and phospholipids.
    b. oligosaccharides.
    c. fatty acids.
    d. nucleic acids.
    e. collagen.

    ANS: A PTS: 1 DIF: Moderate REF: 2.12
    OBJ: Knowledge TOP: A PROTEIN'S SHAPE AND FUNCTION

128. Which of the following is NOT found in every nucleic acid?
    a. ribose
    b. phosphate group
    c. purine
    d. pyrimidine
    e. uracil

    ANS: E PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

129. What is the name for a molecule that accepts hydrogen atoms and electrons that are being removed from other molecules and transfers them to other sites for further use?
    a. enzyme
    b. coenzyme
    c. protein
    d. lipid
    e. steroid

    ANS: B PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

130. Nucleotides are building blocks for
    a. proteins.
    b. steroids.
    c. lipids.
    d. carbohydrates.
    e. DNA, RNA, and ATP.

    ANS: E PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

131. The nucleotide most closely associated with energy is
    a. cyclic AMP.
    b. FAD.
    c. ATP.
    d. NAD.
    e. NADPH.

    ANS: C PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

132. Nucleotides contain what kind of sugars?
    a. three carbon
    b. four carbon
    c. five carbon
    d. six carbon
    e. seven carbon

    ANS: C PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

133. Which molecule links chemical reactions that release energy with other reactions that require energy?
    a. DNA
    b. RNA
    c. NAD
    d. ATP
    e. cyclic AMP

    ANS: D PTS: 1 DIF: Moderate REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

134. Which type of bond holds the nucleotide bases together in a DNA molecule?
    a. hydrogen
    b. covalent
    c. ionic
    d. network
    e. peptide

    ANS: A PTS: 1 DIF: Easy REF: 2.13
    OBJ: Knowledge TOP: NUCLEOTIDES AND NUCLEIC ACIDS

135. Some pesticides can trigger
    a. hives.
    b. joint pain.
    c. headaches.
    d. asthma.
    e. all of these.

    ANS: E PTS: 1 DIF: Easy REF: 2.14
    OBJ: Knowledge TOP: FOOD PRODUCTION AND A CHEMICAL ARMS RACE

136. In what year did chemists begin developing synthetic toxins to protect crops?
a. 1865
b. 1900
c. 1925
d. 1945
e. 1960

ANS: D PTS: 1 DIF: Moderate REF: 2.14
OBJ: Knowledge TOP: FOOD PRODUCTION AND A CHEMICAL ARMS RACE

137. A positive effect associated with pesticide usage does not include
a. killing disease-causing insects.
b. killing some pathogens.
c. increasing food supplies.
d. increasing profits for farmers.
e. causing cancer.

ANS: E PTS: 1 DIF: Moderate REF: 2.14
OBJ: Comprehension
TOP: FOOD PRODUCTION AND A CHEMICAL ARMS RACE

Selecting the Exception

138. Four of the five answers listed below possess electrons in the third orbital. The atomic number is at the right of the element. Select the exception.
a. sodium (11)
b. magnesium (12)
c. chlorine (17)
d. nitrogen (7)
e. sulfur (16)

ANS: D PTS: 1 DIF: Difficult REF: 2.3
OBJ: Application MSC: Selecting the Exception

139. Four of the five answers listed below are related by a unifying characteristic. Select the exception.
a. ionic bond
b. covalent bond
c. polar bond
d. hydrogen bond
e. cluster of nonpolar groups

ANS: E PTS: 1 DIF: Difficult REF: 2.4
OBJ: Comprehension MSC: Selecting the Exception

140. Four of the five answers listed below are alkaline (pH above 7). Select the exception.
a. milk of magnesia
b. household ammonia
c. Tums®
d. phosphate detergent
e. cola soft drink

ANS: E PTS: 1 DIF: Difficult REF: 2.7
OBJ: Analysis MSC: Selecting the Exception

141. Four of the five answers listed below are acidic (pH below 7). Select the exception.
    a. vinegar
    b. soft drink
    c. soap
    d. lemon juice
    e. beer

    ANS: C PTS: 1 DIF: Difficult REF: 2.7
    OBJ: Analysis MSC: Selecting the Exception

142. Four of the five answers listed below are characteristics of water. Select the exception.
    a. stabilize temperature
    b. common solvent
    c. cohesion and surface tension
    d. produce salts
    e. change shape of hydrophilic and hydrophobic substances

    ANS: D PTS: 1 DIF: Moderate REF: 2.5
    OBJ: Comprehension MSC: Selecting the Exception

143. Four of the five answers listed below are related by a common chemical similarity. Select the exception.
    a. cellulose
    b. hydrochloric acid
    c. amino acid
    d. protein
    e. nucleic acid

    ANS: B PTS: 1 DIF: Difficult REF: Ch 2
    OBJ: Analysis MSC: Selecting the Exception

144. Four of the five answers listed below are related as members of the same group. Select the exception.
    a. glucose
    b. fructose
    c. cellulose
    d. ribose
    e. deoxyribose

    ANS: C PTS: 1 DIF: Moderate REF: Ch 2
    OBJ: Knowledge MSC: Selecting the Exception

145. Four of the five answers below are related as members of the same group. Select the exception.
    a. lactose
    b. maltose
    c. sucrose
    d. table sugar
    e. glucose

    ANS: E PTS: 1 DIF: Difficult REF: 2.9
    OBJ: Knowledge MSC: Selecting the Exception

146. Four of the five answers listed below are carbohydrates. Select the exception.
    a. glycerol
    b. cellulose
    c. starch
    d. sucrose
    e. glycogen

    ANS: A PTS: 1 DIF: Difficult REF: 2.9
    OBJ: Comprehension MSC: Selecting the Exception

147. Four of the five answers listed below are lipids. Select the exception.
    a. triglyceride
    b. wax
    c. oil
    d. insulin
    e. steroid

    ANS: D PTS: 1 DIF: Difficult REF: 2.10
    OBJ: Comprehension MSC: Selecting the Exception

148. Four of the five answers listed below are saturated fats. Select the exception.
    a. butter
    b. bacon
    c. margarine
    d. animal fat
    e. lard

    ANS: C PTS: 1 DIF: Moderate REF: 2.10
    OBJ: Analysis MSC: Selecting the Exception

149. Four of the five answers listed below are amino acids. Select the exception.
    a. tryptophan
    b. valine
    c. alanine
    d. adenine
    e. leucine

    ANS: D PTS: 1 DIF: Difficult REF: 2.11
    OBJ: Analysis MSC: Selecting the Exception

150. Four of the five answers listed below are functional groups. Select the exception.
    a. R group
    b. amino group
    c. carboxyl group
    d. hydroxyl group
    e. methyl group

    ANS: A PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Analysis MSC: Selecting the Exception

151. Four of the five answers listed below are dissolved substances found in cells. Select the exception.
    a. nucleotides
    b. sugars
    c. amino acids
    d. alcohols
    e. fatty acids

    ANS: D PTS: 1 DIF: Moderate REF: Ch 2
    OBJ: Knowledge MSC: Selecting the Exception

152. Four of the five answers listed below are long chains of sugars. Select the exception.
    a. polysaccharides
    b. oligosaccharides
    c. complex carbohydrates
    d. corn starch
    e. potato starch

    ANS: B PTS: 1 DIF: Moderate REF: 2.9
    OBJ: Comprehension MSC: Selecting the Exception

153. An element is
    a. a pure substance that can be broken down to another substance.
    b. a pure substance that cannot be broken down to another substance.
    c. the smallest unit that has properties of a given element.
    d. an atom with an unstable nucleus.
    e. an atom with positive electrons.

    ANS: B PTS: 1 DIF: Moderate REF: 2.1
    OBJ: Knowledge TOP: ATOMS AND ELEMENTS

MATCHING

Answer the questions by matching the name to the structure of the functional group.
a. hydroxyl
b. carbonyl
c. carboxyl
d. amino
e. phosphate

1. NH_2
2. PO_4
3. CHO
4. COOH
5. OH

1. ANS: D PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Analysis
2. ANS: E PTS: 1 DIF: Easy REF: 2.8
    OBJ: Analysis
3. ANS: B PTS: 1 DIF: Moderate REF: 2.8
    OBJ: Analysis
4. ANS: C PTS: 1 DIF: Moderate REF: 2.8

OBJ: Analysis

5. ANS: A PTS: 1 DIF: Easy REF: 2.8
   OBJ: Analysis

Choose the one most appropriate answer for each.

a. a six-carbon sugar
b. neutralizes free radicals
c. principal components of cell membranes
d. speeds up metabolic reactions
e. DNA and RNA

6. enzyme
7. glucose
8. antioxidant
9. phospholipids

6. ANS: D PTS: 1 DIF: Moderate REF: Ch 2
   OBJ: Knowledge
7. ANS: A PTS: 1 DIF: Moderate REF: Ch 2
   OBJ: Knowledge
8. ANS: B PTS: 1 DIF: Moderate REF: Ch 2
   OBJ: Knowledge
9. ANS: C PTS: 1 DIF: Moderate REF: Ch 2
   OBJ: Knowledge

Classification. Many different types of reactions take place within the cell. Use the following numbers to answer the questions.

a. Condensation
b. Cleavage
c. Functional group transfer
d. Electron transfer
e. Rearrangement

10. A molecule splits into two smaller ones.
11. Moving internal bonds converts one type of organic compound to another.
12. Two molecules covalently bond into another one.
13. One molecule gives up a functional group, and a different molecule immediately accepts it.
14. One or more electrons from one molecule are donated to another molecule.

10. ANS: B PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Knowledge MSC: Classification
11. ANS: E PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Knowledge MSC: Classification
12. ANS: A PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Knowledge MSC: Classification
13. ANS: C PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Knowledge MSC: Classification
14. ANS: D PTS: 1 DIF: Difficult REF: 2.8
    OBJ: Knowledge MSC: Classification

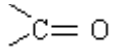
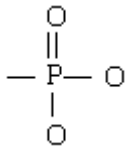
Classification. The following are types of chemical bonds. Answer the questions by matching the statement with the most appropriate bond type.

a. hydrogen
b. ionic
c. covalent
d. disulfide
e. peptide

15. The bond between the atoms of table salt.
16. The bond type holding several molecules of water together.
17. The bond between the oxygen atoms of gaseous oxygen.
18. The bond that breaks when salts dissolve in water.
19. Atoms connected by this kind of bond share electrons.

15. ANS: B PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Comprehension MSC: Classification
16. ANS: A PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Comprehension MSC: Classification
17. ANS: C PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Comprehension MSC: Classification
18. ANS: B PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Comprehension MSC: Classification
19. ANS: C PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Comprehension MSC: Classification

Classification. The following are chemical functional groups that may be part of a biologically active molecule. Answer the questions by matching the statement with the most appropriate group.

a. —COOH
b. —CH_3
c. —NH_2
d. —OH
e. 
f. 
g. —CHO

20. The amino group.
21. The carboxyl group.
22. The group that is acidic.
23. The group that occurs repeatedly in sugars; composed of two elements.
24. The methyl group.
25. The hydroxyl group.
26. The ketone group.
27. The group on the amino-terminal end of proteins.
28. The group on the carboxyl-terminal end of proteins.
29. A group composed of three different elements found in sugars.
30. The group typical of energy carriers such as ATP.

20. ANS: C PTS: 1 DIF: Easy REF: 2.8
OBJ: Comprehension MSC: Classification
21. ANS: A PTS: 1 DIF: Easy REF: 2.8
OBJ: Comprehension MSC: Classification
22. ANS: A PTS: 1 DIF: Moderate REF: 2.8
OBJ: Comprehension MSC: Classification
23. ANS: D PTS: 1 DIF: Moderate REF: 2.8
OBJ: Comprehension MSC: Classification
24. ANS: B PTS: 1 DIF: Easy REF: 2.8
OBJ: Comprehension MSC: Classification
25. ANS: D PTS: 1 DIF: Easy REF: 2.8
OBJ: Comprehension MSC: Classification
26. ANS: E PTS: 1 DIF: Easy REF: 2.8
OBJ: Comprehension MSC: Classification
27. ANS: C PTS: 1 DIF: Moderate REF: 2.8
OBJ: Comprehension MSC: Classification
28. ANS: A PTS: 1 DIF: Moderate REF: 2.8
OBJ: Comprehension MSC: Classification
29. ANS: G PTS: 1 DIF: Difficult REF: 2.8
OBJ: Comprehension MSC: Classification
30. ANS: F PTS: 1 DIF: Moderate REF: 2.8
OBJ: Comprehension MSC: Classification

Classification. The following are basic building blocks of biopolymers. Answer the questions by matching the statement with the most appropriate building block.

a. amino acids
b. glucose
c. glycerol
d. fatty acids
e. nucleotides
f. amino acids and glucose
g. amino acids and glycerol
h. glucose and glycerol
i. glucose and fatty acids
j. glycerol and fatty acids

31. The basic unit of proteins.
32. The basic unit of DNA.
33. The basic unit of messenger RNA.
34. The basic unit of cellulose.
35. The basic unit of glycogen.
36. The basic unit of starch.
37. The "building block" unit of a polypeptide chain.
38. Which two units combine in various ways to form lipids?

31. ANS: A PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification
32. ANS: E PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification
33. ANS: E PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification

34. ANS: B PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification
35. ANS: B PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification
36. ANS: B PTS: 1 DIF: Easy REF: Ch 2
OBJ: Knowledge MSC: Classification
37. ANS: A PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Knowledge MSC: Classification
38. ANS: J PTS: 1 DIF: Moderate REF: Ch 2
OBJ: Knowledge MSC: Classification