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Chapter 02—Molecules of Life

Multiple Choice

1. Hydrogenation is a _____.
    a. manufacturing process that adds hydrogen atoms to carbohydrates
    b. natural process that adds hydrogen atoms to carbohydrates
    c. manufacturing process that adds hydrogen atoms to oils
    d. natural process that removes hydrogen atoms from fats
    e. manufacturing process that removes hydrogen atoms from fats

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 A Big Fat Problem
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.01 - Application
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2. The human body requires about ____ of fat each day to stay healthy.
    a. one teaspoon
    b. four teaspoons
    c. one tablespoon
    d. four tablespoons
    e. one cup

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 A Big Fat Problem
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.01 - Application
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3. The main source of *trans* fats in the American diet has been ____.
    a. red meat
    b. dairy products
    c. seafood
    d. grains
    e. vegetable oils

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 A Big Fat Problem

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QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
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4. A typical fat molecule has ____ fatty acid tails.
   a. one
   b. two
   c. three
   d. four
   e. five

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 A Big Fat Problem
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.01 - Application
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5. Which invention led to *trans* fats being marketed as a solid cooking fat?
   a. the electric light
   b. the telephone
   c. the automobile
   d. the microwave oven
   e. the refrigerator

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 A Big Fat Problem
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.01 - Application
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6. The atomic number is determined by the number of ____.
   a. protons
   b. neutrons
   c. electrons
   d. protons plus neutrons
   e. protons plus electrons

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ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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7. Carbon has an atomic number of 6. Carbon 14 has _____.
   a. 6 neutrons and 6 protons
   b. 6 neutrons and 8 protons
   c. 8 neutrons and 6 protons
   d. 14 neutrons and 6 protons
   e. 14 protons and 6 neutrons

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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8. Tracers are used in what form of medical test?
   a. PET scans
   b. CT scans
   c. sonograms
   d. x-rays
   e. MRI

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.03 - Describe radioactive decay.
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9. We can accurately determine the age of a rock or fossil by measuring its ____.
   a. proton concentration

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b. electron concentration
c. neutron concentration
d. isotope concentration
e. ion concentration

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.03 - Describe radioactive decay.
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10. Helium, neon, and argon are _____.
a. extremely stable because they have vacancies in their outer shells
b. extremely stable because they do not have any vacancies in their outer shells
c. extremely unstable because they have vacancies in their outer shells
d. extremely unstable because they do not have any vacancies in their outer shells
e. extremely unstable because they have vacancies in their inner shells

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.04 - Use the concept of vacancies to explain the chemical activity of atoms.
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11. The nucleus of an atom contains ____.
a. protons only
b. electrons only
c. neutrons only
d. protons and neutrons
e. protons and electrons

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.

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12. The negative subatomic particle is the ____.
    a. neutron
    b. proton
    c. electron
    d. quark
    e. Higg's boson

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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13. The positive subatomic particle is the ____.
    a. neutron
    b. proton
    c. electron
    d. positron
    e. quark

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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14. Oxygen has an atomic number of 8. This means that oxygen has ____.
    a. eight electrons in its outer most shell
    b. eight neutrons in its nucleus
    c. four protons and four neutrons in its nucleus
    d. eight protons in its nucleus
    e. eight protons and eight neutrons in its nucleus

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Apply

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REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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15. The neutral subatomic particle is the ____.
    a. neutron
    b. proton
    c. electron
    d. quark
    e. Higg's boson

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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16. Carbon 14 radioisotopes decay into stable ____.
nitrogen 15 isotopes
    a. carbon 13 isotopes
    b. nitrogen atoms
    c. carbon atoms
    d. nitrogen 15 isotopes
    e. sodium atoms

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.03 - Describe radioactive decay.
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17. An atom that carries a charge is called a(n) ____.
    a. ion
    b. molecule
    c. compound

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d. element
e. microelement

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.04 - Use the concept of vacancies to explain the chemical activity of atoms.
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18. A(n) ____ is a type of chemical bond in which a strong mutual attraction forms between ions of opposite charge.
a. hydrogen bond
b. nonpolar bond
c. polar bond
d. covalent bond
e. ionic bond

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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19. The bond in table salt (NaCl) is ____.
a. polar
b. ionic
c. covalent
d. double
e. nonpolar

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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20. In ____ bonds, atoms share electrons equally.
    a. double
    b. ionic
    c. polar covalent
    d. nonpolar covalent
    e. hydrogen

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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21. Which type of chemical bond is found within a water molecule?
    a. hydrogen
    b. ionic
    c. polar covalent
    d. nonpolar covalent
    e. triple

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.02 - Explain polarity in terms of ionic bonds and covalent bonds.
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22. The positively charged ion, potassium, and the negatively charged ion, fluoride, will form what kind of bond?
    a. ionic
    b. polar covalent
    c. nonpolar covalent
    d. hydrogen
    e. isotonic

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice

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HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.02 - Explain polarity in terms of ionic bonds and covalent bonds.
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23. Which of the following molecules would be considered a covalent compound?

a. oxygen (O_2)
b. sodium chloride (NaCl)
c. water (H_2O)
d. a diamond (C)
e. ozone (O_3)

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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24. The structural formula for molecular oxygen is depicted as O=O. What kind of bond holds molecular oxygen together?

a. ionic
b. polar covalent
c. single covalent
d. double covalent
e. triple covalent

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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25. Which substance is hydrophobic?

a. canola oil
b. sodium chloride
c. sugar
d. water
e. the potassium ion

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ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.03 - Describe the way an ionic substance dissolves in water.
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26. Fats will dissolve in ethanol. Ethanol is an example of a ____.
    a. solute
    b. solution
    c. solvent
    d. salt
    e. ion

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.03 - Describe the way an ionic substance dissolves in water.
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27. Which bond is weakest?
    a. ionic
    b. double covalent
    c. polar covalent
    d. nonpolar covalent
    e. hydrogen

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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28. Water molecules are attracted to one another because the ____.

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a. slightly positive charge of the hydrogen atom from one molecule of water attracts the slightly negative charge of the oxygen atom from another molecule
b. slightly negative charge of the hydrogen atom from one molecule of water attracts the slightly negative charge of the oxygen atom from another molecule
c. slightly positive charge of the hydrogen atom attracts the oxygen within the same molecule of water, which leads to an increase in its polarity
d. water molecules participate in nonpolar covalent bonds, which increase the attraction of the molecules to each other
e. water molecules bind to each other through their mutual attraction to ionic compounds

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.02 - Draw a hydrogen bond between two water molecules.
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29. A solution is a uniform mixture in which a ____ is dissolved completely in a ____.
a. salt; solute
b. solute; salt
c. solute; solvent
d. solvent; salt
e. solvent; solute

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.03 - Describe the way an ionic substance dissolves in water.
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30. Surface tension is an example of ____.
a. hydrophobicity
b. concentration
c. evaporation
d. cohesion
e. polarity

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember

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REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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31. Sweating to keep cool in the summer is the result of ____.
    a. hydrogen bonds breaking to release energy
    b. hydrogen bonds forming, which requires energy
    c. evaporation of water absorbing energy
    d. cohesion of water molecules giving off energy
    e. cohesion of water molecules requiring energy

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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32. Hydrogen bonding ____ the movement of molecules, therefore, substances that form a lot of hydrogen bonds, like water, will require ____ energy to increase their temperature by one degree Celsius.
    a. decreases; less
    b. decreases; more
    c. does not affect; no additional
    d. increases; less
    e. increases; more

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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33. When water molecules form into ice, ____.
    a. the water molecules jiggle more

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b. their structure becomes less rigid
c. the water molecules pack less densely
d. hydrogen bonds between water molecules readily break
e. evaporation of water molecules happens more readily

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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34. Hydrophobic molecules are ____ water.
a. attracted by
b. absorbed by
c. repelled by
d. mixed with
e. polarized by

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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35. ____ is the tendency of water molecules to stay attached to one another.
a. Adhesion
b. Cohesion
c. Fusion
d. Interaction
e. Junction

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False

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LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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36. Which property of water molecules is responsible for movement of water from roots to leaves in a plant?
    a. hydrophobicity
    b. temperature stability
    c. fusion
    d. solvent polarity
    e. cohesion

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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37. Glucose dissolves in water because it ____.
    a. ionizes
    b. is a polysaccharide
    c. is polar and forms many hydrogen bonds with water molecules
    d. has a very reactive primary structure
    e. is an isotope

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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38. A uniform mixture is called a ____.
    a. concentration
    b. salt
    c. solute
    d. solution
    e. solvent

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ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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39. A solution at a pH of 10 contains how many times more hydrogen ions than a solution at a pH of 7?
    a. 2
    b. 3
    c. 10
    d. 100
    e. 1,000

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.01 - Define pH.
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40. Of these pH values, which has the highest concentration of hydrogen ions?
    a. 1
    b. 3
    c. 5
    d. 7
    e. 9

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.01 - Define pH.
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41. Nearly all of life's chemistry occurs near a pH range of ____.

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a. 1–2
b. 3–4
c. 5–6
d. 7–8
e. 9–10

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.01 - Define pH.
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42. What category of compounds helps our body fluids to stay within a consistent pH range?
a. solvents
b. buffers
c. solutes
d. acids
e. bases

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.03 - Describe the way that buffers work.
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43. ____ is one of the substances that maintains our blood pH between 7.35 and 7.45.
a. Water
b. Carbonic acid
c. Hydrochloric acid
d. Hydrogen peroxide
e. Sodium hydroxide

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.03 - Describe the way that buffers work.

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44. Which two atoms are found in all organic compounds?
    a. carbon and hydrogen
    b. carbon and oxygen
    c. oxygen and hydrogen
    d. carbon and phosphorous
    e. oxygen and sulfur

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.01 - Explain the basic structure of an organic molecule.
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45. Which is an organic molecule?
    a. carbon dioxide (CO_2)
    b. water (H_2O)
    c. methane (CH_4)
    d. hydrochloric acid (HCl)
    e. oxygen (O_2)

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.01 - Explain the basic structure of an organic molecule.
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46. Large polymers are formed from smaller subunits by which type of reaction?
    a. oxidation
    b. reduction
    c. condensation
    d. hydrolysis
    e. decarboxylation

ANSWER: c
POINTS: 1

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DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.03 - Explain how the molecules of life are polymers.
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47. The breakdown of large molecules by enzymes and the addition of water is known as a ____ reaction.
    a. oxidation
    b. reduction
    c. condensation
    d. hydrolysis
    e. decarboxylation

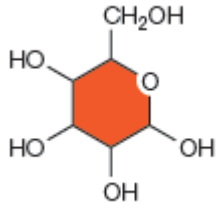
ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.04 - Give an example of a metabolic reaction.
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48. The chemical reactions that cells use to acquire and use energy to live, grow, and reproduce are called ____.
    a. hydrolysis
    b. condensation
    c. phosphorylation
    d. metabolism
    e. oxidation

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.04 - Give an example of a metabolic reaction.
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49. 

How many carbons are present in this figure?

a. zero
b. four
c. five
d. six
e. seven

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.01 - Explain the basic structure of an organic molecule.
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50. Which organic molecule is a carbohydrate monomer?

a. triglyceride
b. fatty acid
c. nucleotide
d. amino acid
e. monosaccharide

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 The Chemistry of Biology
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.06.01 - Explain the basic structure of an organic molecule.
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51. Glucose monomers linked into a highly branched chain make up ____.

a. glycogen
b. cellulose
c. fructose
d. starch
e. sucrose

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ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.01 - Describe the structure of carbohydrates and explain their roles in cells.
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52. 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 galactose

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.01 - Describe the structure of carbohydrates and explain their roles in cells.
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53. Plants store their excess carbohydrates in the form of ____.
    a. cellulose
    b. starch
    c. glycogen
    d. sucrose
    e. galactose

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.02 - Using an example, explain how the structure of a polysaccharide gives rise to its function.
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54. Glycogen is a polysaccharide used for energy storage by ____.
    a. plants
    b. animals
    c. protists
    d. bacteria
    e. archaea

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.03 - Name the function that glycogen serves in the human body.
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55. Which type of bonding allows the long, straight chains of cellulose to lock together tightly?
    a. hydrogen
    b. polar covalent
    c. ionic
    d. nonpolar covalent
    e. metallic

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.02 - Using an example, explain how the structure of a polysaccharide gives rise to its function.
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56. Cellulose is ____.
    a. the most complex of the organic compounds
    b. a polymer of glucose and fructose
    c. a polymer of glucose and galactose
    d. a component of plasma membranes
    e. a material found in plant cell walls

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice

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HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.02 - Using an example, explain how the structure of a polysaccharide gives rise to its function.
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57. ____ is a monosaccharide.
    a. Cellulose
    b. Fructose
    c. Glycogen
    d. Starch
    e. Sucrose

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.01 - Describe the structure of carbohydrates and explain their roles in cells.
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58. Humans do not contain the enzymes to break down ____.
    a. cellulose
    b. fructose
    c. glycogen
    d. starch
    e. sucrose

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.02 - Using an example, explain how the structure of a polysaccharide gives rise to its function.
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59. A triglyceride molecule is made up of ____.
    a. one glycerol and two fatty acids
    b. two fatty acids and two glycerols
    c. one fatty acid and three glycerols
    d. one glycerol and three fatty acids

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e. one glycerol and two fatty acids

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
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60. In a cell membrane, the phospholipid heads are ____.
a. hydrophobic
b. nonpolar
c. dissolved in the cell's watery interior
d. sandwiched between the phospholipid tails
e. formed by fatty acids

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.03 - Describe the lipid bilayer.
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61. Unsaturated fats ____.
a. are solid at room temperature
b. have at least one double bond in their fatty acid tail
c. are saturated with hydrogen atoms
d. mainly come from animals
e. consist of straight chain fatty acids

ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
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62. All steroids have ____.
    a. the same number of double bonds
    b. double bonds in the same positions
    c. four carbon rings
    d. the same functional groups
    e. the same number and positions of double bonds

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.04 - Give one example of a molecule that is made from cholesterol.
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63. Which food product would likely contain the largest amount of unsaturated fat?
    a. butter
    b. lard
    c. cream
    d. olives
    e. cheese

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
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64. Fats that contain ____ double bonds are liquids at room temperature, whereas fats that contain ____ double bonds are solids at room temperature.
    a. *trans*; *cis*
    b. *cis*; *trans*
    c. hydrogenated; partially hydrogenated
    d. partially hydrogenated; hydrogenated
    e. unsaturated; saturated

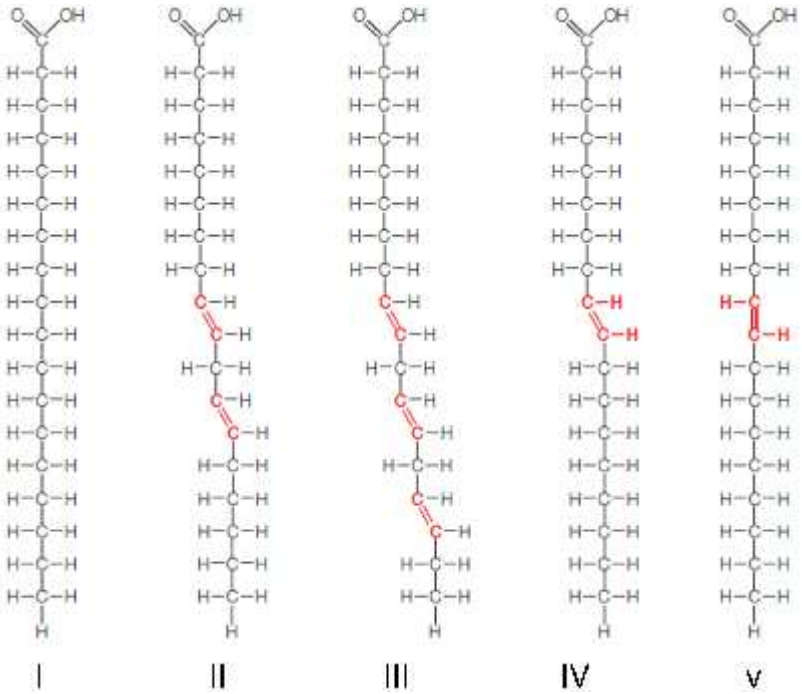
ANSWER: b
POINTS: 1
DIFFICULTY: Bloom's: Understand

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REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
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65.



In the given figure, which fatty acid(s) is/are most likely to be solid at room temperature?

a. I
b. II, III, and IV
c. II, III, IV, and V
d. I and IV
e. I and V

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.8 Lipids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
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66. A(n) ____ is a protein monomer.

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a. nucleotide
b. monosaccharide
c. simple sugar
d. amino acid
e. ribose

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.01 - Draw the generalized structure of an amino acid.
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67. Primary protein structure is dependent upon ____.
a. hydrophobic interactions
b. hydrogen bonds between two amino acids
c. covalent linkages between carbons and nitrogens of adjacent amino acids
d. covalent linkages between carbons and oxygens of adjacent amino acids
e. covalent linkages between the polypeptide and sugars or lipids

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.
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68. Which type of bond exists between two amino acids in a protein?
a. peptide
b. ionic
c. hydrogen
d. amino
e. sulfhydryl

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False

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LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.
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69. Two amino acids are bonded together to form a dipeptide by which type of reaction?
    a. condensation
    b. oxidation reduction
    c. hydrolysis
    d. decomposition
    e. acid–base
ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.
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70. Protein misfolding causes ____.
    a. Creutzfeldt–Jakob disease
    b. arthritis
    c. immunodepression
    d. schizophrenia
    e. tuberculosis
ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.03 - Using an appropriate example, explain why changes in protein structure can be dangerous.
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71. When a protein denatures, which type of bonding is affected?
    a. covalent
    b. peptide
    c. ionic
    d. hydrogen
    e. metallic

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ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.03 - Using an appropriate example, explain why changes in protein structure can be dangerous.
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72. A protein that is linked to a carbohydrate is known as a ____.
    a. glycoprotein
    b. lipoprotein
    c. fibrous proteins
    d. denatured proteins
    e. prions

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.
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73. Nucleotides are monomers of ____.
    a. complex lipids
    b. proteins
    c. polysaccharides
    d. nucleic acids
    e. cellulose

ANSWER: d
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.10.01 - Use an example to describe the structure of a nucleic acid.
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74. A nucleotide consists of ____.
    a. a five-carbon sugar, a nitrogenous acid, and a phosphate group
    b. a six-carbon sugar, a nitrogenous base, and a phosphate group
    c. a five-carbon sugar, a nitrogenous base, and a phosphate group
    d. a six-carbon sugar, a nitrogenous acid, and a phosphate group
    e. a four-carbon sugar, a nitrogenous acid, and a phosphate group

ANSWER: c
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.10.01 - Use an example to describe the structure of a nucleic acid.
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75. In a polymer of nucleotides, how does one nucleotide attach to another?
    a. The base of one nucleotide is attached to the base of the next.
    b. The base of one nucleotide it attached to the sugar of the next.
    c. The sugar of one nucleotide is attached to the sugar of the next.
    d. The phosphate group of one nucleotide is attached to the base of the next.
    e. The phosphate group of one nucleotide is attached to the sugar of the next.

ANSWER: e
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.10.01 - Use an example to describe the structure of a nucleic acid.
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76. Which type of bonds hold the two chains of DNA together in a DNA molecule?
    a. hydrogen
    b. polar covalent
    c. nonpolar covalent
    d. ionic
    e. peptide

ANSWER: a
POINTS: 1
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False

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LEARNING OBJECTIVES: BTAT.STAR.21.02.10.01 - Use an example to describe the structure of a nucleic acid.
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Matching

Match the following terms to the correct description.
a. mass number
b. atomic number
c. radioisotope
d. isotopes
e. ions
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Atoms
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.02.02 - Explain the difference between an atom and an element.
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77. forms of an element that differ in the number of neutrons their atoms carry
ANSWER: d
POINTS: 1

78. number of protons in the atomic nucleus
ANSWER: b
POINTS: 1

79. isotope with an unstable nucleus
ANSWER: c
POINTS: 1

80. total number of protons and neutrons in the nucleus of an atom
ANSWER: a
POINTS: 1

81. atoms with more or less electrons than protons
ANSWER: e
POINTS: 1

Match the following terms to the correct description.
a. acid
b. base
c. neutral
d. buffer
e. pH

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DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 Acids and Bases
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.05.02 - Differentiate between acids and bases.
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82. solution that contains the same concentration of H^+ ions as OH^- ions
ANSWER: c
POINTS: 1

83. measure of the relative concentration of hydrogen ions in a solution
ANSWER: e
POINTS: 1

84. substance that releases hydrogen ions in solution
ANSWER: a
POINTS: 1

85. substance that accepts hydrogen ions in solution
ANSWER: b
POINTS: 1

86. substance that can maintain the pH of a solution at a relatively constant level
ANSWER: d
POINTS: 1

The following are types of chemical bonds. Match these to the correct description. (The bonds may fit more than one description.)
a. hydrogen
b. ionic
c. covalent
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Chemical Bonds
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.03.01 - Describe a chemical bond.
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87. the bond between the atoms in an NaCl molecule
ANSWER: b
POINTS: 1

88. the bond between the hydrogen atoms of molecular hydrogen

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ANSWER: c
POINTS: 1

89. the bond that breaks when salts dissolve in water
ANSWER: b
POINTS: 1

90. the bond in which electrons are shared
ANSWER: c
POINTS: 1

91. the bond that holds organic molecules together
ANSWER: c
POINTS: 1

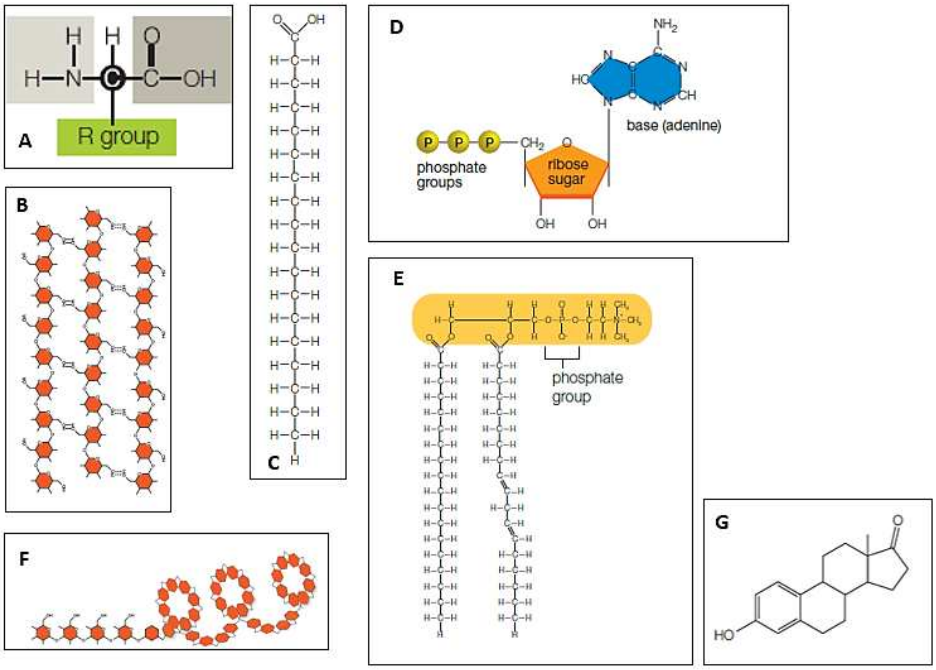
The following are types of chemical bonds. Match these to the correct description.
a. hydrogen
b. cohesion
c. evaporation
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Special Properties of Water
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.04.01 - Using appropriate examples, explain how the polarity of the water molecule gives rise to properties of water that are essential to life.
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92. the bond that gives water special properties
ANSWER: a
POINTS: 1

93. the property that allows certain insects to walk on water
ANSWER: b
POINTS: 1

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Match the structures with the appropriate label in the given figure.

a. A
b. B
c. C
d. D
e. E
f. F
g. G

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.8 Lipids
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

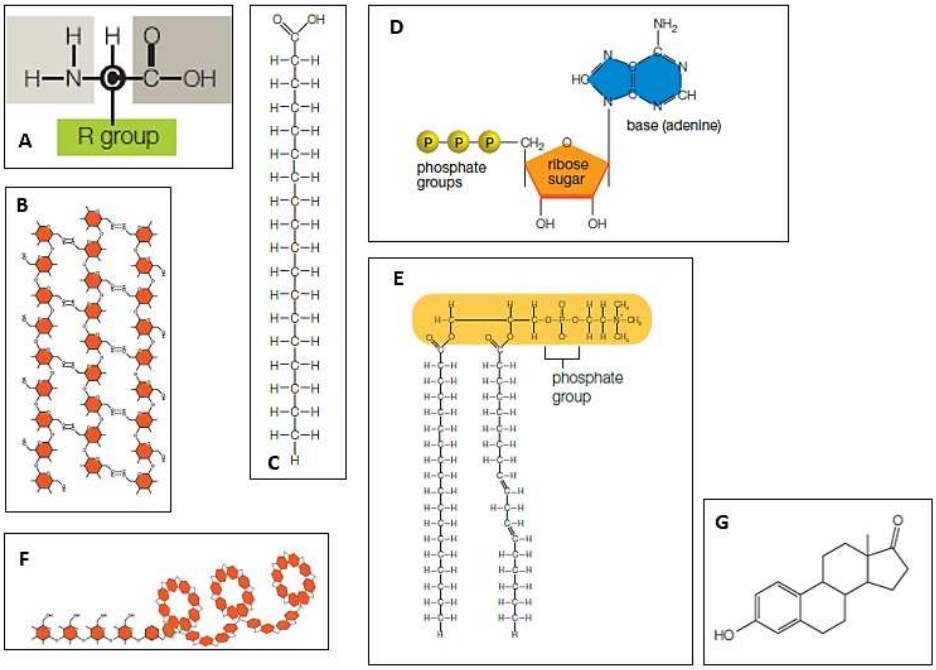
94. fatty acid
ANSWER: c
POINTS: 1

95. phospholipid
ANSWER: e
POINTS: 1

96. steroid
ANSWER: g
POINTS: 1

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Match the structures with the appropriate label in the given figure.

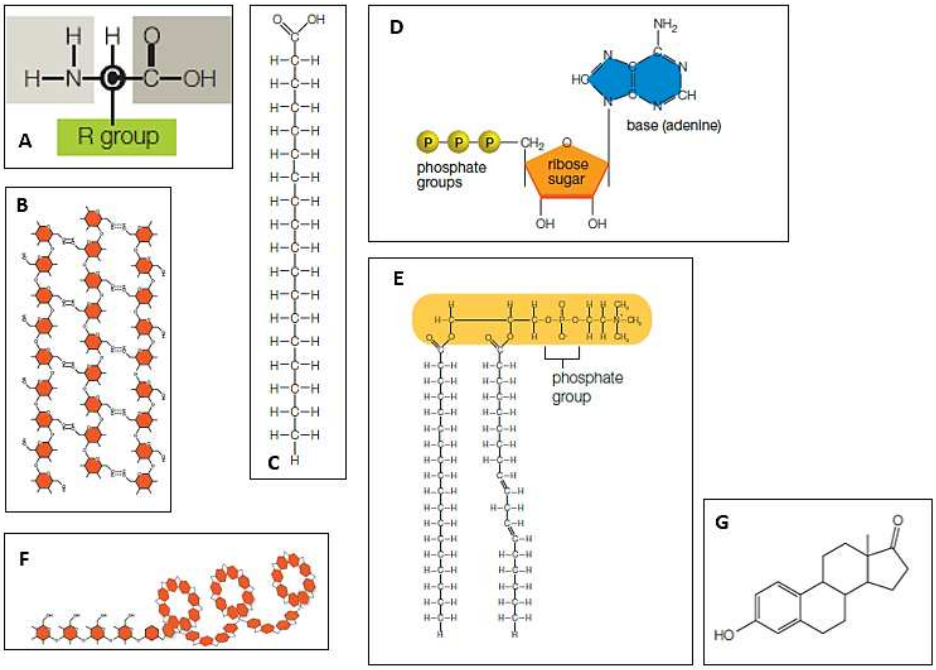
a. A b. B
c. C d. D
e. E f. F
g. G

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.9 Proteins
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.
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97. amino acid
ANSWER: a
POINTS: 1

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Match the structures with the appropriate label in the given figure.

a. A b. B
c. C d. D
e. E f. F
g. G

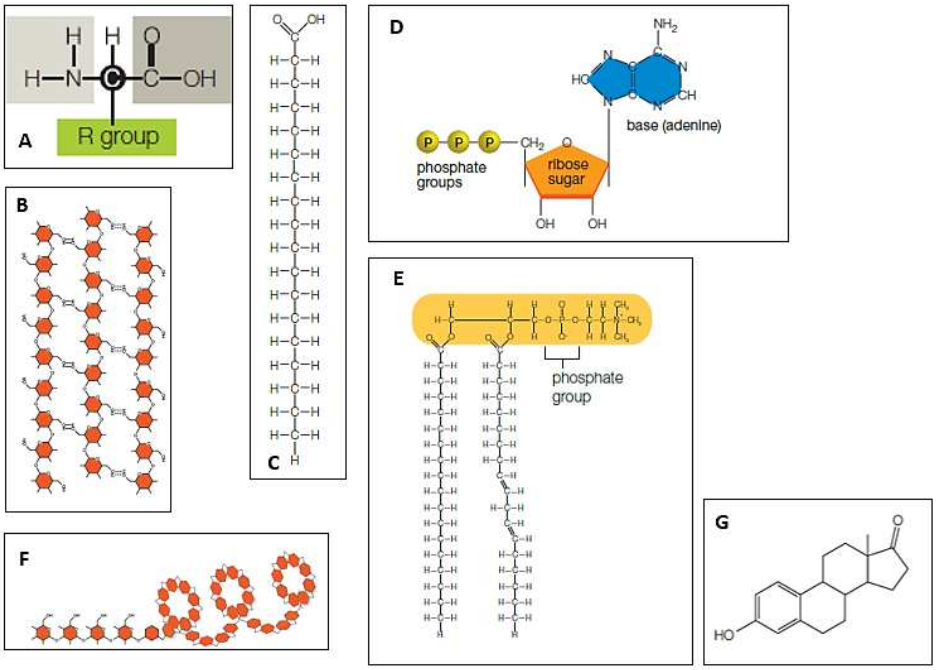
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.7 Carbohydrates
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.07.02 - Using an example, explain how the structure of a polysaccharide gives rise to its function.
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98. cellulose
ANSWER: b
POINTS: 1

99. starch
ANSWER: f
POINTS: 1

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Match the structures with the appropriate label in the given figure.

a. A b. B
c. C d. D
e. E f. F
g. G

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.10 Nucleic Acids
QUESTION TYPE: Matching
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.10.01 - Use an example to describe the structure of a nucleic acid.
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100. nucleotide
ANSWER: d
POINTS: 1

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