

Chapter 02—Molecules of Life

Multiple Choice

1. Hydrogenation is a ____.
- manufacturing process that adds hydrogen atoms to carbohydrates
 - natural process that adds hydrogen atoms to carbohydrates
 - manufacturing process that adds hydrogen atoms to oils
 - natural process that removes hydrogen atoms from fats
 - 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
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

2. The human body requires about ____ of fat each day to stay healthy.
- one teaspoon
 - four teaspoons
 - one tablespoon
 - four tablespoons
 - 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
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

3. The main source of *trans* fats in the American diet has been ____.
- red meat
 - dairy products
 - seafood
 - grains
 - vegetable oils

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

Chapter 02—Molecules of Life

QUESTION TYPE: Multiple Choice
HAS VARIABLES: False
LEARNING OBJECTIVES: BTAT.STAR.21.02.01 - Application
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

4. A typical fat molecule has ____ fatty acid tails.
- one
 - two
 - three
 - four
 - 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
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

5. Which invention led to *trans* fats being marketed as a solid cooking fat?
- the electric light
 - the telephone
 - the automobile
 - the microwave oven
 - 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
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

6. The atomic number is determined by the number of ____.
- protons
 - neutrons
 - electrons
 - protons plus neutrons
 - protons plus electrons

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

9. We can accurately determine the age of a rock or fossil by measuring its _____.

- a. proton concentration

Chapter 02—Molecules of Life

- 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

Chapter 02—Molecules of Life

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

17. An atom that carries a charge is called a(n) ____.

- a. ion
- b. molecule
- c. compound

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

HAS VARIABLES: False

LEARNING OBJECTIVES: BTAT.STAR.21.02.03.02 - Explain polarity in terms of ionic bonds and covalent bonds.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

23. Which of the following molecules would be considered a covalent compound?

- a. oxygen (O₂)
- b. sodium chloride (NaCl)
- c. water (H₂O)
- d. a diamond (C)
- e. ozone (O₃)

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

25. Which substance is hydrophobic?

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

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

28. Water molecules are attracted to one another because the _____.

Chapter 02—Molecules of Life

- slightly positive charge of the hydrogen atom from one molecule of water attracts the slightly negative charge of the oxygen atom from another molecule
- slightly negative charge of the hydrogen atom from one molecule of water attracts the slightly negative charge of the oxygen atom from another molecule
- slightly positive charge of the hydrogen atom attracts the oxygen within the same molecule of water, which leads to an increase in its polarity
- water molecules participate in nonpolar covalent bonds, which increase the attraction of the molecules to each other
- 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

29. A solution is a uniform mixture in which a ____ is dissolved completely in a ____.

- salt; solute
- solute; salt
- solute; solvent
- solvent; salt
- 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

30. Surface tension is an example of ____.

- hydrophobicity
- concentration
- evaporation
- cohesion
- polarity

ANSWER: d

POINTS: 1

DIFFICULTY: Bloom's: Remember

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

33. When water molecules form into ice, ____.

- a. the water molecules jiggle more

Chapter 02—Molecules of Life

- 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

38. A uniform mixture is called a ____.

- a. concentration
- b. salt
- c. solute
- d. solution
- e. solvent

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

41. Nearly all of life's chemistry occurs near a pH range of _____.

Chapter 02—Molecules of Life

- 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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.

Chapter 02—Molecules of Life

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

45. Which is an organic molecule?

- a. carbon dioxide (CO₂)
- b. water (H₂O)
- c. methane (CH₄)
- d. hydrochloric acid (HCl)
- e. oxygen (O₂)

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

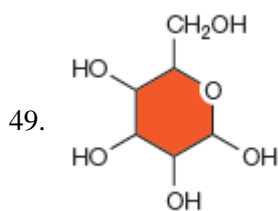
47. The breakdown of large molecules by enzymes and the addition of water is known as a ____ reaction.
- a. oxidation
 - b. reduction
 - c. condensation
 - d. hydrolysis
 - e. decarboxylation

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

Chapter 02—Molecules of Life



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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

51. Glucose monomers linked into a highly branched chain make up _____.

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

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

Chapter 02—Molecules of Life

62. All steroids have ____.
- the same number of double bonds
 - double bonds in the same positions
 - four carbon rings
 - the same functional groups
 - 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

63. Which food product would likely contain the largest amount of unsaturated fat?
- butter
 - lard
 - cream
 - olives
 - 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

64. Fats that contain ____ double bonds are liquids at room temperature, whereas fats that contain ____ double bonds are solids at room temperature.
- trans*; *cis*
 - cis*; *trans*
 - hydrogenated; partially hydrogenated
 - partially hydrogenated; hydrogenated
 - unsaturated; saturated

ANSWER: b

POINTS: 1

DIFFICULTY: Bloom's: Understand

Chapter 02—Molecules of Life

REFERENCES:

2.8 Lipids

QUESTION TYPE:

Multiple Choice

HAS VARIABLES:

False

LEARNING OBJECTIVES:

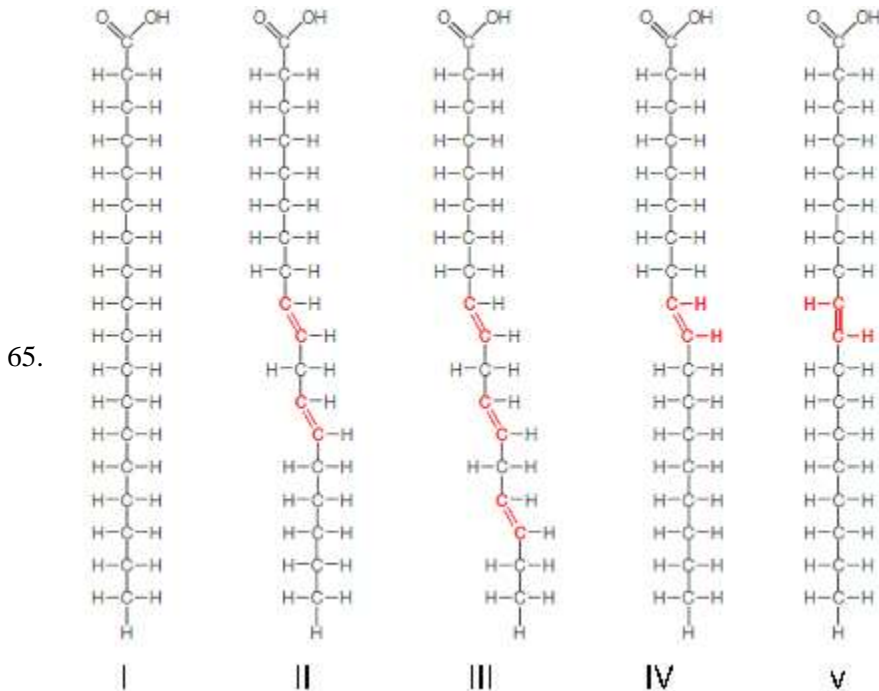
BTAT.STAR.21.02.08.01 - Describe a fat, and identify the difference between saturated and unsaturated fats.

DATE CREATED:

11/18/2019 2:48 PM

DATE MODIFIED:

12/4/2019 6:11 AM



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.

DATE CREATED:

11/18/2019 2:48 PM

DATE MODIFIED:

12/4/2019 6:11 AM

66. A(n) ____ is a protein monomer.

Chapter 02—Molecules of Life

- 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

LEARNING OBJECTIVES: BTAT.STAR.21.02.09.02 - Describe and give general examples of the four levels of protein structure.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

71. When a protein denatures, which type of bonding is affected?

- a. covalent
- b. peptide
- c. ionic
- d. hydrogen
- e. metallic

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

Chapter 02—Molecules of Life

74. A nucleotide consists of ____.
- a five-carbon sugar, a nitrogenous acid, and a phosphate group
 - a six-carbon sugar, a nitrogenous base, and a phosphate group
 - a five-carbon sugar, a nitrogenous base, and a phosphate group
 - a six-carbon sugar, a nitrogenous acid, and a phosphate group
 - 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

75. In a polymer of nucleotides, how does one nucleotide attach to another?
- The base of one nucleotide is attached to the base of the next.
 - The base of one nucleotide it attached to the sugar of the next.
 - The sugar of one nucleotide is attached to the sugar of the next.
 - The phosphate group of one nucleotide is attached to the base of the next.
 - 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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

76. Which type of bonds hold the two chains of DNA together in a DNA molecule?
- hydrogen
 - polar covalent
 - nonpolar covalent
 - ionic
 - peptide

ANSWER: a

POINTS: 1

DIFFICULTY: Bloom's: Remember

REFERENCES: 2.10 Nucleic Acids

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

Chapter 02—Molecules of Life

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

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

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

Chapter 02—Molecules of Life

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

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.
DATE CREATED: 11/18/2019 2:48 PM
DATE MODIFIED: 12/4/2019 6:11 AM

87. the bond between the atoms in an NaCl molecule

ANSWER: b

POINTS: 1

88. the bond between the hydrogen atoms of molecular hydrogen

Chapter 02—Molecules of Life

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.

DATE CREATED: 11/18/2019 2:48 PM

DATE MODIFIED: 12/4/2019 6:11 AM

92. the bond that gives water special properties

ANSWER: a

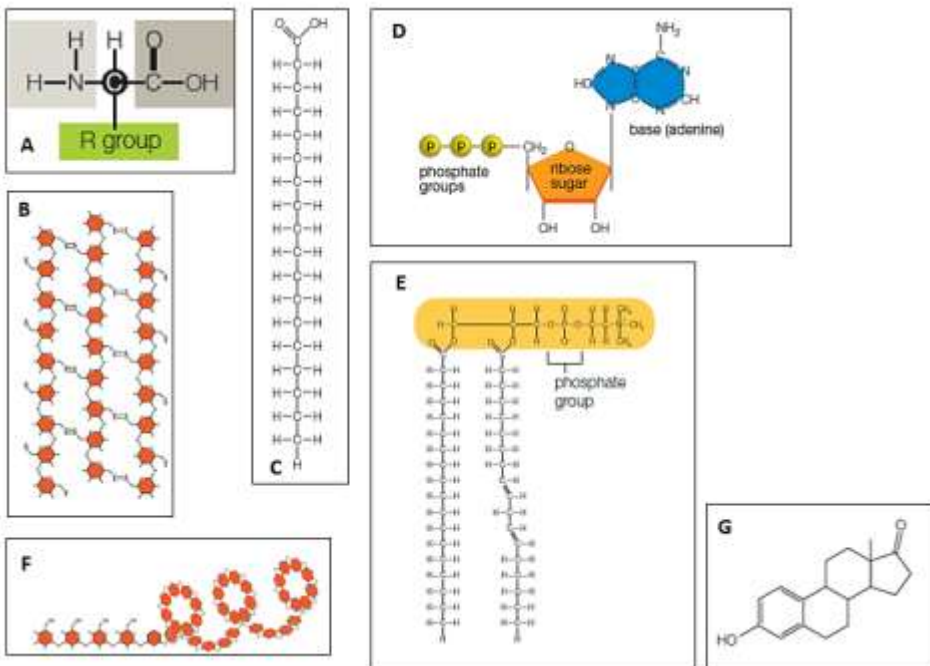
POINTS: 1

93. the property that allows certain insects to walk on water

ANSWER: b

POINTS: 1

Chapter 02—Molecules of Life



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

- A
- B
- C
- D
- E
- F
- 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

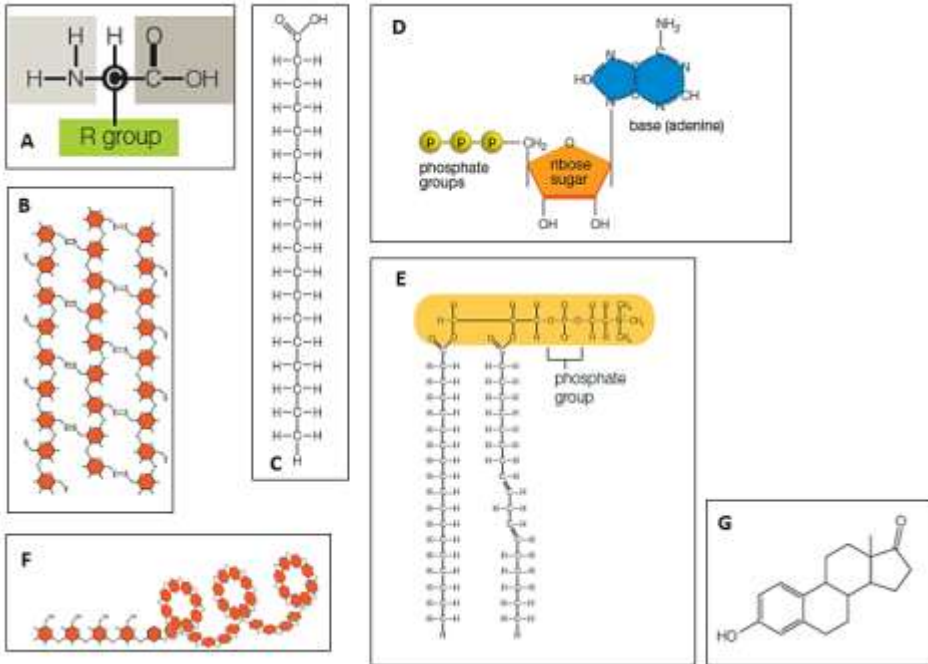
POINTS: 1

96. steroid

ANSWER: g

POINTS: 1

Chapter 02—Molecules of Life



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.

DATE CREATED:

11/18/2019 2:48 PM

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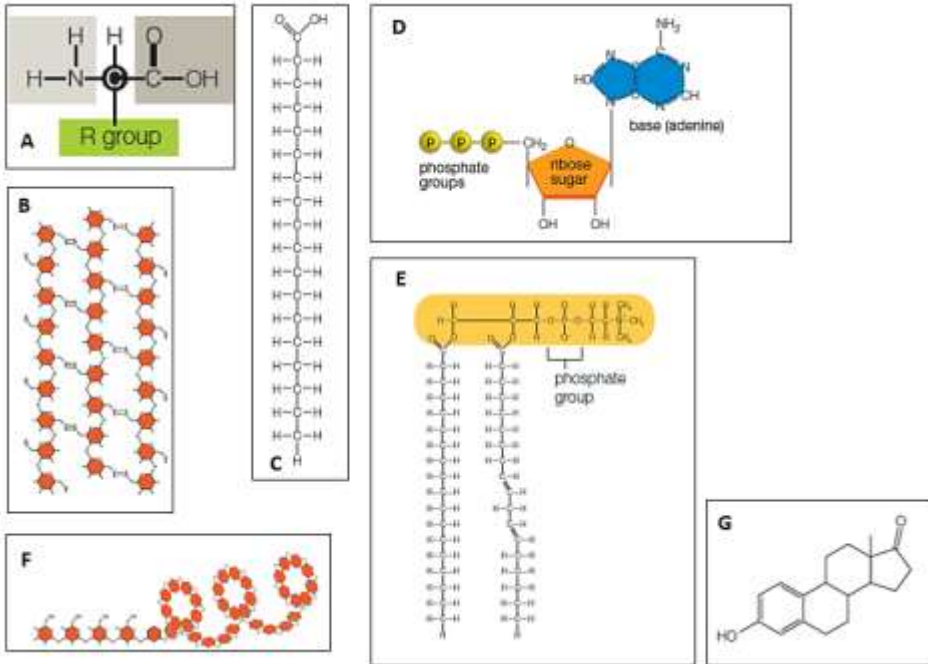
12/4/2019 6:11 AM

97. amino acid

ANSWER: a

POINTS: 1

Chapter 02—Molecules of Life



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.

DATE CREATED:

11/18/2019 2:48 PM

DATE MODIFIED:

12/4/2019 6:11 AM

98. cellulose

ANSWER: b

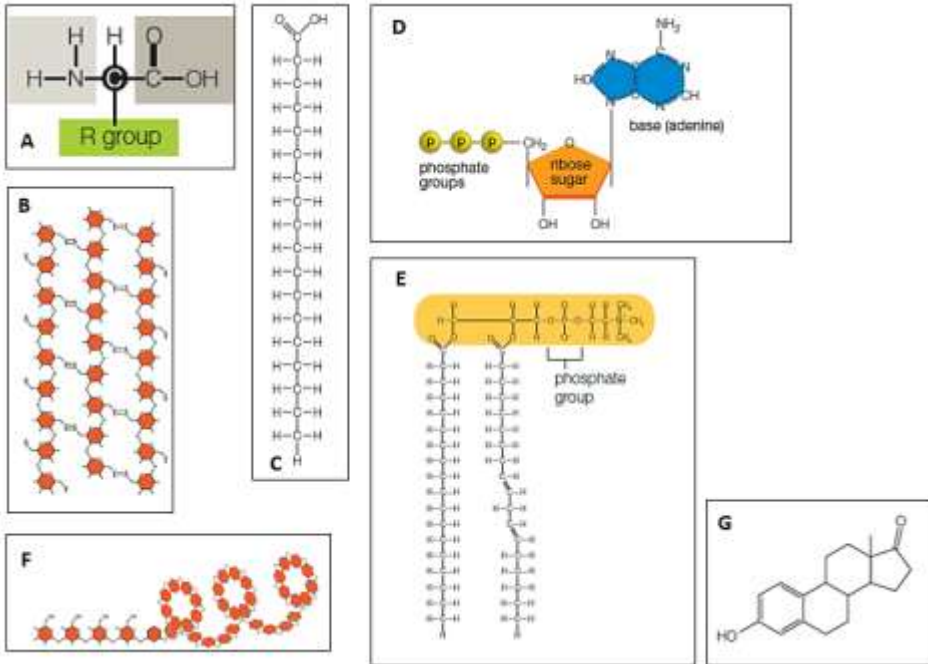
POINTS: 1

99. starch

ANSWER: f

POINTS: 1

Chapter 02—Molecules of Life



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.

DATE CREATED:

11/18/2019 2:48 PM

DATE MODIFIED:

12/4/2019 6:11 AM

100. nucleotide

ANSWER: d

POINTS: 1