CHAPTER 02—MOLECULES OF LIFE

Multiple Choice

1. Hydrogenation is a _____.
   a. manufacturing process that adds hydrogen atoms to carbohydrates
   b. natural process that 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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Fear of Frying
LEARNING OBJECTIVES: BTAT.STAR.16.02.01 - Discuss the history and harmful health effects of trans fats.

2. The human body requires about ____ of fat each day to stay healthy.
   a. 1 teaspoon
   b. 4 teaspoons
   c. 1 tablespoon
   d. 4 tablespoons
   e. 1 cup

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Fear of Frying
LEARNING OBJECTIVES: BTAT.STAR.16.02.01 - Discuss the history and harmful health effects of trans fats.

3. Fats are major components of the cell's ____.
   a. membranes
   b. cytoplasm
   c. proteins
   d. ribosomes
   e. DNA

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Fear of Frying
LEARNING OBJECTIVES: BTAT.STAR.16.02.01 - Discuss the history and harmful health effects of trans fats.

4. A typical fat molecule has ____ fatty acid tails.
   a. one
   b. two
   c. three
   d. four
   e. five

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Fear of Frying
LEARNING OBJECTIVES: BTAT.STAR.16.02.01 - Discuss the history and harmful health effects of trans fats.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 Fear of Frying
LEARNING OBJECTIVES: BTAT.STAR.16.02.01 - Discuss the history and harmful health effects of trans fats.

6. The atomic number is determined by the number of ____.
   a. protons
   b. neutrons
   c. electrons
   d. protons plus neutrons
   e. protons plus electrons

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

9. We can accurately determine the age of a rock or fossil by measuring its ____.
   a. proton concentration
   b. electron concentration
   c. neutron concentration
   d. isotope concentration
   e. ion concentration

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

10. Helium, neon and argon are _____.
   a. extremely stable because they have vacancies in their outer shells
   b. extremely stable because they don't have any vacancies in their outer shells
   c. extremely unstable because they have vacancies in their outer shells
   d. extremely unstable because they don't have any vacancies in their outer shells
   e. extremely unstable because they have vacancies in their inner shells

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

13. The positive subatomic particle is the ____.

a. neutron
b. proton
c. electron
d. positron
e. quark

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

14. Oxygen has an atomic number of 8. This means that oxygen has ____.
a. 8 electrons in its outer most shell
b. 8 neutrons in its nucleus
c. 4 protons and 4 neutrons in its nucleus
d. 8 protons in its nucleus
e. 8 protons and 8 neutrons in its nucleus

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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

a. ion
b. molecule
c. compound
d. element
e. microelement

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

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

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

20. In ____ bonds, atoms share electrons equally.
a. double
b. ionic
c. polar covalent
d. nonpolar covalent
e. hydrogen

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

21. Which type of chemical bonds are found within a water molecule?
    a. hydrogen
    b. ionic
    c. polar covalent
    d. nonpolar covalent
    e. triple

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

23. What molecule 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
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

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

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

25. Which substance is hydrophobic?
    a. canola oil
    b. sodium chloride
    c. sugar
    d. water
    e. the potassium ion
ANSWER: a
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

26. Fats will dissolve in ethanol. Ethanol is an example of a ____.
    a. solute
    b. solution
    c. solvent
    d. salt
    e. ion
ANSWER: c
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

27. Which bond is weakest?
    a. ionic
    b. double covalent
    c. polar covalent
    d. nonpolar covalent
    e. hydrogen
ANSWER: e
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

28. Water molecules are attracted to one another because the ____.
    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 non-polar 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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

30. Surface tension is an example of ____.

a. hydrophobicity

b. concentration

c. evaporation

d. cohesion

e. polarity

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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 giving off energy

d. cohesion of water molecules giving off energy

e. cohesion of water molecules requiring energy

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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. doesn't affect; no additional
d. increases; less
e. increases; more

ANSWER: b
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

33. When water molecules form into ice, ____.
a. the water molecules jiggle more
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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

34. Hydrophobic molecules are ____ water.
a. attracted by
b. absorbed by
c. repelled by
d. mixed with
e. polarized by

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

37. Glucose dissolves in water because it ____.
a. ionizes
b. is a polysaccharide
c. is a polar and forms many hydrogen bonds with water molecules
d. has a very reactive primary structure
e. is an isotope

ANSWER: c
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

38. 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
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

39. A pH value of ____ has the highest concentration of hydrogen ions.
a. 1
b. 3
c. 5
d. 7
e. 9

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

40. Nearly all of life’s chemistry occurs near a pH of ____.
a. 1

b. 3
c. 5
d. 7
e. 9

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

41. A uniform mixture is called a ____.
a. concentration
b. salt
c. solute
d. solution
e. solvent

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

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
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

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
DIFFICULTY: Bloom's: Remember

REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

49. 

How many carbons are present in this figure?
    a. 0
    b. 4
    c. 5
    d. 6
    e. 7

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.6 Organic Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.06 - Define organic molecules and demonstrate their importance in the structure and function of biological systems.

50. Which organic molecule is a carbohydrate monomer?
    a. triglyceride
    b. fatty acids
    c. nucleotide
    d. amino acid
    e. monosaccharide

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

51. Glucose monomers linked into a highly branched chain make up ____.
    a. glycogen
    b. cellulose

c. fructose
d. starch
e. sucrose

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

53. Plants store their excess carbohydrates in the form of ____.
a. cellulose
b. starch
c. glycogen
d. sucrose
e. galactose

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

54. Glycogen is a polysaccharide used for energy storage by ____.
a. plants
b. animals
c. protists
d. bacteria
e. archaea

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

57. ____ is a monosaccharide.
a. Cellulose
b. Fructose
c. Glycogen
d. Starch
e. Sucrose

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

58. Humans do not contain the enzymes to break down ____.
a. cellulose
b. fructose
c. glycogen
d. starch
e. sucrose

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

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
e. one glycerol and two fatty acids

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

63. Which food product would likely contain the largest amount of unsaturated fat?
a. butter
b. lard

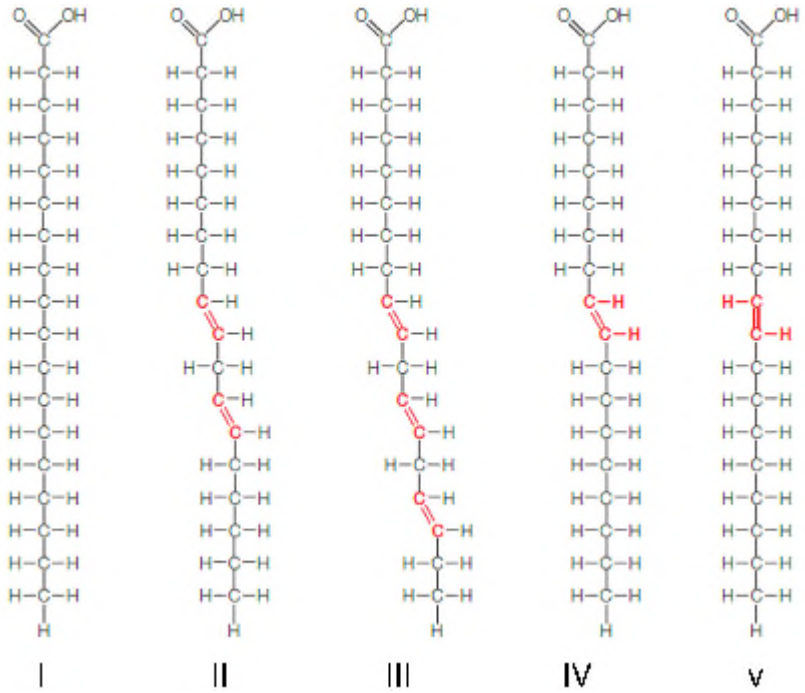
c. salami
d. olives
e. cheese

ANSWER: d
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

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
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

65.



In the figure above, which fatty acids 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
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

66. A(n) ____ is a protein monomer.
    a. nucleotide
    b. monosaccharide
    c. simple sugar
    d. amino acid
    e. ribose

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

70. Protein misfolding causes ____.
a. Creutzfeldt-Jakob disease
b. arthritis
c. immunodepression
d. schizophrenia
e. tuberculosis

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

71. When a protein denatures, which type of bonding is affected?
a. covalent
b. peptide
c. ionic
d. hydrogen
e. metallic

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

73. Nucleotides are monomers of ____.

a. complex lipids
b. proteins
c. polysaccharides
d. nucleic acids
e. cellulose

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
LEARNING OBJECTIVES: BTAT.STAR.16.02.10 - Describe the features and functions of various types of nucleic acids.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
LEARNING OBJECTIVES: BTAT.STAR.16.02.10 - Describe the features and functions of various types of nucleic acids.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
LEARNING OBJECTIVES: BTAT.STAR.16.02.10 - Describe the features and functions of various types of nucleic acids.

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
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.10 Nucleic Acids
LEARNING OBJECTIVES: BTAT.STAR.16.02.10 - Describe the features and functions of various types of nucleic acids.

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 Start with Atoms
LEARNING OBJECTIVES: BTAT.STAR.16.02.02 - Describe the atom and its components.

77. forms of an element that differ in the number of neutrons their atoms carry
ANSWER: d

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

79. isotope with an unstable nucleus
ANSWER: c

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

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

Match the following terms to the correct description.

a. acid
b. base
c. neutral
d. buffer
e. pH

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 Acids and Bases
LEARNING OBJECTIVES: BTAT.STAR.16.02.05 - Define pH and explain its importance in the maintenance of biological functions.

82. solution that contains the same concentration of H^+ ions as OH^- ions
ANSWER: c

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

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

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

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

The following are types of chemical bonds. Match these to the correct description.
a. hydrogen
b. ionic
c. covalent
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 From Atoms to Molecules
LEARNING OBJECTIVES: BTAT.STAR.16.02.03 - Define a chemical bond and, using examples, illustrate the different types of chemical bonds.

87. the bond between the atoms in an NaCl molecule
ANSWER: b

88. the bond between the hydrogen atoms of molecular hydrogen
ANSWER: c

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

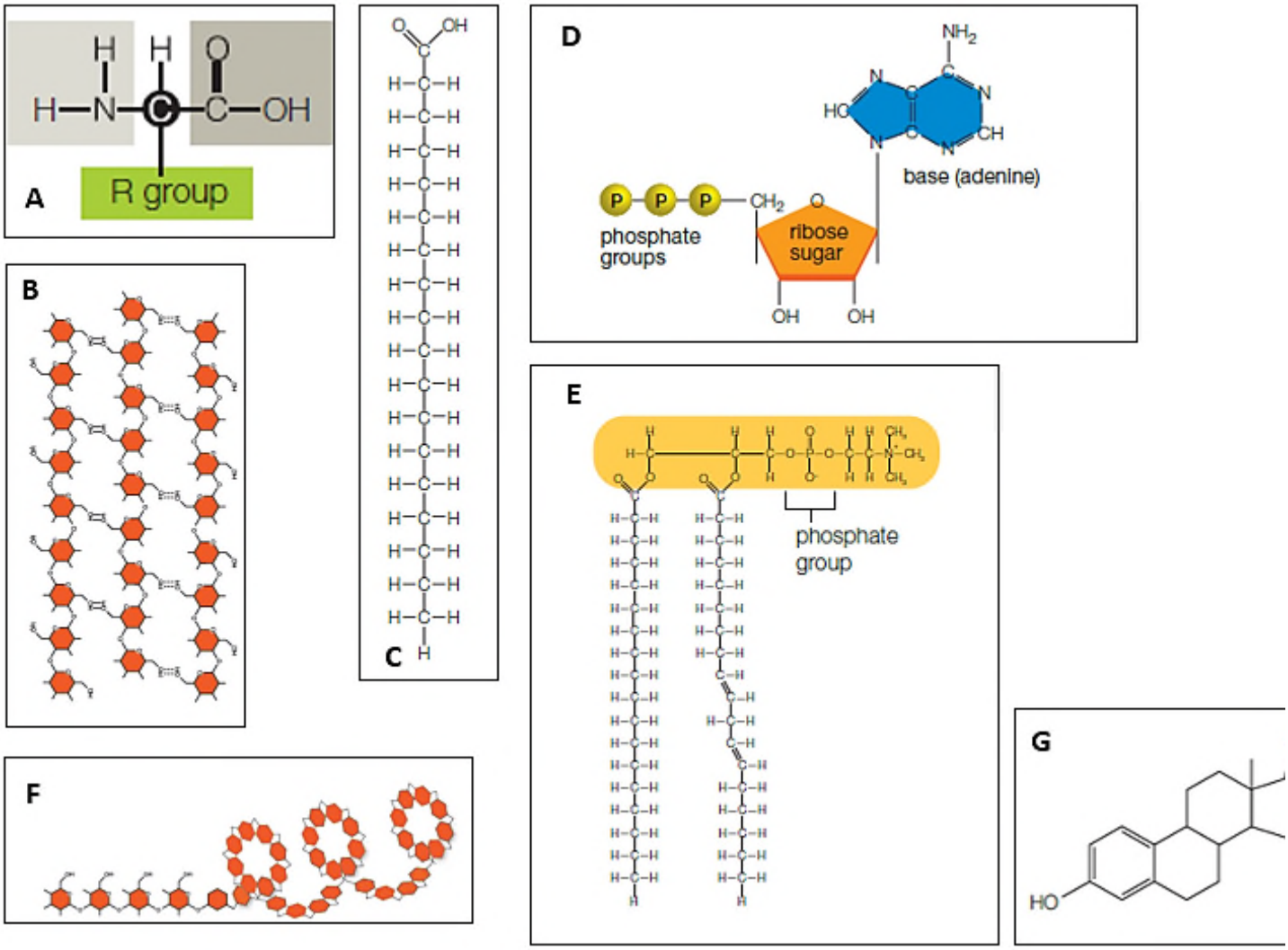
90. the bond in which electrons are shared
ANSWER: c

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

The following are types of chemical bonds. Match these to the correct description.
a. hydrogen
b. ionic
c. covalent
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Hydrogen Bonds and Water
LEARNING OBJECTIVES: BTAT.STAR.16.02.04 - Explain the composition and properties of water.

92. the bond between the two strands of DNA in a double helix
ANSWER: a

93. the bond that is easiest to break
ANSWER: a



Match the structures below with the appropriate label in the figure above.

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

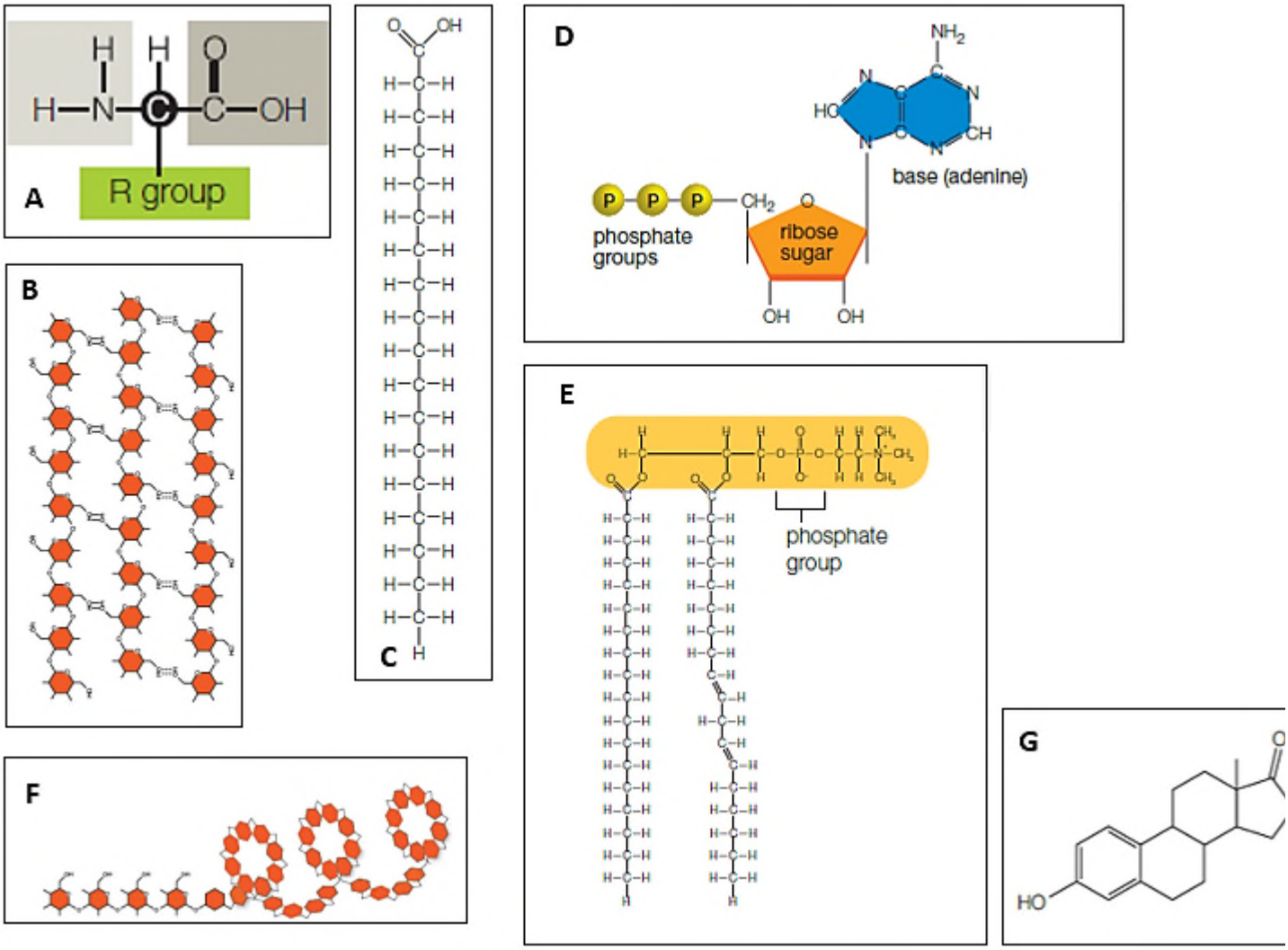
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.8 Lipids
LEARNING OBJECTIVES: BTAT.STAR.16.02.08 - Describe the structures and functions of the various types of lipids.

94. fatty acid
ANSWER: c

95. phospholipid

ANSWER: e

96. steroid
ANSWER: g

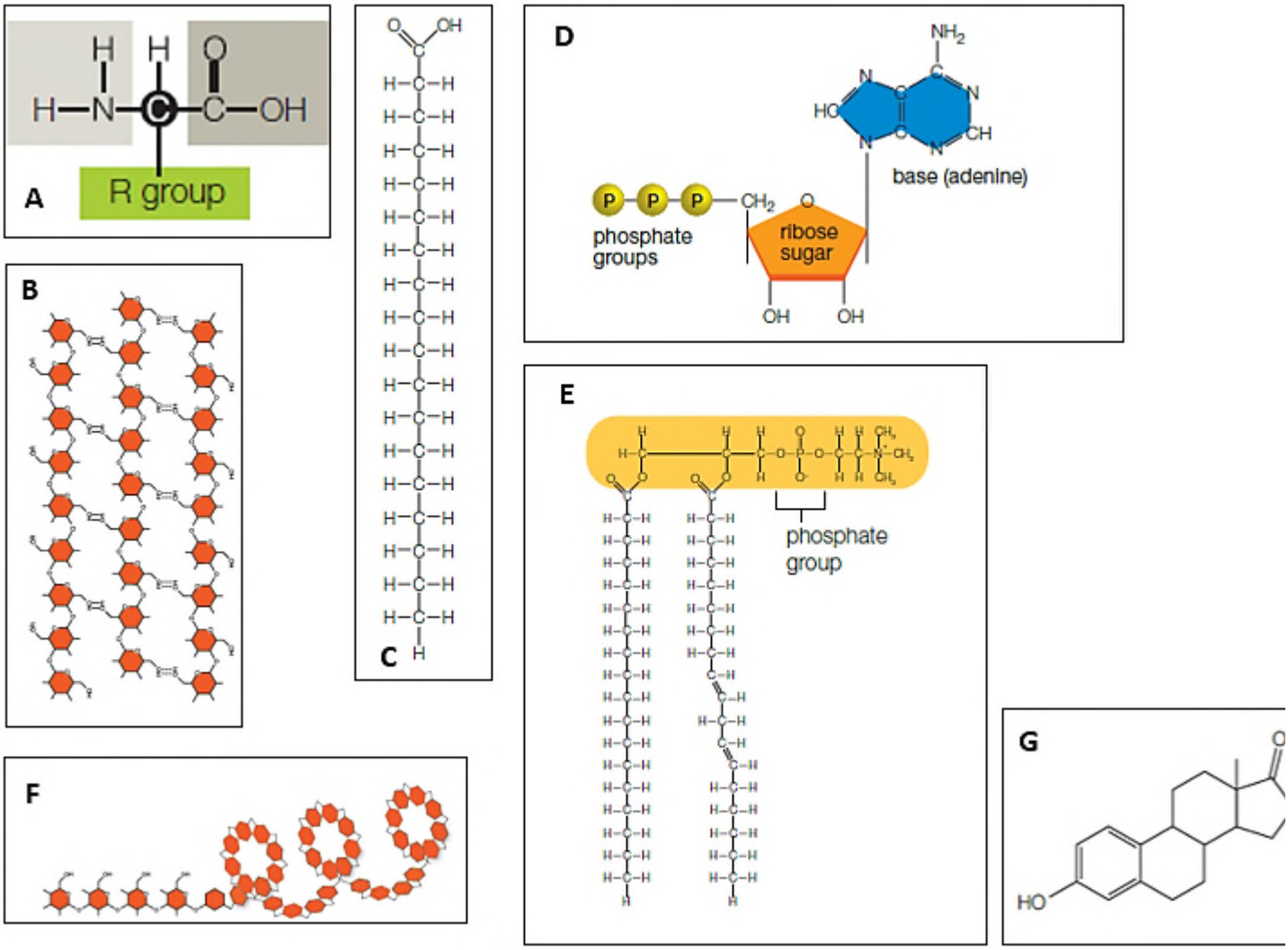


Match the structures below with the appropriate label in the figure above.

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

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.9 Proteins
LEARNING OBJECTIVES: BTAT.STAR.16.02.09 - Describe the structure of a protein and explain its importance to protein function.

97. amino acid
ANSWER: a



Match the structures below with the appropriate label in the figure above.

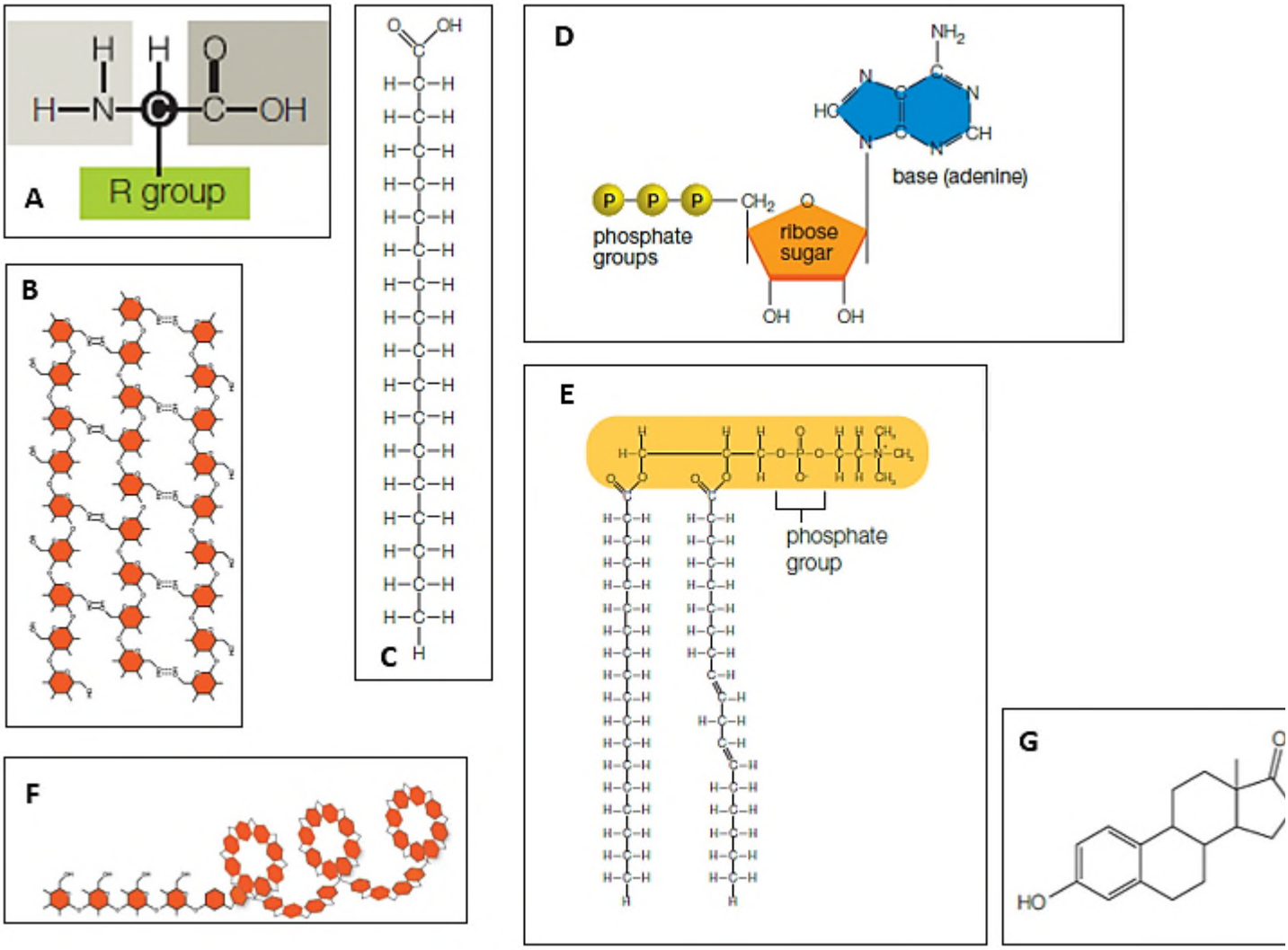
a. A b. B
c. C d. D
e. E f. F
g. G

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.7 Carbohydrates
LEARNING OBJECTIVES: BTAT.STAR.16.02.07 - Summarize the types of carbohydrates with examples.

98. cellulose
ANSWER: b

99. starch
ANSWER: f

CHAPTER 02—MOLECULES OF LIFE



Match the structures below with the appropriate label in the figure above.

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

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.10 Nucleic Acids
LEARNING OBJECTIVES: BTAT.STAR.16.02.10 - Describe the features and functions of various types of nucleic acids.

100. nucleotide
ANSWER: d