

## Test Bank for Maders Understanding Human Anatomy and Physiology 9th Edition Longenbaker 1259296431 9781259296437

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### Solution Manual:

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## Chapter 02 Chemistry of Life

### Multiple Choice Questions

1. The smallest unit of matter is the
- A. molecule.
  - B. atom.**
  - C. compound.
  - D. isotope.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.03 Compare and contrast the terms atoms, molecules, elements, and compounds.*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

2. An element is any substance that contains one type of
- A. molecule.
  - B. isotope.
  - C. atom.**
  - D. proton.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.03 Compare and contrast the terms atoms, molecules, elements, and compounds.*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

### True / False Questions

3. Over 90% of the body is composed of four elements: carbon, nitrogen, chlorine, and hydrogen.

**FALSE**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.03 Compare and contrast the terms atoms, molecules, elements, and compounds.*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

### Multiple Choice Questions

4. The positively charged particles in the nucleus of an atom are

A. neutrons.

B. electrons.

**C.** protons.

D. isotopes.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

5. The atomic mass of a proton is

A. 0 atomic mass units.

B. 2 atomic mass units.

**C.** 1 atomic mass units.

D. -1 atomic mass units.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

6. Which of the following subatomic particles are found in the nucleus of an atom?
- A. Protons and electrons
  - B. Electrons and neutrons
  - C. Protons and shells
  - D. Neutrons and protons**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

7. The number of protons in an atom is called the
- A. atomic number.**
  - B. atomic weight.
  - C. mass number.
  - D. combining weight.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

8. Which subatomic particle determines the identity of an atom?
- A. Neutron
  - B. Proton**
  - C. Electron
  - D. Prion

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons with respect to the structure of an atom*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

Chapter 02 - Chemistry of Life

9. Which subatomic particle determines the chemical activity of an atom?

- A. Neutron
- B. Proton
- C. Electron**
- D. Prion

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01b Relate the number of electrons in an electron shell to an atom's chemical stability and its ability to form chemical bonds.*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

10. Which is characteristic of an ion?

- A. Contains an unequal number of electrons and protons**
- B. Contains a different number of neutrons
- C. Contains extra protons
- D. Contains equal numbers of protons, electrons, and neutrons

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01c Explain how ions and isotopes are produced by changing the relative number of specific subatomic particles with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

11. The number of an element is equal to

- A. protons plus the number of neutrons.**
- B. protons plus the number of electrons.
- C. protons.
- D. electrons plus the number of neutrons.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

Chapter 02 - Chemistry of Life

12. An atom or group of atoms with a charge is called a(n)
- A. molecule.
  - B. isotope.
  - C. compound.
  - D. ion.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Atoms and molecules*

13. Atoms with more than one shell are most stable when the outermost shell contains \_\_\_\_\_ electrons.
- A. 10 B.
  - 1
  - C. 8**
  - D. 6

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01b Relate the number of electrons in an electron shell to an atoms chemical stability and its ability to form chemical bonds.*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

14. Exactly  $6.02 \times 10^{23}$  atoms of any element is called one \_\_\_\_ of that element.
- A. atomic mass unit
  - B. isotope
  - C. mole**
  - D. mouse

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

15. Different forms of the same element with different numbers of neutrons are called
- A. molecules.
  - B. compounds.
  - C. isotopes.**
  - D. lattices.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.01c Explain how ions and isotopes are produced by changing the relative number of specific subatomic particles with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

16. If the atomic number of an element is 9 and the mass number is 19, how many neutrons does the atom have?
- A. 10**
  - B. 9
  - C. 19
  - D. 28

*Bloom's Level: 3. Apply*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

17. If the atomic number of an element is 27 and the mass number is 60, how many neutrons does the atom have?
- A. 27
  - B. 33**
  - C. 87
  - D. 60

*Bloom's Level: 3. Apply*

*HAPS Objective: C.01.01d Distinguish among the terms atomic number, mass number and atomic weight with respect to the structure of an atom*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

18. Compared to "regular" isotopes, radioactive isotopes **A.** emit energy from the nucleus.  
B. lose or gain neutrons.  
C. lose or gain electrons.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Atoms and molecules*

19. Low levels of radiation are commonly used to  
A. sterilize dental products.  
B. destroy cancer cells.  
**C.** produce images of body parts.  
D. All apply.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Atoms and molecules*

20. What makes an isotope radioactive?  
A. It has more protons than electrons. **B.**  
It releases energy to become stable. C. It  
releases hydrogen ions into solution.  
D. It breaks down into hydrogen and electrons.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Atoms and molecules*

Chapter 02 - Chemistry of Life

21. High levels of radiation are NOT used
- A. to sterilize medical equipment.
  - B. to kill cancer cells.
  - C.** as tracers to detect molecular changes.
  - D. to sterilize medical tools and equipment.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Atoms and molecules*

22. Atoms bonded together to form a chemical unit are called
- A.** molecules.
  - B. ions.
  - C. radioisotopes.
  - D. buffers.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.03 Compare and contrast the terms atoms, molecules, elements, and compounds.*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Atoms and molecules*

*Topic: Chemical bonding*

23. Molecules form from
- A. the shape of the individual atoms.
  - B. the attraction between electrons.
  - C.** the sharing of electrons.
  - D. a drive toward solubility.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

Chapter 02 - Chemistry of Life

24. A molecule made of two or more different atoms bonded together is called a(n)
- A. ion.
  - B. isotope.
  - C. atom.
  - D. compound.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.03 Compare and contrast the terms atoms, molecules, elements, and compounds.*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Atoms and molecules*

*Topic: Chemical bonding*

25. An anion is an atom or molecule that
- A. is positively charged.
  - B. is negatively charged.**
  - C. emits radioactive energy.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Atoms and molecules*

26. A bond created from the attraction between positively and negatively charged ions is a(n) \_\_\_\_\_ bond.
- A. covalent
  - B. hydrogen
  - C. ionic**
  - D. metallic

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

27. Sodium chloride dissociates when dissolved in water. Therefore, it is considered a \_\_\_\_\_.

- A.** salt
- B. compound
- C. acid
- D. base

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.03 Define the term salt and give examples of physiological significance.*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

28. A bond created from the sharing of electrons between two atoms is a(n) \_\_\_\_\_ bond.

- A.** covalent
- B. hydrogen
- C. ionic
- D. metallic

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

29. When two pairs of electrons are shared between two atoms, a \_\_\_\_\_ bond is formed.

- A. single covalent
- B.** double covalent
- C. triple covalent
- D. double ionic

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

30. When one atom has a stronger attraction for shared electrons than the other atom, a(n) \_\_\_\_\_ covalent bond is formed.

- A.** polar
- B. nonpolar
- C. ionic
- D. metallic

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

31. Ionic bonds involve \_\_\_\_\_, while covalent bonds involve \_\_\_\_\_.

- A.** the donation of electrons; the sharing of electrons
- B. the sharing of electrons; the donation of electrons
- C. weak attractions; the donation of electrons

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

32. Equal sharing of electrons is a characteristic of a \_\_\_\_\_ covalent bond, while unequal sharing is in a \_\_\_\_\_ bond.

- A. polar; nonpolar
- B.** nonpolar; polar

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemical bonding*

33. The most abundant molecule in living organisms is

- A.** water.
- B. glucose.
- C. oxygen.
- D. ammonia.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

34. Organic compounds always contain \_\_\_\_\_ atoms.

- A. water
- B.** carbon
- C. nitrogen
- D. oxygen

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Atoms and molecules*

35. Water molecules are

- A.** polar.
- B. nonpolar.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

36. The attraction between a slightly positive hydrogen to a slightly negative oxygen of another molecule describes a(n) \_\_\_\_\_ bond.

- A.** hydrogen
- B. oxygen
- C. nitrogen
- D. ionic

*Bloom's Level: 1. Remember*

*HAPS Objective: C.02.01b Explain the mechanism of each type of bond With respect to non-polar covalent, polar covalent, ionic, and hydrogen bonds*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Chemical bonding*

37. Which of the following is NOT a property of water?

- A. High heat capacity
- B.** Low heat of vaporization
- C. Solvent for polar and ionic compounds
- D. Cohesiveness

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

38. Which of the following is NOT a property of water?

- A. The ability to cling to other water molecules, yet flow
- B. The ability to facilitate chemical reactions
- C. The ability to insulate the body from temperature extremes
- D.** The ability to dissolve nonpolar, hydrophobic molecules

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*HAPS Objective: C.03.02 Distinguish among the terms solution, solute, solvent, colloid suspension, and emulsion.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

39. Substances that dissolve in water are called

- A.** hydrophilic.
- B. hydrophobic.
- C. hydrophoric.
- D. hydrochromic.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

40. The ability of water molecules to cling to each other is \_\_\_\_\_, while the ability to cling to other surfaces is \_\_\_\_\_.

- A.** cohesion; adhesion
- B. dissolving; vaporization
- C. adhesion; cohesion
- D. cohesion; dissolving

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

41. The ability of water to absorb large amounts of heat energy without changing its temperature is a

- A. low specific heat capacity.
- B. low heat of vaporization.
- C.** high specific heat capacity.
- D. high heat of vaporization.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.01 Discuss the physiologically important properties of water.*

*Learning Outcome: 02.04*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

42. A substance that dissociates in water, releasing hydrogen ions, is a(n)

- A. salt.
- B. base.
- C. protein.
- D. acid.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance.*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

43. A substance that can take up hydrogen ions or release hydroxide ions in water is a(n)

- A. salt.
- B. base.**
- C. protein.
- D. acid.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance.*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

44. Hydrochloric acid is considered a strong acid because it

- A. produces very few hydrogen ions in water.
- B. produces many hydroxide ions in water.
- C. produces many hydrogen ions in water.**
- D. dissociates very little in water.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance.*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

### True / False Questions

45. A weak base will accept many hydrogen ions, while a strong base will accept only a few hydrogen ions.

**FALSE**

A strong base will accept many hydrogen ions.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance.*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

### Multiple Choice Questions

46. The lower the pH,

A. the lesser the hydrogen ion concentration.

**B.** the more acidic the solution.

C. the lesser the hydrogen ion concentration and the more acidic the solution.

D. the greater the hydroxide ion concentration.

E. the more basic the solution and the greater the hydroxide ion concentration.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

47. The pH of the blood is slightly basic. Which of the following describes this pH?

- A. 6.4
- B. 12.6
- C. 4.7
- D. 7.4**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

48. A pH of 5.5 would be considered

- A. acidic.**
- B. basic.
- C. neutral.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

49. A pH of 7.0 would be considered

- A. acidic.
- B. basic.
- C. neutral.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

50. A blood pH of 7.2 would be considered \_\_\_\_\_, while a pH of 7.6 would be \_\_\_\_\_.
- A. acidosis; alkalosis
  - B. alkalosis; acidosis
  - C. acidosis; normal
  - D. Both values are within the normal range.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance.*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

51. Chemicals that help keep body fluids within a normal pH range are called
- A. acids.
  - B. bases.
  - C. buffers.
  - D. salts.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.03.05 State acidic, neutral, and alkaline pH values.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

52. An electrolyte is a substance that releases \_\_\_\_\_ when dissolved in water.
- A. ions
  - B. electrons
  - C. bases

*Bloom's Level: 1. Remember*

*HAPS Objective: C.01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*HAPS Objective: C.03.03 Define the term salt and give examples of physiological significance.*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Inorganic compounds and solutions*

### Check All That Apply Questions

53. Which four are the main macromolecules found in cells?

- Proteins
- Water
- Carbohydrates
- Nucleic acids
- Lipids

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.07*

*Section: 02.03*

*Topic: Organic compounds*

### Multiple Choice Questions

54. What monomer is NOT correctly matched with its macromolecule?

- A. carbohydrates - glucose
- B. lipids - glycerol and citric acids**
- C. proteins - amino acids
- D. nucleic acids - nucleotides

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Organic compounds*

55. The subunit molecules for proteins are

- A. nucleic acids.
- B. amino acids.**
- C. fatty acids.
- D. monosaccharides.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Organic compounds*

56. Which arrow in the following equation represents dehydration?

- A. Arrow 1**
- B. Arrow 2

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.03 Define and give examples of dehydration synthesis and hydrolysis reactions.*

*Learning Outcome: 02.07*

*Section: 02.03*

*Topic: Organic compounds*

57. The addition of water in an enzyme-catalyzed reaction is a(n) \_\_\_\_\_ reaction.

- A. dehydration
- B. hydrolysis**
- C. exchange
- D. neutralization

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.03 Define and give examples of dehydration synthesis and hydrolysis reactions.*

*Learning Outcome: 02.07*

*Section: 02.03*

*Topic: Organic compounds*

58. The removal of a water molecule during a reaction results in

- A. breaking a bond.
- B. forming an acid.
- C. hydrolysis.
- D. forming a bond.**

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.02 Explain the relationship between monomers and polymers.*

*HAPS Objective: C.04.03 Define and give examples of dehydration synthesis and hydrolysis reactions.*

*Learning Outcome: 02.07*

*Section: 02.03*

*Topic: Organic compounds*

59. The main function of carbohydrates is to provide

- A. cellular energy.**
- B. insulation.
- C. transport molecules. D.
- hereditary information.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

60. A monosaccharide of five carbons is a

- A. hexose sugar.
- B. glycerol.
- C. fatty acid.
- D. pentose sugar.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

61. The monomer of carbohydrates is a

- A. nucleotide.
- B. fatty acid.
- C. monosaccharide.**
- D. amino acid.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

62. Which of the following is NOT a monosaccharide?

- A. Glucose
- B. Fructose
- C. Sucrose**
- D. Galactose

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

63. Which of the following is NOT a disaccharide?

- A. Maltose
- B. Galactose**
- C. Lactose
- D. Sucrose

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

64. Which of the following contains glucose?

- A. Protein
- B. Fat
- C. Nucleic acid
- D. Starch**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

65. Glycogen is

- A. a monosaccharide used for quick energy.
- B. a protein found in cell membranes.
- C. a polysaccharide used as stored energy in animals.**
- D. a fat found in margarine.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

### Check All That Apply Questions

66. Which are characteristics of starch? Choose all that apply.

It is a polysaccharide.

It is a disaccharide.

It is found in plants.

It is found in animals.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04d Identify dietary sources With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

### Multiple Choice Questions

67. Which of the following is the main component of fiber in our diet?

A. Glycogen

B. Protein

**C. Cellulose**

D. Starch

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.09*

*Section: 02.04*

*Topic: Organic compounds*

68. Organic compounds that are always insoluble in water are called

- A. sugars.
- B. lipids.**
- C. nucleotides.
- D. proteins.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

69. Which of the following is NOT a function of lipids?

- A. Long-term energy storage
- B. Formation of antibodies**
- C. Formation of cell membranes
- D. Component of sex hormones

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

### True / False Questions

70. Fats are usually liquid at room temperature and oils are solids.

**FALSE**

Fats are usually solid at room temperature and oils are liquid.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

## Multiple Choice Questions

71. Which macromolecule is composed of one glycerol plus three fatty acids? **A.** Lipids  
B. Proteins  
C. Nucleic acids  
D. Carbohydrates

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

72. The process that allows fats to mix with water, particularly so digestion can occur, is called  
A. hydrolysis. B.  
degradation. C.  
dehydration. **D.**  
emulsification.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

73. When fatty acids contain one or more double bonds, they are considered  
A. saturated.  
**B.** unsaturated.  
C. emulsified.  
D. synthesized.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

74. What makes a phospholipid different from a fat?

- A. Fats are neutral while phospholipids are ionized.
- B. Fats are solid while phospholipids are liquid.
- C. Fats are ionized while phospholipids are neutral.
- D. Fats are basic while phospholipids are acidic.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

75. The macromolecules that are the main component of cell membranes are

- A. steroids.
- B. triglycerides.
- C. phospholipids.
- D. prostaglandins.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.07.01 Describe how lipids are distributed in a cell membrane, and explain their functions.*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

76. Steroids differ in structure from other lipids in that they have a backbone of

- A. four fused carbon rings.
- B. branched chains of carbons.
- C. saturated carbon chains.
- D. unsaturated carbon chains.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

### Check All That Apply Questions

77. Which are characteristics of cholesterol? Choose all that apply.

- It is a type of protein.  
 It is hydrophobic.  
 It is an important component of cell membranes.  
 It is an energy-storage molecule.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.10*

*Section: 02.05*

*Topic: Organic compounds*

### Multiple Choice Questions

78. Which of the following is NOT a function of proteins?

- A. They form structural components such as collagen.  
B. They form many hormones.  
C. They form actin and myosin needed for muscular movement.  
**D. They form important energy molecules.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*HAPS Objective: C.07.03 Describe how proteins are distributed in a cell membrane, and explain their functions.*

*Learning Outcome: 02.11*

*Section: 02.06*

79. Which of the following is NOT a function of proteins?

- A. They form enzymes to speed up reactions.
- B.** They form the backbone of cell membranes.
- C. They form hemoglobin to transport oxygen in the blood.
- D. They form antibodies to protect the body from disease.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.07.03 Describe how proteins are distributed in a cell membrane, and explain their functions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

80. How many different amino acids compose all human polypeptides (proteins)?

- A. 10
- B. 15
- C.** 20
- D. 25

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

81. The sequence of amino acids makes up the \_\_\_\_\_ structure of a protein.

- A.** primary
- B. secondary
- C. tertiary
- D. quaternary

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

82. The coiling or folding of a polypeptide chain is the \_\_\_\_\_ structure of a protein.

- A. primary
- B. secondary**
- C. tertiary
- D. quaternary

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

83. The coiling and folding of a polypeptide chain into a more circular molecule is the \_\_\_\_\_ structure of a protein.

- A. primary
- B. secondary
- C. tertiary**
- D. quaternary

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

84. Proteins that have more than one polypeptide arranged together have a \_\_\_\_\_ structure.

- A. primary
- B. secondary
- C. tertiary
- D. quaternary**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

85. The differences between one polypeptide and another lies in
- A. the type of peptide bond they contain.
  - B. the type of sugar they contain.
  - C. whether they are saturated or not.
  - D.** the sequence of amino acids.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

86. Any process that causes an irreversible change in the shape of a protein is called
- A.** denaturation.
  - B. emulsification.
  - C. hydrolysis.
  - D. degradation.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

### Check All That Apply Questions

87. Which of the following can denature proteins? Choose all that apply.

- High salt concentration
- High temperature
- Low calcium concentration
- Low pH

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

### Multiple Choice Questions

88. The sum of all the chemical reactions that occur in a cell is called
- A. emulsification.
  - B. metabolism.**
  - C. denaturation.
  - D. synthesis.

*Bloom's Level: 1. Remember*  
*Learning Outcome: 02.11*  
*Section: 02.06*

89. What is the role of an enzyme in a chemical reaction?
- A. Raises the energy of activation
  - B. Raises the temperature of the reaction
  - C. Lowers the energy of activation**
  - D. Lowers the temperature of the reaction

*Bloom's Level: 1. Remember*  
*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*  
*Learning Outcome: 02.11*  
*Section: 02.06*

90. In the reactions that occur in metabolism, enzymes function as
- A. amino acids.
  - B. lipids. **C.**
  - catalysts.
  - D. compounds.

*Bloom's Level: 1. Remember*  
*Learning Outcome: 02.11*  
*Section: 02.06*  
*Topic: Organic compounds*

91. The substance that an enzyme acts upon is its

- A.** substrate.
- B. active site.
- C. catalyst.
- D. product.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

92. An enzyme's specificity for its substrate is due to

- A.** the shape of its active site.
- B. its denaturation.
- C. the presence of cofactors or coenzymes.

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

93. The area of the enzyme that binds to its substrate is called the

- A.** active site.
- B. catalyst.
- C. activation energy.
- D. product.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

94. What role can inorganic metals such as iron or zinc have in a reaction?

- A. A catalyst
- B. A coenzyme
- C. A substrate
- D. A cofactor**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

95. What role do some vitamins play in chemical reactions?

- A. As a coenzyme**
- B. As a substrate
- C. As an enzyme
- D. As energy

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme-catalyzed reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

96. Which of the following types of reactions involves the production of a larger product by combining smaller reactants?

- A. Degradation
- B. Replacement
- C. Synthesis**
- D. Decomposition

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.03 Define and give examples of dehydration synthesis and hydrolysis reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

97. A hydrolysis reaction is an example of which reaction type?

- A.** Decomposition
- B. Synthesis
- C. Replacement
- D. Neutralization

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.03 Define and give examples of dehydration synthesis and hydrolysis reactions.*

*Learning Outcome: 02.11*

*Section: 02.06*

98. Very small protein molecules that seem to be disease-causing agents are called

- A. viruses.
- B. bacteria.
- C. flukes.
- D.** prions.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.05 Describe the four levels of protein structure and discuss the importance of protein shape for protein function.*

*Learning Outcome: 02.11*

*Section: 02.06*

*Topic: Organic compounds*

99. Which of the following is NOT a component of a nucleotide?

- A. Pentose sugar
- B. Phosphate group
- C.** Glucose
- D. Nitrogen-containing base

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Organic compounds*

### Check All That Apply Questions

100. Which are examples of nucleic acids? Choose all that apply.

- Deoxyribonucleic acid
- Amino acid
- Ribonucleic acid
- Glucose

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04c Provide specific examples With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

### Multiple Choice Questions

101. Which of the following is NOT an instruction found in genes?

- A. How to join amino acids to make proteins
- B. How to replicate DNA
- C. How to break down complex carbohydrates**
- D. How to make RNA

*Bloom's Level: 2. Understand*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.10.01 Define the terms genetic code, transcription and translation.*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

102. Which of the following is NOT a nitrogen base found in DNA?

- A.** Uracil
- B. Adenine
- C. Guanine
- D. Cytosine

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

103. The shape of the DNA molecule is a(n)

- A. single strand.
- B. globule.
- C.** double helix.
- D. inverted T.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

104. The backbone or sides of a DNA helix consists of

- A. nitrogen base pairs.
- B.** a sugar-phosphate chain.
- C. an adenine-ribose chain.
- D. a glucose-phosphate chain.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

105. The rungs of the DNA ladder are composed of

- A.** nitrogen base pairs.
- B. sugar-phosphate chain.
- C. adenine-ribose chain.
- D. glucose-phosphate chain.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

106. In the DNA molecule, the complementary base pair of adenine is always

- A. uracil.
- B. cytosine.
- C.** thymine.
- D. guanine.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04a Identify the monomers and polymers With respect to carbohydrates, proteins, lipids and, nucleic acids*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

107. In the DNA molecule, the complementary base pair of cytosine is always

- A. uracil.
- B.** guanine.
- C. adenine.
- D. thymine.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04b Compare and contrast general molecular structure With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

Chapter 02 - Chemistry of Life

108. A three-base sequence on DNA and therefore RNA codes for a(n)

- A. glucose.
- B. fatty acid.
- C. amino acid.**
- D. steroid.

*Bloom's Level: 1. Remember*

*HAPS Objective: C.10.01 Define the terms genetic code, transcription and translation.*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

109. Which of the following is NOT true of RNA?

- A. It is single stranded.
- B. It has uracil instead of thymine.
- C. It has ribose sugar.
- D. It contains the blueprint for assembling a protein.**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.04.04e Discuss physiological and structural roles in the human body With respect to carbohydrates, proteins, lipids and, nucleic acids*

*Learning Outcome: 02.12*

*Section: 02.07*

*Topic: Nucleic acids: DNA and RNA*

110. Which of the following molecules is the primary energy carrier in cells?

- A. DNA
- B. ATP**
- C. RNA
- D. GNA

*Bloom's Level: 1. Remember*

*HAPS Objective: C.05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell.*

*Learning Outcome: 02.13*

*Section: 02.07*

*Topic: Energy transfer using ATP*

111. What is the main molecule that provides the energy to produce ATP?

- A. Phosphate
- B. Glucose**
- C. RNA
- D. Uracil

*Bloom's Level: 1. Remember*

*HAPS Objective: C.05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell.*

*Learning Outcome: 02.13*

*Section: 02.07*

*Topic: Energy transfer using ATP*

112. Which of the following contains high-energy phosphate bonds? A. DNA

- B. Glycogen
- C. RNA
- D. ATP**

*Bloom's Level: 1. Remember*

*HAPS Objective: C.05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell.*

*Learning Outcome: 02.13*

*Section: 02.07*

*Topic: Energy transfer using ATP*