

Chapter 02 - Life, Matter, and Energy

**Chapter 02**  
**Life, Matter, and Energy**

**Multiple Choice Questions**

1. (p. 33) The most abundant element in the human body, by weight, is
- A. hydrogen.
  - B. oxygen.**
  - C. calcium.
  - D. nitrogen.
  - E. carbon.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.1a Recognize elements of the human body from their chemical symbols.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

2. (p. 33) Sodium has an atomic number of 11 and an atomic mass of 23. Sodium has
- A. 12 neutrons and 11 protons.**
  - B. 12 protons and 11 neutrons.
  - C. 12 electrons and 11 neutrons.
  - D. 12 protons and 11 electrons.
  - E. 12 electrons and 11 protons.

*Blooms Level: 3. Apply*

*HAPS Objective: C01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1a Recognize elements of the human body from their chemical symbols.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

3. (p. 33) \_\_\_\_\_ account for 98.5% of the body's weight.
- A. Carbon, oxygen, hydrogen, sodium, potassium, and chlorine
  - B. Carbon, oxygen, iron, sodium, potassium, and chlorine
  - C. Carbon, nitrogen, hydrogen, sodium, potassium, and chlorine
  - D. Carbon, oxygen, hydrogen, nitrogen, sodium, and potassium
  - E.** Carbon, oxygen, hydrogen, nitrogen, calcium, and phosphorus

*Blooms Level: 1. Remember*

*Learning Outcome: 02.1a Recognize elements of the human body from their chemical symbols.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### **True / False Questions**

4. (p. 36) Molecules composed of two or more atoms are called compounds.

**FALSE**

*Blooms Level: 3. Apply*

*HAPS Objective: C01.03 Compare and contrast the terms atoms, molecules, elements, and compounds*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1b Distinguish between chemical elements and compounds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

5. (p. 32) Potassium, sodium, and chlorine are trace elements.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.1a Recognize elements of the human body from their chemical symbols.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### Multiple Choice Questions

6. (p. 32) The chemical bonding properties of an atom are determined by its

A. protons.

**B.** electrons.

C. neutrons.

D. protons and neutrons.

E. particles.

*Blooms Level: 3. Apply*

*HAPS Objective: C01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1b Distinguish between chemical elements and compounds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

7. (p. 36) Sodium, which has an atomic number of 11, will react with chlorine, which has an atomic number of 17. When these two atoms react, both become stable. To become stable, sodium will \_\_\_\_\_, while chlorine will \_\_\_\_\_.

- A. accept one electron; give up one electron
- B. give up one proton; accept one proton
- C. share one electron with chlorine; share one electron with sodium
- D. become an anion; become a cation
- E. give up one electron; accept one electron**

*Blooms Level: 3. Apply*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

8. (p. 33) Consider oxygen, which has an atomic number of 8 and an atomic mass of 16. How many valence electrons does it have?

- A. 2
- B. 4
- C. 6**
- D. 8
- E. 16

*Blooms Level: 5. Evaluate*

*HAPS Objective: C01.01a Describe the charge, mass, and relative location of electrons, protons and neutrons*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1b Distinguish between chemical elements and compounds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

## **True / False Questions**

9. (p. 33) Minerals are organic elements extracted from the soil by plants.

**FALSE**

*Blooms Level: 1. Remember*

*HAPS Objective: O01.01e List the important dietary minerals and describe the major uses of each mineral in the body*

*HAPS Topic: Module O01 Nutrition*

*Learning Outcome: 02.1c State the functions of minerals in the body.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

10. (p. 34) Hydrogen, deuterium, and tritium are three isotopes of hydrogen.

**TRUE**

*Blooms Level: 1. Remember*

*HAPS Objective: C01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1d Explain the basis for radioactivity and the types and hazards of ionizing radiation.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

## **Multiple Choice Questions**

11. (p. 34) Varieties of elements called \_\_\_\_\_ differ from one another only in number of neutrons, and therefore differ in atomic mass.

- A. cations
- B. anions
- C. isotopes**
- D. electrolytes
- E. free radicals

*Blooms Level: 1. Remember*

*HAPS Objective: C01.02 Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1d Explain the basis for radioactivity and the types and hazards of ionizing radiation.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### Check All That Apply Questions

12. (p. 34) Which of these is a cation? Check all that apply.

- \_\_\_\_\_ O<sub>2</sub>
- ☒ K<sup>+</sup>
- ☒ Na<sup>+</sup>
- ☒ Ca<sup>2+</sup>
- \_\_\_\_\_ Cl<sup>-</sup>

*Blooms Level: 2. Understand*

*HAPS Objective: C01.01c Explain how ions and isotopes are produced by changing the relative number of specific subatomic particles*

*HAPS Topic: Module C01 Atoms & molecules*

*Learning Outcome: 02.1e Distinguish between ions, electrolytes, and free radicals.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### True / False Questions

13. (p. 36) Ionic bonds break apart in water more easily than covalent bonds.

**TRUE**

*Blooms Level: 2. Understand*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### Multiple Choice Questions

14. (p. 36) Oxygen has an atomic number of eight. When two oxygen atoms come together, they form a(n) \_\_\_\_\_ bond.

A. hydrogen

**B.** nonpolar covalent

C. polar covalent

D. ionic

E. Van der Waals

*Blooms Level: 3. Apply*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

15. (p. 36) When table salt, sodium chloride (NaCl), is placed in water
- A.  $\text{Na}^+$  and  $\text{Cl}^-$  form ionic bonds with each other.
  - B.  $\text{Na}^+$  and  $\text{Cl}^-$  form polar covalent bonds with each other.
  - C.  $\text{Na}^+$  and  $\text{Cl}^-$  form hydrogen bonds with water.
  - D.** ionic bonds between  $\text{Na}^+$  and  $\text{Cl}^-$  are broken.
  - E.  $\text{Na}^+$  and  $\text{Cl}^-$  become separated by their Van der Waals forces.

*Blooms Level: 3. Apply*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

16. (p. 34) The bonding properties of an atom are determined by its
- A.** electrons.
  - B. protons.
  - C. positrons.
  - D. neutrons.
  - E. photons.

*Blooms Level: 2. Understand*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*



17. (p. 36) What type of bond attracts one water molecule to another?

- A. An ionic bond
- B. A peptide bond
- C. A hydrogen bond**
- D. A covalent bond
- E. A hydrolytic bond

*Blooms Level: 1. Remember*

*HAPS Objective: C02.01b Explain the mechanism of each type of bond*

*HAPS Topic: Module C02 Chemical bonding*

*Learning Outcome: 02.1f Define the types of chemical bonds.*

*Section: 02.01*

*Topic: Life, Matter, and Energy*

### **True / False Questions**

18. (p. 39) The high heat capacity of water makes it a very ineffective coolant.

**FALSE**

*Blooms Level: 2. Understand*

*HAPS Objective: C03.01 Discuss the physiologically important properties of water*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2a Describe the biologically important properties of water.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

### **Multiple Choice Questions**

19. (p. 39) When you jump off a high diving board into water, you notice the great resistance of water. This resistance is called \_\_\_\_\_ and is caused by water's great \_\_\_\_\_.

- A. surface tension; adhesiveness
- B. surface tension; cohesiveness**
- C. hydrophobic tension; adhesiveness
- D. hydrophilic tension; cohesiveness
- E. hydrophilic tension; adhesiveness

*Blooms Level: 3. Apply*

*HAPS Objective: C03.01 Discuss the physiologically important properties of water*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2a Describe the biologically important properties of water.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

20. (p. 39) Which of these is hydrophobic?

- A. Sugar
- B.  $K^+$
- C.  $Cl^-$
- D. Water
- E. Fat**

*Blooms Level: 3. Apply*

*HAPS Objective: C03.01 Discuss the physiologically important properties of water*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2a Describe the biologically important properties of water.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

## **True / False Questions**

21. (p. 40) A solution is a mixture composed of two or more substances that are physically blended but not chemically combined.

**TRUE**

*Blooms Level: 2. Understand*

*HAPS Objective: C03.02 Distinguish among the terms solution, solute, solvent, colloid suspension, and emulsion*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2b Define mixture and distinguish between three types of mixtures*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

### Multiple Choice Questions

22. (p. 40) Consider a mixture of blood, which contains sodium chloride, protein, and cells or formed elements. The sodium chloride is in a(n) \_\_\_\_\_, the protein is in a(n) \_\_\_\_\_, and the cells are in a \_\_\_\_\_.

A. emulsion; solution; suspension

B. solvent; emulsion; colloid

C. colloid; suspension; solution

D. suspension; colloid; solution

**E.** solution; colloid; suspension

*Blooms Level: 3. Apply*

*HAPS Objective: C03.02 Distinguish among the terms solution, solute, solvent, colloid suspension, and emulsion*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2b Define mixture and distinguish between three types of mixtures*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

### True / False Questions

23. (p. 41) Blood pH is approximately 7.4, which is slightly acidic.

**FALSE**

*Blooms Level: 1. Remember*

*HAPS Objective: C03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2c Define acid and base and interpret the pH scale.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

### Multiple Choice Questions

24. (p. 41) A solution with pH 4 has \_\_\_\_\_ the  $H^+$  concentration of a solution with pH 8.

A. half

B. twice

C. 4 times

**D.** 10,000 times

E. 1/10,000

*Blooms Level: 5. Evaluate*

*HAPS Objective: C03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2c Define acid and base and interpret the pH scale.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

25. (p. 41) Which of these has the highest  $H^+$  concentration?

- A. Lemon juice, pH = 2.3
- B. Red wine, pH = 3.2
- C. Tomato juice, pH = 4.7
- D. Saliva, pH = 6.6
- E. Household ammonia, pH = 10.8

*Blooms Level: 3. Apply*

*HAPS Objective: C03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2c Define acid and base and interpret the pH scale.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

26. (p. 41) Blood has a pH ranging from 7.35 to 7.45. Slight deviations from this can cause major problems or even death. You are doing an intense workout, and your skeletal muscle cells are producing metabolic acids such as lactic acid. Your blood pH does not drop significantly in spite of the metabolic acids released into the blood. You maintain a constant blood pH because

- A. metabolic acids are neutralized in muscle cells before being released into the blood.
- B. metabolic bases are produced at the same rate by muscle cells to neutralize the acids.
- C. the respiratory system removes excess  $H^+$  from the blood before the pH is lowered.
- D. the body contains chemicals called buffers that resist changes in pH.
- E. endothelial cells secrete excess  $H^+$  to prevent a decrease in pH.

*Blooms Level: 5. Evaluate*

*HAPS Objective: C03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2c Define acid and base and interpret the pH scale.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

27. (p. 41) A solution that resists a change in pH when acid or base is added to it is

- A.** a buffer.
- B. a catalyst.
- C. a reducing agent.
- D. an oxidizing agent.
- E. a colloid.

*Blooms Level: 1. Remember*

*HAPS Objective: C03.04 Define the terms pH, acid, base, and buffer and give examples of physiological significance*

*HAPS Topic: Module C03 Inorganic compounds & solutions*

*Learning Outcome: 02.2c Define acid and base and interpret the pH scale.*

*Section: 02.02*

*Topic: Life, Matter, and Energy*

28. (p. 56) The most relevant form of energy in human physiology is the energy stored in

- A. electrolytes ionized in water.
- B. free radicals with an odd number of electrons.
- C. radioisotopes.
- D.** the chemical bonds of organic molecules.
- E. Van der Waals forces.

*Blooms Level: 3. Apply*

*HAPS Objective: C05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell*

*HAPS Topic: Module C05 Energy transfer using ATP*

*Learning Outcome: 02.3f Describe the structure, production, and function of ATP.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

29. (p. 58) Any chemical reaction that removes electrons from an atom is called

- A. reduction.
- B. condensation.
- C. hydrolysis.
- D. anabolism.
- E. oxidation.**

*Blooms Level: 1. Remember*

*HAPS Objective: O02.05 Describe the processes of oxidation, reduction, decarboxylation, and phosphorylation*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4d Define oxidation and reduction and relate these to changes in the energy content of a molecule.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

30. (p. 55) When ATP breaks down to ADP, potential energy stored in bonds is released. This energy stored in bonds is \_\_\_\_\_ energy.

- A. electromagnetic
- B. electrical
- C. chemical**
- D. heat
- E. kinetic

*Blooms Level: 1. Remember*

*HAPS Objective: C05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell*

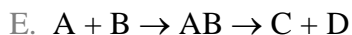
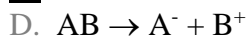
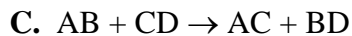
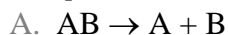
*HAPS Topic: Module C05 Energy transfer using ATP*

*Learning Outcome: 02.3f Describe the structure, production, and function of ATP.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

31. (p. 57) Which of the following equations depicts an exchange reaction?



*Blooms Level: 2. Understand*

*Learning Outcome: 02.4b List and define the fundamental types of chemical reactions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

### **True / False Questions**

32. (p. 57) In an exchange reaction, covalent bonds are broken and new covalent bonds are formed.

**TRUE**

*Blooms Level: 5. Evaluate*

*Learning Outcome: 02.4b List and define the fundamental types of chemical reactions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*



33. (p. 43) The opposite of a dehydration synthesis is hydrolysis.

**TRUE**

*Blooms Level: 1. Remember*

*HAPS Objective: C04.03 Define and give examples of dehydration synthesis and hydrolysis reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3a Discuss the relevance of polymers to biology and explain how they are formed and broken by dehydration synthesis and hydrolysis.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

### **Multiple Choice Questions**

34. (p. 58) Any chemical reaction in which an atom gains electrons is called

- A.** reduction.
- B. condensation.
- C. hydrolysis.
- D. anabolism.
- E. oxidation.

*Blooms Level: 1. Remember*

*HAPS Objective: O02.05 Describe the processes of oxidation, reduction, decarboxylation, and phosphorylation*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4d Define oxidation and reduction and relate these to changes in the energy content of a molecule.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

35. (p. 58) The breakdown of glycogen (an energy-storage compound) is an example of a(n) \_\_\_\_\_ reaction.

- A.** exergonic
- B. endergonic
- C. exchange
- D. synthesis
- E. equilibrium

*Blooms Level: 2. Understand*

*HAPS Objective: O02.01 Define metabolism, anabolism and catabolism*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4c Define metabolism and its two subdivisions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

36. (p. 58) Digestive enzymes break down the starch in a potato into thousands of glucose molecules. This exemplifies a(n) \_\_\_\_\_ reaction.

- A. synthesis
- B.** decomposition
- C. exchange
- D. anabolic
- E. reductive

*Blooms Level: 2. Understand*

*HAPS Objective: O02.01 Define metabolism, anabolism and catabolism*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4c Define metabolism and its two subdivisions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

## **True / False Questions**

37. (p. 58) All the chemical reactions in which larger molecules are broken down to smaller ones are called catabolic reactions.

**TRUE**

*Blooms Level: 1. Remember*

*HAPS Objective: O02.01 Define metabolism, anabolism and catabolism*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4c Define metabolism and its two subdivisions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

### Multiple Choice Questions

38. (p. 58) Glucose is broken down in most of your cells to form carbon dioxide, oxygen, and the energy currency of the cell called ATP. This type of reaction is both \_\_\_\_\_ and \_\_\_\_\_.

A. anabolic; endergonic

**B. catabolic; exergonic**

C. anabolic; exergonic

D. catabolic; endergonic

E. anabolic; exothermic

*Blooms Level: 3. Apply*

*HAPS Objective: O02.01 Define metabolism, anabolism and catabolism*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4c Define metabolism and its two subdivisions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

39. (p. 58) Which of the following words includes all of the other terms?

- A. Catabolism
- B. Anabolism
- C. Metabolism**
- D. Oxidative reactions
- E. Reductive reactions

*Blooms Level: 3. Apply*

*HAPS Objective: O02.01 Define metabolism, anabolism and catabolism*

*HAPS Topic: Module O02 Introduction to metabolism*

*Learning Outcome: 02.4c Define metabolism and its two subdivisions.*

*Section: 02.04*

*Topic: Life, Matter, and Energy*

40. (p. 43) A \_\_\_\_\_ reaction converts a \_\_\_\_\_ to its monomers.

- A. hydrolysis; polymer**
- B. dehydration synthesis; molecule
- C. dehydration synthesis; polymer
- D. polymer; molecule
- E. condensation; reactant

*Blooms Level: 3. Apply*

*HAPS Objective: C04.03 Define and give examples of dehydration synthesis and hydrolysis reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3a Discuss the relevance of polymers to biology and explain how they are formed and broken by dehydration synthesis and hydrolysis.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

41. (p. 44) \_\_\_\_\_ is a monosaccharide, whereas \_\_\_\_\_ is a polysaccharide.

- A. Fructose; sucrose
- B. Galactose; maltose
- C. Lactose; glycogen
- D. Glucose; starch**
- E. Cellulose; glucose

*Blooms Level: 3. Apply*

*HAPS Objective: C04.04b Compare and contrast general molecular structure*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3c Describe or define the subclasses of each of those categories of biomolecules.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

42. (p. 44) Which of the following is a disaccharide?

- A. Galactose
- B. Lactose**
- C. Glucose
- D. Fructose
- E. Amylose

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04c Provide specific examples (of organic molecules)*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3c Describe or define the subclasses of each of those categories of biomolecules.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

43. (p. 44) Table sugar is a disaccharide called \_\_\_\_\_ and is made up of the monomer(s) \_\_\_\_\_.

- A. maltose; glucose
- B. sucrose; glucose and fructose**
- C. lactose; glucose and galactose
- D. glycogen; glucose
- E. glucose; galactose and fructose

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04c Provide specific examples (of organic molecules)*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3c Describe or define the subclasses of each of those categories of biomolecules.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

### **True / False Questions**

44. (p. 45) Unsaturated fatty acids have as much hydrogen as they can carry.

**FALSE**

*Blooms Level: 2. Understand*

*HAPS Objective: C04.04c Provide specific examples (of organic molecules)*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3c Describe or define the subclasses of each of those categories of biomolecules.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

### **Multiple Choice Questions**

45. (p. 45) Triglycerides are molecules consisting of one 3-carbon compound called \_\_\_\_\_ bound to three \_\_\_\_\_.
- A. eicosanoid; fatty acids
  - B. steroid; glycerols
  - C. eicosanoid; steroid
  - D.** glycerol; fatty acids
  - E. steroid; fatty acids

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04b Compare and contrast general molecular structure*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3b Describe the structural properties that distinguish carbohydrates, lipids, proteins, and nucleic acids from each other*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

### **True / False Questions**

46. (p. 49) A dipeptide is a molecule with two peptide bonds.  
**FALSE**

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04b Compare and contrast general molecular structure*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3c Describe or define the subclasses of each of those categories of biomolecules.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

### **Multiple Choice Questions**

47. (p. 49) Proteins can serve all of the following functions *except*

- A. catalyze metabolic reactions.
- B. give structural strength to cells and tissues.
- C. produce muscular and other forms of movement.
- D. regulate transport of solutes into and out of cells.
- E.** store hereditary information.

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04e Discuss physiological and structural roles in the human body*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3d Discuss the roles that each of these categories of molecules play in the body.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

48. (p. 51) A drastic conformational change in proteins in response to conditions such as extreme heat or pH will lead to loss of a protein's function. This drastic change in three-dimensional shape is called

- A. contamination.
- B.** denaturation.
- C. saturation.
- D. sedimentation.
- E. deconformation.

*Blooms Level: 1. Remember*

*HAPS Objective: C04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme catalyzed reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3d Discuss the roles that each of these categories of molecules play in the body.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*



49. (p. 49) Proteins are \_\_\_\_\_ built from \_\_\_\_\_ different amino acids.

- A. monomers; 10
- B. molecules; 10
- C. polymers; 20**
- D. macromolecules; 40
- E. polypeptides; 80

*Blooms Level: 1. Remember*

*HAPS Objective: C04.04b Compare and contrast general molecular structure*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3b Describe the structural properties that distinguish carbohydrates, lipids, proteins, and nucleic acids from each other*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

50. (p. 52) Enzymes are specific to substrates because of the shape of their

- A. active sites.**
- B. receptors.
- C. secondary structure.
- D. terminal amino acids.
- E. alpha chain.

*Blooms Level: 1. Remember*

*HAPS Objective: C04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme catalyzed reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3e Explain how enzymes function.*

*Section: 02.03*

*Topic: Life, Matter, and Energy*

51. (p. 52) \_\_\_\_\_ is the substrate of \_\_\_\_\_.

- A. Glucose; lactose
- B. Lactase; glucose
- C. Lactose; lactase**
- D. Galactose; lactose
- E. Sucrase; sucrose

*Blooms Level: 3. Apply*

*HAPS Objective: C04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme catalyzed reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3e Explain how enzymes function.*

*Section: 02.03*

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52. (p. 52) Most enzymes are \_\_\_\_\_ that act as catalysts, helping chemical reactions go faster at normal body temperature.

- A. cofactors
- B. proteins**
- C. lipids
- D. carbohydrates
- E. nucleic acids

*Blooms Level: 3. Apply*

*HAPS Objective: C04.06 Demonstrate factors that affect enzyme activity, including denaturation, and interpret graphs showing the effects of various factors on the rate of enzyme catalyzed reactions*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3e Explain how enzymes function.*

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## True / False Questions

53. (p. 55) ATP is the body's most important form of long-term energy storage.

**FALSE**

*Blooms Level: 2. Understand*

*HAPS Objective: C05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell*

*HAPS Topic: Module C05 Energy transfer using ATP*

*Learning Outcome: 02.3f Describe the structure, production, and function of ATP.*

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### Multiple Choice Questions

54. (p. 55) ATP \_\_\_\_\_ endergonic and exergonic reactions.

A. opposes

B. decomposes

C. reduces

**D. links**

E. dehydrates

*Blooms Level: 3. Apply*

*HAPS Objective: C05.01 Describe the generalized reversible reaction for release of energy from ATP and explain the role of ATP in the cell*

*HAPS Topic: Module C05 Energy transfer using ATP*

*Learning Outcome: 02.3f Describe the structure, production, and function of ATP.*

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Chapter 02 - Life, Matter, and Energy

55. (p. 53) Nucleic acids are \_\_\_\_\_ of \_\_\_\_\_.

A. molecules; monosaccharides

B. monomers; ATP

**C. polymers; nucleotides**

D. polymers; cAMP

E. polymers; DNA

*Blooms Level: 3. Apply*

*HAPS Objective: C04.04b Compare and contrast general molecular structure*

*HAPS Topic: Module C04 Organic compounds*

*Learning Outcome: 02.3b Describe the structural properties that distinguish carbohydrates, lipids, proteins, and nucleic acids from each other*

*Section: 02.03*

*Topic: Life, Matter, and Energy*