

Package Title: Testbank
Course Title: IHB10e
Chapter Number: 2

Question type: Multiple Choice

1) Negatively charged particles in an atom are called

- a) neutrons.
- b) electrons.
- c) protons.
- d) elements.
- e) isotopes.

Answer: b

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

2) When two or more atoms share electrons, the resulting combination is called a(n)

- a) electrolyte.
- b) ion.
- c) element.
- d) molecule.
- e) salt.

Answer: d

Difficulty: Medium

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Section Reference 1: Section 2.1 Introduction to Chemistry.

3) The chemical symbol for sodium is

- a) N.
- b) S.
- c) Mg.
- d) Na.
- e) Sn.

Answer: d

Difficulty: Medium

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Section Reference 1: Section 2.1 Introduction to Chemistry.

4) Substances that cannot be broken down into simpler substances by ordinary chemical means are called

- a) matter.
- b) compounds.
- c) chemical elements.
- d) inorganic molecules.
- e) organic molecules.

Answer: c

Difficulty: Medium

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Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

5) The number of protons in the nucleus of an atom is indicated by the

- a) atomic mass.
- b) atomic number.
- c) molecular formula.
- d) atomic weight.
- e) valence number.

Answer: b

Difficulty: Easy

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Section Reference 1: Section 2.1 Introduction to Chemistry.

6) Which of the following is an abundant element found in both water molecules and most organic molecules?

- a) nitrogen
- b) hydrogen
- c) potassium
- d) carbon
- e) sodium

Answer: b

Difficulty: Medium

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Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

7) The backbone and rings of all organic molecules are formed by

- a) carbon.
- b) oxygen.
- c) magnesium.
- d) phosphorus.
- e) nitrogen.

Answer: a

Difficulty: Medium

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Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

8) An atom that has given up or gained an electron is referred to as a(n)

- a) molecule.
- b) neutron.
- c) ion.
- d) compound.
- e) isotope.

Answer: c

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

9) A chemical bond formed between two oppositely charged ions is a(n)

- a) hydrogen bond.
- b) ionic bond.
- c) single covalent bond.
- d) double covalent bond.
- e) polar covalent bond.

Answer: b

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

10) An atom that gives up electrons becomes a(n)

- a) anion.
- b) cation.
- c) compound.
- d) electron.
- e) molecule.

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

11) A type of weak chemical bond that forms between a hydrogen atom with partial positive charge and another atom with partial negative charge is called a(n)

- a) hydrogen bond.
- b) ionic bond.
- c) single covalent bond.
- d) double covalent bond.
- e) None of the choices is correct.

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

12) A chemical bond in which one pair of electrons is shared between two atoms is a(n)

- a) hydrogen bond.
- b) ionic bond.
- c) single covalent bond.
- d) double covalent bond.
- e) triple covalent bond.

Answer: c

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

13) The most common type of chemical bond in the human body is

- a) the covalent bond.
- b) the ionic bond.
- c) the hydrogen bond
- d) the double bond.
- e) None of the choices is correct.

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

14) All of the following are organic compounds EXCEPT

- a) nucleic acids.
- b) water.
- c) proteins.
- d) lipids.
- e) carbohydrates.

Answer: b

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

15) Most of the energy needed to drive energy-requiring chemical reactions in the body is provided by the hydrolysis of

- a) ribonucleic acid (RNA).
- b) deoxyribonucleic acid (DNA).
- c) adenosine diphosphate (ADP).
- d) adenosine triphosphate (ATP).
- e) adenosine monophosphate (AMP).

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

16) In an average lean healthy adult, 55% to 60% of the body weight is composed of

- a) amino acids.
- b) salts.
- c) water.
- d) fat.
- e) proteins.

Answer: c

Difficulty: Medium

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Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

17) All of the following are properties of water EXCEPT:

- a) water is an excellent solvent.
- b) water absorbs heat very quickly.
- c) water participates in many chemical reactions.
- d) water serves as a lubricant.
- e) water releases heat very slowly.

Answer: b

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

18) A molecule that dissociates into one or more hydrogen ions when dissolved in water is a(n)

- a) salt.
- b) acid.
- c) base.
- d) buffer.
- e) solvent.

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

19) Which of the following describes the most acidic solution?

- a) pH 4
- b) pH 5
- c) pH 7
- d) pH 9
- e) pH 14

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

20) The normal pH of blood is

- a) 4.00 to 5.00.
- b) 6.75 to 7.00.
- c) 7.20 to 7.60.
- d) 7.35 to 7.45.
- e) 7.65 to 8.00.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

21) To prevent rapid, drastic changes in the pH of body fluids, the body

- a) uses digestive enzymes.
- b) increases lipid production.
- c) creates ATP.
- d) uses chemical compounds called buffers.
- e) changes its temperature.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

22) A polysaccharide that serves as common storage form of energy in liver and muscle cells is called

- a) fructose.
- b) glycogen.
- c) fat.
- d) starch.
- e) glycerol.

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

23) The building blocks used to assemble complex carbohydrates are called

- a) polysaccharides.
- b) disaccharides.
- c) monosaccharides.
- d) glycogen.
- e) starches.

Answer: c

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

24) In the human body, glycogen is commonly stored in the cells of the

- a) brain.
- b) liver.
- c) smooth muscles.
- d) brain and liver.
- e) liver and skeletal muscles.

Answer: e

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

25) Polysaccharides can be broken down into simple sugars by the process of

- a) dehydration synthesis.
- b) hydrogen bonding.
- c) hydrolysis.
- d) anabolism.
- e) None of the choices is correct.

Answer: c

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

26) The most highly concentrated source of chemical energy found in the human body is found in

- a) proteins.
- b) amino acids.
- c) glycogen.
- d) triglycerides.
- e) glucose.

Answer: d

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

27) The building blocks of triglycerides are

- a) fatty acids and glycerol.
- b) cholesterol and glycerol.
- c) monosaccharides.
- d) amino acids.
- e) fatty acids, glycerol and phosphate-containing group.

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

28) Certain sex hormones such as estrogens and testosterone are classified chemically as

- a) proteins.
- b) carbohydrates.
- c) nucleic acids.
- d) lipids.
- e) starches.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

29) Unsaturated fatty acids are commonly found in all of the following EXCEPT

- a) regular dairy products.
- b) olive oil.
- c) sunflower oil.
- d) canola oil.
- e) corn oil.

Answer: a

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

30) Estradiol, a sex hormone secreted by the ovaries, is chemically classified as a(n)

- a) amino acid.
- b) steroid.
- c) protein.
- d) enzyme.
- e) nucleic acid.

Answer: b

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

31) The building blocks of proteins are

- a) monosaccharides.
- b) nucleotides
- c) amino acids.
- d) glycerol.
- e) fatty acids.

Answer: c

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

32) When three amino acids are chemically linked by peptide bonds, the result is production of a(n)

- a) dipeptide.
- b) tripeptide.
- c) triglyceride.
- d) protein.
- e) polypeptide.

Answer: b

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

33) The type of covalent bond that joins amino acids together to form more complex molecules like proteins is called a

- a) peptide bond.
- b) ionic bond.
- c) hydrogen bond.
- d) nitrogen bond.
- e) glycosidic bond.

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

34) All of the following statements about enzymes are true EXCEPT:

- a) the presence of enzyme speeds up chemical reactions.
- b) most enzymes are proteins.
- c) enzymes are highly specific in the reactions that they catalyze.
- d) enzymes are biological catalysts.
- e) enzymes are permanently modified by the chemical reactions in which they participate.

Answer: e

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.4 Describe how enzymes function.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

35) All of the following are enzymes EXCEPT

- a) lactose.
- b) peptidase.
- c) oxidase.
- d) aminopeptidase.
- e) amylase.

Answer: a

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.4 Describe how enzymes function.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

36) The building blocks of nucleic acids are called

- a) amino acids.
- b) fatty acids.
- c) monosaccharides
- d) nucleotides.
- e) glycerol.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living

things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

37) Which of the following molecules contains the approximately 30,000 genes found in the cell's nucleus?

- a) protein
- b) RNA
- c) DNA
- d) ATP
- e) glycogen

Answer: c

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

38) Which of the following molecules contains the sugar deoxyribose?

- a) RNA
- b) DNA
- c) ATP
- d) ADP
- e) AMP

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

39) Which of the following molecules has a structure described as a double helix?

- a) mRNA
- b) tRNA
- c) rRNA
- d) DNA
- e) ATP

Answer: d

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

40) Which of the following best describes how energy is released from ATP stored in cells?

- a) The terminal phosphate is hydrolyzed.
- b) All three phosphates are sequentially removed by dehydration reactions.
- c) The adenosine is reduced to adenine.
- d) The three phosphates are sequentially donated to glucose.
- e) The three phosphates are used to make new bonds between the nucleotides in DNA.

Answer: a

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

41) Which of the following is NOT a nitrogenous base found in DNA?

- a) guanine
- b) thymine
- c) uracil
- d) cytosine
- e) adenine

Answer: c

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

42) The two strands of DNA are held together by

- a) peptide bonds between the nitrogenous bases.
- b) hydrogen bonds between complementary bases.
- c) ionic bonds between the phosphates.
- d) polar covalent bonds between the bases.
- e) glycosidic linkages between deoxyribose molecules.

Answer: b

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

43) The mass number of an atom is determined by

- a) adding the total number of protons, neutrons and electrons.
- b) determining the number of protons in the outer shell.
- c) adding the total number of neutrons, protons and proteins.
- d) determining the number of protons in the nucleus.
- e) adding the total number of protons and neutrons.

Answer: e

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

44) The process in which a protein loses its normal configuration and is no longer able to perform its normal functions due to exposure to heat, chemicals, pH or radiation is called

- a) deamination.
- b) hydrolysis.
- c) hydrogenation.
- d) denaturation.
- e) attenuation.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

45) DNA and RNA are large polymers composed of repeating building blocks called

- a) nucleotides.
- b) amino acids.
- c) monosaccharides.
- d) fatty acids.

e) phospholipids.

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

46) What is the smallest complete unit of matter that retains the properties and characteristics of the element?

- a) atom
- b) molecule
- c) proton
- d) neutron
- e) free radical

Answer: a

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

47) Which of the following particles is found in the atomic nucleus?

- a) protons only
- b) protons and neutrons
- c) protons, neutrons and electrons
- d) DNA and RNA
- e) None of the choices is correct.

Answer: b

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

48) Which of the following chemical reactions is a synthesis reaction?

- a) $AB + CD \rightarrow AC + BD$
- b) $A + B \rightarrow AB$
- c) $AB \rightarrow A + B$

- d) acid + base \rightarrow salt + water
- e) None of the choices represent a synthesis reaction.

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.3 Describe what happens in a chemical reaction and explain why it is important to the human body.

Section Reference 1: Section 2.1 Introduction to Chemistry.

49) Which of the following is NOT one of four major elements that make up about 96% of the human body's mass?

- a) hydrogen (H)
- b) sodium (Na)
- c) oxygen (O)
- d) carbon (C)
- e) nitrogen (N)

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

50) In addition to the four major elements, there are an additional _____ lesser elements that make up approximately 3.6% of the body's mass.

- a) 3
- b) 4
- c) 8
- d) 10
- e) 14

Answer: c

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

51) Which of the following is NOT true about herbal supplements?

- a) they can come from any part of a plant

- b) they can be useful
- c) they can be toxic
- d) they should always be avoided
- e) they are natural

Answer: d

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

52) Which property of water makes it important in the breakdown of organic chemicals like our nutrients?

- a) Water requires a large amount of heat to change state.
- b) Water serves as a lubricant.
- c) Water releases heat very slowly.
- d) Water participates in chemical reactions.
- e) None of the choices is correct.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

53) An inorganic substance that dissociates into one or more hydroxyl (OH^-) ions is classified as a(n)

- a) acid.
- b) salt.
- c) solvent.
- d) base.
- e) carbohydrate.

Answer: d

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

54) Hydrogen atoms often lose an electron from the valence shell to form H^+ . In this ionic form, how many electrons are in the valence electron shell of hydrogen ion?

- a) zero
- b) one
- c) two
- d) three
- e) four

Answer: a

Difficulty: Hard

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

55) The chemical symbol for iron is

- a) K.
- b) Na.
- c) I.
- d) Fe.
- e) Mg.

Answer: d

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

56) Which of the following structures are the main locations of ionic bonds in the human body?

- a) cartilage and bones
- b) teeth and bones
- c) ligaments and tendons
- d) smooth and cardiac muscles
- e) elastic and filamentous connective tissues

Answer: b

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

57) Which of the following molecules contains polar covalent bonds?

- a) H₂

- b) O₂
- c) N₂
- d) CH₄
- e) H₂O

Answer: e

Difficulty: Hard

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

58) All of the following are lipids commonly found in the human EXCEPT

- a) triglyceride.
- b) cholesterol.
- c) estradiol.
- d) albumin.
- e) phospholipid.

Answer: d

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

59) Which of the following structural components are found in both phospholipids and triglycerides?

- a) glycerol backbone
- b) cholesterol ring
- c) polar phosphate-containing head group
- d) modified amino acid backbone
- e) hydrophobic amino acid sidechains

Answer: a

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

Question type: True/False

60) Chemical elements present in high concentrations in the human body are called trace elements.

Answer: False

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

61) All atoms of a specific element contain the same number of protons.

Answer: True

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

62) A full second electron shell of an atom holds only six electrons.

Answer: False

Difficulty: Hard

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

63) A compound is a molecule composed of two or more different elements.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

64) A covalent bond is more stable and harder to break than a hydrogen bond.

Answer: True

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

65) Decomposition reactions involve the breaking of chemical bonds.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.3 Describe what happens in a chemical reaction and explain why it is important to the human body.

Section Reference 1: Section 2.1 Introduction to Chemistry.

66) Inorganic compounds always contain carbon.

Answer: False

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

67) The combination of a solvent and a solution is called a solute.

Answer: False

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

68) Water requires a large amount of heat to change from a liquid to a gas.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

69) A solution with a pH of 7 is slightly basic.

Answer: False

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

70) Carbohydrates are composed of carbon, hydrogen, and oxygen atoms usually in a ratio of 1:2:1.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

71) Glycogen is a monosaccharide.

Answer: False

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

72) Cholesterol is used to produce some sex hormones.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

73) A change in the shape of a protein that results in loss of function is called denaturation.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

74) Hydrogen bonding between different parts of large molecules like proteins and DNA helps

determine the molecule's three-dimensional shape.

Answer: True

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

75) If a dietary supplement is natural, then it is always safe.

Answer: False

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

76) Dietary supplements often more closely resemble drugs than food in the effects that they produce when ingested.

Answer: True

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

77) Certain types of unsaturated fats are beneficial to our health.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

78) Chemistry is the study of the structure and interactions of matter.

Answer: True

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds

are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

79) The four nitrogenous bases found in DNA are adenine, thymine, cytosine and uracil.

Answer: False

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.5 Explain the importance of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP).

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes

Question type: Text Entry

80) Anything that occupies space and has mass is considered to be ____.

Answer: matter

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

81) The portion of an atom that contains protons and neutrons is the ____.

Answer: nucleus

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

82) A triglyceride that contains only single covalent bonds between the carbon atoms in its fatty acids is called a ____ fat.

Answer: saturated

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

83) A chemical reaction in which a molecule is split apart by breaking chemical bonds is referred to as a(n) _____ reaction.

Answer: decomposition

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.3 Describe what happens in a chemical reaction and explain why it is important to the human body.

Section Reference 1: Section 2.1 Introduction to Chemistry.

84) The capacity to do work is called _____.

Answer: energy

Difficulty: Easy

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.3 Describe what happens in a chemical reaction and explain why it is important to the human body.

Section Reference 1: Section 2.1 Introduction to Chemistry.

85) A substance that can be dissolved in a solvent is called a _____.

Answer: solute

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

86) The most common way to indicate the acidity or alkalinity of a solution is to use the _____ scale.

Answer: pH

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

87) A solution with a high hydrogen ion concentration has a _____ pH.

Answer: low

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.2 Define pH and explain how the body attempts to keep pH within the limits of homeostasis.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

88) When many monosaccharides are joined together through dehydration synthesis, a _____ is formed.

Answer: polysaccharide

Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

Question type: Essay

89) Name the different types of chemical bonds and briefly describe how they are formed.

Answer:

Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.2 Explain how chemical bonds form.

Section Reference 1: Section 2.1 Introduction to Chemistry.

Solution: Covalent bonds are formed by the sharing of one, two, or three pairs of electrons by two atoms. Ionic bonds are formed when an actual transfer of electrons occurs between atoms thus forming oppositely charged ions that are attracted to one another. Hydrogen bonds are the weakest of the chemical bonds and are formed by attraction between a hydrogen atom with partial positive charge and another atom with partial negative charge.

90) Briefly explain the importance of water in the human body.

Answer:

Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

Solution: Water makes up about 55 to 60 percent of body weight and therefore is the most abundant chemical substance in the body. Water is an excellent solvent and participates in many chemical reactions in the body. It absorbs and releases heat very slowly, helping to maintain the homeostasis of

body temperature. In addition, water requires a large amount of energy to change from a liquid to a gas allowing evaporation to be used as an effective cooling mechanism. Water also serves as a lubricant.

91) Explain the difference between acids, bases, and salts.

Answer:

Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

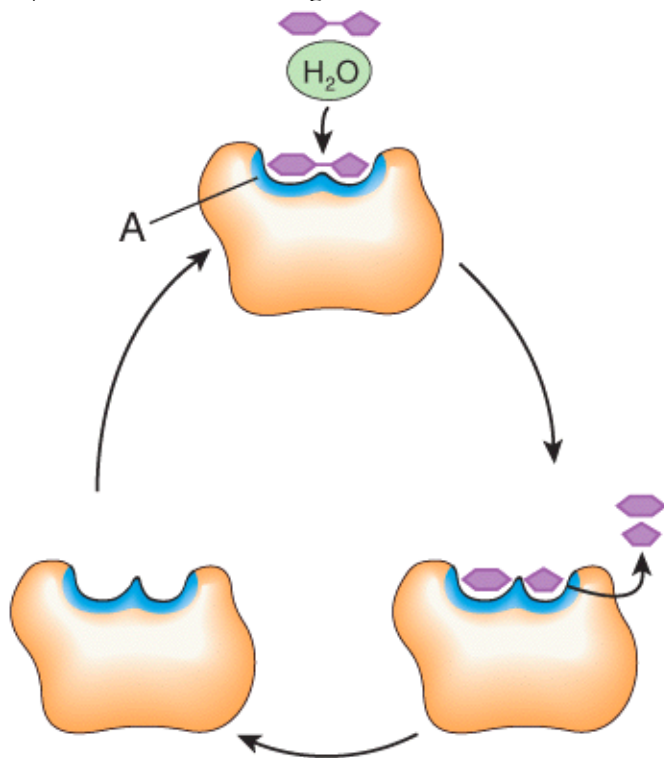
Learning Objective 2: LO 2.2.1 Discuss the functions of water and inorganic acids, bases, and salts.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

Solution: Acids are compounds, which dissociate in water and give off hydrogen ions. Bases give off hydroxide ions when they dissociate in water, and salts ionize in water into cations and anions, neither of which are hydrogen or hydroxide ions.

Question type: Multiple Choice

92) Which of the following structures is labeled A in the Figure shown?



- a) active site
- b) substrate
- c) product
- d) enzyme
- e) cofactor

Answer: a

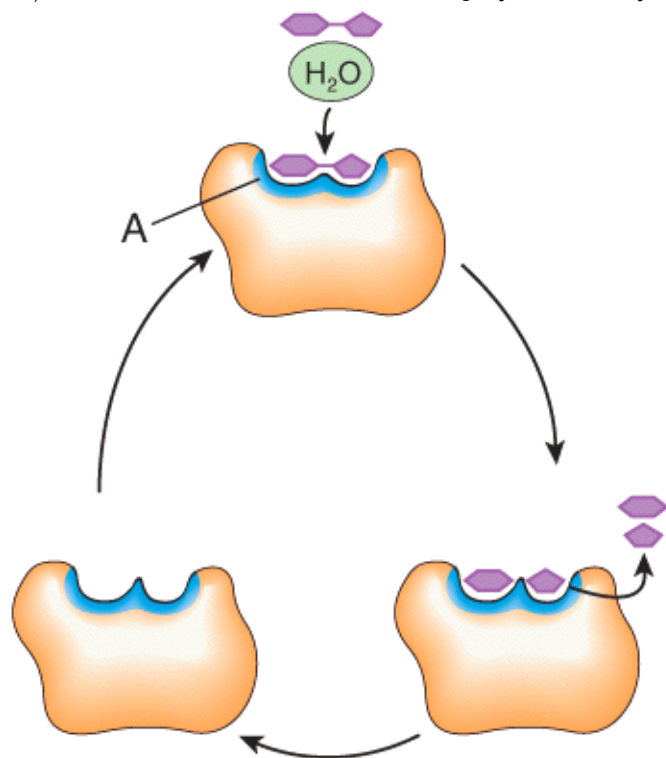
Difficulty: Easy

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.4 Describe how enzymes function.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

93) What role does sucrose and water play in the enzyme-catalyzed reaction shown?



- a) enzymes
- b) substrates
- c) products
- d) cofactors
- e) vitamins

Answer: b

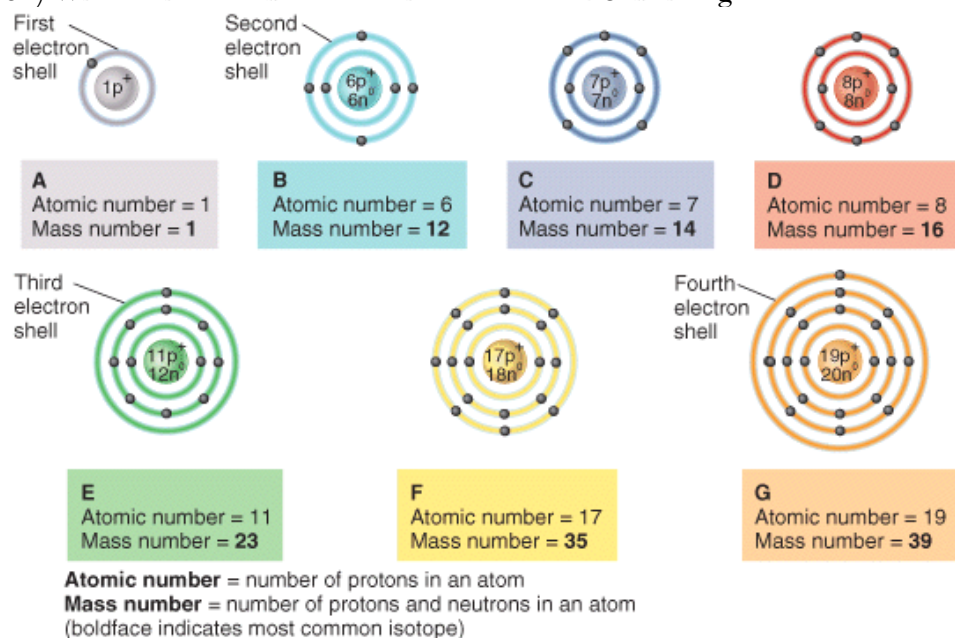
Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.4 Describe how enzymes function.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

94) What is the mass number of the atom labeled C in the figure?



- a) 0
- b) -1
- c) 7
- d) 14
- e) 21

Answer: d

Difficulty: Easy

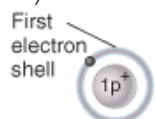
Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

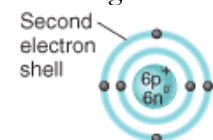
95) Which of the following statements would be true if atom G donated one valence electron to atom F?

A
Atomic number = 1
Mass number = 1



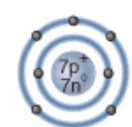
First electron shell

B
Atomic number = 6
Mass number = 12




Second electron shell

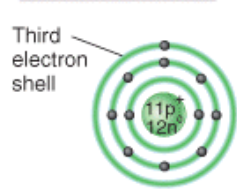
C
Atomic number = 7
Mass number = 14



D
Atomic number = 8
Mass number = 16

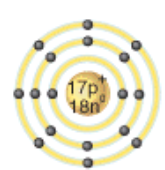


E
Atomic number = 11
Mass number = 23

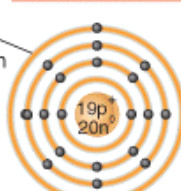


Third electron shell

F
Atomic number = 17
Mass number = 35



G
Atomic number = 19
Mass number = 39



Fourth electron shell

Atomic number = number of protons in an atom
Mass number = number of protons and neutrons in an atom
 (boldface indicates most common isotope)

- Both atoms would become anions.
- New isotopes of each atom would be formed.
- Atom F would become an anion and atom G would become a cation.
- Atom G would become an anion and atom F would become a cation
- The atoms would both become new elements.

Answer: c

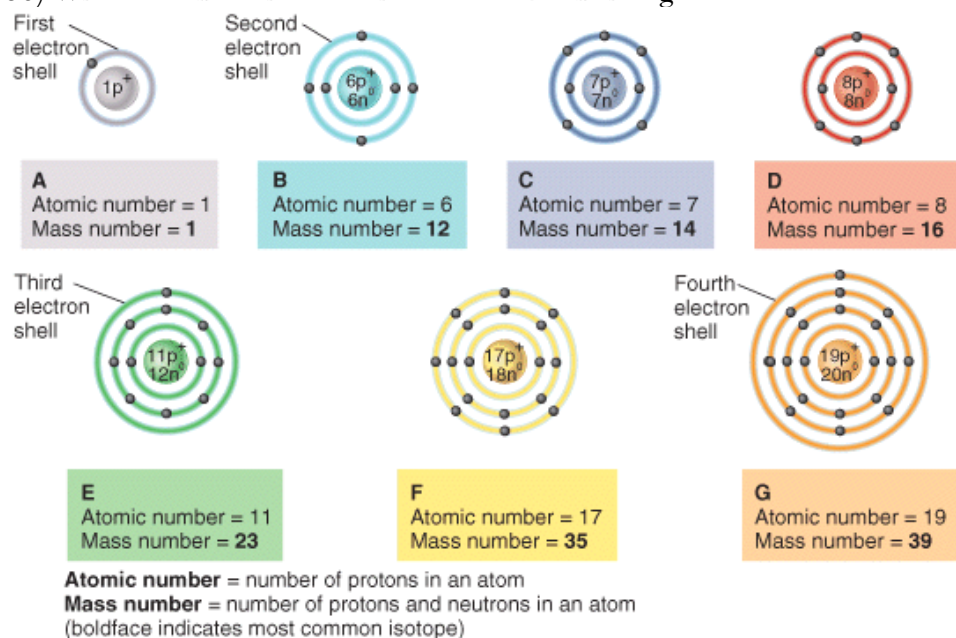
Difficulty: Hard

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

96) What element is the atom that is labeled B in the figure?



- a) carbon
- b) nitrogen
- c) oxygen
- d) water
- e) hydrogen

Answer: a

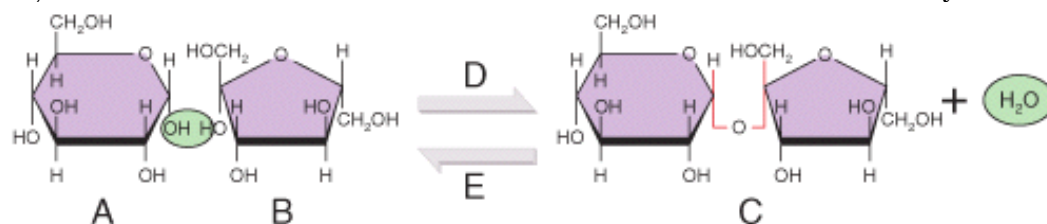
Difficulty: Medium

Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.1 Define a chemical element, atom, ion, molecule, and compound.

Section Reference 1: Section 2.1 Introduction to Chemistry.

97) Which of the labeled chemicals in this reaction are considered to be carbohydrates?



- a) A only
- b) B only
- c) C only
- d) A and B
- e) A, B, and C

Answer: e

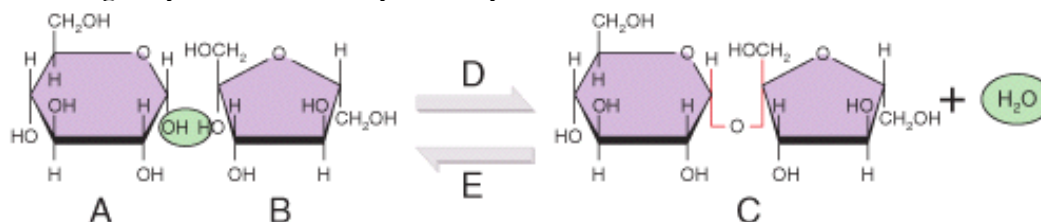
Difficulty: Medium

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.3 Describe the functions of carbohydrates, lipids, and proteins.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

98) If the chemical reaction shown in the figure proceeds from right to left (indicated by arrow labeled E in the figure) leading to the breakdown of the substrate sucrose (labeled C in the figure), which of the following enzymes is most likely to catalyze this reaction?



- a) lactase
- b) lactose dehydrogenase
- c) hexokinase
- d) sucrase
- e) sucrose synthase

Answer: d

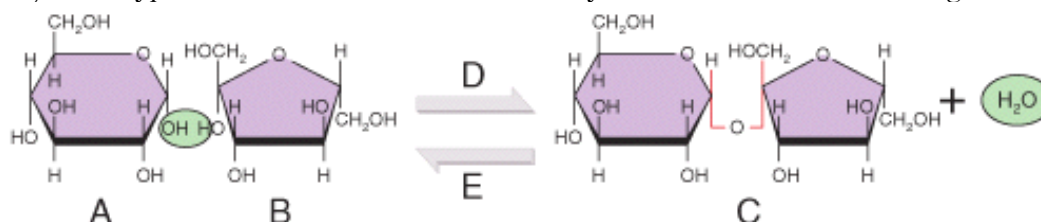
Difficulty: Hard

Learning Objective 1: LO 2.2 Describe the critical roles water and organic molecules play in all living things.

Learning Objective 2: LO 2.2.4 Describe how enzymes function.

Section Reference 1: Section 2.2 Chemical Compounds and Life Processes.

99) What type of chemical reaction is indicated by the arrow labeled D in the figure?



- a) synthesis reaction
- b) hydrolysis reaction
- c) decomposition reaction
- d) exchange reaction
- e) None of the choices is correct.

Answer: a

Difficulty: Hard

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Learning Objective 1: LO 2.1 Understand how the structures of atoms, ions, molecules, and compounds are related to the main chemical elements of the human body.

Learning Objective 2: LO 2.1.3 Describe what happens in a chemical reaction and explain why it is important to the human body.

Section Reference 1: Section 2.1 Introduction to Chemistry.