Hole's Human Anatomy & Physiology 15th edition Shier Test Bank

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Hole's Human Anatomy & Physiology, 15e **(Shier)**
Chapter 2 Chemical Basis of Life

1) Matter is composed of elements, which are composed of _____.
A) atoms
B) inorganic molecules
C) organic molecules
D) chemicals

Answer: A
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

2) The atomic number of an atom equals the number of _____, and the atomic weight equals the _____.
A) neutrons; number of protons
B) protons; weight of all the electrons
C) neutrons; number of protons plus electrons
D) protons; number of protons plus neutrons

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

3) In a covalent bond
A) one atom loses and another atom gains electrons.
B) atoms share a pair or more of electrons.
C) oppositely charged atoms attract.
D) like-charged atoms repel.

Answer: B
Section: 02.02
Topic: Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

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4) In an ionic bond
A) each atom gains electrons.
B) atoms share a pair or more of electrons.
C) oppositely charged atoms attract.
D) like-charged atoms repel.

Answer: C
Section: 02.02
Topic: Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

5) Sodium ions and calcium ions are examples of
A) cations.
B) uncharged particles.
C) anions.
D) salts.

Answer: A
Section: 02.02
Topic: Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

6) When K^+ and Cl^- meet, they will
A) repel and form no product.
B) form KCl with an ionic bond.
C) form KCl with a covalent bond.
D) form individual molecules.

Answer: B
Section: 02.02
Topic: Chemical bonding
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

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7) When placed into water, the ionic compound NaCl will
A) bond more strongly to each other.
B) dissociate into Na^+ and Cl^- ions.
C) bond covalently with water molecules, forming HCl and NaOH.
D) decompose.

Answer: B
Section: 02.02
Topic: Chemical bonding
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

8) Considering the number of valence electrons carbon has, what is the maximum number of hydrogen atoms a free carbon atom may bond with?
A) 1
B) 2
C) 4
D) 8

Answer: C
Section: 02.02
Topic: Atoms and molecules; Chemical bonding
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

9) Which of the following isotopes has the longest half-life?
A) Iodine-131
B) Iron-59
C) Phosphorus-32
D) Cobalt-60

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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10) The _____ uses iodine in a synthesis reaction.
A) spleen
B) liver
C) thymus
D) thyroid gland

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

11) The isotope most likely to be used to study the thyroid gland is
A) iodine-131.
B) iron-59.
C) thallium-201.
D) cobalt-60.

Answer: A
Section: 02.02; Boxed Reading: From Science to Technology 2.1
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

12) Atomic radiation is useful for treating cancer because
A) radiation affects cancer cells but not normal cells.
B) radiation protects normal cells against the effects of cancer.
C) radiation harms cancer cells more readily than it does most non-cancer cells.
D) normal cells are not affected by radiation.

Answer: C
Section: 02.02; Boxed Reading: From Science to Technology 2.2
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
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13) Exposure to ionizing radiation may
A) cloud the lens of the eye.
B) cause cancer.
C) interfere with normal growth.
D) All of the answer choices are correct.

Answer: D
Section: 02.02; Boxed Reading: From Science to Technology 2.2
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

14) Which of the following is not a source of ionizing radiation?
A) Cosmic rays from outer space
B) Cholesterol and triglycerides
C) Atomic and nuclear weapons
D) Smoke detectors

Answer: B
Section: 02.02; Boxed Reading: From Science to Technology 2.2
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

15) A computerized tomography (CT) scan differs from a conventional X-ray image because it is
A) two-dimensional.
B) three-dimensional.
C) four-dimensional.
D) safer.

Answer: B
Section: 02.02; Boxed Reading: From Science to Technology 2.3
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
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16) Positron emission tomography (PET) imaging follows the emission of
A) positrons.
B) electrons.
C) neutrons.
D) protons.

Answer: A
Section: 02.02; Boxed Reading: From Science to Technology 2.3
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

17) Chemistry deals with
A) the composition of and changes to substances that make up living as well as non-living matter.
B) the composition of and changes to substances found in organisms only.
C) the composition of and changes to substances that make up non-living matter only.
D) the location of organs in body cavities.

Answer: A
Section: 02.01
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.01 Give examples of how the study of living materials requires an understanding of chemistry.
Accessibility: Keyboard Navigation

18) Chemistry is important to the study of physiology because
A) the foods that we eat are chemicals.
B) body functions depend on cellular functions that reflect chemical changes.
C) chemical reactions enable our bodies to extract energy from nutrients.
D) All of the answer choices are correct.

Answer: D
Section: 02.01
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.01 Give examples of how the study of living materials requires an understanding of chemistry.
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19) Which of the following substances is an element?
A) Iron
B) Water
C) Sodium chloride
D) Glucose

Answer: A
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

20) Which of the following groups of elements accounts for more than 95% of the human body by weight?
A) Carbon, hydrogen, oxygen, nitrogen
B) Calcium, hydrogen, oxygen, nitrogen
C) Carbon, phosphorus, oxygen, hydrogen
D) Calcium, phosphorus, hydrogen, nitrogen

Answer: A
Section: 02.02
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

21) The atoms of different elements have
A) the same atomic number and same atomic weight.
B) the same atomic number but different atomic weights.
C) different atomic numbers.
D) different atomic numbers but the same number of electrons.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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22) Isotopes of an element have
A) the same atomic number and same atomic weight.
B) the same atomic number but different atomic weights.
C) different atomic numbers but the same atomic weight.
D) different atomic numbers and different atomic weights.

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

23) Which of the following is(are) ionizing radiation?
A) Cosmic radiation only
B) Gamma radiation only
C) Both cosmic radiation and gamma radiation
D) Neither cosmic nor gamma radiation

Answer: C
Section: 02.02; Boxed Reading: From Science to Technology 2.2
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

24) The atomic weight of an element whose atoms contain 8 protons, 8 electrons, and 8 neutrons is
A) 8.
B) 16.
C) 24.
D) 32.

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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25) The atoms of the isotopes of a particular element vary in the number of
A) electrons.
B) protons.
C) neutrons.
D) nuclei.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

26) The first electron shell of an atom can hold a maximum of
A) 1 electron.
B) 2 electrons.
C) 4 electrons.
D) 8 electrons.

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

27) When forming a bond, an atom that has 3 electrons in its second shell and a filled first shell will
A) lose 3 electrons from its second shell.
B) lose all of the electrons from its first shell.
C) lose all of the electrons from both its first and second shells.
D) gain 5 electrons in its second shell.

Answer: A
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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28) The formula H_2O refers to
A) two hydrogen molecules and one oxygen molecule.
B) one hydrogen molecule and two oxygen molecules.
C) a molecule that contains two hydrogen atoms and one oxygen atom.
D) a molecule that contains one hydrogen atom and two oxygen atoms.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:04 Explain how molecular and structural formulas symbolize the composition of compounds.
Accessibility: Keyboard Navigation

29) Which of the following best describes the reaction $H_2CO_3 \rightarrow H_2O + CO_2$?
A) Decomposition reaction
B) Exchange reaction
C) Reversible reaction
D) Synthesis reaction

Answer: A
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:05 Describe three types of chemical reactions.
Accessibility: Keyboard Navigation

30) A water solution that contains equal numbers of hydrogen ions and hydroxide ions is
A) acidic.
B) basic.
C) alkaline.
D) neutral.

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
Accessibility: Keyboard Navigation

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31) When placed in a solution, HNO_3 dissociates into H+ and NO_3-. The compound HNO3 must be a(n) _____.
A) base.
B) nucleotide.
C) acid.
D) electron.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
Accessibility: Keyboard Navigation

32) The difference in hydrogen ion concentration between solutions with pH 4 and pH 5 is
A) twofold.
B) fivefold.
C) tenfold.
D) twentyfold.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.; 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

33) Which of the following best describes the reaction $NaNO_3 + HCl \rightarrow HNO_3 + NaCl$?
A) Decomposition reaction
B) Exchange reaction
C) Reversible reaction
D) Synthesis reaction

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02:05 Describe three types of chemical reactions.
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34) Consider the following list of commonly found items and their pH values:

Baking Soda (8.3), Battery Acid (1.0), Beer (4.2), Bleach (12.8), Butter (6.1–6.4), Coffee (5.0), Egg Whites (7.6–8.0), Grapes (3.5–4.5), Milk of Magnesia (10.6), Tomato (4.0–4.5), Vinegar (2.2), White Bread (5.0–6.0)

Which of the following choices includes all acids?
A) Egg whites, baking soda, milk of magnesia, and bleach
B) Tomatoes, egg whites, and baking soda
C) Vinegar, grapes, tomatoes, and coffee
D) Beer, butter, and baking soda

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

35) Electrolytes are substances that
A) form covalent bonds with water.
B) ionize in water.
C) cannot conduct electricity in solution.
D) form bonds that are stable in water.

Answer: B
Section: 02.03
Topic: Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02:09 List the major inorganic chemicals common in cells and explain the function (s) of each.
Accessibility: Keyboard Navigation

36) The pH scale measures the
A) concentration of hydrogen ions in solution.
B) number of molecules of salts dissolved in water.
C) number of hydroxide ions in water.
D) strength of an electrical current that a solution carries.

Answer: A
Section: 02.02
Topic: Inorganic compounds and solutions
Bloom's: 1. Remember
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

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37) Which of the following is the most abundant inorganic substance in the body?
A) Carbohydrate
B) Water
C) Lipid
D) Protein

Answer: B
Section: 02.03
Topic: Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02:09 List the major inorganic chemicals common in cells and explain the function (s) of each.
Accessibility: Keyboard Navigation

38) A person has alkalosis if the blood pH
A) is above 7.0.
B) is below 7.0.
C) rises above 7.5.
D) drops below 7.3.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.; 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

39) A complete atom is electrically neutral because
A) the number of protons equals the number of neutrons.
B) the number of electrons equals the number of neutrons.
C) the number of electrons equals the number of protons.
D) the number of electrons is greater than the number of protons.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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40) Synthesis reactions are particularly important in the body for
A) release of energy.
B) digestion of food products.
C) growth of body parts.
D) neutralization of acids by buffers.

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:05 Describe three types of chemical reactions.
Accessibility: Keyboard Navigation

41) On the pH scale
A) a tenfold difference in hydrogen ion concentration separates each whole number.
B) the lower the whole number on the scale, the greater the H^+ concentration.
C) pH values above 7 are basic (alkaline).
D) All of the answer choices are correct.

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

42) An acid reacting with a base is
A) a synthesis reaction.
B) hydrolysis.
C) a decomposition reaction.
D) an exchange reaction.

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
Accessibility: Keyboard Navigation

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43) The following reaction occurs: $HBr + NaOH \rightarrow NaBr + H_2O$. What is the product NaBr considered in this reaction?
A) A buffer
B) A salt
C) A solvent
D) A protein

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
Accessibility: Keyboard Navigation

44) A substance is added to a protein sample that does not alter the composition or amino acid sequence of the protein itself, but changes its three-dimensional structure. Which of the following was altered by the substance?
A) Oxygen double bonds
B) Covalent bonds
C) Ionic bonds
D) Hydrogen bonds

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

45) In the body, oxygen
A) reacts with water to form carbonic acid.
B) is used during cellular respiration.
C) is a major electrolyte.
D) is produced by cells.

Answer: B
Section: 02.03
Topic: Organic compounds; Cellular respiration
Bloom's: 2. Understand
Learning Outcome: 02:09 List the major inorganic chemicals common in cells and explain the function (s) of each.
Accessibility: Keyboard Navigation

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46) Which of the following is characteristic of carbohydrates?
A) They contain C, H, O, with twice as many hydrogen as oxygen atoms.
B) They provide much of the energy that the cell requires.
C) They include sugars and starches.
D) All of the answer choices are correct.

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

47) A simple carbohydrate
A) has a molecular formula of $C_6H_{12}O_6$.
B) is a building block of protein.
C) consists of several joined chains.
D) has only one nucleotide.

Answer: A
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

48) Lipids
A) are insoluble in water.
B) include phospholipids, cholesterol, and fats.
C) contain C, H, and O, but with proportionately less oxygen than in carbohydrates.
D) All of the answer choices are correct.

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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49) Collagen, a helical protein, became straight and flat as the temperature of its environment was changed. Its primary structure was not altered. What happened to cause it to flatten?
A) Bonds between carbon and oxygen were broken.
B) Hydrogen bonds were broken.
C) Peptide bonds were broken.
D) Peptide bonds were formed.

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

50) Which of the following is not organic?
A) Sodium chloride
B) Lipids
C) Nucleic acids
D) Enzymes

Answer: A
Section: 02.03
Topic: Inorganic compounds and solutions; Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

51) Lard will _____ than peanut oil.
A) contain more water
B) have more glycerol
C) have more single carbon-carbon bonds
D) have fewer hydrogen atoms bonded to carbon atoms

Answer: C
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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52) Proteins
A) are structural materials.
B) can function as enzymes.
C) contain C, H, O, and N, and sometimes S.
D) All of the answer choices are correct.

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

53) Amylase is an enzyme that promotes the breakdown of starches during digestion. Which of the following describes the method by which amylase functions?
A) It catalyzes starch breakdown without being changed or depleted.
B) It functions as a hormone that signals for starch breakdown to begin.
C) It inhibits chemical reactions by being changed or depleted by the starch.
D) It changes its composition in order to break starch down itself.

Answer: A
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

54) The parts of a protein that change when it denatures are
A) the primary and secondary structures.
B) the secondary and tertiary structures.
C) the amino acid sequence and the secondary structure.
D) the tertiary and quaternary structures.

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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55) DNA
A) is a protein.
B) plays no role in the synthesis of fats.
C) stores genetic information, including instructions for enzymes that synthesize fats and carbohydrates.
D) is routinely broken down to provide cellular energy.

Answer: C
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

56) Nucleic acids are
A) very small, simple molecules.
B) structural molecules that have no function other than support.
C) composed of building blocks called nucleotides.
D) primary sources of cellular energy.

Answer: C
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

57) The nitrogenous bases of DNA and RNA provide informational content because
A) the bases are of several types and therefore can form a code sequence.
B) they all contain nitrogen.
C) their sugars and phosphates vary.
D) the bases are also parts of amino acids.

Answer: A
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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58) In phenylketonuria, an individual cannot break down the amino acid phenylalanine. Molecules that include phenylalanine build up in the blood, which causes intellectual disability and other symptoms. This inherited disease can be controlled by following a diet that is very low in
A) carbohydrates.
B) cholesterol.
C) protein.
D) nucleic acids.

Answer: C
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

59) The breakdown of table sugar into glucose and fructose is an example of a(n) _____ reaction.
A) synthesis
B) hydrolysis
C) acid-base
D) exchange

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

60) Nucleic acids include
A) proteins and DNA.
B) RNA and DNA.
C) enzymes and RNA.
D) steroids and triglycerides.

Answer: B
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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61) DNA and RNA differ in that
A) RNA has deoxyribose and DNA has ribose.
B) RNA is double-stranded and DNA is single-stranded.
C) DNA holds genetic information and RNA uses that information to synthesize protein.
D) RNA is found only in the nucleus and DNA is found only in the cytoplasm.

Answer: C
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

62) The type of organic molecule that can replicate is a
A) protein.
B) lipid.
C) carbohydrate.
D) nucleic acid.

Answer: D
Section: 02.03
Topic: Organic compounds; Nucleic acids: DNA and RNA
Bloom's: 1. Remember
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

63) The term conformation refers to:
A) the three-dimensional shape of a molecule, such as a protein.
B) the energy held in the bonds of an organic molecule, such as a protein.
C) the ability of DNA to copy itself.
D) the amino acid sequence (primary structure) of a protein.

Answer: A
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
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64) An organic compound always contains
A) carbon and hydrogen.
B) oxygen and nitrogen.
C) carbon and oxygen.
D) nitrogen and hydrogen.

Answer: A
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

65) Which of these is not a monosaccharide?
A) Glucose
B) Ribose
C) 6-carbon sugar
D) Sucrose

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

66) Glycogen is stored in the liver and _____.
A) spleen
B) skeletal muscles
C) pancreas
D) heart

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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67) A triglyceride consists of
A) 3 glycerols and 1 fatty acid.
B) 3 glucose molecules.
C) 3 fatty acids and 3 phosphate groups.
D) 3 fatty acids and 1 glycerol.

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

68) Which of the following is the least likely to dissolve in water?
A) Albumin
B) A triglyceride
C) Table sugar (sucrose)
D) Nucleotides

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

69) Which of the following molecules does not have a polar region?
A) Water
B) Triglyceride
C) Water-soluble amino acid
D) Glucose

Answer: B
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
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70) If helium (He) were to gain a proton, it would become
A) He^+.
B) He^-.
C) Helium-3.
D) Lithium.

Answer: D
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

71) A patient's blood test shows that their blood pH is 7.29. They are most likely experiencing
A) alkalosis.
B) acidosis.
C) blood clots.
D) nothing, their blood pH is normal.

Answer: B
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.; 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

72) A ribosome exists as an association between different ribosomal protein subunits. The entire structure of the ribosome with its associations between subunits is considered the
A) primary structure.
B) secondary structure.
C) tertiary structure.
D) quaternary structure.

Answer: D
Section: 02.03
Topic: Organic compounds
Bloom's: 3. Apply
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
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73) Consider the following list of commonly found items and their pH values:

Battery acid (1.0), vinegar (2.2), grapes (3.5–4.5), tomato (4.0–4.5), beer (4.2), coffee (5.0), white bread (5.0–6.0), butter (6.1–6.4), egg whites (7.6–8.0), baking soda (8.3), milk of magnesia (10.6), bleach (12.8)

Which of the following is closest to the pH of water?
A) White bread
B) Baking soda
C) Egg whites
D) Grapes

Answer: C
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

74) Consider the following list of commonly found items and their pH values:

Battery acid (1.0), vinegar (2.2), grapes (3.5–4.5), tomato (4.0–4.5), beer (4.2), coffee (5.0), white bread (5.0–6.0), butter (6.1–6.4), egg whites (7.6–8.0), baking soda (8.3), milk of magnesia (10.6), bleach (12.8)

Based on your knowledge of acid and base reactions, which of the following would be most likely to react with a base to form a salt?
A) Bleach
B) Battery acid
C) Coffee
D) Egg whites

Answer: B
Section: 02.02
Topic: Inorganic compounds and solutions
Bloom's: 3. Apply
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

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75) The number of protons in an atom of an element always equals its atomic weight.

Answer: FALSE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

76) Radioactive isotopes have stable nuclei.

Answer: FALSE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

77) Sodium and chloride atoms combine readily because they both lose electrons.

Answer: FALSE
Section: 02.02
Topic: Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

78) The symbol Na+ represents a sodium atom that has lost an electron.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

79) Water is an example of a compound.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules; Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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80) If Ca^{+2} were to gain 2 electrons, it would become Ca^{0} and become neutral.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

81) Two negatively charged bromide (Br^{-}) ions exist in solution. They will be attracted to each other and form an ionic bond.

Answer: FALSE
Section: 02.02
Topic: Chemical bonding
Bloom's: 3. Apply
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

82) Chemistry is the study of the composition of matter and how matter changes.

Answer: TRUE
Section: 02.01
Topic: Atoms and molecules
Bloom's: 1. Remember
Learning Outcome: 02.01 Give examples of how the study of living materials requires an understanding of chemistry.
Accessibility: Keyboard Navigation

83) $CaCl_2$ is dissolved in water. The chlorine that is released will be in the form of anions.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02:04 Explain how molecular and structural formulas symbolize the composition of compounds.
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84) The compound H_2SO_4 will dissociate in water to create HSO_4^- and H^+. The product HSO_4^- is a base.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02:04 Explain how molecular and structural formulas symbolize the composition of compounds.
Accessibility: Keyboard Navigation

85) In the reaction between HCl and $Ca(OH)_2$, the product $CaCl_2$ will be a salt.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02:04 Explain how molecular and structural formulas symbolize the composition of compounds.
Accessibility: Keyboard Navigation

86) Chemically inert atoms always have their outermost electron shell full.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

87) An acid is an electrolyte that releases hydroxide ions (OH^-) in water.

Answer: FALSE
Section: 02.02
Topic: Atoms and molecules; Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
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88) A base is an electrolyte that releases ions that combine with hydrogen ions.

Answer: TRUE
Section: 02.02
Topic: Atoms and molecules; Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.
Accessibility: Keyboard Navigation

89) An electrolyte ionizes in water.

Answer: TRUE
Section: 02.03
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02:09 List the major inorganic chemicals common in cells and explain the function (s) of each.
Accessibility: Keyboard Navigation

90) A person with alkalosis has a blood pH less than 7.3.

Answer: FALSE
Section: 02.02; 02.03
Topic: Atoms and molecules; Inorganic compounds and solutions
Bloom's: 2. Understand
Learning Outcome: 02:06 Describe the differences among acids, bases and salts.; 02:07 Explain the pH scale.; 02:09 List the major inorganic chemicals common in cells and explain the function (s) of each.
Accessibility: Keyboard Navigation

91) A complex carbohydrate consists of a phosphate group attached to a sugar molecule.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

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92) Cholesterol, a type of lipid, is composed of three fatty acid chains attached to glycerol.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

93) Glycogen is a complex carbohydrate that is obtained by eating plants.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

94) A phospholipid differs structurally from a triglyceride in that it has three phosphate groups attached to the glycerol molecule rather than three fatty acid chains.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

95) Nucleic acids are composed of building blocks called amino acids.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
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96) A protein is formed from a sequence of amino acids.

Answer: TRUE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

97) Proteins encode nucleic acids.

Answer: FALSE
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

98) DNA and RNA are nucleic acids.

Answer: TRUE
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

99) When atoms form chemical bonds, the subatomic particles that directly interact are the _____.

Answer: electrons
Section: 02.02
Topic: Atoms and molecules; Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.
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100) The opposite of a decomposition reaction is a _____ reaction.

Answer: synthesis
Section: 02.02
Topic: Atoms and molecules; Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02:05 Describe three types of chemical reactions.
Accessibility: Keyboard Navigation

101) The midpoint of the pH scale is pH _____.

Answer: 7
7.0
Section: 02.02
Topic: Inorganic compounds and solutions
Bloom's: 1. Remember
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

102) Apricots have a pH of 3.8. Therefore, they are _____.

Answer: acidic
acid
Section: 02.02
Topic: Inorganic compounds and solutions
Bloom's: 3. Apply
Learning Outcome: 02:07 Explain the pH scale.
Accessibility: Keyboard Navigation

103) Amino acids are building blocks of _____.

Answer: protein
proteins
peptides
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02.03 Describe how atomic structure determines how atoms interact.; 02:10 Describe the general functions of the main classes of organic molecules in cells.
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104) The amino acid sequence of a protein is its _____ structure.

Answer: primary
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

105) _____ are building blocks of nucleic acids.

Answer: nucleotides
Section: 02.03
Topic: Organic compounds
Bloom's: 1. Remember
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

106) _____ has the unique ability among types of organic molecules to replicate.

Answer: DNA
Deoxyribonucleic acid
Section: 02.03
Topic: Organic compounds
Bloom's: 2. Understand
Learning Outcome: 02:10 Describe the general functions of the main classes of organic molecules in cells.
Accessibility: Keyboard Navigation

107) A change from Fe^{2+} to Fe^{3+} would require a change in the number of _____.

Answer: electrons
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
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108) The difference between carbon-13 and carbon-14 is their number of _____.

Answer: neutrons
Section: 02.02
Topic: Atoms and molecules
Bloom's: 3. Apply
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.
Accessibility: Keyboard Navigation

109) The type of chemical bond formed when ions with opposite electrical charges attract is a(n) _____ bond.

Answer: ionic
Section: 02.02
Topic: Chemical bonding
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
Accessibility: Keyboard Navigation

110) Two or more atoms bonding form a _____.

Answer: molecule
Section: 02.02
Topic: Atoms and molecules
Bloom's: 2. Understand
Learning Outcome: 02.02 Describe the relationships among matter, atoms, and compounds.; 02.03 Describe how atomic structure determines how atoms interact.
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