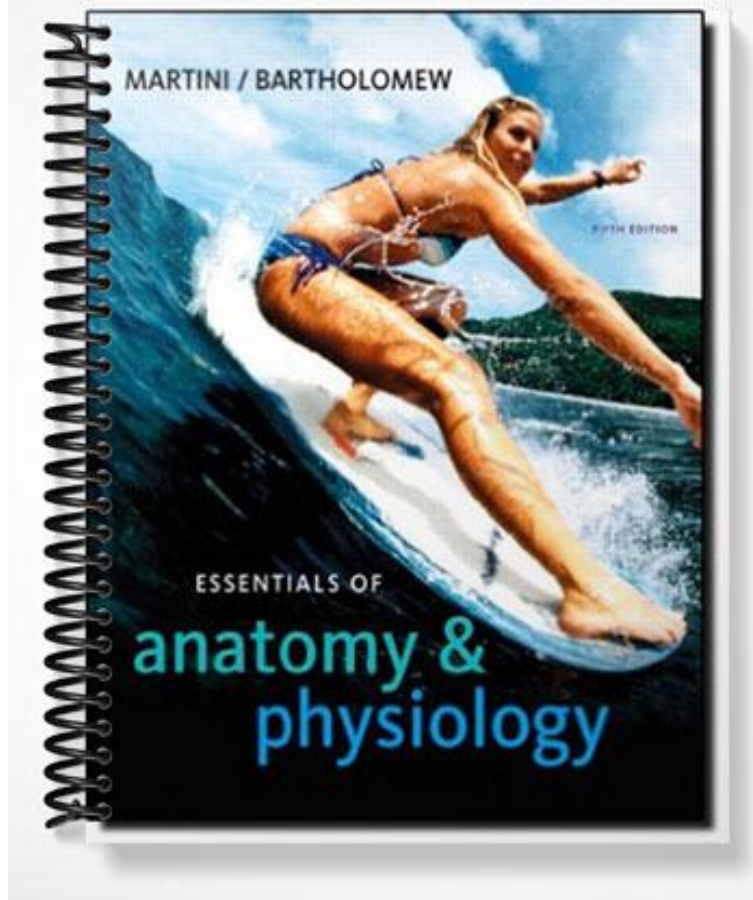


TEST BANK



Essentials of Anatomy and Physiology, 5e (Martini/Nath)
Chapter 2 The Chemical Level of Organization

Multiple-Choice Questions

1) The branch of science that deals with changes in molecules is

- A) biology.
- B) pathology.
- C) botany.
- D) geology.
- E) chemistry.

Answer: E

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

2) The uncharged subatomic particles are

- A) atoms.
- B) molecules.
- C) protons.
- D) neutrons.
- E) electrons.

Answer: D

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

3) Which of the following would have a negative charge?

- A) an atom
- B) a molecule
- C) a proton
- D) a neutron
- E) an electron

Answer: E

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

4) Atoms of the same element but containing different numbers of neutrons are called

- A) isomers.
- B) cations.
- C) isotopes.
- D) anions.
- E) none of the above

Answer: C

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

5) The identity of an atom is determined by the

- A) number of protons.
- B) number of neutrons.
- C) number and arrangement of electrons.
- D) size of the atom.
- E) mass of the atom.

Answer: A

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

6) Positively charged subatomic particles are called

- A) protons.
- B) neutrons.
- C) electrons.
- D) quarks.
- E) radioactivity.

Answer: A

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

7) The mass number represents the number of

- A) protons in an atom.
- B) electrons in an ion.
- C) neutrons in an atom.
- D) protons and neutrons.
- E) neutrons and electrons.

Answer: D

Diff: 2

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

8) Which of the following is sometimes used in diagnostic imaging?

- A) a radioisotope.
- B) a proton.
- C) an ion.
- D) an atom.
- E) a gamma ray.

Answer: A

Diff: 1

Learning Outcome: 2-1

Skill Level: 2 Reviewing Concepts

9) Which of the following is the most abundant element in the human body?

- A) hydrogen
- B) oxygen
- C) iron
- D) carbon
- E) copper

Answer: A

Diff: 2

Learning Outcome: 2-1

Skill Level: 2 Reviewing Concepts

10) If an element is composed of atoms with an atomic number of 8 and a mass number of 14, then a neutral atom of this element contains

- A) 6 protons.
- B) 6 neutrons.
- C) 6 electrons.
- D) 14 protons.
- E) 14 electrons.

Answer: B

Diff: 2

Learning Outcome: 2-1

Skill Level: 2 Reviewing Concepts

11) Matter containing two atoms of the same element bonded together would be called

- A) molecules.
- B) cells.
- C) compounds.
- D) elements.
- E) none of the above

Answer: A

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

12) Combinations of atoms that contain different elements are called

- A) molecules.
- B) compounds.
- C) mixtures.
- D) isotopes.
- E) none of the above

Answer: B

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

13) Ions with a negative charge are called

- A) cations.
- B) anions.
- C) radicals.
- D) polyatomic ions.
- E) none of the above

Answer: B

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

14) Which of the following is a weak electrical attraction between molecules?

- A) ionic bond
- B) covalent bond
- C) polar bond
- D) metallic bond
- E) hydrogen bond

Answer: E

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

15) Covalent bonds are formed when

- A) atoms share electrons.
- B) cations and anions are held together by their opposite charges.
- C) a pair of electrons is shared unequally by two atoms.
- D) hydrogen forms bonds with negatively charged atoms in the same or different molecules.
- E) two or more atoms lose electrons at the same time.

Answer: A

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

- 16) In a molecule of oxygen, two pairs of electrons are shared equally; such a bond is called a
- A) hydrogen covalent bond.
 - B) polar covalent bond.
 - C) nonpolar covalent bond.
 - D) oxygen covalent bond.
 - E) hydrogen bond.

Answer: C

Diff: 2

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

- 17) If two pairs of electrons are shared between two atoms, what type of bond occurs?
- A) single covalent bond
 - B) double covalent bond
 - C) triple covalent bond
 - D) polar covalent bond
 - E) hydrogen bond

Answer: B

Diff: 2

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

- 18) How many electrons do MOST atoms need in their outer shell to be stable?
- A) two
 - B) three
 - C) four
 - D) six
 - E) eight

Answer: E

Diff: 2

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

- 19) When electrons are shared between one atom and another and the two atoms unite as a result of the electron sharing,
- A) an ion is formed.
 - B) a molecule is formed.
 - C) a hydrogen bond is formed.
 - D) an ionic bond is formed.
 - E) a covalent bond is formed.

Answer: E

Diff: 1

Learning Outcome: 2-2

Skill Level: 2 Reviewing Concepts

20) Which of the following is a characteristic of hydrogen bonds?

- A) Hydrogen bonds are strong attractive forces between hydrogen atoms and negatively charged atoms.
- B) Hydrogen bonds occur ONLY in water.
- C) Hydrogen bonds can form between neighboring molecules.
- D) Hydrogen bonds are part of fatty-acid structure.
- E) Hydrogen bonds are part of carbohydrate structure.

Answer: C

Diff: 1

Learning Outcome: 2-2

Skill Level: 2 Reviewing Concepts

21) Chlorine atoms have seven electrons in the outermost shell. As a result, one would expect chlorine to form ions with a charge of

- A) +1.
- B) +2.
- C) -1.
- D) -2.
- E) none of the above

Answer: C

Diff: 2

Learning Outcome: 2-2

Skill Level: 2 Reviewing Concepts

22) Which statement about the reaction $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$ is correct?

- A) H_2 and Cl_2 are the products.
- B) HCl is the product.
- C) One molecule of hydrogen contains one atom.
- D) One molecule of chlorine contains one atom.
- E) All of the above are correct.

Answer: B

Diff: 1

Learning Outcome: 2-3

Skill Level: 1 Reviewing Facts and Terms

23) The reaction $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ would be an example of a(n)

- A) exchange reaction.
- B) decomposition reaction.
- C) synthesis reaction.
- D) enzyme reaction.
- E) metabolic reaction.

Answer: C

Diff: 1

Learning Outcome: 2-3

Skill Level: 1 Reviewing Facts and Terms

24) $AB \rightarrow A + B$ is to decomposition as $A + B \leftrightarrow AB$ is to

- A) exchange.
- B) reversible.
- C) combustion.
- D) replacement.
- E) metabolism.

Answer: B

Diff: 1

Learning Outcome: 2-3

Skill Level: 2 Reviewing Concepts

25) When two monosaccharides undergo a dehydration synthesis,

- A) a new monosaccharide is formed.
- B) a disaccharide is formed.
- C) a polysaccharide is formed.
- D) a starch is formed.
- E) hydrolysis occurs.

Answer: B

Diff: 1

Learning Outcome: 2-3

Skill Level: 2 Reviewing Concepts

26) A decomposition reaction of a triglyceride could yield

- A) a steroid.
- B) a hormone.
- C) monoglyceride and a fatty acid.
- D) a diglyceride and two fatty acids.
- E) glycerol and three fatty acids.

Answer: E

Diff: 2

Learning Outcome: 2-3

Skill Level: 2 Reviewing Concepts

27) The addition of energy to start a reaction is called the energy of

- A) endergonic control.
- B) activation.
- C) exergonic control.
- D) release.
- E) none of the above

Answer: B

Diff: 1

Learning Outcome: 2-4

Skill Level: 1 Reviewing Facts and Terms

- 28) In an endergonic reaction,
- A) large molecules are broken down into smaller ones.
 - B) small molecules are assembled into larger ones.
 - C) molecules are rearranged to form new molecules.
 - D) molecules move from reactants to products and back.
 - E) energy is consumed during the reaction.

Answer: E

Diff: 3

Learning Outcome: 2-4

Skill Level: 1 Reviewing Facts and Terms

- 29) All of the elements and compounds that are eaten and used by the body for some function are called

- A) inorganic compounds.
- B) organic compounds.
- C) nutrients.
- D) metabolites.
- E) enzymes.

Answer: C

Diff: 1

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

- 30) Which of the following is inorganic?

- A) hydrogen
- B) oxygen
- C) carbon
- D) calcium
- E) none of the above

Answer: D

Diff: 1

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

- 31) Inorganic acids in the body include

- A) hydrochloric
- B) carbonic
- C) sulfuric
- D) phosphoric
- E) all of the above

Answer: E

Diff: 2

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

- 32) The best definition of organic material is anything that
- A) contains carbon.
 - B) contains carbon, oxygen, and hydrogen covalently bonded.
 - C) contains carbon, nitrogen, and hydrogen covalently bonded.
 - D) contains hydrogen covalently bonded.
 - E) contains carbon and hydrogen covalently bonded.

Answer: E

Diff: 3

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

- 33) Which of the following is the most abundant chemical compound in the human body?
- A) water
 - B) acids
 - C) bases
 - D) salts
 - E) organic molecules

Answer: A

Diff: 1

Learning Outcome: 2-6

Skill Level: 1 Reviewing Facts and Terms

- 34) A solution containing more hydrogen ions than hydroxide ions is
- A) acidic.
 - B) basic.
 - C) neutral.
 - D) alkaline.
 - E) none of the above

Answer: A

Diff: 1

Learning Outcome: 2-7

Skill Level: 1 Reviewing Facts and Terms

- 35) Which of the following substances would be nearest the pH of human blood?
- A) lemon juice, pH = 5.5
 - B) urine, pH = 6
 - C) tomato juice, pH = 4
 - D) white wine, pH = 3
 - E) stomach secretions, pH = 2

Answer: B

Diff: 1

Learning Outcome: 2-7

Skill Level: 1 Reviewing Facts and Terms

36) Which of the following is an example of a strong base?

- A) NaCl
- B) NaOH
- C) HCl
- D) KF
- E) H₂O

Answer: B

Diff: 1

Learning Outcome: 2-7

Skill Level: 1 Reviewing Facts and Terms

37) When placed in water, an inorganic compound dissociates 99 percent, forming hydrogen ions and anions. This substance would be a

- A) strong base.
- B) weak base.
- C) strong acid.
- D) weak acid.
- E) salt.

Answer: C

Diff: 1

Learning Outcome: 2-7

Skill Level: 2 Reviewing Concepts

38) It is important to keep pH regulated because an imbalance in H⁺ concentration can cause

- A) unwanted chemical reactions.
- B) overactivation of enzymes.
- C) deactivation of enzymes.
- D) structural damage.
- E) all of the above

Answer: E

Diff: 2

Learning Outcome: 2-7

Skill Level: 2 Reviewing Concepts

39) A decrease of hydrogen ions in the body fluids can have disastrous results because

- A) decreased hydrogen ions can break chemical bonds.
- B) decreased hydrogen ions can change the shape of large complex molecules, rendering them nonfunctional.
- C) decreased hydrogen ions can disrupt tissue functions.
- D) decreased hydrogen ions can kill living cells.
- E) all of the above

Answer: E

Diff: 3

Learning Outcome: 2-7

Skill Level: 2 Reviewing Concepts

40) If a substance resists changes in pH, it is called

- A) neutral.
- B) acidic.
- C) alkaline.
- D) a buffer.
- E) a salt.

Answer: D

Diff: 1

Learning Outcome: 2-8

Skill Level: 1 Reviewing Facts and Terms

41) Which is a characteristic of carbon dioxide?

- A) It is composed of polar molecules.
- B) It can pass easily through a cell membrane.
- C) It is required by the body.
- D) It makes up a majority of the atmosphere.
- E) It is a nutrient.

Answer: B

Diff: 1

Learning Outcome: 2-8

Skill Level: 2 Reviewing Concepts

42) During ionization, water molecules disrupt the ionic bonds of a solute, resulting in a mixture of ions. These ions are called

- A) cations.
- B) anions.
- C) dissociates.
- D) electrolytes.
- E) anti-ions.

Answer: D

Diff: 1

Learning Outcome: 2-8

Skill Level: 2 Reviewing Concepts

43) Carbohydrate molecules may be used for which of the following?

- A) a primary energy storage molecule
- B) part of nucleic acid structure
- C) the body's most important source of energy
- D) receptors of the cell surface
- E) all of the above

Answer: E

Diff: 1

Learning Outcome: 2-9

Skill Level: 1 Reviewing Facts and Terms

44) The most important metabolic fuel molecule in the body is

- A) sucrose.
- B) starch.
- C) protein.
- D) vitamin B₁₂.
- E) glucose.

Answer: E

Diff: 1

Learning Outcome: 2-9

Skill Level: 1 Reviewing Facts and Terms

45) A disaccharide is

- A) starch.
- B) glycogen.
- C) fructose.
- D) cellulose.
- E) sucrose.

Answer: E

Diff: 1

Learning Outcome: 2-9

Skill Level: 1 Reviewing Facts and Terms

46) The group of organic compounds containing mostly carbon and hydrogen with small amounts of oxygen is defined as a

- A) carbohydrate.
- B) lipid.
- C) protein.
- D) nucleic acid.
- E) none of the above

Answer: B

Diff: 1

Learning Outcome: 2-10

Skill Level: 1 Reviewing Facts and Terms

47) Lipids are used for which of the following?

- A) form essential structural components of cells
- B) provide roughly 10 times as much energy as carbohydrates
- C) help reduce body temperature
- D) help protect the skeleton
- E) carry genetic information

Answer: A

Diff: 1

Learning Outcome: 2-10

Skill Level: 1 Reviewing Facts and Terms

48) A fatty acid that contains only single covalent bonds in its carbon chain is said to be

- A) saturated.
- B) polyunsaturated.
- C) monounsaturated.
- D) hydrogenated.
- E) carboxylated.

Answer: A

Diff: 2

Learning Outcome: 2-10

Skill Level: 1 Reviewing Facts and Terms

49) A class of lipids used to signal cells to undergo changes is called

- A) steroids.
- B) phospholipids.
- C) triglycerides.
- D) hormones.
- E) monoglycerides.

Answer: D

Diff: 1

Learning Outcome: 2-10

Skill Level: 2 Reviewing Concepts

50) Which of the following is a function of proteins?

- A) support
- B) transport
- C) metabolic regulation
- D) movement
- E) all of the above

Answer: E

Diff: 1

Learning Outcome: 2-11

Skill Level: 1 Reviewing Facts and Terms

51) Proteins are composed of units called

- A) amino acids.
- B) simple sugars.
- C) fatty acids.
- D) adenosines.
- E) nucleotides.

Answer: A

Diff: 1

Learning Outcome: 2-11

Skill Level: 1 Reviewing Facts and Terms

52) Enzymes

- A) are lipids.
- B) function as biological catalysts.
- C) raise the activation energy for a reaction.
- D) are carbohydrates.
- E) all of the above

Answer: B

Diff: 1

Learning Outcome: 2-11

Skill Level: 1 Reviewing Facts and Terms

53) Substrate molecules bind to enzymes at the

- A) allosteric sites.
- B) active sites.
- C) reaction sites.
- D) modification sites.
- E) none of the above

Answer: B

Diff: 1

Learning Outcome: 2-11

Skill Level: 1 Reviewing Facts and Terms

54) Which of the following can be denatured?

- A) enzymes.
- B) ions.
- C) atoms.
- D) molecules.
- E) none of the above

Answer: A

Diff: 1

Learning Outcome: 2-11

Skill Level: 2 Reviewing Concepts

55) Each amino acid forms bonds by connecting its carboxyl group to the next amino acid's

- A) central carbon atom.
- B) amino group.
- C) carboxyl group.
- D) R group.
- E) hydroxide group.

Answer: B

Diff: 1

Learning Outcome: 2-11

Skill Level: 2 Reviewing Concepts

56) Molecules that perform most cellular "work" are called

- A) proteins.
- B) nucleic acids.
- C) carbohydrates.
- D) steroids.
- E) lipids.

Answer: A

Diff: 1

Learning Outcome: 2-11

Skill Level: 2 Reviewing Concepts

57) If a polypeptide contains 9 peptide bonds, how many amino acids does it contain?

- A) 0
- B) 5
- C) 10
- D) 11
- E) 12

Answer: C

Diff: 1

Learning Outcome: 2-11

Skill Level: 2 Reviewing Concepts

58) A bond between a phosphate group and a sugar can be found linking together

- A) two simple sugars.
- B) one amino acid to an amino group of another.
- C) two nucleotides.
- D) a fatty acid and a glycerol molecule.
- E) a cholesterol molecule and a fatty-acid molecule.

Answer: C

Diff: 1

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

59) A DNA nucleotide consists of

- A) a five-carbon sugar and a phosphate group.
- B) a five-carbon sugar and a nitrogen base.
- C) a ribose sugar, a nitrogenous base, and a phosphate group.
- D) a deoxyribose sugar, a nitrogenous base, and a phosphate group.
- E) a five-carbon sugar and an amino acid.

Answer: D

Diff: 2

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

60) According to the rules of complementary base pairing, a nucleotide containing the base cytosine would only pair with a nucleotide containing the base

- A) thymine.
- B) adenine.
- C) uracil.
- D) cytosine.
- E) guanine.

Answer: E

Diff: 2

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

61) Which of the following is unique to RNA?

- A) glucose
- B) phosphate group
- C) ribose
- D) adenosine triphosphate
- E) deoxyribose

Answer: C

Diff: 2

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

62) The nucleic acid DNA

- A) is double stranded.
- B) contains uracil in place of thymine.
- C) contains the pentose ribose.
- D) contains protein bases.
- E) synthesizes lipids.

Answer: A

Diff: 1

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

Fill in the Blank Questions

1) A(n) _____ contains atoms with the same atomic number.

Answer: element

Diff: 1

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

2) The area around the center of an atom that contains negatively charged subatomic particles is called the electron _____.

Answer: shell (cloud)

Diff: 2

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

3) Atoms of the same element have the same number of _____ but may have a different number of _____.

Answer: protons; neutrons

Diff: 2

Learning Outcome: 2-1

Skill Level: 2 Reviewing Concepts

4) A molecule containing two atoms of hydrogen and one atom of oxygen in combination is called a(n) _____.

Answer: water molecule

Diff: 1

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

5) Ions with a positive charge are called _____.

Answer: cations

Diff: 2

Learning Outcome: 2-2

Skill Level: 1 Reviewing Facts and Terms

6) Elements that form anions tend to be found on the _____ side of the periodic table.

Answer: right

Diff: 1

Learning Outcome: 2-2

Skill Level: 2 Reviewing Concepts

7) In a _____ reaction, bonds between atoms are broken and atoms are rearranged into new combinations.

Answer: chemical

Diff: 1

Learning Outcome: 2-3

Skill Level: 1 Reviewing Facts and Terms

8) The term that applies to all of the decomposition reactions that occur in metabolism is _____.

Answer: catabolism

Diff: 2

Learning Outcome: 2-3

Skill Level: 1 Reviewing Facts and Terms

9) Reactions that result in larger molecules formed from smaller ones are called _____ reactions.

Answer: synthesis

Diff: 1

Learning Outcome: 2-3

Skill Level: 2 Reviewing Concepts

10) Chemical reactions that occur in the human body are controlled by special protein molecules called _____.

Answer: enzymes

Diff: 2

Learning Outcome: 2-4

Skill Level: 1 Reviewing Facts and Terms

11) In living cells, complex reactions proceed in a sequence of interlocking steps called a metabolic _____.

Answer: pathway

Diff: 2

Learning Outcome: 2-4

Skill Level: 1 Reviewing Facts and Terms

12) Chemical reactions that require an input of energy are said to be _____.

Answer: endergonic

Diff: 2

Learning Outcome: 2-4

Skill Level: 1 Reviewing Facts and Terms

13) _____ compounds do not contain carbon as the primary structural atom.

Answer: Inorganic

Diff: 1

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

14) A mixture of water and a salt would result in breaking down the salt. This process is called _____.

Answer: dissociation or ionization

Diff: 2

Learning Outcome: 2-6

Skill Level: 1 Reviewing Facts and Terms

15) The most acidic solution would have a pH of _____.

Answer: zero (0)

Diff: 1

Learning Outcome: 2-7

Skill Level: 1 Reviewing Facts and Terms

16) _____ are compounds that maintain pH of solutions within given limits.

Answer: Buffers

Diff: 1

Learning Outcome: 2-8

Skill Level: 1 Reviewing Facts and Terms

17) _____ are soluble inorganic compounds whose ions will conduct an electric current in solutions.

Answer: Electrolytes

Diff: 1

Learning Outcome: 2-8

Skill Level: 1 Reviewing Facts and Terms

18) Amino acids contain a central carbon atom adjacent to a(n) _____ group and a(n) _____ group.

Answer: amine; carboxylic acid

Diff: 3

Learning Outcome: 2-11

Skill Level: 1 Reviewing Facts and Terms

19) The molecule DNA contains the five-carbon sugar _____.

Answer: deoxyribose

Diff: 1

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

20) The molecule RNA contains the five-carbon sugar _____.

Answer: ribose

Diff: 1

Learning Outcome: 2-12

Skill Level: 1 Reviewing Facts and Terms

21) A _____ bond is a covalent bond that stores an unusually large amount of energy.

Answer: high-energy

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

22) The hydrolysis of ATP yields the molecule _____.

Answer: ADP

Diff: 2

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

23) The branch of science that concerns itself with the chemistry of living things is referred to as _____.

Answer: biochemistry

Diff: 1

Learning Outcome: 2-14

Skill Level: 1 Reviewing Facts and Terms

Matching Questions

1) Match the terms in the first column with the definitions in the second.

- | | |
|-------------------|---|
| _____ 1. atom | A. cannot be broken down physically |
| _____ 2. element | B. the smallest unit of matter |
| _____ 3. molecule | C. two or more elements bonded together |
| _____ 4. compound | D. two or more atoms sharing electrons |
| _____ 5. ion | E. an electrically charged atom |

Answer: 1-B, 2-A, 3-D, 4-C, 5-E

Diff: 2

Learning Outcome: 2-1

Skill Level: 1 Reviewing Facts and Terms

2) Identify the following compounds as organic (O) or inorganic (I).

1. _____ fatty acid
2. _____ protein
3. _____ hydrogen
4. _____ glycogen
5. _____ sodium

Answer: 1-O, 2-O, 3-I, 4-O, 5-I

Diff: 2

Learning Outcome: 2-5

Skill Level: 1 Reviewing Facts and Terms

3) Identify the following carbohydrates as monosaccharides (M), disaccharides (D), or polysaccharides (P).

1. _____ glucose
2. _____ sucrose
3. _____ fructose
4. _____ lactose
5. _____ glycogen

Answer: 1-M, 2-D, 3-M, 4-D, 5-P

Diff: 2

Learning Outcome: 2-9

Skill Level: 1 Reviewing Facts and Terms

4) Identify the macromolecule type based on the function. Use L for lipids, P for protein, C for carbohydrate, D for DNA, and R for RNA.

1. _____ most of membrane structure
2. _____ major source of energy
3. _____ determines our inherited characteristics
4. _____ controls reaction rates
5. _____ manufactures proteins

Answer: 1-L, 2-C, 3-D, 4-P, 5-R

Diff: 2

Learning Outcome: 2-13

Skill Level: 2 Reviewing Concepts

Essay Questions

1) A certain reaction pathway consists of four steps. How would increasing the amount of enzyme that catalyzes the third step affect the amount of product produced at the end of the pathway?

Answer: Increasing the amount of enzyme at the third step might not affect the whole series of reactions because the rate of the first, second, and fourth enzymes would remain the same. While more substrate would be available for the next step, that doesn't necessarily mean that the fourth enzyme will increase its speed. The net result would be no change if the first, second, and fourth enzyme's were working at maximum before the change is made, or it could be an increase in the amount of product if the first, second, and fourth enzymes were working at submaximum before the change.

Diff: 3

Learning Outcome: 2-4

Skill Level: 3 Critical Thinking & Clinical Applications

2) Why is it life-threatening to have a low pH?

Answer: A low pH can be life-threatening because the change in hydrogen ion concentration can cause certain proteins, such as vital enzymes, to become inactive. When this occurs, the proteins become nonfunctional, and if they catalyze reactions that are necessary for life, life will cease.

Diff: 1

Learning Outcome: 2-7

Skill Level: 3 Critical Thinking & Clinical Applications

3) How does the RNA molecule differ from a DNA molecule?

Answer: RNA is usually single stranded, DNA is double stranded. RNA contains ribose sugars and DNA contains deoxyribose sugars. DNA contains the nitrogenous bases A, G, C, and T, while RNA contains A, G, C, and U.

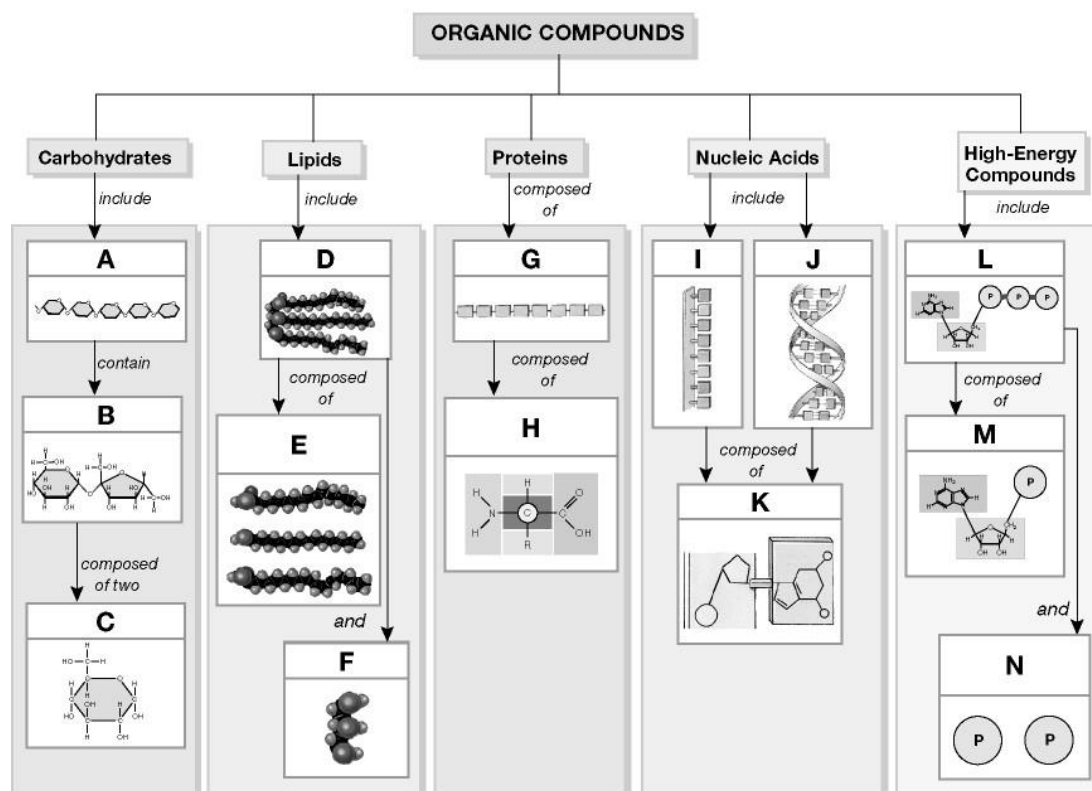
Diff: 2

Learning Outcome: 2-12

Skill Level: 2 Reviewing Concepts

Labeling Exercises

A Structural Overview of Organic Compounds in the Body



Using the figure above, identify the labeled part.

1) Label A: _____

Answer: Polysaccharides

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

2) Label B: _____

Answer: Disaccharides

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

3) Label C: _____

Answer: Monosaccharides

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

4) Label D: _____
Answer: Triglycerides
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

5) Label E: _____
Answer: Fatty acids
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

6) Label F: _____
Answer: Glycerol
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

7) Label G: _____
Answer: Peptides
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

8) Label H: _____
Answer: Amino acids
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

9) Label I: _____
Answer: RNA
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

10) Label J: _____
Answer: DNA
Diff: 1
Learning Outcome: 2-13
Skill Level: 1 Reviewing Facts and Terms

11) Label K: _____

Answer: Nucleotides

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

12) Label L: _____

Answer: ATP

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

13) Label M: _____

Answer: Nucleotide

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms

14) Label N: _____

Answer: Phosphate groups

Diff: 1

Learning Outcome: 2-13

Skill Level: 1 Reviewing Facts and Terms