Essentials of Anatomy and Physiology 8th edition Martini Test Bank

SKU: 9780135203804-TEST-BANK

Essentials of Anatomy & Physiology, 8e **(Martini)**
Chapter 2 The Chemical Level of Organization

2.1 Multiple-Choice Questions

1) An element has 6 electrons, 6 protons, and 6 neutrons. What will be the mass number of that element?
A) 6
B) 12
C) 18
D) 36
E) 15
Answer: B
Learning Outcome: 2-1
Bloom's Taxonomy: Understanding

2) The uncharged subatomic particles are called
A) atoms.
B) molecules.
C) protons.
D) neutrons.
E) electrons.
Answer: D
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

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
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

4) Atoms that are of the same element but contain different numbers of neutrons are called
A) isomers.
B) cations.
C) isotopes.
D) anions.
E) None of these is correct.
Answer: C
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

5) The atomic number 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
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

6) Which statement is **true** regarding atomic structure and function?
A) Electrons and protons comprise the nucleus of the atom.
B) An atom is electrically neutral, having the same number of positively charged protons and negatively charged electrons.
C) Neutrons are found in orbits around the atomic nucleus.
D) The charge of an atom depends on where the protons and electrons are located.
E) All shells around the nucleus optimally contain 8 electrons.
Answer: B
Learning Outcome: 2-1
Bloom's Taxonomy: Understanding

7) A(n) _____ contains atoms with the same atomic number.
A) base
B) element
C) cation
D) anion
E) enzyme
Answer: B
Learning Outcome: 2-1
Bloom's Taxonomy: Understanding

8) The area around the center of an atom, which contains negatively charged subatomic particles, is called the electron
A) cloud.
B) nucleus.
C) active site.
D) buffering zone.
E) double helix.
Answer: A
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

9) Which of the following elements is found in **all** organic molecules?
A) nitrogen
B) oxygen
C) iron
D) carbon
E) copper
Answer: D
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

10) An oxygen atom can have 8, 9, or 10 neutrons in its nucleus. This variation describes
A) atomic number.
B) electric charge.
C) bonding characteristics.
D) isotopes.
E) proton therapy.
Answer: D
Learning Outcome: 2-1
Bloom's Taxonomy: Understanding

11) 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 in an atom.
E) neutrons and electrons in an atom.
Answer: D
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

12) Which of the following is sometimes used in diagnostic imaging?
A) a radioisotope
B) a proton
C) an ion
D) an atom
E) an electrolyte
Answer: A
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

13) How many electrons do **most** atoms need in their second outer shell in order to be stable?
A) two
B) three
C) four
D) six
E) eight
Answer: E
Learning Outcome: 2-1
Bloom's Taxonomy: Remembering

14) If an element is composed of atoms with an atomic number of 8 and a mass number of 14, then an electrically neutral atom of this element contains
A) 6 protons.
B) 6 neutrons.
C) 6 electrons.
D) 14 protons.
E) 14 electrons.
Answer: B
Learning Outcome: 2-1
Bloom's Taxonomy: Understanding

15) Which is the correct description of a molecule?
A) It is an electrically charged atom.
B) It cannot be broken down physically.
C) It is comprised of two or more elements bonded together.
D) It is the smallest unit of matter.
E) It is comprised of two or more atoms sharing electrons.
Answer: E
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

16) Combinations of atoms that contain two or more different elements are called
A) molecules.
B) compounds.
C) mixtures.
D) isotopes.
E) None of these is correct.
Answer: B
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

17) Ions with a negative charge are called
A) cations.
B) anions.
C) radicals.
D) polyatomic ions.
E) None of these is correct.
Answer: B
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

18) Covalent bonds are formed when
A) atoms share electrons.
B) cations and anions are held together by their opposite charges.
C) electrons are exchanged between 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
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

19) The bond between sodium and chlorine is a(n) _____ bond.
A) covalent
B) ionic
C) hydrogen
D) hydrophobic
E) metallic
Answer: B
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

20) A molecule containing two atoms of hydrogen and one atom of oxygen in combination is called a(n)
A) oxygen molecule.
B) carbon dioxide molecule.
C) water molecule.
D) hydroxyl molecule.
E) hydroxide molecule.
Answer: C
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

21) Ions with a positive charge are called
A) anions.
B) bases.
C) metabolites.
D) cations.
E) acids.
Answer: D
Learning Outcome: 2-2
Bloom's Taxonomy: Remembering

22) 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 adjacent molecules.
D) Hydrogen bonds are part of fatty-acid structure.
E) Hydrogen bonds are part of carbohydrate structure.
Answer: C
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

23) Which of the following is an example of an anion?
A) magnesium
B) potassium
C) calcium
D) chloride
E) sodium
Answer: D
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

24) Which of these is a molecule but is **not** considered to be a compound?
A) H_2O
B) CO_2
C) $C_6H_{12}O_6$
D) H_2
E) CO
Answer: D
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

25) 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
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

26) In a molecule of hydrogen, a pair of electrons is shared equally. Such a bond is called a(n)
A) ionic bond.
B) polar covalent bond.
C) nonpolar covalent bond.
D) oxygen covalent bond.
E) hydrogen bond.
Answer: C
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

27) 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
Learning Outcome: 2-2
Bloom's Taxonomy: Understanding

28) 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) 0.
D) -2.
E) -1.
Answer: E
Learning Outcome: 2-2
Bloom's Taxonomy: Applying

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

29) The term that applies to all of the decomposition reactions that occur in metabolism is
A) anabolism.
B) dehydration synthesis.
C) catabolism.
D) ionization.
E) homeostasis.
Answer: C
Learning Outcome: 2-3
Bloom's Taxonomy: Remembering

30) Reactions that ultimately result in larger molecules formed from smaller ones are called _____ reactions.
A) hydrolysis
B) reversible
C) exergonic
D) dissociation
E) synthesis
Answer: E
Learning Outcome: 2-3
Bloom's Taxonomy: Remembering

31) Which statement about the reaction $H_2 + Cl_2 \rightarrow 2HCl$ 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) The reaction is unbalanced.
Answer: B
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

32) When two monosaccharides undergo a dehydration synthesis,
A) a new monosaccharide is formed.
B) a starch is formed.
C) a polysaccharide is formed.
D) a condensation reaction occurs.
E) hydrolysis occurs.
Answer: D
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

33) Hydrolysis is an example of which type of reaction?
A) exchange
B) reversible
C) anabolism
D) synthesis
E) decomposition
Answer: E
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

34) Choose the **most accurate** definition of *chemical reaction*.
A) It is a process in which bonds between atoms are formed or broken.
B) It is the energy of motion.
C) It is an increase in random molecular motion.
D) It is movement or a change in the physical structure of matter.
E) It is the capacity to perform work.
Answer: A
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

35) The reaction $NaOH + HCl \rightarrow NaCl + H_2O$ would be an example of a(n)
A) exchange reaction.
B) decomposition reaction.
C) synthesis reaction.
D) enzyme reaction.
E) metabolic reaction.
Answer: A
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

36) The symbol □, used in visual chemical reactions, means that
A) the chemical reaction can go in either direction.
B) the concentration of the end products is the same as that of the reactants.
C) the substrates can become reactants and vice versa.
D) there is more end product than reactant.
E) input of energy is required.
Answer: A
Learning Outcome: 2-3
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

37) Chemical reactions that occur in the human body are catalyzed by special protein molecules called
A) electrolytes.
B) enzymes.
C) metabolites.
D) steroids.
E) buffers.
Answer: B
Learning Outcome: 2-4
Bloom's Taxonomy: Remembering

38) The addition of energy to start a reaction is called the energy of
A) endergonic control.
B) activation.
C) exergonic control.
D) release.
E) equilibrium.
Answer: B
Learning Outcome: 2-4
Bloom's Taxonomy: Remembering

39) Chemical reactions that release energy are categorized as
A) endergonic.
B) catabolic.
C) anabolic.
D) hydrolytic.
E) exergonic.
Answer: E
Learning Outcome: 2-4
Bloom's Taxonomy: Remembering

40) 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
Learning Outcome: 2-4
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

41) Which is the mechanism of enzyme functioning?
A) Enzymes raise the activation energy of a reaction.
B) Enzymes remove hydrogen ions.
C) Enzymes lower the activation energy of a reaction.
D) Enzymes replace hydrogen ions.
E) Enzymes promote complementary base-pairing.
Answer: C
Learning Outcome: 2-4
Bloom's Taxonomy: Understanding

42) Carbon dioxide is produced as a result of
A) metabolic activity.
B) carbon monoxide instability.
C) oxygen synthesis during aerobic respiration.
D) the breakdown of water into oxygen.
E) glucose synthesis.
Answer: A
Learning Outcome: 2-5
Bloom's Taxonomy: Understanding

43) Which of the following is an organic compound?
A) CO_2
B) CH_4
C) H_2O
D) CCl_4
E) HCl
Answer: B
Learning Outcome: 2-5
Bloom's Taxonomy: Understanding

44) What is the primary composition of organic compounds?
A) carbon and oxygen atoms
B) oxygen and hydrogen atoms
C) oxygen and nitrogen atoms
D) carbon and hydrogen atoms
E) nitrogen and carbon atoms
Answer: D
Learning Outcome: 2-5
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

45) Which of the following pairs of elements can be classified as inorganic **only**?
A) sodium and hydrogen
B) carbon and oxygen
C) calcium and carbon
D) hydrogen and carbon
E) sodium and calcium
Answer: E
Learning Outcome: 2-5
Bloom's Taxonomy: Understanding

46) The best definition of organic material is anything that contains
A) carbon and oxygen covalently bonded.
B) carbon, oxygen, and hydrogen covalently bonded.
C) carbon and hydrogen covalently bonded.
D) hydrogen covalently bonded.
E) carbon, nitrogen, and hydrogen covalently bonded.
Answer: C
Learning Outcome: 2-5
Bloom's Taxonomy: Understanding

47) Which of the following is inorganic?
A) fatty acid
B) protein
C) DNA
D) sodium
E) glycogen
Answer: D
Learning Outcome: 2-5
Bloom's Taxonomy: Understanding

48) Which of the following constitutes **most** of the total body weight in humans?
A) water
B) acids
C) bases
D) salts
E) organic molecules
Answer: A
Learning Outcome: 2-6
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

49) A mixture of water and a salt would result in breaking down the salt into a mixture of cations and anions. This process is called
A) dehydration synthesis.
B) dissociation.
C) hydrolysis.
D) condensation reaction.
E) equilibrium.
Answer: B
Learning Outcome: 2-6
Bloom's Taxonomy: Understanding

50) Water is an excellent solvent because
A) it dissolves all solutes.
B) water molecules covalently bond with atoms in other molecules.
C) it has a high heat capacity.
D) it makes up a major part of every cell.
E) water molecules are polar.
Answer: E
Learning Outcome: 2-6
Bloom's Taxonomy: Understanding

51) A solution containing more hydrogen ions than hydroxide ions is
A) acidic.
B) basic.
C) neutral.
D) alkaline.
E) organic.
Answer: A
Learning Outcome: 2-7
Bloom's Taxonomy: Remembering

52) The **most acidic** solution would have a pH of
A) 0.
B) 7.
C) 14.
D) 4.
E) 10.
Answer: A
Learning Outcome: 2-7
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

53) Which of the following substances would be nearest the pH of human blood?
A) milk, pH ≈ 6.5
B) pure water, pH ≈ 7
C) tomato juice, pH ≈ 4
D) wine, pH ≈ 3
E) stomach secretions, pH ≈ 1
Answer: B
Learning Outcome: 2-7
Bloom's Taxonomy: Applying

54) Why is it important to precisely regulate the pH of blood or other body fluids?
A) Blood functions as an excellent solvent.
B) Blood and other body fluids have a very high heat capacity.
C) Dehydration synthesis of large molecules occurs.
D) Hydrogen ions are extremely reactive.
E) Some organic molecules have polar covalent bonds.
Answer: D
Learning Outcome: 2-7
Bloom's Taxonomy: Understanding

55) If a substance resists changes in pH, either by removing or replacing hydrogen ions, it is called
A) neutral.
B) acidic.
C) alkaline.
D) a buffer.
E) a salt.
Answer: D
Learning Outcome: 2-8
Bloom's Taxonomy: Remembering

56) _____ are compounds that maintain the pH of solutions within given limits.
A) Enzymes
B) Electrolytes
C) Metabolites
D) Isotopes
E) Buffers
Answer: E
Learning Outcome: 2-8
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

57) Which of the following are defined as soluble inorganic compounds whose ions will conduct an electric current in solutions?
A) catalysts
B) electrolytes
C) strong acids
D) buffers
E) steroid hormones
Answer: B
Learning Outcome: 2-8
Bloom's Taxonomy: Remembering

58) During ionization, water molecules disrupt the ionic bonds of a solute, resulting in a mixture of ions that can conduct an electrical current in solution. These ions are called
A) cations.
B) anions.
C) isotopes.
D) electrolytes.
E) reactants.
Answer: D
Learning Outcome: 2-8
Bloom's Taxonomy: Remembering

59) A buffer
A) removes or replaces hydrogen ions in a solution.
B) is a compound with an extra electron in its outer shell.
C) has an unstable nucleus, making it highly reactive.
D) donates hydrogen ions to a solution.
E) consists of long carbon-carbon chains.
Answer: A
Learning Outcome: 2-8
Bloom's Taxonomy: Remembering

60) Which of the following is an example of a strong base?
A) NaCl
B) NaOH
C) HCl
D) KF
E) H_2O
Answer: B
Learning Outcome: 2-8
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

61) When placed in solution, an inorganic substance dissociates completely, 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
Learning Outcome: 2-8
Bloom's Taxonomy: Understanding

62) Functionally, carbohydrates are **most important** as
A) storage of glucose molecules.
B) a part of nucleic acid structure.
C) sources of energy.
D) receptors of the cell surface.
E) insulation under the skin.
Answer: C
Learning Outcome: 2-9
Bloom's Taxonomy: Remembering

63) The **most important** metabolic fuel molecule in the body is
A) sucrose.
B) starch.
C) protein.
D) vitamin B_{12}.
E) glucose.
Answer: E
Learning Outcome: 2-9
Bloom's Taxonomy: Remembering

64) Which of the following is an example of a disaccharide?
A) starch
B) glycogen
C) sucrose
D) cellulose
E) fructose
Answer: C
Learning Outcome: 2-9
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

65) Which carbohydrate and example pair are **not** correctly matched?
A) glycogen - monosaccharide
B) glucose - monosaccharide
C) starch - polysaccharide
D) fructose - monosaccharide
E) sucrose - disaccharide
Answer: A
Learning Outcome: 2-9
Bloom's Taxonomy: Remembering

66)

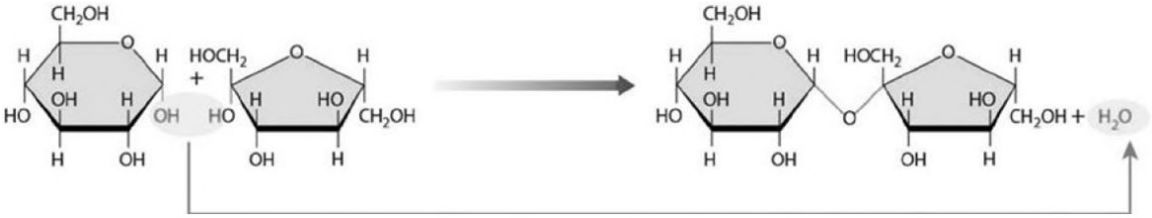


Figure 2-1 A Chemical Reaction
Use Figure 2-1 to answer the following question:

Determine which reaction is shown in the figure and specify its mechanism of action.
A) The addition of a water molecule breaks down a complex molecule.
B) The removal of a water molecule breaks down a complex molecule.
C) Ionic bonds are broken apart as individual ions interact with the positive or negative ends of polar water molecules.
D) The removal of a water molecule facilitates the union of two molecules.
E) The addition of a water molecule facilitates the union of two molecules.
Answer: D
Learning Outcome: 2-9
Bloom's Taxonomy: Applying

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

67)

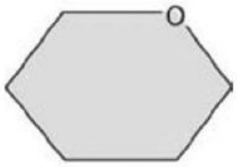


Figure 2-2 A Molecule
Use Figure 2-2 to answer the following question:

The molecule shown in the figure is considered to be the **most important** metabolic "fuel" in the body. Choose the **best** category of molecules to which it belongs.
A) steroid
B) saturated fatty acid
C) monoglyceride
D) cholesterol
E) monosaccharide
Answer: E
Learning Outcome: 2-9
Bloom's Taxonomy: Understanding

68) Lipids are used for which of the following?
A) to form essential structural components of cells
B) to provide roughly 10 times as much energy as carbohydrates
C) to help reduce body temperature
D) to help protect the skeleton
E) to carry genetic information
Answer: A
Learning Outcome: 2-10
Bloom's Taxonomy: Understanding

69) A class of lipids used as chemical messengers, to signal cells to undergo changes, is called
A) polysaccharides.
B) phospholipids.
C) triglycerides.
D) steroids.
E) monoglycerides.
Answer: D
Learning Outcome: 2-10
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

70) 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) fatty acid.
Answer: B
Learning Outcome: 2-10
Bloom's Taxonomy: Understanding

71) 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
Learning Outcome: 2-10
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

72)

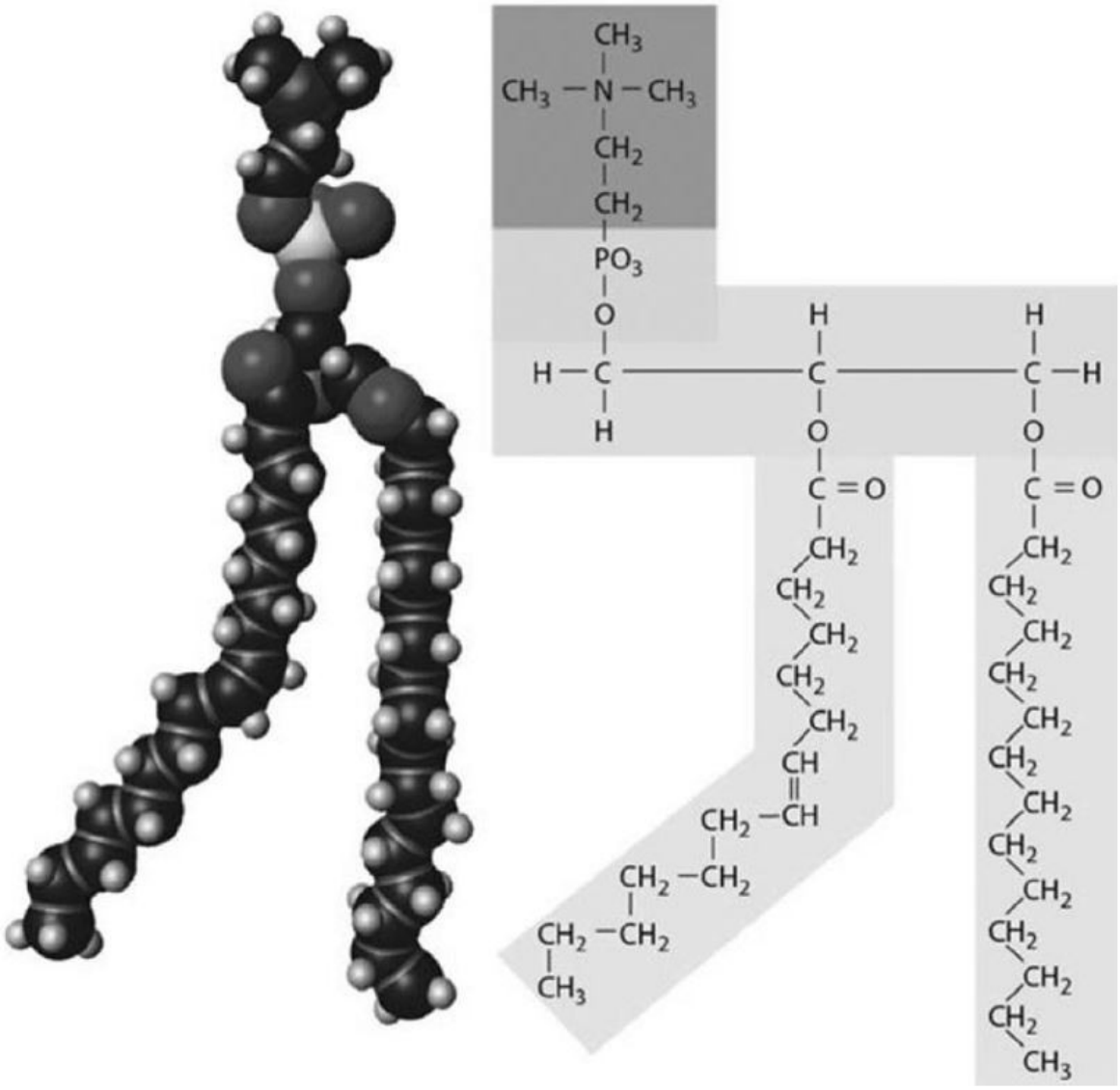


Figure 2-3 A Structure
Use Figure 2-3 to answer the following question:

Indicate the primary function(s) of the structure shown in the figure.
A) structural component of cell membranes
B) storage of glucose molecules
C) energy source
D) structural component of cell membranes, hormones, and digestive secretions in bile
E) energy source, energy storage, and insulation
Answer: A
Learning Outcome: 2-10
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

73) Enzymes
A) are lipids.
B) function as biological catalysts.
C) raise the activation energy for a reaction.
D) are carbohydrates.
E) are derived from cholesterol.
Answer: B
Learning Outcome: 2-11
Bloom's Taxonomy: Remembering

74) Substrate molecules bind to enzymes at the
A) allosteric sites.
B) modification sites.
C) reaction sites.
D) active sites.
E) ionic sites.
Answer: D
Learning Outcome: 2-11
Bloom's Taxonomy: Remembering

75) Proteins are composed of units called
A) amino acids.
B) simple sugars.
C) fatty acids.
D) adenosines.
E) nucleotides.
Answer: A
Learning Outcome: 2-11
Bloom's Taxonomy: Remembering

76) 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) hydroxyl group.
E) hydroxide group.
Answer: B
Learning Outcome: 2-11
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

77) You are working with a particular protein in your research lab to determine how its properties affect the function of the protein. To determine what consequences there might be on protein function, you decide to change just one amino acid of the entire length of the protein, which consists of a total of 100 amino acids. You have just directly changed the _____ structure of the protein.
A) primary
B) secondary
C) tertiary
D) quaternary
E) binary
Answer: A
Learning Outcome: 2-11
Bloom's Taxonomy: Applying

78) Some proteins, like hemoglobin or antibody molecules, require multiple polypeptide chains to come together to act as a single protein. If the association among the different polypeptide chains is blocked, the _____ structure of the protein is destroyed.
A) primary
B) secondary
C) tertiary
D) quaternary
E) binary
Answer: D
Learning Outcome: 2-11
Bloom's Taxonomy: Understanding

79) Which of the following can be denatured?
A) enzymes
B) ions
C) atoms
D) molecules
E) isotopes
Answer: A
Learning Outcome: 2-11
Bloom's Taxonomy: Understanding

80) Amino acids contain a central carbon atom adjacent to a(n) _____ group and a(n) _____ group.
A) carboxyl; phosphate
B) nitrogenous; carboxyl
C) nitrogenous; amino
D) amino; carboxyl
E) amino; phosphate
Answer: D
Learning Outcome: 2-11
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

81) If a polypeptide contains 9 peptide bonds, how many amino acids does it contain?
A) 0
B) 5
C) 12
D) 11
E) 10
Answer: E
Learning Outcome: 2-11
Bloom's Taxonomy: Applying

82) Which of the following is unique to RNA?
A) glucose
B) phosphate group
C) ribose
D) adenosine triphosphate
E) deoxyribose
Answer: C
Learning Outcome: 2-12
Bloom's Taxonomy: Remembering

83) 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
Learning Outcome: 2-12
Bloom's Taxonomy: Remembering

84) The molecule DNA contains the unique five-carbon sugar
A) ribose.
B) pentose.
C) deoxyribose.
D) sucrose.
E) fructose.
Answer: C
Learning Outcome: 2-12
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

85) Which nitrogenous base is unique to RNA molecules?
A) uracil
B) cytosine
C) adenine
D) guanine
E) thymine
Answer: A
Learning Outcome: 2-12
Bloom's Taxonomy: Remembering

86) 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
Learning Outcome: 2-12
Bloom's Taxonomy: Understanding

87) A DNA nucleotide specifically 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
Learning Outcome: 2-12
Bloom's Taxonomy: Understanding

88) 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
Learning Outcome: 2-12
Bloom's Taxonomy: Remembering

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

89) A(n) _____ bond is a covalent bond that stores an unusually large capacity to perform work.
A) high-energy
B) polar covalent
C) ionic
D) electrically neutral
E) peptide
Answer: A
Learning Outcome: 2-13
Bloom's Taxonomy: Remembering

90) The hydrolysis of ATP yields the molecule
A) adenine.
B) phospholipid.
C) ribose.
D) thymine.
E) adenosine diphosphate.
Answer: E
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

91) Choose the correct pairing of macromolecule type to its function.
A) lipid - manufactures proteins
B) DNA - controls reaction rates
C) carbohydrate - major source of energy
D) protein - comprises majority of membrane structure
E) RNA - determines our inherited characteristics
Answer: C
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

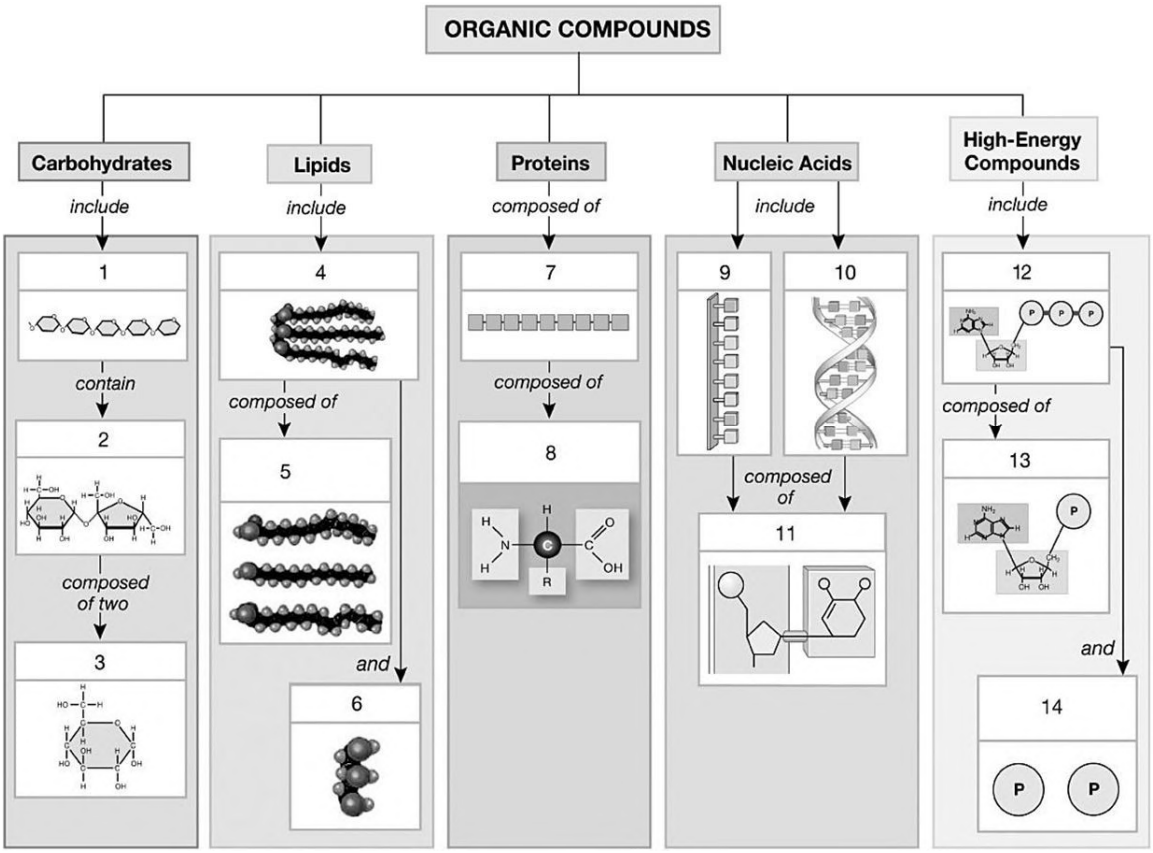


Figure 2-4 An Overview of the Structures of Organic Compounds in the Body
Use Figure 2-4 to answer the following questions:

92) Glucose-based starches are an example of the structure labeled #1. Identify the structure.
A) triglyceride
B) polysaccharide
C) glycerol
D) steroid
E) phospholipid
Answer: B
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

93) Identify the structure labeled #5, a component of triglycerides, which is comprised of long chains of carbon atoms with attached hydrogen atoms that end in a carboxyl group.
A) glycerol
B) monosaccharide
C) amino acid
D) nucleotide
E) fatty acid
Answer: E
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

94) Identify the structure labeled #8, which is a building block of proteins.
A) nucleic acid
B) peptide
C) amino acid
D) monosaccharide
E) lauric acid
Answer: C
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

95) What is/are the primary function(s) of the structure labeled #9?
A) determines an individual's inherited characteristics
B) structural role when attached to lipids
C) energy source; insulation
D) manufactures specific proteins
E) storage or transfer of energy
Answer: D
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

96) Phospholipids consist of _____ linked to a non-lipid group by a phosphate group.
A) four connected rings of carbon atoms
B) a glycerol and three fatty acids
C) a glycerol and two fatty acids
D) long chains of carbon atoms with attached hydrogen atoms that end in a carboxyl group
E) interconnected glucose molecules
Answer: C
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

97) ATP is **most closely** related to
A) a fatty acid.
B) an amino acid.
C) a monosaccharide.
D) a nucleotide.
E) cholesterol.
Answer: D
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

98) The difference between AMP, ADP, and ATP molecules is the
A) type of monosaccharide sugar.
B) type of bond–whether ionic or covalent.
C) presence or absence of nitrogen.
D) structure of the molecule–primary, secondary, or tertiary structure.
E) number of phosphates in the molecule.
Answer: E
Learning Outcome: 2-13
Bloom's Taxonomy: Understanding

99) Which statement is **true** about cells?
A) Carbohydrates direct the production of all proteins made by the cell.
B) Enzymes, required by the cell for chemical reactions, consist of nucleotides.
C) A cell is composed of all of the 4 major organic compound groups.
D) All carbohydrates in a cell come from the diet that the organism eats.
E) A membrane of nucleic acids separates the cell from its environment and gives the cell its feature of semipermeability.
Answer: C
Learning Outcome: 2-14
Bloom's Taxonomy: Understanding

100) Both chemically- and structurally-speaking, which of these compounds does **not** belong?
A) carbohydrates
B) lipids
C) proteins
D) salts
E) nucleic acids
Answer: D
Learning Outcome: 2-14
Bloom's Taxonomy: Analyzing

101) A chemical that you are working with has the elements carbon, hydrogen, oxygen, nitrogen, and phosphorus. In addition, ribose sugar is within its structure. What kind of compound is this molecule?
A) carbohydrate
B) lipid
C) protein
D) salt
E) nucleic acid
Answer: E
Learning Outcome: 2-14
Bloom's Taxonomy: Analyzing

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank

2.2 Essay Questions

1) A certain reaction pathway consists of four steps. How would increasing the amount of enzyme that catalyzes in 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 enzymes were working optimally before the change is made. On the other hand, there could be an increase in the amount of product if the first, second, and fourth enzymes were working at below optimum before the change.
Learning Outcome: 2-4
Bloom's Taxonomy: Analyzing

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.
Learning Outcome: 2-11
Bloom's Taxonomy: Analyzing

3) Prions are infectious proteins within cells that cause normal proteins to misfold and clump together. Prions can occur as a result of a mutation or ingestion, e.g., Mad Cow disease (eating infectious beef from an animal with the disease). Creutzfeldt-Jakob disease and scrapie are prion diseases in both animals and humans. The diseases are progressive, have no cure, and end in death. Using your chemistry knowledge, explain the devastating effects of these diseases.
Answer: Prions are proteins that cause other cellular proteins to misfold and clump, producing a chain reaction resulting in the structural change of proteins. When the structure of a protein changes, the function of that protein changes. So as a result of infectious prion proteins, normal cellular proteins cease to exist in their normal state and, therefore, do not function in their normal way. Because proteins are so prevalent inside of cells and have so many functions that are essential, including enzymatic actions, the cell cannot function normally and dies.
Learning Outcome: 2-11
Bloom's Taxonomy: Analyzing

4) How does the RNA molecule differ from a DNA molecule?
Answer: RNA is usually single stranded and 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.
Learning Outcome: 2-12
Bloom's Taxonomy: Understanding

Copyright © 2020 Pearson Education, Inc.

Essentials of Anatomy and Physiology 8th edition Martini Test Bank