Principles of Anatomy and Physiology 15th edition Tortora Test Bank

SKU: 9781119329398-TEST-BANK

Package Title: Testbank
Course Title: PAP15
Chapter Number: 02
Shuffle: Yes
Case Sensitive: No

Question type: Multiple Choice

1) What are the four major elements found in the chemicals that comprise the human body?

a) nitrogen, oxygen, calcium, sodium
b) hydrogen, carbon, phosphorus, calcium
c) carbon, hydrogen, oxygen and nitrogen
d) oxygen, nitrogen, potassium, calcium
e) potassium, phosphorus, sodium, hydrogen

Answer: c

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.1 Identify the main chemical elements of the human body.
Section Reference 1: Sec 2.1 How Matter is Organized

2) The three types of subatomic particles that are important for understanding chemical reactions in the human body are

a) neutrons, quarks, and muons.
b) protons, neutrons, and electrons.
c) muons, positons, and neutrons.
d) electrons, quarks, and protons.
e) positons, protons, and neutrons.

Answer: b

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.1 Identify the main chemical elements of the human body.
Section Reference 1: Sec 2.1 How Matter is Organized

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

3) Which of the following subatomic particles has/have a neutral charge?

a) neutron
b) electron
c) proton
d) Both neutron and electron.
e) All of these choices.

Answer: a

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

4) What region of an atom contains the protons and neutrons?

a) cloud
b) nucleus
c) element
d) ring
e) shell

Answer: b

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

5) The number of protons in an atom is represented by an element's

a) mass number.
b) atomic number.
c) atomic mass.
d) valence number.

e) None of these choices.

Answer: b

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

6) The nucleus of unstable _____ of an element will decay leading to emission of radiation.

a) compounds
b) cations
c) anions
d) isotopes
e) molecules

Answer: d

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

7) This refers to a weighted average of the atomic weights of all naturally occurring isotopes of an element.

a) mass number
b) atomic number
c) atomic mass
d) ionic mass
e) covalent mass

Answer: c

Difficulty: Medium
Bloomcode: Comprehension

Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

Question type: Essay

8) Briefly describe the octet rule.

Answer:

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
~~Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.~~
Section Reference 1: Sec 2.2 Chemical Bonds
Solution: One atom is more likely to combine with another atom if doing so will leave both atoms with eight electrons in their valence shells.

Question type: Multiple Choice

9) Which of the following subatomic particles are shared by two atoms to form covalent bonds?
1. neutron
2. electron
3. proton

a) 1 only
b) 2 only
c) 3 only
d) 2 & 3 only
e) 1, 2 & 3

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.

Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
~~Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.~~
Section Reference 1: Sec 2.2 Chemical Bonds

10) What is the name given to a negatively charged atom?

a) superoxide
b) isotope
c) catalyst
d) anion
e) cation

Answer: d

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds~~.
Section Reference 1: Sec 2.2 Chemical Bonds

11) A chemical that can conduct electrical current when dissolved in water is called a(n)

a) isotope.
b) isomer.
c) compound.
d) electrolyte
e) valence molecule.

Answer: d

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

12) Which type of chemical bond involves the sharing of valence electron pairs between two atoms?

a) covalent

b) ionic
c) hydrogen
d) atomic
e) electronic

Answer: a

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
Learning Objective 2~~3~~: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

13) The chemical bonds formed between the oxygen and hydrogen atoms making up a water molecule are called

a) nonpolar covalent bonds.
b) polar covalent bonds.
c) hydrogen bonds.
d) ionic bonds.
e) atomic bonds.

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
Learning Objective 2~~3~~: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

Question type: Essay

14) Describe a hydrogen bond.

Answer:

Difficulty: Medium
Bloomcode: Comprehension

Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
Learning Objective 23: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds
Solution: Hydrogen bonds form between a hydrogen atom that has partial positive charge and another atom, like oxygen or nitrogen, carrying partial negative charge.

Question type: Multiple Choice

15) Which relatively weak type of bond helps stabilize the three dimensional structure of large molecules like proteins and DNA?

a) nonpolar covalent
b) polar covalent
c) hydrogen
d) ionic
e) atomic

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
Learning Objective 23: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

16) A chemical reaction involves interactions between the _____ of two different atoms.

a) neutrons
b) protons
c) isotopes
d) valence electrons
e) ions

Answer: d

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.

Learning Objective 2: LO 2.3.1 Define a chemical reaction.
~~Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.~~
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
~~Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.~~
Section Reference 1: Sec 2.3 Chemical Reactions ~~2.2 Chemical Bonds~~

17) Which term is defined as the capacity to do work?

a) metabolism
b) electrolytes
c) chemical reaction
d) concentration
e) energy

Answer: e

Difficulty: Easy ~~Medium~~
Bloomcode: Knowledge
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
Learning Objective 2: LO 2.3.1 Define a chemical reaction.
~~Learning Objective 3: LO 2.3.2 Describe the various forms of energy.~~
Section Reference 1: Sec 2.3 Chemical Reactions

Question type: Essay

18) Describe the law of conservation of energy.

Answer:

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
Learning Objective 2~~3~~: LO 2.3.2 Describe the various forms of energy.
Section Reference ~~2~~1: 2.3 Chemical Reactions
Solution: Energy cannot be created or destroyed but it may be converted from one form to another form.

Question type: Multiple Choice

19) Which type of chemical reaction will absorb more energy than it releases?

a) exergonic
b) endergonic
c) potential
d) kinetic
e) activation

Answer: b

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
Learning Objective 2~~3~~: LO 2.3.2 Describe the various forms of energy.
Section Reference 1: Sec 2.3 Chemical Reactions

20) An enzyme acts to

a) raise the activation energy needed to start the reaction.
b) lower the activation energy needed to start the reaction.
c) convert the activation energy into potential energy.
d) convert the activation energy into kinetic energy.
e) stop a chemical reaction.

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
~~Learning Objective 3: LO 2.3.2 Describe the various forms of energy.~~
Learning Objective 2~~4~~: LO 2.3.4 Describe the role of activation energy and catalysts in chemical reactions.
Section Reference 1: Sec 2.3 Chemical Reactions

Question type: Essay

21) List three factors that increase the rate of chemical reactions.

Answer:

Difficulty: Hard
Bloomcode: Application
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
~~Learning Objective 3: LO 2.3.2 Describe the various forms of energy.~~
Learning Objective 2~~4~~: LO 2.3.4 Describe the role of activation energy and catalysts in chemical reactions.
Section Reference 1: Sec 2.3 Chemical Reactions
Solution: Three factors that increase reaction rates are the presence of enzymes (catalysts), increased concentration of reactants, and increased temperature.

Question type: Multiple Choice

22) Which type of chemical reaction combines reactants to produce larger products?

a) synthesis
b) decomposition
c) potential
d) exchange
e) activated

Answer: a

Difficulty: Easy ~~Medium~~
Bloomcode: Knowledge
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
Learning Objective 2~~3~~: LO 2.3.5 Describe synthesis, decomposition, exchange, and reversible reactions.
Section Reference 1: Sec 2.3 Chemical Reactions

23) Which type of chemical reaction breaks larger reactants into smaller products?

a) synthesis
b) decomposition
c) potential
d) exchange
e) activated

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
~~Learning Objective 2: LO 2.3.1 Define a chemical reaction.~~
Learning Objective 2~~3~~: LO 2.3.5 Describe synthesis, decomposition, exchange, and reversible reactions.
Section Reference 1: Sec 2.3 Chemical Reactions

24) What is the most abundant and most important inorganic compound in the body?

a) water
b) oxygen gas
c) carbon dioxide
d) glucose
e) DNA

Answer: a

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.1 Describe the properties of water and those of inorganic acids, bases, and salts.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

25) A solute that readily dissolves in water is

a) hydrophobic.
b) hydrostatic.
c) lipophilic.
d) hydrophilic.
e) hydrozone.

Answer: d

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.

Learning Objective 2: LO 2.4.1 Describe the properties of water and those of inorganic acids, bases, and salts.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

26) In the body fluid ~~compartments found in~~ of the human body, the solvent is

a) glucose.
b) lipids.
c) carbon dioxide.
d) water.
e) electrolyte.

Answer: d

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.1 Describe the properties of water and those of inorganic acids, bases, and salts.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

Question type: Essay

27) Describe the functions of water in the body.

Answer:

Difficulty: Hard
Bloomcode: Application
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.1 Describe the properties of water and those of inorganic acids, bases, and salts.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions
Solution: Water is a Solvent that allows transportation of Solutes. Water acts in hydrolysis reactions to split reactants. Water can transport heat in the body and can be used to release heat from the body as occurs in sweating. Water is used as a lubricant, particularly in serous fluids like those surrounding the lungs and on mucosal membranes like those lining the gastrointestinal tract.

Question type: Multiple Choice

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

28) A solution with a pH value less than 7 is

a) basic.
b) neutral.
c) acidic.
d) alkaline.
e) concentrated.

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.3 Define pH and explain the role of buffer systems in homeostasis.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

29) A chemical compound that helps control the pH of a solution by adding or removing hydrogen ions is a(n)

a) electrolyte.
b) salt.
c) cation.
d) colloid.
e) buffer.

Answer: e

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.3 Define pH and explain the role of buffer systems in homeostasis.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

30) Which of the following is a proton donor?

a) acid
b) base
c) salt
d) organic compound
e) colloid

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

Answer: a

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.1 Describe the properties of water and those of inorganic acids, bases, and salts.
~~Learning Objective 2: LO 2.4.3 Define pH and explain the role of buffer systems in homeostasis~~.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

31) Specific arrangements of atoms within an organic molecule that confer characteristic chemical properties upon that molecule are called

a) hydrocarbon chains.
b) polymers.
c) carbon skeleton.
d) functional groups.
e) isomers.

Answer: d

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.5 Describe the importance of carbon and functional groups in the structure of organic molecules.
Learning Objective 2: LO 2.5.1 Describe the functional groups of organic molecules.
Section Reference 1: Sec 2.5 Organic Compounds

32) Which of the following is a monosaccharide that is used by cells to produce energy?

a) glucose
b) sucrose
c) lactose
d) glycogen
e) maltose

Answer: a

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates

33) Which of the following is a polysaccharide that serves as a storage form of energy in muscle and liver cells?

a) cellulose
b) ribose
c) lipids
d) glucose
e) glycogen

Answer: e

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates

34) This type of fatty acid contains more than one double bond in its hydrocarbon chain.

a) saturated
b) monounsaturated
c) polyunsaturated
d) volatile
e) short chain

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates

35) This type of lipid is the body's primary long-term energy storage molecule.

a) steroid
b) phospholipid
c) cholesterol
d) triglyceride
e) lipoprotein

Answer: d

Difficulty: Medium

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

Bloomcode: Comprehension
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.1 Identify the different types of lipids.
Section Reference 1: Sec 2.7 Lipids

36) This lipid is used by the body as a precursor for the production of steroid hormones.

a) arachidonic acid
b) phospholipid
c) cholesterol
d) triglyceride
e) lipoprotein

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.2 Discuss the functions of lipids.
Section Reference 1: Sec 2.7 Lipids

37) Which of the following is NOT true about phospholipids?

a) They contain a glycerol backbone.
b) The head group is polar.
c) The molecule is an important part of cell membranes.
d) The tail groups are nonpolar.
e) They are a major form of energy storage.

Answer: e

Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.2 Discuss the functions of lipids.
Section Reference 1: Sec 2.7 Lipids

Question type: Essay

38) Describe the structural characteristics of an amino acid.

Answer:

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates
Solution: Amino acids contain a central carbon atom with 1) a hydrogen atom, 2) an amino group, 3) an acidic carboxyl group, and 4) a side chain attached to it.

39) List the six major functions of proteins.

Answer:

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.2 Describe the functional roles of proteins.
Section Reference 1: Sec 2.8 Proteins
Solution: Proteins have 1) structural, 2) regulatory, 3) contractile, 4) immunological, 5) transport, and 6) catalytic functions.

Question type: Multiple Choice

40) The primary structure of a protein consists of

a) alpha helices.
b) beta-pleated sheets.
c) three dimensional folded conformation.
d) a sequence of amino acids linked by peptide bonds.
e) the overall folded conformation of the protein's subunits.

Answer: d

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.1 Identify the building blocks of proteins.
Section Reference 1: Sec 2.8 Proteins

41) Which of the following is NOT a property of enzymes?

a) Enzymes are catalytic proteins.
b) Enzymes are highly specific.

c) Enzymes are efficient.
d) Enzymes are subject to a variety of cellular controls.
e) Enzymes are irreversibly changed by the reactions that they catalyze.

Answer: e

Difficulty: Medium
Bloomcode: Analysis
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.2 Describe the functional roles of proteins.
Section Reference 1: Sec 2.8 Proteins

Question type: Essay

42) Describe what happens to a protein's structure and function when it is denatured.

Answer:

Difficulty: Hard
Bloomcode: Application
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.2 Describe the functional roles of proteins.
Section Reference 1: Sec 2.8 Proteins
Solution: During denaturation, the folded conformation of a protein unravels and loses its unique shape. Loss of that shape destroys the protein's ability to accomplish its function.

Question type: Multiple Choice

43) Which of the following is a common function of RNA?

a) produces electrical impulses
b) ~~storage of energy~~ transfers energy for cellular metabolism
c) ~~transfer information~~ carries genetic code needed for protein synthesis
d) ~~long-term storage of information for~~ carries inherited genetic code that controls protein synthesis
e) transports ~~of~~ fluids

Answer: c

Difficulty: Medium
Bloomcode: Comprehension

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

Learning Objective 1: LO 2.9 Describe the structure and functions of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).
Section Reference 1: Sec 2.9 Nucleic Acids

44) Which of the following is the major function of DNA?

a) catalyzes metabolic reactions
b) ~~storage of energy~~ transfers energy for cellular metabolism
c) ~~transfer information~~ carries genetic code needed for protein synthesis
d) ~~long-term storage of information for~~ carries inherited genetic code that controls protein synthesis
e) transports ~~of~~ electrolytes

Answer: d

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.9 Describe the structure and functions of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).
Section Reference 1: Sec 2.9 Nucleic Acids

45) Which of the following describes the major function of ATP in cells?

a) forms the building blocks for the synthesis of proteins.
b) transfers energy for cell functions
c) ~~transfers information~~ carries genetic code needed for protein synthesis
d) ~~stores information for~~ carries inherited genetic code that controls protein synthesis
e) transports fluids

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: Sec 2.10 Describe the functional role of adenosine triphosphate (ATP).
Section Reference 1: Sec 2.10 Adenosine Triphosphate

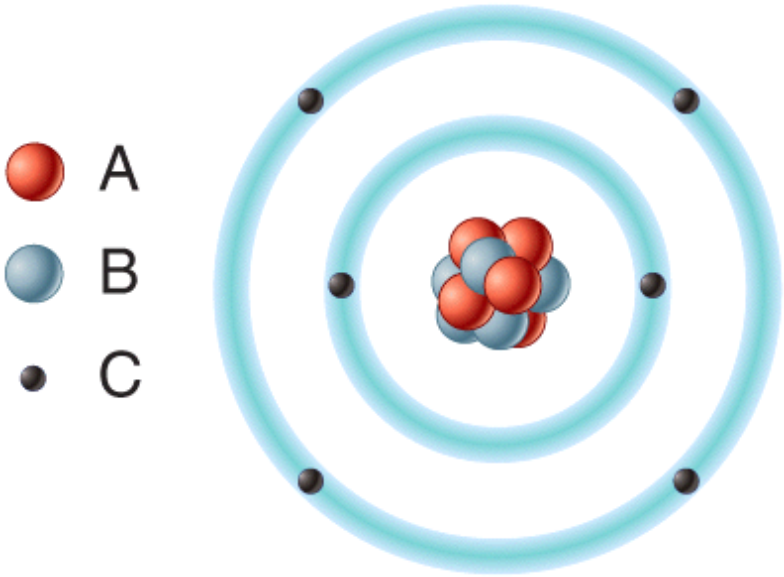
46) Which monomer is used to build RNA and DNA?

a) fatty acid
b) amino acid
c) monosaccharide
d) glycerol
e) nucleotide

Answer: e

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.9 Describe the structure and functions of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).
Section Reference 1: Sec 2.9 Nucleic Acids

47) In the diagram which particles are negatively charged?

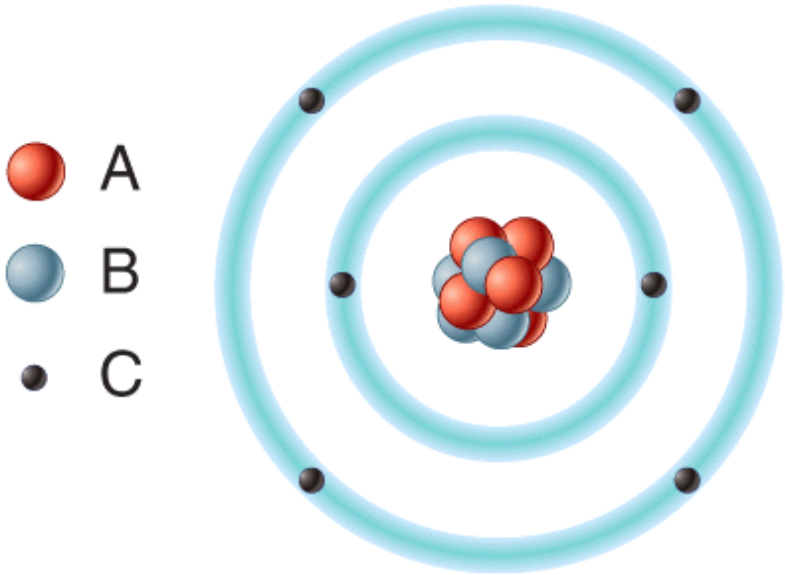


a) A
b) B
c) C
d) All of these choices.
e) None of these choices.

Answer: c

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

48) In the diagram, removal of one or more of this type of subatomic particle would result in the formation of a cation?



a) A
b) B
c) C
d) All of these choices.
e) None of these choices.

Answer: ~~b~~ c

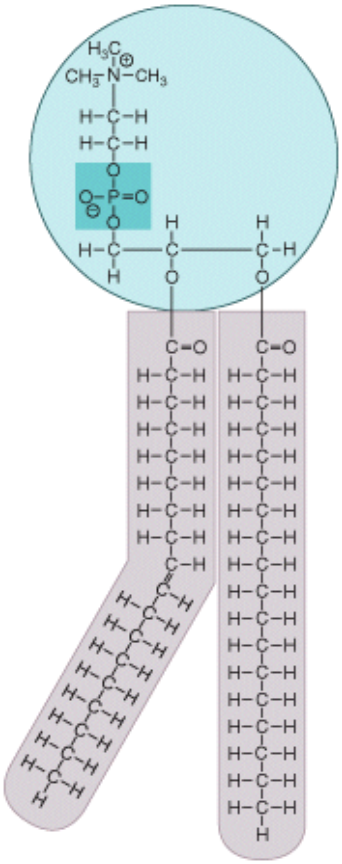
Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

Question type: Essay

Answer:

49) What type of molecule is shown in the diagram? Where in a human body cell would this type of molecule be commonly found? What special chemical properties does this molecule possess

that allows it to accomplish its functions?

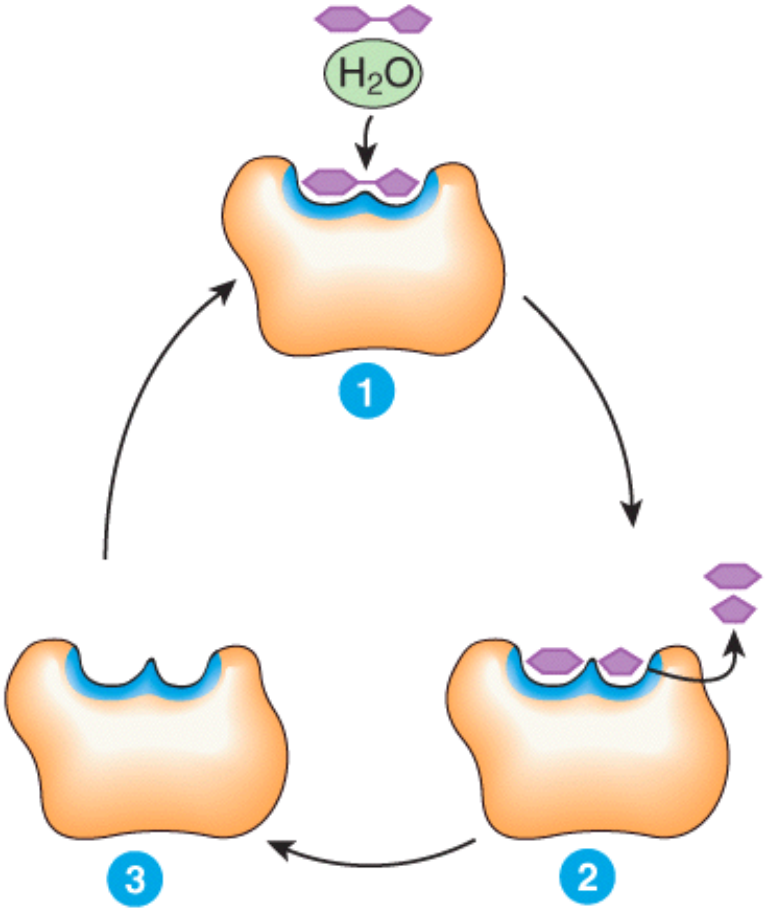


Answer:

Difficulty: Medium
Bloomcode: Analysis
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.2 Discuss the functions of lipids.
Section Reference 1: Sec 2.7 Lipids
Solution: This is a phospholipid found in the plasma membranes of eukaryotic cells. It has a polar hydrophilic head group and a nonpolar hydrophobic tail group making it amphipathic. This chemical property allows it to form the lipid bilayer of the membrane with its polar group oriented on the surface of the membrane and its hydrophobic tails oriented away from the surrounding water in the interior of the lipid bilayer.

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

50) Describe what is happening at places 1, 2 and 3 in the diagram.

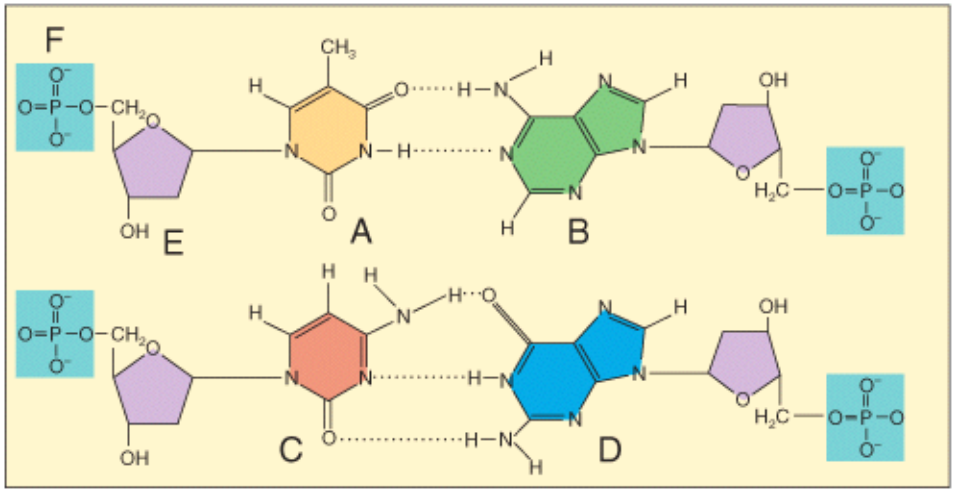


Answer:

Difficulty: Hard
Bloomcode: Application
Learning Objective 1: LO 2.5 Describe the importance of carbon and functional groups in the structure of organic molecules.
Learning Objective 2: LO 2.5.1 Describe the functional groups of organic molecules.
Section Reference: 1. 2.5 Organic Compounds
Solution: This figure represents how an enzyme works. At number one, the enzyme and substrate come together at the active site of the enzyme forming the enzyme-substrate complex. At number two, the enzyme catalyzes the reaction and transforms the substrate into products, which are then released from the enzyme. At number three, the reaction is complete and the enzyme remains unchanged and free to catalyze the same reaction again on a new substrate.

Question type: Multiple Choice

51) Which of the labeled structures are found in DNA but not RNA?



1 A
2 B
3 C
4 E

a) 1 only
b) 2 only
c) 3 only
d) 4 only
e) 1 and 4

Answer: e

Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.5 Describe the importance of carbon and functional groups in the structure of organic molecules.
Learning Objective 2: LO 2.5.1 Describe the functional groups of organic molecules.
Section Reference 1: Sec 2.5 Organic Compounds

Question type: Essay

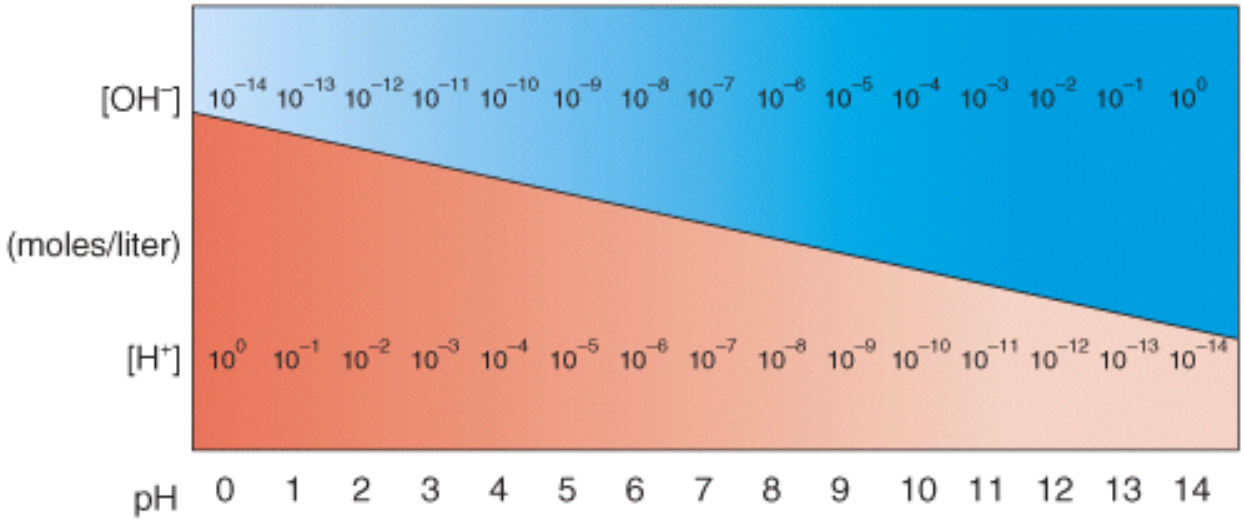
52) What is the difference between atomic mass, mass number and atomic number?

Answer:

Difficulty: Medium
Bloomcode: Comprehension

Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized
Solution: Atomic number is the number of protons found in the nucleus of an atom. Atomic mass is the weighted average mass of all naturally occurring isotopes of the atom. Mass number is the sum of protons and neutrons found in an atom.

53) In the diagram, what pH value represents an acidic Solution?



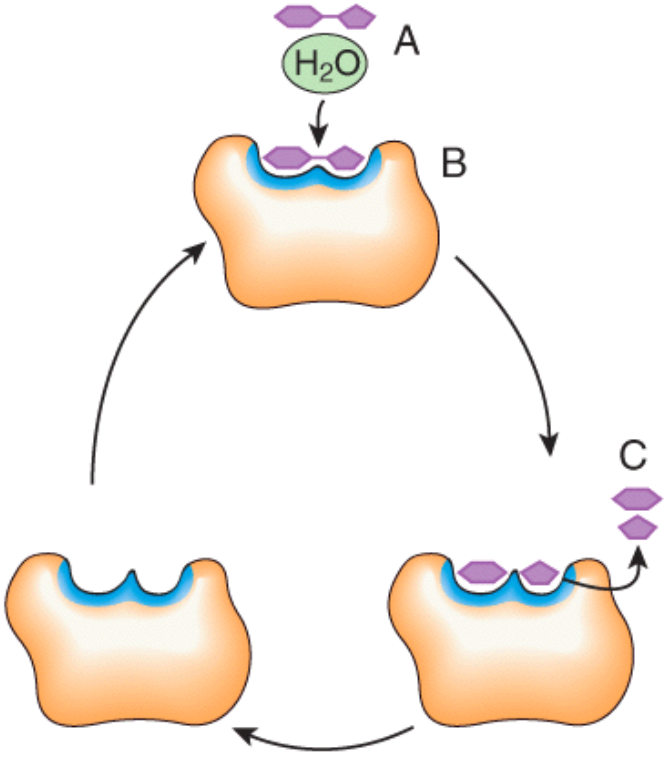
a) 12
b) 10
c) 8
d) 6
e) None of these choices.

Answer: d

Difficulty: Medium
Bloomcode: Application
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.3 Define pH and explain the role of buffer systems in homeostasis.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

54) In the diagram, what would happen to the concentration of C if the concentration of A increases?



a) increases
b) decreases
c) no change

Answer: a

Difficulty: Medium
Bloomcode: Analysis
Learning Objective 1: LO 2.5 Describe the importance of carbon and functional groups in the structure of organic molecules.
Learning Objective 2: LO 2.5.1 Describe the functional groups of organic molecules.
Section Reference: 1. Sec 2.8 Proteins ~~2.5 Organic Compounds~~

Question type: Multiple Choice

55) Which of the following describes the major significance of the element carbon in the human body?

a) ionized form makes body fluids acidic
b) constituent of water
c) forms backbone of all organic molecules

d) required to harden the structure of bones and teeth
e) ionized form is the part of hemoglobin that carries oxygen

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.1 Identify the main chemical elements of the human body.
Section Reference 1: Sec 2.1 How Matter is Organized

56) Which of the following describes the major significance of the element chlorine in the human body?

a) ionized form makes body fluids acidic
b) ionized form is most plentiful anion in extracellular fluid
c) forms backbone of all organic molecules
d) required for bone and tooth structure
e) ionized form is most plentiful cation in extracellular fluid

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.1 Identify the main chemical elements of the human body.
Section Reference 1: Sec 2.1 How Matter is Organized

57) Which of the following describes the major significance of the element nitrogen in the human body?

a) The ionized form makes body fluids acidic.
b) The ionized form is most plentiful anion in extracellular fluid.
c) The ionized form is needed for action of many enzymes.
d) It is a component of all proteins and nucleic acids.
e) The ionized form is most plentiful cation in extracellular fluid.

Answer: d

Difficulty: Medium
Bloomcode: Comprehension

Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.1 Identify the main chemical elements of the human body.
Section Reference 1: Sec 2.1 How Matter is Organized

58) Which of the following can lower the amount of free radicals in the body?

a) x-rays
b) ultraviolet radiation
c) oxygen
d) carbon tetrachloride
e) antioxidants

Answer: e

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference 1: Sec 2.1 How Matter is Organized

59) Which of the following substances has a pH closest to 7.0?

a) lye
b) vaginal fluid
c) gastric juice
d) cerebrospinal fluid
e) milk of magnesia

Answer: d

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.4 Apply the properties of water, inorganic acids, bases and salts to the properties of Solutions , colloids and suspensions and the role of pH in buffer systems.
Learning Objective 2: LO 2.4.3 Define pH and explain the role of buffer systems in homeostasis.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions

60) Which of the following carbohydrates is a disaccharide?

a) ribose

b) lactose
c) galactose
d) glycogen
e) cellulose

Answer: b

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates

61) Which of the following carbohydrates is a polysaccharide?

a) ribose
b) lactose
c) glycogen
d) maltose
e) galactose

Answer: c
Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.6 Identify the components and functions of carbohydrates.
Section Reference 1: Sec 2.6 Carbohydrates

62) This type of lipid is used by the body for insulation.

a) phospholipids
b) triglycerides
c) bile salts
d) sex hormones
e) carotenes

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.1 Identify the different types of lipids.
Section Reference 1: Sec 2.7 Lipids

63) This type of protein is involved with shortening of muscle cells to produce movement.

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

a) contractile
b) structural
c) regulatory
d) catalytic
e) transport

Answer: a

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.1 Identify the building blocks of proteins.
Section Reference 1: Sec 2.8 Proteins

64) This type of protein protects against pathogens.

a) contractile
b) immunological
c) regulatory
d) catalytic
e) transport

Answer: b

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 1: LO 2.8.1 Identify the building blocks of proteins.
Section Reference 1: Sec 2.8 Proteins

65) Surface tension of an aqueous Solution is generated by the presence of _____ between water molecules.

a) covalent bonds
b) ionic bonds
c) hydrogen bonds
d) ester links
e) None of these choices.

Answer: c

Difficulty: Medium
Bloomcode: Comprehension

Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

Question type: Essay

Answer:

66) Define mixture and then distinguish between the three types of mixtures called Solutions , colloids and suspensions.

Answer:

Difficulty: Medium
Bloomcode: Application
Learning Objective 1: LO 2.4 Explain the importance of water, salts, acids, and bases in the functioning of the human body.
Learning Objective 2: LO 2.4.2 Distinguish among Solutions , colloids, and suspensions.
Section Reference 1: Sec 2.4 Inorganic Compounds and Solutions
Solution: A mixture is a combination of elements or compounds that are physically blended together but not bound by chemical bonds. A Solution is a mixture where the Solute s are evenly dispersed among the Solvent molecules. Solutions have a clear appearance. Colloids are like Solutions except the Solute s are big enough to scatter light. A colloid appears translucent or opaque. Suspensions are mixtures where the suspended material will eventually settle out.

Question type: Multiple Choice

67) A molecule with an unpaired electron in the outermost shell is called a(n)

a) compound.
b) free radical.
c) colloid.
d) molecule.

Answer: b

Difficulty: Medium
Bloomcode: Application
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of atoms, ions, molecules, and compounds.

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds
Section Reference 1: Sec 2.1 How Matter is Organized

Question type: Essay

68) What organic compound is lacking the human digestive system that makes it unable to digest cellulose?

Answer:

Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Section Reference 1: Sec 2.8 Proteins
Solution: Human digestive system lacks the enzyme to recognize the structure and break the bonds that hold this polysaccharide together.

Question type: Multiple Choice

69) A triple covalent bond is formed between atoms sharing _____ valence electrons.

a) one
b) two
c) three
d) six
e) eight

Answer: d

Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

70) In a polar covalent bond, the atom that has the most electronegativity will have a

a) full negative charge (-1).

b) full positive charge (+1).
c) partial negative charge.
d) partial positive charge.
e) neutral charge.

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.2 Explain how atoms form molecules and compounds, and describe the nature of the various types of bonds that join them.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

71) Which of the following is a general term used to refer to the sum of all the chemical reactions occurring in the body?

a) anabolism
b) catabolism
c) metabolism
d) catalysis
e) homeostasis

Answer: c

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.2. Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.
Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.2 Chemical Bonds

72) The energy stored in the bonds of the molecules in the foods that humans eat is
1. a form of kinetic energy.
2. a form of potential energy.
3. referred to as chemical energy.

a) 1 only
b) 2 only
c) 3 only
d) 2 and 3
e) All of these choices

Answer: d

Difficulty: Medium
Bloomcode: Application
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.3 Chemical Reactions

73) The initial energy "investment" needed to start a chemical reaction in a cell is called the

a) energy of products.
b) energy of reactants.
c) potential energy.
d) Gibb's free energy.
e) activation energy.

Answer: e

Difficulty: Easy
Bloomcode: Knowledge
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.3 Chemical reactions

74) All of the following are characteristics of anabolism EXCEPT:

a) It involves synthesizing new biomolecules.
b) It primarily involves endergonic reactions.
c) It releases large amounts of energy.
d) An example of anabolism is linking amino acids together to form proteins.
e) An example is the formation of two ammonia molecules from one nitrogen molecule and three hydrogen molecules.

Answer: c

Difficulty: Hard
Bloomcode: Analysis
Learning Objective 1: LO 2.2 Explain the formation of molecules and compounds and the nature of their chemical bonds.
Learning Objective 2: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.
Section Reference 1: Sec 2.3 Chemical reactions

Principles of Anatomy and Physiology 15th edition Tortora Test Bank

75) AB + CD → AD + BC is a general example of a(n) _____ reaction.

a) decomposition
b) synthesis
c) exchange
d) reversible
e) catalyzed

Answer: c

Difficulty: Medium
Bloomcode: Comprehension
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
Learning Objective 2: LO 2.3.5 Describe synthesis, decomposition, exchange, and reversible reactions.
Section Reference 1: Sec 2.3 Chemical reactions

76) The characteristics listed below represent which element in the periodic table?
1. 7 valence electrons
2. easily gains an electron
3. most likely to form an anion
4. high electronegativity

a) sodium
b) carbon
c) chlorine
d) nitrogen
e) oxygen

Answer: c

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
~~Learning Objective 1: LO 2.2. Explain the formation of molecules and compounds and the nature of their chemical bonds.~~
~~Learning Objective 2: LO 2.2.1 Describe how valence electrons form chemical bonds.~~
~~Learning Objective 3: LO 2.2.2 Distinguish among ionic, covalent, and hydrogen bonds.~~
Section Reference 1~~2~~: Sec 2.1 How Matter is Organized

~~Section Reference 1: Sec 2.2 Chemical Bonds~~

Question type: Multiple Text Dropdown

77) Choose the appropriate atomic number associated with the element.

Carbon's atomic mass (P = 6, N = 6) is [dropdown 1~~a~~]. Carbon has [dropdown 2~~b~~] valence electrons. Carbon can form up to [dropdown 3~~c~~] covalent bonds. Carbon 14 is a radioactive isotope and contains [dropdown 4~~d~~] neutrons.

Dropdown choices
2
4
6
7
8
12
14

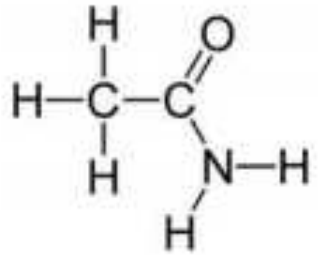
Answer 1: 12
Answer 2: 4
Answer 3: 4
Answer 4: 8

~~[a] 12~~
~~[b] 4~~
~~[c] 4~~
~~[d] 8~~

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Section Reference: 2.1

Question type: Multiple Selection ~~(Need Picture)~~

78) What functional groups are present on the molecule in the diagram. Choose all that apply.



_____ ~~Picture like this~~

a) ——Hydroxyl
b) ——Carbonyl
c) ——Carboxyl
d) ——Ester
e) ——Amino

Answer 1: c
Answer 2: d

Difficulty: Hard
Shuffle: Yes
Bloomcode: Evaluate
Learning Objective 1: LO 2.5 Describe the importance of carbon and functional groups in the structure of organic molecules.
Learning Objective 2: LO 2.5.1 Describe the functional groups of organic molecules.
Section Reference ~~1~~: Sec 2.5 Organic Compounds

79) Choose which statement describes an anabolic (synthesis) reaction. Select all that apply.

a) ——Monomers are joined together.
b) ——Breaking a protein into amino acids.
c) ——Cooking raw fish in acids to make ceviche
d) ——Glucose is linked together to make glycogen.
e) ——A molecule of water is removed to bond a galactose and glucose.
f) ——A molecule of water is added to separate glycine from lysine.
g) ——Using ATPase to speed up the breakdown of ATP into ADP and P.

Answer 1: a
Answer 2: d
Answer 3: e

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.3 Explain what happens when atoms combine with or separate from other atoms during a chemical reaction.
Learning Objective 2: LO 2.3.1 Define a chemical reaction.
Section Reference 1: Sec 2.3 Chemical Reactions

80) If hydrogen bonding was prevented in proteins, which structure would be affected? Select all that apply.

a) Primary
b) Secondary
c) Tertiary
d) Quaternary

Answer 1: b
Answer 2: d
Answer 3: c

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 21: LO 2.8.1 Identify the building blocks of proteins.
Learning Objective 31: LO 2.8.2 Describe the functional roles of proteins.

Section Reference 1: Sec 2.8 Proteins

Question type: Multiple Cchoice

81) If there is 24% Adenine present in a DNA helix, how much thymine would be present?

a) ——12% thymine
b) ——24% thymine
c) ——26% thymine
d) ——52% thymine
e) ——75% thymine

Answer: b

Difficulty: Hard
Shuffle: Yes
Bloomcode: Synthesis
Learning Objective 1: LO 2.9.2 -Describe the components of a nucleotide
Section Reference ~~1~~: Sec 2.9 Nucleic Acids

82) Vitamin D is synthesized from cholesterol. What is true about Vitamin D?

a) ——Vitamin D is water soluble
b) ——Vitamin D is fat soluble
c) ——Vitamin D is not soluble in fat or water
d) ——Vitamin D is soluble in both fat and water

Answer: b

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.1 Identify the different types of lipids.
Learning Objective 3~~2~~: LO 2.7.2 Discuss the functions of lipids.
Section Reference ~~1~~: Sec 2.7 Lipids

83) The R group of an amino acid would need to have what characteristic to be located in a cell membrane?

a) The R group would need to be polar
b) The R group would need to be nonpolar
c) The R group would need to be hydrophilic
d) The R group has to ionize

Answer: b

Difficulty: Hard
Shuffle: Yes
Bloomcode: Evaluation
Learning Objective 1: LO 2.8 Identify the components and functions of proteins.
Learning Objective 2~~1~~: LO 2.8.1 Identify the building blocks of proteins.
Learning Objective 3~~1~~: LO 2.8.2 Describe the functional roles of proteins.

Section Reference~~1~~: Sec 2.8 Proteins

84) In laboratory, Sudan IV is used to test for the presence of hydrophobic substances in food. Which organic molecule would exhibit a positive reaction with Sudan IV?

a) ——Lipids
b) ——Nucleic Acids
c) ——Carbohydrates
d) ——Globular proteins

Answer: a

Difficulty: Medium
Shuffle: Yes
Bloomcode: Analysis
Learning Objective 1: LO 2.7 Identify the components and functions of lipids.
Learning Objective 2: LO 2.7.1 Identify the different types of lipids.
Learning Objective 3~~2~~: LO 2.7.2 Discuss the functions of lipids.
Section Reference~~1~~: Sec 2.7 Lipids

Question type: Text Dropdown

85) ~~.~~A radioactive isotope of sulfur would be trackable in [dropdown~~a~~].

Dropdown Choices:
cysteine
f~~F~~atty acid chain
g~~G~~lucose
~~Answer options~~
glycine
~~cysteine~~
nucleotide
~~Glucose~~
~~Fatty acid chain~~

Answer: cysteine

Difficulty: Hard
Shuffle: Yes
Bloomcode: Evaluation
Learning Objective 1: LO 2.1 Describe the main chemicals of the human body and the structures of the atoms, ions, molecules, and compounds.
Learning Objective 2: LO 2.1.2 Describe the structures of atoms, ions, molecules, free radicals, and compounds.
Learning Objective 3: LO 2.8 Identify the components and functions of proteins.
Learning Objective 4: LO 2.8.2 Describe the functional roles of proteins.
Section Reference 1: Sec 2.1 How Matter is Organized
Section Reference 2: Sec 2.8 Proteins