

Chapter 02 Testbank

Student: _____

- Anything that occupies space and has mass is called
 - an electron.
 - living.
 - matter.
 - energy.
 - space.
- The electrons of an atom are
 - always equal to the number of neutrons in an atom.
 - found in the nucleus.
 - used to determine atomic number.
 - positively charged.
 - moving in pathways called orbitals.
- All of the following pertain to the atom $^{14}_6\text{C}$ *except* it(s)
 - has 6 protons.
 - has 6 electrons.
 - has 14 neutrons.
 - is an isotope of carbon.
 - mass number is 14.
- The subatomic particles that surround the nucleus are the
 - electrons.
 - protons.
 - neutrons.
 - protons and neutrons.
 - protons and electrons.
- Cations are
 - charged subatomic particles.
 - atoms that have gained electrons.
 - radioactive isotopes.
 - capable of forming ionic bonds with anions.
 - atoms without protons.
- Isotopes are atoms of the same element that differ in their
 - neutron number.
 - electron number.
 - proton number.
 - atomic number.
 - chemical properties.
- What is the maximum number of electrons in the second energy shell of an atom?
 - 2
 - 4
 - 8
 - 18
 - 32
- Two or more atoms bonded together are called a/an
 - ion.
 - isotope.
 - element.
 - electrolyte.
 - molecule.
- What would be the valence number of electrons in the sulfur atom $^{32}_{16}\text{S}$?
 - 2
 - 6
 - 8
 - 16
 - 32
- Polar molecules are composed of covalently bonded
 - identical atoms.
 - carbon atoms.
 - ions.
 - atoms of different electronegativity.
 - atoms of identical electronegativity.

11. Reactions involving electron release are called _____ reactions.
 - A. oxidation.
 - B. reduction.
 - C. ionization.
 - D. decomposition.
 - E. dissolution.
12. Which of the following represents a synthesis reaction?
 - A. $AB \rightarrow A + B$
 - B. $A + B \rightarrow AB$
 - C. $AB + XY \rightarrow AX + BY$
 - D. $AB + XY \rightarrow AX + BY$
 - E. None of the choices are correct.
13. The important solvent associated with living things is
 - A. carbon dioxide.
 - B. sodium chloride.
 - C. ethyl alcohol.
 - D. benzene.
 - E. water.
14. Which term does *not* belong in this list?
 - A. lactic acid
 - B. vinegar
 - C. hydrogen ion donor
 - D. pH 8
 - E. acidic
15. A solution of pH 7 compared to a solution of pH 9
 - A. is more basic.
 - B. has no OH^- ions.
 - C. has more H^+ ions.
 - D. has a higher pH.
 - E. All of the choices are correct.
16. What do H_2O , NaCl , CO_2 , and HCl all have in common?
 - A. all salts
 - B. all acids
 - C. all gases
 - D. all inorganic
 - E. all solutes
17. Which of the following functional groups is *mismatched* to the organic compound?
 - A. phosphate - carbohydrates
 - B. sulfhydryl - proteins
 - C. amino - proteins
 - D. hydroxyl - alcohols
 - E. carboxyl - fatty acids
18. The building blocks of an enzyme are
 - A. nucleotides.
 - B. glycerol and fatty acids.
 - C. monosaccharides.
 - D. phosphate, glycerol, fatty acids.
 - E. amino acids.
19. All of the following are monosaccharides *except*
 - A. glucose.
 - B. glycogen.
 - C. fructose.
 - D. ribose.
 - E. deoxyribose.
20. All of the following are lipids *except*
 - A. cholesterol.
 - B. starch.
 - C. phospholipid.
 - D. wax.
 - E. triglyceride.
21. A monosaccharide with 5 carbon atoms will have _____ hydrogen atoms and _____ oxygen atoms.
 - A. 10, 5
 - B. 5, 10
 - C. 5, 5
 - D. 10, 10
 - E. 2, 1
22. One nucleotide contains
 - A. one phosphate.
 - B. one pentose.
 - C. one nitrogen base.
 - D. All of the choices are correct.
 - E. None of the choices are correct.

23. Which of the following would have glycosidic bonds?
A. triglycerides
B. monosaccharides
C. polypeptides
D. polysaccharides
E. ATP
24. All of the following are polysaccharides, *except*
A. dextran in some bacterial slime layers.
B. agar used to make solid culture media.
C. a cell's glycocalyx.
D. cellulose in certain cell walls.
E. prostaglandins in inflammation.
25. What part of a phospholipid forms hydrophobic tails?
A. fatty acids
B. glycerol
C. phosphate
D. alcohol
E. All of the choices are correct.
26. An amino acid contains all of the following, *except*
A. an amino group.
B. a carboxyl group.
C. a variable R group.
D. an a carbon.
E. a nitrogen base.
27. Which pertains to DNA but *not* to RNA?
A. contains ribose
B. contains adenine
C. contains thymine
D. contains uracil
E. contains nucleotides
28. ATP is best described as
A. an enzyme.
B. a double helix.
C. an electron carrier.
D. the energy molecule of cells.
E. All of the choices are correct.
29. Which is *not* true about enzymes?
A. found in all cells
B. are catalysts
C. participate in the cell's chemical reactions
D. can be denatured by heat and other agents
E. have high-energy bonds between phosphates
30. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?
A. valine
B. cysteine
C. serine
D. alanine
E. tyrosine
31. The nucleic acid that delivers the correct amino acid for protein synthesis is
A. rRNA.
B. DNA.
C. tRNA.
D. mRNA.
E. ATP.
32. The purine bases in nucleic acids include
A. thymine and cytosine.
B. guanine and adenine.
C. cytosine and guanine.
D. adenine and thymine.
E. ribose and deoxyribose.
33. A weak, attractive force between nearby molecules is called a/an
A. hydrogen bond.
B. covalent bond.
C. ionic bond.
D. peptide bond.
E. glycosidic bond.

34. A student forgot to label a beaker containing a DNA solution and a beaker containing a glucose solution. If chemical analysis was performed to identify the contents of each beaker, which of the following would be found in the beaker of DNA but *not* in the beaker with glucose?
- amino acids
 - hydrogen and oxygen atoms
 - nitrogen and phosphorus
 - fatty acids
 - carbon atoms
35. $C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11} + H_2O$ represents
- formation of a peptide bond.
 - a decomposition reaction.
 - denaturation.
 - formation of a polysaccharide.
 - dehydration synthesis.
36. The atomic number equals the number of _____ an atom possesses.
- neutrons
 - protons
 - protons plus electrons
 - neutrons plus protons
 - electrons plus protons
37. If carbon has an atomic number of 6 and an atomic mass of 14, how many neutrons does it have?
- 6
 - 7
 - 8
 - 14
 - impossible to determine
38. The neutrons of an atom are
- always equal to the number of protons in an atom.
 - found in the nucleus.
 - used to determine atomic number.
 - positively charged.
 - moving in pathways called orbitals.
39. Which of the following represents an exchange reaction?
- $AB \rightarrow A + B$
 - $A + B \rightarrow AB$
 - $X + Y \rightarrow XYD$
 - $AB + XY \rightarrow AX + BY$
 - None of the choices are correct.
40. Jim needs to prepare one liter of a 4% NaCl solution. How much NaCl should he weigh out?
- 0.4 grams
 4. grams
 - 40 grams
 - 400 grams
 - None of the choices are correct.
41. How many times more acidic is a solution with a pH of 3 than a solution with a pH of 6?
- 3
 - 10
 - 1000
 - 36
 - 63
42. Which of the following carbohydrates is found in dairy?
- lactose
 - sucrose
 - maltose
 - glucose
 - fructose
43. Which of the following is the stored form of carbohydrates in animals?
- glycogen
 - maltose
 - starch
 - cellulose
 - galactose
44. All of the following are correct about triglycerides, *except*
- they are insoluble in water.
 - they are a concentrated source of energy.
 - when they are unsaturated they are solid.
 - they dissolve in nonpolar solvents.
 - they are digested by lipases.

45. The type of chemical bond linking amino acids together is a(n)
A. glycosidic bond.
B. peptide bond.
C. ester bond.
D. ionic bond.
E. hydrogen bond.
46. The α helix and β -pleated sheet are examples of
A. primary structure.
B. secondary structure.
C. tertiary structure.
D. quaternary structure.
E. gamma structures.
47. The polynucleotide strands of DNA are linked along their length by _____ bonds between the bases.
A. covalent
B. ionic
C. Van der Waals
D. double
E. hydrogen
48. Which of the following examples are NOT hydrophobic?
A. Glucose
B. Vegetable oil
C. Butter
D. Cholesterol
E. Choices B, C, and D are correct
49. A covalent bond is formed between an anion and a cation.
True False
50. Electrons that participate in chemical bonding are typically located closest to the nucleus.
True False
51. Only charged atoms can form ionic bonds.
True False
52. Water molecules are nonpolar molecules.
True False
53. Polar molecules have more reactivity compared to nonpolar molecules.
True False
54. Elements have predictable chemical properties.
True False
55. The concentration of a solution expresses the amount of solvent present.
True False
56. If solution A has a lower pH compared to solution B, then solution A is more acidic than solution B.
True False
57. The only part of an amino acid that differs from other amino acids is its R group.
True False
58. All proteins are enzymes.
True False
59. Replication is the cellular mechanism for making a copy of its DNA.
True False
60. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.
True False
61. The total number of protons and neutrons of an element establishes its _____ number.

62. Atoms that gain or lose electrons become charged particles called _____.

63. Protons and neutrons make up the atom's central core referred to as its _____.

64. A solution is composed of one or more substances called _____ that are uniformly dispersed in a dissolving medium called a _____.

65. Organic chemicals always have a basic framework of the element _____ bonded to other atoms.

66. _____ bonds are formed by dehydration synthesis between adjacent amino acids.

67. A fat is called _____ if all carbons of the fatty acid chain are single bonded to 2 other carbons and 2 hydrogens.

68. Purines and pyrimidines are components in the building block units of all _____.

69. During protein synthesis, _____ RNA is made to be a copy of a gene from the DNA.

70. In _____ reproduction, offspring arise from the division of a single parent cell into two identical progeny cells.

71. Certain antibiotics are effective against bacteria that cause human infections because they target prokaryotic ribosomes. Discuss, in detail, how the drug attacking a pathogen's ribosomes will affect the cell. Discuss at least 3 specific detrimental results.
72. Explain what radioisotopes are, and describe how they can be used to monitor the uptake of a specific biochemical by a microbial culture.
73. Compare and contrast the chemical and functional characteristics of DNA and RNA molecules.
74. Identify and provide specific examples of the classes of macromolecules that are associated with life.

Chapter 02 Testbank Key

1. Anything that occupies space and has mass is called
A. an electron.
B. living.
C. matter.
D. energy.
E. space.
- Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.*
2. The electrons of an atom are
A. always equal to the number of neutrons in an atom.
B. found in the nucleus.
C. used to determine atomic number.
D. positively charged.
E. moving in pathways called orbitals.
- Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.*
3. All of the following pertain to the atom $^{14}_6\text{C}$ *except* it(s)
A. has 6 protons.
B. has 6 electrons.
C. has 14 neutrons.
D. is an isotope of carbon.
E. mass number is 14.
- Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.*
Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.
4. The subatomic particles that surround the nucleus are the
A. electrons.
B. protons.
C. neutrons.
D. protons and neutrons.
E. protons and electrons.
- Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.*
5. Cations are
A. charged subatomic particles.
B. atoms that have gained electrons.
C. radioactive isotopes.
D. capable of forming ionic bonds with anions.
E. atoms without protons.
- Learning objective: 02.10 Describe ionization and distinguish between anions and cations.*
6. Isotopes are atoms of the same element that differ in their
A. neutron number.
B. electron number.
C. proton number.
D. atomic number.
E. chemical properties.
- Learning objective: 02.02 Characterize elements and their isotopes.*
7. What is the maximum number of electrons in the second energy shell of an atom?
A. 2
B. 4
C. 8
D. 18
E. 32
- Learning objective: 02.05 Describe the electron orbitals and energy shells and how they are filled.*
8. Two or more atoms bonded together are called a/an
A. ion.
B. isotope.
C. element.
D. electrolyte.
E. molecule.
- Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.*
9. What would be the valence number of electrons in the sulfur atom $^{32}_{16}\text{S}$?
A. 2
B. 6
C. 8
D. 16
E. 32
- Learning objective: 02.05 Describe the electron orbitals and energy shells and how they are filled.*
10. Polar molecules are composed of covalently bonded
A. identical atoms.
B. carbon atoms.
C. ions.
D. atoms of different electronegativity.
E. atoms of identical electronegativity.

Learning objective: 02.07 State the relationship among an atom, molecule, and compound.
Learning objective: 02.09 Summarize the concepts of valence, polarity, and diatomic elements.

11. Reactions involving electron release are called _____ reactions.
A. oxidation.
B. reduction.
C. ionization.
D. decomposition.
E. dissolution.
12. Which of the following represents a synthesis reaction?
Learning objective: 02.11 Compare oxidation and reduction and their effects.
A. $AB \rightarrow A + B$
B. $A + B \rightarrow AB$
C. $AB + XY \rightarrow AX + BY$
D. $AB + XY \rightarrow AX + BY$
E. None of the choices are correct.
13. The important solvent associated with living things is
Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.
A. carbon dioxide.
B. sodium chloride.
C. ethyl alcohol.
D. benzene.
E. water.
14. Which term does *not* belong in this list?
Learning objective: 02.13 Explain solutes, solvents, and hydration.
A. lactic acid
B. vinegar
C. hydrogen ion donor
D. pH 8
E. acidic
15. A solution of pH 7 compared to a solution of pH 9
Learning objective: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral.
A. is more basic.
B. has no OH^- ions.
C. has more H^+ ions.
D. has a higher pH.
E. All of the choices are correct.
16. What do H_2O , NaCl, CO_2 , and HCl all have in common?
Learning objective: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral.
A. all salts
B. all acids
C. all gases
D. all inorganic
E. all solutes
17. Which of the following functional groups is *mismatched* to the organic compound?
Learning objective: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.
A. phosphate - carbohydrates
B. sulfhydryl - proteins
C. amino - proteins
D. hydroxyl - alcohols
E. carboxyl - fatty acids
18. The building blocks of an enzyme are
Learning objective: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.
Learning objective: 02.17 Identify functional groups and know some examples.
A. nucleotides.
B. glycerol and fatty acids.
C. monosaccharides.
D. phosphate, glycerol, fatty acids.
E. amino acids.
19. All of the following are monosaccharides *except*
Learning objective: 02.18 Relate what macromolecules, polymers, and monomers are.
A. glucose.
B. glycogen.
C. fructose.
D. ribose.
E. deoxyribose.
20. All of the following are lipids *except*
Learning objective: 02.18 Relate what macromolecules, polymers, and monomers are.
Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.
A. cholesterol.
B. starch.
C. phospholipid.
D. wax.
E. triglyceride.

Learning objective: 02.18 Relate what macromolecules, polymers, and monomers are.
Learning objective: 02.22 Define lipid, triglyceride, phospholipid, fatty acid, and cholesterol.

21. A monosaccharide with 5 carbon atoms will have _____ hydrogen atoms and _____ oxygen atoms.
A. 10, 5
B. 5, 10
C. 5, 5
D. 10, 10
E. 2, 1

Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.

22. One nucleotide contains
A. one phosphate.
B. one pentose.
C. one nitrogen base.
D. All of the choices are correct.
E. None of the choices are correct.

Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.

23. Which of the following would have glycosidic bonds?
A. triglycerides
B. monosaccharides
C. polypeptides
D. polysaccharides
E. ATP

Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.

24. All of the following are polysaccharides, *except*
A. dextran in some bacterial slime layers.
B. agar used to make solid culture media.
C. a cell's glycocalyx.
D. cellulose in certain cell walls.
E. prostaglandins in inflammation.

Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.

25. What part of a phospholipid forms hydrophobic tails?
A. fatty acids
B. glycerol
C. phosphate
D. alcohol
E. All of the choices are correct.

Learning objective: 02.22 Define lipid, triglyceride, phospholipid, fatty acid, and cholesterol.

26. An amino acid contains all of the following, *except*
A. an amino group.
B. a carboxyl group.
C. a variable R group.
D. an a carbon.
E. a nitrogen base.

Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.

27. Which pertains to DNA but *not* to RNA?
A. contains ribose
B. contains adenine
C. contains thymine
D. contains uracil
E. contains nucleotides

Learning objective: 02.28 Identify a nucleic acid and differentiate between DNA and RNA.

28. ATP is best described as
A. an enzyme.
B. a double helix.
C. an electron carrier.
D. the energy molecule of cells.
E. All of the choices are correct.

Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.

29. Which is *not* true about enzymes?
A. found in all cells
B. are catalysts
C. participate in the cell's chemical reactions
D. can be denatured by heat and other agents
E. have high-energy bonds between phosphates

Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.

30. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?
A. valine
B. cysteine
C. serine
D. alanine
E. tyrosine

Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.

31. The nucleic acid that delivers the correct amino acid for protein synthesis is
 A. rRNA.
 B. DNA.
C. tRNA.
 D. mRNA.
 E. ATP.
32. *Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.*
 The purine bases in nucleic acids include
 A. thymine and cytosine.
B. guanine and adenine.
 C. cytosine and guanine.
 D. adenine and thymine.
 E. ribose and deoxyribose.
33. *Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.*
 A weak, attractive force between nearby molecules is called a/an
A. hydrogen bond.
 B. covalent bond.
 C. ionic bond.
 D. peptide bond.
 E. glycosidic bond.
34. *Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.*
 A student forgot to label a beaker containing a DNA solution and a beaker containing a glucose solution. If chemical analysis was performed to identify the contents of each beaker, which of the following would be found in the beaker of DNA but *not* in the beaker with glucose?
 A. amino acids
 B. hydrogen and oxygen atoms
C. nitrogen and phosphorus
 D. fatty acids
 E. carbon atoms
35. *Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.*
 $C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11} + H_2O$ represents
 A. formation of a peptide bond.
 B. a decomposition reaction.
 C. denaturation.
 D. formation of a polysaccharide.
E. dehydration synthesis.
36. *Learning objective: 02.12 Classify different forms of chemical shorthand, formulas, and types of reactions.*
 The atomic number equals the number of _____ an atom possesses.
 A. neutrons
B. protons
 C. protons plus electrons
 D. neutrons plus protons
 E. electrons plus protons
37. *Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.*
 If carbon has an atomic number of 6 and an atomic mass of 14, how many neutrons does it have?
 A. 6
 B. 7
C. 8
 D. 14
 E. impossible to determine
38. *Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.*
 The neutrons of an atom are
 A. always equal to the number of protons in an atom.
B. found in the nucleus.
 C. used to determine atomic number.
 D. positively charged.
 E. moving in pathways called orbitals.
39. *Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.*
 Which of the following represents an exchange reaction?
 A. $AB \rightarrow A + B$
 B. $A + B \rightarrow AB$
 C. $X + Y \rightarrow XYD$
D. $AB + XY \rightarrow AX + BY$
 E. None of the choices are correct.
40. *Learning objective: 02.12 Classify different forms of chemical shorthand, formulas, and types of reactions.*
 Jim needs to prepare one liter of a 4% NaCl solution. How much NaCl should he weigh out?
 A. 0.4 grams
 B. 4. grams
C. 40 grams
 D. 400 grams
 E. None of the choices are correct.

Learning objective: 02.13 Explain solutes, solvents, and hydration.

41. How many times more acidic is a solution with a pH of 3 than a solution with a pH of 6?
A. 3
B. 10
C. 1000
D. 36
E. 63

42. Which of the following carbohydrates is found in dairy?
Learning objective: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral.
A. lactose
B. sucrose
C. maltose
D. glucose
E. fructose

43. Which of the following is the stored form of carbohydrates in animals?
Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.
Learning objective: 02.21 Discuss the functions of carbohydrates in cells.
A. glycogen
B. maltose
C. starch
D. cellulose
E. galactose

44. All of the following are correct about triglycerides, *except*
Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.
Learning objective: 02.21 Discuss the functions of carbohydrates in cells.
A. they are insoluble in water.
B. they are a concentrated source of energy.
C. when they are unsaturated they are solid.
D. they dissolve in nonpolar solvents.
E. they are digested by lipases.

45. The type of chemical bond linking amino acids together is a(n)
Learning objective: 02.04 List the major elements that are associated with life.
Learning objective: 02.22 Define lipid, triglyceride, phospholipid, fatty acid, and cholesterol.
A. glycosidic bond.
B. peptide bond.
C. ester bond.
D. ionic bond.
E. hydrogen bond.

46. The a helix and b-pleated sheet are examples of
Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.
A. primary structure.
B. secondary structure.
C. tertiary structure.
D. quaternary structure.
E. gamma structures.

47. The polynucleotide strands of DNA are linked along their length by _____ bonds between the bases.
Learning objective: 02.26 Characterize the 4 levels of protein structure and describe the pattern of folding.
A. covalent
B. ionic
C. Van der Waals
D. double
E. hydrogen

48. Which of the following examples are NOT hydrophobic?
Learning objective: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.
Learning objective: 02.28 Identify a nucleic acid and differentiate between DNA and RNA.
Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.
A. Glucose
B. Vegetable oil
C. Butter
D. Cholesterol
E. Choices B, C, and D are correct

49. A covalent bond is formed between an anion and a cation.
Learning objective: 02.14 Differentiate between hydrophilic and hydrophobic.
FALSE

50. Electrons that participate in chemical bonding are typically located closest to the nucleus.
Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.
FALSE

51. Only charged atoms can form ionic bonds.
Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.
Learning objective: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.
Learning objective: 02.09 Summarize the concepts of valence, polarity, and diatomic elements.
TRUE

52. Water molecules are nonpolar molecules.
Learning objective: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.
FALSE

Learning objective: 02.09 Summarize the concepts of valence, polarity, and diatomic elements.

53. Polar molecules have more reactivity compared to nonpolar molecules.
TRUE
54. Elements have predictable chemical properties.
Learning objective: 02.09 Summarize the concepts of valence, polarity, and diatomic elements.
TRUE
55. The concentration of a solution expresses the amount of solvent present.
Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.
FALSE
56. If solution A has a lower pH compared to solution B, then solution A is more acidic than solution B.
Learning objective: 02.13 Explain solutes, solvents, and hydration.
TRUE
57. The only part of an amino acid that differs from other amino acids is its R group.
Learning objective: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral.
TRUE
58. All proteins are enzymes.
Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.
FALSE
59. Replication is the cellular mechanism for making a copy of its DNA.
Learning objective: 02.26 Characterize the 4 levels of protein structure and describe the pattern of folding.
TRUE
60. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.
Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.
FALSE
61. The total number of protons and neutrons of an element establishes its _____ number.
Learning objective: 02.26 Characterize the 4 levels of protein structure and describe the pattern of folding.
mass
62. Atoms that gain or lose electrons become charged particles called _____.
Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.
ions
63. Protons and neutrons make up the atom's central core referred to as its _____.
Learning objective: 02.10 Describe ionization and distinguish between anions and cations.
nucleus
64. A solution is composed of one or more substances called _____ that are uniformly dispersed in a dissolving medium called a _____.
Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.
solutes or solvent
65. Organic chemicals always have a basic framework of the element _____ bonded to other atoms.
Learning objective: 02.13 Explain solutes, solvents, and hydration.
carbon
66. _____ bonds are formed by dehydration synthesis between adjacent amino acids.
Learning objective: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.
Peptide
67. A fat is called _____ if all carbons of the fatty acid chain are single bonded to 2 other carbons and 2 hydrogens.
Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.
saturated
68. Purines and pyrimidines are components in the building block units of all _____.
Learning objective: 02.04 List the major elements that are associated with life.
Learning objective: 02.18 Relate what macromolecules, polymers, and monomers are.
Learning objective: 02.23 Describe how an ester bond is formed.
Learning objective: 02.24 Discuss major functions of lipids in cells.
nucleic acids
69. During protein synthesis, _____ RNA is made to be a copy of a gene from the DNA.
Learning objective: 02.04 List the major elements that are associated with life.
Learning objective: 02.28 Identify a nucleic acid and differentiate between DNA and RNA.
Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.
messenger
70. In _____ reproduction, offspring arise from the division of a single parent cell into two identical progeny cells.
Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.
asexual
71. Certain antibiotics are effective against bacteria that cause human infections because they target prokaryotic ribosomes. Discuss, in detail, how the drug attacking a pathogen's ribosomes will affect the cell. Discuss at least 3 specific detrimental results.
Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.
72. Explain what radioisotopes are, and describe how they can be used to monitor the uptake of a specific biochemical by a microbial culture.
Learning objective: 02.27 Summarize some of the essential functions of proteins.

Learning objective: 02.02 Characterize elements and their isotopes.

73. Compare and contrast the chemical and functional characteristics of DNA and RNA molecules.

Learning objective: 02.28 Identify a nucleic acid and differentiate between DNA and RNA.

74. Identify and provide specific examples of the classes of macromolecules that are associated with life.

Learning objective: 02.04 List the major elements that are associated with life.

Chapter 02 Testbank Summary

<i>Category</i>	<i># of Questions</i>
Learning objective: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.	6
Learning objective: 02.02 Characterize elements and their isotopes.	2
Learning objective: 02.03 Explain the differences between atomic number, mass number, and atomic weight.	5
Learning objective: 02.04 List the major elements that are associated with life.	4
Learning objective: 02.05 Describe the electron orbitals and energy shells and how they are filled.	2
Learning objective: 02.06 Explain how elements make chemical bonds to form molecules and compounds.	5
Learning objective: 02.07 State the relationship among an atom, molecule, and compound.	1
Learning objective: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.	3
Learning objective: 02.09 Summarize the concepts of valence, polarity, and diatomic elements.	4
Learning objective: 02.10 Describe ionization and distinguish between anions and cations.	2
Learning objective: 02.11 Compare oxidation and reduction and their effects.	1
Learning objective: 02.12 Classify different forms of chemical shorthand, formulas, and types of reactions.	2
Learning objective: 02.13 Explain solutes, solvents, and hydration.	4
Learning objective: 02.14 Differentiate between hydrophilic and hydrophobic.	1
Learning objective: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral.	4
Learning objective: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.	3
Learning objective: 02.17 Identify functional groups and know some examples.	1
Learning objective: 02.18 Relate what macromolecules, polymers, and monomers are.	4
Learning objective: 02.20 Distinguish among mono-, di-, and polysaccharides and describe how their bonds are made.	6
Learning objective: 02.21 Discuss the functions of carbohydrates in cells.	2
Learning objective: 02.22 Define lipid, triglyceride, phospholipid, fatty acid, and cholesterol.	3
Learning objective: 02.23 Describe how an ester bond is formed.	1
Learning objective: 02.24 Discuss major functions of lipids in cells.	1
Learning objective: 02.25 Describe the structures of peptides and polypeptides and how their bonds form.	6
Learning objective: 02.26 Characterize the 4 levels of protein structure and describe the pattern of folding.	3
Learning objective: 02.27 Summarize some of the essential functions of proteins.	1
Learning objective: 02.28 Identify a nucleic acid and differentiate between DNA and RNA.	4
Learning objective: 02.29 Describe the structures of nucleotides and list the nitrogen bases.	5
Learning objective: 02.30 Explain how the DNA code may be copied and describe the basic functions of RNA and ATP.	5