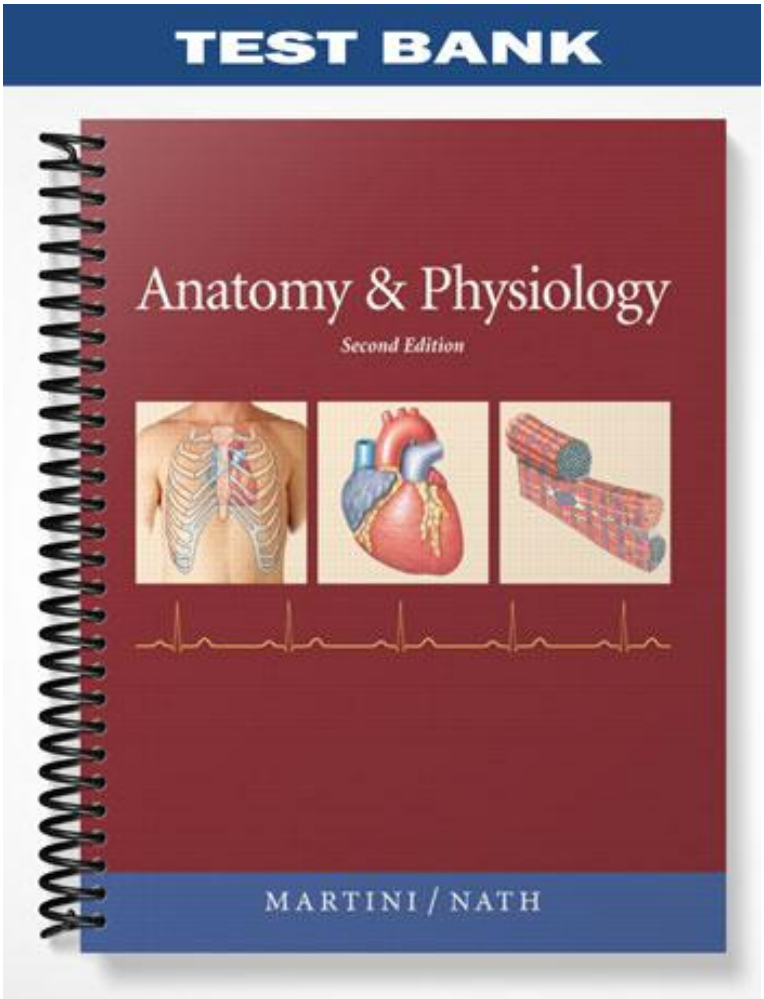
TEST BANK



MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The smallest stable units of matter are 1) _____
A) electrons.
B) molecules.
C) protons.
D) neutrons.
E) atoms.

2) The "atomic number" of an atom is determined by the number of _____ it has. 2) _____
A) protons + neutrons
B) protons
C) electrons
D) protons + electrons
E) neutrons

3) Isotopes of an element differ in the number of 3) _____
A) electron clouds.
B) protons in the nucleus.
C) electrons in energy shells.
D) electrons in the nucleus.
E) neutrons in the nucleus.

4) The mass number represents the number of 4) _____
A) neutrons in an atom.
B) protons in an atom.
C) neutrons + electrons.
D) electrons in an ion.
E) protons + neutrons.

5) The "atomic weight" of an atom reflects the average number of 5) _____
A) protons + neutrons.
B) protons.
C) protons + neutrons + electrons.
D) neutrons.
E) electrons.

6) Radioisotopes have unstable 6) _____
A) electron clouds.
B) nuclei.
C) protons.
D) ions.
E) isotopes.

7) The chemical behavior of an atom is determined by 7) _____
A) the outermost electron shell.
B) the mass of the nucleus.
C) the number of neutrons.
D) the number of protons.
E) the size of the atom.

8) Ions with a + charge are called 8) _____
A) anions.
B) positrons.
C) isotopes.
D) cations.
E) radicals.

9) The nucleus of an atom consists of 9) _____
A) electrons.
B) protons.
C) protons + neutrons.
D) protons + electrons.
E) neutrons.

10) By weight, which element is the most plentiful in the human body? 10) _____
A) oxygen
B) carbon
C) sodium
D) potassium
E) sulfur

11) By weight, which element is the second most abundant in the human body? 11) _____
A) carbon
B) oxygen
C) hydrogen
D) nitrogen
E) calcium

12) The innermost electron shell in an atom holds up to _____ electrons. 12) _____
A) 2 B) 1 C) 8 D) 6 E) 4

13) Indicate which of these lists contains only trace elements. 13) _____
A) sulfur, chlorine, oxygen
B) boron, oxygen, carbon
C) selenium, hydrogen, calcium
D) cobalt, calcium, sodium
E) silicon, fluorine, tin

14) The mass of an atom is largely determined by the number of _____ it has. 14) _____
A) electrons
B) protons + neutrons
C) protons
D) protons + electrons
E) neutrons

15) A nanometer is 15) _____
A) 10^{-9} meter.
B) 10^{-10} meter.
C) 10^{-12} meter.

D) 10^{-6} meter.
E) 10^{-8} meter.

16) If an isotope of oxygen has 8 protons, 10 neutrons, and 8 electrons, its mass number is 16) _____
A) 12. B) 26. C) 18. D) 8. E) 16.

17) Which element commonly has only a proton as its nucleus? 17) _____
A) neon
B) helium
C) argon
D) hydrogen
E) none of the above

18) If an element is composed of atoms with an atomic number of 6 and a mass number of 14, then a neutral atom of this element contains 18) _____
A) 8 electrons.
B) 6 protons.
C) 8 neutrons.
D) both A and B
E) both A and C

19) In a molecule of nitrogen, three pairs of electrons are shared by two nitrogen atoms. The type of bond that is formed is an example of a(n) 19) _____
A) single trivalent bond.
B) double divalent bond.
C) triple covalent bond.
D) hydrogen bond.
E) polar covalent bond.

20) If a pair of electrons is unequally shared between two atoms, a(n) _____ occurs. 20) _____
A) polar covalent bond
B) single covalent bond
C) double covalent bond
D) triple covalent bond
E) hydrogen bond

21) Elements that have atoms with full outer shells of electrons 21) _____
A) frequently form hydrogen bonds.
B) will normally form anions.
C) will form many compounds.
D) will normally form cations.
E) are inert gases.

22) When atoms complete their outer electron shell by sharing electrons, they form 22) _____
A) cations.
B) ionic bonds.
C) anions.
D) covalent bonds.
E) hydrogen bonds.

23) Which of the following is **not** a cation? 23) _____

A) Mg^{2+}
B) Na^{+}
C) K^{+}
D) Cl^{-}
E) Ca^{2+}

24) The weakest bond between two atoms is the _____ bond. 24) _____

A) polar
B) ionic
C) nonpolar
D) hydrogen
E) covalent

25) Ionic bonds are formed when 25) _____

A) two or more atoms lose electrons at the same time.
B) hydrogen forms bonds with negatively charged atoms.
C) electrons are completely transferred from one atom to another.
D) a pair of electrons is shared unequally by two atoms.
E) atoms share electrons.

26) In an aqueous solution, cations are attracted toward 26) _____

A) anions.
B) water.
C) salt.
D) buffers.
E) hydrogen ions.

27) Identify which of the following is both an anion and a compound: 27) _____

A) NaCl
B) Cl^{-}
C) Na^{+}
D) HCO_3^{-}
E) K^{+}

28) In an aqueous solution, sodium ions would move toward 28) _____

A) a positive terminal.
B) the bottom.
C) a pH terminal.
D) an organic terminal.
E) a negative terminal.

29) When electrons are transferred from one atom to another, and the two atoms unite as a result of the opposite charges, 29) _____

A) an ion is formed.
B) a molecule is formed.
C) a covalent bond is formed.
D) a hydrogen bond is formed.
E) an ionic bond is formed.

30) Magnesium atoms have two electrons in the outermost shell. As a result, you would expect magnesium to form ions with a charge of 30) _____
A) -1.
B) +1.
C) -2.
D) +2.
E) either +2 or -2

31) Which of the following statements about hydrogen bonds is **false**? 31) _____
A) Hydrogen bonds are strong attractive forces between hydrogen atoms and negatively charged atoms.
B) Hydrogen bonds are responsible for many of the properties of water.
C) Hydrogen bonds can form between neighboring molecules.
D) Hydrogen bonds are important for holding large molecules together.
E) Hydrogen bonds can occur within a single molecule.

32) AB → A + B is to decomposition as A + B → AB is to 32) _____
A) exchange.
B) metabolism.
C) synthesis.
D) combustion.
E) replacement.

33) The reaction $N_2 + 3\ H_2 \rightarrow 2\ NH_3$ is an example of a(n) 33) _____
A) synthesis reaction.
B) metabolic reaction.
C) enzyme reaction.
D) decomposition reaction.
E) exchange reaction.

34) The reaction A + B + energy → AB is an example of a(n) 34) _____
A) decomposition reaction.
B) endergonic reaction.
C) exergonic reaction.
D) exchange reaction.
E) equilibrium reaction.

35) Chemical reactions that yield energy, such as heat, are said to be 35) _____
A) activated.
B) neutral.
C) exergonic.
D) endergonic.
E) thermonuclear.

36) In hydrolysis reactions, compounds react with 36) _____
A) water, causing decomposition.
B) carbon, causing decomposition.
C) glucose, causing decomposition.
D) water, causing synthesis.
E) hydrogen, causing decomposition.

37) In dehydration reactions, compounds 37) _____
A) convert hydrogen and oxygen to water.
B) lose water molecules.
C) convert water molecules to hydrogen and oxygen.
D) gain electrons.
E) gain water molecules.

38) Which one of the following statements is **not** correct about the reaction $H_2 + Cl_2 \rightarrow 2\ HCl$? 38) _____
A) Two molecules of HCl are formed in the reaction.
B) One molecule of hydrogen contains two atoms.
C) HCl is the product.
D) H_2 and Cl_2 are the reactants.
E) This reaction is easily reversible.

39) The molecule NO is known as 39) _____
A) noxious oxide.
B) nitrous oxide.
C) nitric oxygen.
D) nitric oxide.
E) noxious oxygen.

40) The molecule CO_2 is known as 40) _____
A) carbon dioxide.
B) carbonized oxygen.
C) carbonated oxygen.
D) carbon oxide.
E) carbon monoxide.

41) The molecule H_2 is known as 41) _____
A) helium.
B) hydrogen.
C) semi-water.
D) hydrohydrogen.
E) hydroxide.

42) The molecule O_2 is known as 42) _____
A) oxygen.
B) organic.
C) oxide.
D) B or C
E) none of the above

43) H_2O is an example of a(n) 43) _____
A) glucose molecule.
B) molecular formula.
C) ionic formula.
D) covalent formula.
E) water molecule.

44) Magnesium atoms have two electrons in the outermost shell and chlorine atoms have seven. The compound magnesium chloride would contain 44) _____
A) 1 magnesium and 2 chlorine.
B) 2 magnesium and 1 chlorine.
C) 1 magnesium and 1 chlorine.
D) 2 magnesium and 7 chlorine.
E) impossible to tell without more information

45) In the reaction listed below, what coefficient needs to be added to balance the equation? 6 CO_2 + 6 H_2O → $C_6H_{12}O_6$ + _____ O_2 45) _____
A) 2 B) 4 C) 6 D) 8 E) 10

46) All of the following are true concerning enzymes, **except** that they 46) _____
A) are proteins.
B) function as biological catalysts.
C) are consumed during the reaction.
D) affect only the rate of a chemical reaction.
E) lower the activation energy required for a reaction.

47) Substrate molecules bind to enzymes at the _____ sites. 47) _____
A) carboxyl
B) reactant
C) active
D) neutral
E) amino

48) The term _____ means each enzyme catalyzes only one type of reaction. 48) _____
A) monoreactive
B) specificity
C) saturation
D) inertia
E) activation

49) The maximum rate of an enzyme reaction occurs at 49) _____
A) hydrolysis.
B) dehydration.
C) synthesis.
D) saturation limit.
E) reversible.

50) How would the lack of a cofactor for an enzyme affect that enzyme's function? 50) _____
A) The enzyme would function more slowly.
B) The enzyme's function would not be altered.
C) The enzyme would function more quickly.
D) The enzyme would cease to function after reaching a maximum rate.
E) The enzyme would not be able to function.

51) Compounds that can be synthesized or broken down by chemical reactions

inside the body are called 51) ___ ___

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

52) Each of the following is an example of an inorganic compound, **except** 52) _____
A) acids.
B) bases.
C) rocks.
D) water.
E) salts.

53) Carbohydrates, lipids, and proteins are classified as 53) _____
A) inorganic molecules.
B) acids.
C) salts.
D) organic molecules.
E) bases.

54) An example of an organic substance is 54) _____
A) sodium chloride.
B) nitric oxide.
C) oxygen.
D) carbonic acid.
E) sucrose.

55) An example of an inorganic substance is 55) _____
A) fructose.
B) water.
C) glycerol.
D) carbon dioxide.
E) both B and D

56) Which of the following statements about water is **not** correct? 56) _____
A) has a relatively low heat capacity
B) is responsible for much of the mass of the human body
C) contains hydrogen bonds
D) can dissolve many substances
E) is composed of polar molecules

57) During ionization, water molecules disrupt the ionic bonds of a salt to produce a mixture of ions. These ions can carry a current and so are called 57) _____
A) counterions.
B) cations.
C) acids.
D) electrolytes.

E) anions.

58) Oppositely charged ions in solution are prevented from combining by 58) _____
A) hydrogen bonding.
B) water's nonpolar nature.
C) free radicals.
D) hydration spheres.
E) heat capacity of water.

59) Which property of water helps keep body temperature stabilized? 59) _____
A) kinetic energy
B) reactivity
C) lubrication
D) thermal inertia
E) surface tension

60) Hydrophilic molecules readily associate with 60) _____
A) lipid molecules.
B) water molecules.
C) hydrophobic molecules.
D) both A and B
E) all of the above

61) A dust particle floating on a water surface illustrates 61) _____
A) hydrophilic attraction.
B) heat capacity.
C) static electricity.
D) chemical tension.
E) surface tension.

62) Nonpolar organic molecules are good examples of 62) _____
A) hydrophobic compounds.
B) molecules that will dissociate when placed into water.
C) solutes.
D) hydrophilic compounds.
E) electrolytes.

63) A solution containing equal numbers of hydrogen ions and hydroxide ions is 63) _____
A) in equilibrium.
B) basic.
C) alkaline.
D) acidic.
E) neutral.

64) Which of the following substances would be most acidic? 64) _____
A) urine, pH = 6
B) tomato juice, pH = 4
C) white wine, pH = 3
D) lemon juice, pH = 2
E) stomach secretions, pH = 1

65) If a substance has a pH that is greater than 7, it is 65) _____
A) neutral.
B) alkaline.
C) acidic.
D) a salt.
E) a buffer.

66) A(n) _____ removes hydrogen ions and a(n) _____ releases hydrogen ions. 66) _____
A) molecule; acid
B) acid; base
C) compound; element
D) element; compound
E) base; acid

67) Of the following choices, the pH of the least acidic solution is 67) _____
A) 6.0.
B) 4.5.
C) 2.3.
D) 12.0.
E) 1.0.

68) Which has the greater concentration of hydrogen ions, a substance with a pH of 5 or a substance with a pH of 4? 68) _____
A) A pH of 4 is greater.
B) A pH of 5 is greater.
C) They are both equal; 4 and 5 are relative values.
D) pH 9, if you mixed the solutions .
E) Not enough information to say.

69) Of the list below, which has the highest concentration of hydroxide ions? 69) _____
A) pH 14
B) pH 7
C) pH 10
D) pH 2
E) pH 1

70) Which pH is closest to normal body pH? 70) _____
A) pH 3
B) pH 2
C) pH 8
D) pH 4
E) pH 7

71) An excess of hydrogen ions in the body fluids can have fatal results because this can 71) _____
A) change the shape of large complex molecules, rendering them nonfunctional.
B) disrupt tissue functions.
C) block ion movements.
D) all of the above

E) A and C only

72) When placed in water, an inorganic compound dissociates 99 percent, forming hydrogen ions and anions. This compound would be 72) _____
A) a weak base.
B) a salt.
C) a strong base.
D) a weak acid.
E) a strong acid.

73) When a small amount of HCl or NaOH is added to a solution of Na_2HPO_4, the pH of the solution barely changes. Based on these observations, all of the following are true concerning the compound Na_2HPO_4, **except** 73) _____
A) Na_2HPO_4 acts as a buffer.
B) Na_2HPO_4 is able to accept extra hydrogen ions from the HCl.
C) Na_2HPO_4 is able to donate hydrogen ions to the OH^- from NaOH.
D) Na_2HPO_4 adsorbs excess H^+ and OH^- directly onto the surface of its crystalline structure.
E) Na_2HPO_4 is a salt formed from reacting a strong base with a weak acid.

74) An important buffer in body fluids is 74) _____
A) NaOH.
B) HCl.
C) NaCl.
D) H_2O.
E) $NaHCO_3$.

75) In the body, inorganic compounds 75) _____
A) can serve as buffers.
B) are structural components of cells.
C) may be held together by ionic bonds.
D) can make up proteins.
E) both A and C

76) Oxygen is required in biological systems for 76) _____
A) chemical messengers.
B) serving as structural components of bone.
C) storage of energy.
D) cellular metabolism.
E) serving as catalysts.

77) Carbohydrate molecules 77) _____
A) form the regulatory molecules known as enzymes.
B) are composed of C, H, O, and N atoms.
C) are the building blocks of cellular membranes.
D) contain the genetic information found in cells.
E) are the body's most readily available source of energy.

78) The most important metabolic fuel molecule in the body is 78) _____

A) glucose.
B) caffeine.
C) sucrose.
D) protein.
E) vitamins.

79) Molecules that have the same molecular formula but different structural formulas are called 79) _____
A) isotypes.
B) isomers.
C) isotopes.
D) isozymes.
E) isomoles.

80) A polysaccharide that is formed in liver and muscle cells to store glucose is 80) _____
A) sucrose.
B) cellulose.
C) lactose.
D) fructose.
E) glycogen.

81) The group of organic compounds containing carbon, hydrogen, and oxygen in a near 1:2:1 ratio is defined as a 81) _____
A) carbohydrate.
B) lipid.
C) nucleic acid.
D) protein.
E) either A or B

82) Artificial sweeteners 82) _____
A) are generally many times sweeter than sucrose.
B) provide the same number of calories as an equivalent amount of sucrose.
C) are naturally similar to sugars.
D) are always some form of carbohydrate.
E) are inorganic sugar substitutes.

83) Fructose 83) _____
A) is an isomer of glucose.
B) is a hexose.
C) is found in male reproductive fluids.
D) all of the above
E) A and B only

84) When two monosaccharides undergo a dehydration synthesis, 84) _____
A) a disaccharide is formed.
B) hydrolysis occurs.
C) a starch is formed.
D) a polysaccharide is formed.
E) two new monosaccharides are formed.

85) Lipids 85) _____
A) help to maintain body temperature.
B) provide roughly twice the energy as carbohydrates.
C) form essential structural components of cells.
D) cushion organs against shocks.
E) all of the above

86) A fatty acid that contains two or more double covalent bonds is said to be 86) _____
A) hydrogenated.
B) saturated.
C) polyunsaturated.
D) carboxylated.
E) monounsaturated.

87) Most of the fat found in the human body is in the form of 87) _____
A) cholesterol.
B) triglycerides.
C) monoglycerides.
D) prostaglandins.
E) phospholipids.

88) Lipids that are produced by nearly every tissue in the body and that act as local regulators of metabolism are the 88) _____
A) monoglycerides.
B) prostaglandins.
C) glycolipids.
D) steroids.
E) phospholipids.

89) Cholesterol, phospholipids, and glycolipids are examples of 89) _____
A) dietary fats.
B) lipid drugs.
C) steroids.
D) prostaglandins.
E) structural lipids.

90) Which of the following is/are needed to form a triglyceride molecule? 90) _____
A) 3 fatty acid molecules
B) 3 glycerol molecules
C) 1 glycerol molecule
D) both A and C
E) both B and C

91) A shortage of cholesterol in the body could interfere with the formation of 91) _____
A) plasma membranes.
B) sex hormones.
C) glycogen.
D) proteins.
E) both A and C

92) You would expect a peptide bond to link 92) _____
A) two amino acids.
B) two simple sugars.
C) a sugar and a peptide.
D) a peptide and a fatty acid.
E) two nucleotides.

93) Each amino acid differs from another in the 93) _____
A) nature of the side chain.
B) number of central carbon atoms.
C) size of the amino group.
D) number of peptide bonds in the molecule.
E) number of carboxyl groups.

94) The alpha-helix and pleated sheet are examples of _____ protein structure. 94) _____
A) quaternary
B) primary
C) tertiary
D) secondary
E) pentanary

95) Interaction between individual polypeptide chains to form a protein complex is _____ structure. 95) _____
A) primary
B) quaternary
C) tertiary
D) secondary
E) pentagonal

96) Glycoproteins and proteoglycans are combinations of amino acids and 96) _____
A) carbohydrates.
B) lipids.
C) nucleic acids.
D) fatty acids.
E) none of the above

97) Which of the following is the symbol for an amino group? 97) _____
A) –OH
B) –COOH
C) –AMO
D) $-PO_3$
E) $-NH_2$

98) A functional group is best described as reoccurring clusters of 98) _____
A) atoms that greatly influence the chemical properties of molecules they are part of.
B) elements that form at high pH.
C) amino acids in a globular protein.
D) elements that occur in a salt.
E) atoms that function in the body.

99) A side chain on an amino acid is sometimes called _____. 99) _____
A) fibrous or globular.
B) an isozyme.
C) nucleic acid.
D) an R group.
E) a polypeptide chain.

100) Molecules that store and process genetic information are the 100) _____
A) lipids.
B) steroids.
C) nucleic acids.
D) carbohydrates.
E) proteins.

101) According to the rules of complementary base pairing in nucleic acids, cytosine would pair with the base 101) _____
A) uracil.
B) cytosine.
C) thymine.
D) adenine.
E) guanine.

102) A nucleotide consists of 102) _____
A) a five-carbon sugar and a nitrogenous base.
B) a five-carbon sugar, a nitrogenous base, and a phosphate group.
C) a five-carbon sugar and an amino acid.
D) a phosphate group and a nitrogenous base.
E) a five-carbon sugar and phosphate group.

103) Adenine and guanine are 103) _____
A) nucleotides represented by A and G.
B) purines represented by T and C.
C) pyrimidines represented by A and G.
D) pyrimidines represented by T and C.
E) purines represented by A and G.

104) An amino acid is to a protein as _____ is to a nucleic acid. 104) _____
A) a nucleotide
B) a neutron
C) a purine
D) a proton
E) a protein

105) The structure of RNA differs from DNA in that 105) _____
A) RNA contains purines but not pyrimidines.
B) the backbone of RNA contains ribose.
C) DNA contains purines but not pyrimidines.
D) DNA contains pyrimidines but not purines.
E) RNA contains pyrimidines but not purines.

106) The most abundant high-energy compound in cells is 106) _____
A) DNA.

B) adenosine monophosphate.
C) adenosine triphosphate.
D) adenosine diphosphate.
E) RNA.

107) A high-energy bond in ATP is present 107) _____
A) between adenine and ribose.
B) between adenine and a phosphate group.
C) between the first and second phosphate group.
D) between the second and third phosphate group.
E) both C and D

108) AMP + P → 108) _____
A) DNA
B) adenine
C) ATP
D) 2ADP
E) ADP

109) Identify the product formed from the phosphorylation of ADP. 109) _____
A) adenosine diphosphate
B) ribose
C) adenosine triphosphate
D) deoxyribonucleic acid
E) adenine

110) The phosphorylation of adenosine forms 110) _____
A) ATP.
B) ADP.
C) ribose.
D) AMP.
E) 2ATP.

111) The average time between synthesis and breakdown is known as the _____ time. 111) _____
A) catabolism
B) specificity
C) turnover
D) anabolism
E) metabolism

112) Continuous breakdown and replacement of cellular molecules is termed 112) _____
A) catabolic turnover.
B) anabolic turnover.
C) metabolic turnover.
D) metabolism.
E) both A and C

113) Muscle proteins are destroyed after 17 days and then replaced. This is an example of 113) _____
A) surface tension.
B) specificity.

C) metabolic turnover.
D) surveillance.
E) disease.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

114) A(n) _____ is a pure substance composed of atoms. 114) _____

115) The center of an atom is called the _____. 115) _____

116) Electrons whirl around the center of the atom at high speed, forming a(n) _____. 116) _____

117) Electrons in an atom occupy an orderly series of electron shells or _____. 117) _____

118) The actual mass of an atom is known as its _____. 118) _____

119) Atoms of the same element whose nuclei contain the same number of protons, but different numbers of neutrons, are called _____. 119) _____

120) The _____ of a radioactive substance is the time required for a 50 percent reduction in the rate of radiation emission. 120) _____

121) Ions with a positive charge are called _____. 121) _____

122) Ions with a negative charge are called _____. 122) _____

123) The three familiar states of matter are solids, liquids, and _____. 123) _____

124) Chemical reactions that release energy are called _____. 124) _____

125) Chemical reactions that absorb energy are called _____. 125) _____

126) Kinetic energy is stored as _____ energy when a spring is stretched. 126) _____

127) _____ accelerate chemical reactions that occur in the human body. 127) _____

128) In living cells, complex metabolic reactions proceed in a series of steps called a(n) _____. 128) _____

129) _____ molecules are compounds that contain carbon as the primary structural atom. 129) _____

130) _____ compounds do not usually contain carbon as a primary structural atom. 130) _____

131) A(n) _____ is a homogeneous mixture containing a solvent and a solute. 131) _____

132) _____ are soluble inorganic compounds whose solutions will conduct an electric current. 132) _____

133) Molecules that do not readily dissolve in water are called _____. 133) _____

134) The _____ of a solution is the negative logarithm of the hydrogen ion concentration expressed in moles per liter. 134) _____

135) All fatty acids contain a functional group at one end called the _____. 135) _____

136) In water, fatty acids tend to form tiny droplets with hydrophobic tails buried inside called _____. 136) _____

137) _____ are molecules with two fatty acid chains and a phosphate group that form biological membranes. 137) _____

138) Individual steroids differ in the _____ attached to the carbon rings. 138) _____

139) The molecule DNA contains a five-carbon sugar called _____. 139) _____

140) The purines found in DNA are _____ and _____. 140) _____

141) The pyrimidine bases found in DNA are _____ and _____. 141) _____

142) Identify the three structural components of a nucleotide. 142) _____

143) A(n) _____ is a covalent bond that stores an unusually large amount of energy. 143) _____

144) In the process of _____ a phosphate group is transferred to a molecule. 144) _____

145) The hydrolysis of ATP yields ADP, phosphate ion, and _____. 145) _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

146) The element sulfur has an atomic number of 16 and mass number of 32. How many neutrons are in the nucleus of a sulfur atom? If sulfur forms covalent bonds with hydrogen, how many hydrogen atoms can bond to one sulfur atom?

147) What role do buffer systems play in the human body?

148) Blood has a very narrow normal pH range but urine has a very broad normal pH range. What does that indicate about the physiology of pH?

149) Explain the role of water molecules in polysaccharide formation.

150) How does the DNA molecule control the appearance and function of a cell?

1) E
2) B
3) E
4) E
5) C
6) B
7) A
8) D
9) C
10) A
11) A
12) A
13) E
14) B
15) A
16) C
17) D
18) E
19) C
20) A
21) E
22) D
23) D
24) D
25) C
26) A
27) D
28) E
29) E
30) D
31) A
32) C
33) A
34) B
35) C
36) A
37) B
38) E
39) D
40) A
41) B
42) A
43) B
44) A
45) C
46) C
47) C
48) B
49) D
50) E
51) E

52) C
53) D
54) E
55) E
56) A
57) D
58) D
59) D
60) B
61) E
62) A
63) E
64) E
65) B
66) E
67) D
68) A
69) A
70) E
71) D
72) E
73) D
74) E
75) E
76) D
77) E
78) A
79) B
80) E
81) A
82) A
83) D
84) A
85) E
86) C
87) B
88) B
89) E
90) E
91) E
92) A
93) A
94) D
95) B
96) A
97) E
98) A
99) D
100) C
101) E
102) B
103) E

104) A
105) B
106) C
107) E
108) E
109) C
110) D
111) C
112) C
113) C
114) element
115) nucleus
116) electron cloud
117) energy levels
118) atomic weight
119) isotopes
120) half-life
121) cations
122) anions
123) gases
124) exergonic
125) endergonic
126) potential
127) Enzymes
128) pathway
129) Organic
130) Inorganic
131) solution
132) Electrolytes
133) hydrophobic
134) pH
135) carboxylic acid group
136) micelles
137) Phospholipids
138) side chains
139) deoxyribose
140) adenine; guanine
141) thymine; cytosine
142) pentose; phosphate group; nitrogenous base
143) high-energy bond
144) phosphorylation
145) energy
146) The number of neutrons in an atom is equal to the mass number minus the atomic number. Thus, sulfur has 32 — 16 = 16 neutrons. The atomic number indicates the number of protons, so a neutral sulfur atom contains 16 protons plus 16 electrons to balance the protons electrically. The electrons would be distributed as follows: 2 in the first electron shell, 8 in the second, and the remaining 6 in the third. To achieve a full 8 electrons in the third (outermost) electron shell, the sulfur atom can accept 2 electrons in an ionic bond or can share 2 electrons in a covalent bond. Because hydrogen atoms can share one electron in a covalent bond, the sulfur atom can form two covalent bonds with hydrogen, one with each of two hydrogen atoms. In chemical notation, this is H_2S.
147) Buffer systems help maintain pH within normal limits by removing or replacing hydrogen

ions as needed.

148) Homeostasis requires that the pH of body fluids be maintained almost constant to avoid disruptions of healthy function. To accomplish this, the urinary system eliminates or retains hydrogen ion as needed. These actions cause the pH of urine to vary widely, depending on whether there is too much or not enough hydrogen ion in the body.

149) Water molecules are removed in the dehydration synthesis of polysaccharides.

150) The DNA molecule controls the synthesis of enzymes and structural proteins. By controlling the synthesis of structural proteins, the DNA is able to influence the physical appearance of a cell. By controlling the production of enzymes, the DNA is able to control all aspects of cellular metabolism and thus control the activity and biological functions of the cell.