

## Chapter 02 Chemical Composition of the Body

### Multiple Choice Questions

1. Water makes up \_\_\_\_\_ of the total body weight of an average adult.
- A. 50-60%
  - B. 55-65%
  - C. 60-70%**
  - D. 65-75%

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

2. Most of the water found in the body is in the
- A. blood.
  - B. intracellular fluid compartment.**
  - C. extracellular fluid compartment.
  - D. blood and extracellular fluid compartment.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

### True / False Questions

3. Neutrons are uncharged particles found in the nucleus of an atom.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

4. An element with 5 protons, 5 neutrons, and 5 electrons would have an atomic number of 15.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

5. The atomic nucleus does not contain \_\_\_\_\_, which are negatively charged subatomic particles.

A. protons

**B.** electrons

C. neutrons

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

6. An element with 11 neutrons, 11 protons, and 11 electrons would have a mass number of
- A. 11
  - B. 33
  - C. 22**
  - D. cannot be determined

*Blooms Level: 2. Understand*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

7. The \_\_\_\_\_ is the physical space which an electron occupies in an atom.
- A. nucleus
  - B. orbital
  - C. energy level
  - D. Both orbital and energy level are correct.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

8. The \_\_\_\_\_ electrons are the outermost electrons of an atom.
- A. kernel
  - B. valence**
  - C. atomic
  - D. anion

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

9. Isotopes have the same \_\_\_\_\_ number, but a different \_\_\_\_\_ number.

- A. mass, atomic
- B. neutron, mass
- C. atomic, mass
- D. atomic, proton

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

10. Which of the following is NOT true of isotopes of a given atom?

- A. have the same number of neutrons
- B. have the same number of protons
- C. have different atomic masses
- D. All apply.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

### **True / False Questions**

11. The term "chemical element" refers to the most common isotope of that element.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

12. Which of the following subatomic particles have negligible mass?

- A. electrons
- B. neutrons
- C. protons
- D. Both neutrons and protons.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

### True / False Questions

13. Molecules with polar covalent bonds are hydrophobic.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

14. Negatively charged ions will migrate towards the anode in an electrical field.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

15. Hydrogen bonds form between the partially charged atoms of two polar molecules, such as the slightly positively charged hydrogen atom of one water molecule and the slightly negatively charged oxygen atom of another.

**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

16. Atoms sharing a pair of electrons form covalent bonds.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

17. Carbon atoms form many organic molecules by forming polar covalent bonds with other carbon atoms.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

18. When an atom loses one or more electrons, it  
A. becomes positively charged.  
B. becomes negatively charged.  
C. is called an anion.  
D. has no change in its charge.

*Blooms Level: 1. Remember*  
*Learning Outcome: 02.01*  
*Section: 02.01*  
*Topic: Chemistry*

19. When an atom gains one or more electrons, it  
A. becomes positively charged.  
B. has no change in its charge.  
C. is called an anion.  
D. is called a cation.

*Blooms Level: 1. Remember*  
*Learning Outcome: 02.01*  
*Section: 02.01*  
*Topic: Chemistry*

20. An atom with 5 protons, 5 neutrons, and 6 electrons would have a net charge of  
A. -1.  
B. -2.  
C. +1.  
D. +2.

*Blooms Level: 2. Understand*  
*Learning Outcome: 02.01*  
*Section: 02.01*  
*Topic: Chemistry*

21. \_\_\_\_\_ bonds are formed when atoms share electrons unequally.
- A. Nonpolar covalent
  - B. Ionic
  - C. Polar covalent**
  - D. van der Waals

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

22. Hydration spheres can be formed by compounds which contain \_\_\_\_\_ bonds.
- A. nonpolar covalent
  - B. polar covalent
  - C. ionic
  - D. either polar covalent or ionic**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

### **True / False Questions**

23. Ionic bonds are very strong and will not easily dissociate in water.  
**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

24. Hydrophobic molecules would contain \_\_\_\_\_ bonds.
- A.** nonpolar covalent
  - B. polar covalent
  - C. hydrogen
  - D. ionic

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

### True / False Questions

25. The formation of hydration spheres makes an ion or molecule soluble in water.  
**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

26. Surface tension between water molecules occurs because adjacent water molecules form \_\_\_\_\_ bonds with each other.

- A. nonpolar covalent
- B. polar covalent
- C. hydrogen**
- D. ionic

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

27. Bonds that are formed between oxygen and hydrogen atoms within water molecules are called

- A. hydrogen bonds.
- B. ionic bonds.
- C. nonpolar covalent bonds.
- D. polar covalent bonds.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

28. The type of bond found in sodium chloride is

- A. an ionic bond.
- B. a polar covalent bond.
- C. a hydrogen bond.
- D. a nonpolar covalent bond.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

29. What type of bond is formed between potassium and iodine?

- A. polar covalent bond
- B. ionic bond**
- C. nonpolar covalent bond
- D. hydrogen bond

*Blooms Level: 2. Understand*

*Learning Outcome: 02.01*

*Section: 02.01*

*Topic: Chemistry*

30. Which of the following would be most easily broken?

- A. a hydrogen bond**
- B. a nonpolar covalent bond
- C. an ionic bond
- D. a polar covalent bond

*Blooms Level: 2. Understand*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

31. The ability of water to be pulled as a column through narrow channels is called

- A. osmolality.
- B. surface tension.
- C. neutrality.
- D. capillary action.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.02*

*Section: 02.01*

*Topic: Chemistry*

**True / False Questions**

32. The pH of a solution is directly proportional to the hydrogen ion concentration of the solution.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

33. Acids release hydrogen ions into solutions.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

34. As the pH of the blood decreases, the amount of hydrogen ions in the blood would decrease.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

35. Water molecules form \_\_\_\_\_ ions when they associate with a hydrogen ion.

- A. hydroxide
- B. bicarbonate
- C. hydronium
- D. water

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

36. A solution of a pH above 7 is called \_\_\_\_\_.

- A. acidic
- B. neutral
- C. basic

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

37. Bases will \_\_\_\_\_ protons in a solution.

- A. accept
- B. donate
- C. ignore
- D. repel

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

38. The primary buffer in the blood is the \_\_\_\_\_ buffer.

- A. hydronium
- B. ammonia
- C. phosphate
- D.** bicarbonate

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

### **True / False Questions**

39. A buffer has an acid component and a base component that can prevent drastic changes in pH.

**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

40. The pH of a solution increases as the \_\_\_\_\_ ion concentration decreases.

- A. hydrogen
- B. hydroxide
- C. bicarbonate
- D. sodium

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

41. In an acidic solution,

- A. the  $\text{OH}^-$  ion concentration is greater than the  $\text{H}^+$  ion concentration.
- B. the  $\text{OH}^-$  ion concentration is less than the  $\text{H}^+$  ion concentration.
- C. the  $\text{H}^+$  ion concentration is equal to the  $\text{OH}^-$  ion concentration.
- D. the  $\text{H}^+$  ion concentration is less than the  $\text{OH}^-$  ion concentration only if the solution is buffered.

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

42. A blood pH of 7.6 is

- A. indicative of acidosis.
- B. indicative of alkalosis.
- C. in the normal physiological range.
- D. indicates effective buffering by the bicarbonate/carbonic acid system.

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

43. Regarding acids and bases,
- A. acids will increase the pH of a solution.
  - B. bases will decrease the pH of a solution.
  - C. acids will accept hydrogen ions in a solution.
  - D.** bases will accept hydrogen ions in a solution.

*Blooms Level: 2. Understand*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

44. Ammonia usually
- A.** acts as a base.
  - B. acts as an acid.
  - C. acts as a buffer.
  - D. ionizes to form a hydroxyl ion.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Section: 02.01*

*Topic: Chemistry*

### **True / False Questions**

45. Organic acids contain carbonyl groups.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.03*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

46. Molecules that contain carbon and hydrogen atoms are

- A. ionic.
- B. inorganic.
- C. organic.**
- D. carbonic.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

### True / False Questions

47. An ionized organic acid is designated with the suffix - ate.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

48. The ionized form of the organic lactic acid is lactate.

**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

49. How many single bonds can a carbon atom form if it is double-bonded to an oxygen atom?

- A. 1
- B. 2**
- C. 3
- D. 4

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

50. A six-sided organic molecule with alternating double bonds is termed a(n)

- A. aromatic compound.**
- B. ketone.
- C. alcohol.
- D. organic acid.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

51. Ketones contain a(n) \_\_\_\_\_ group within the carbon chain.

A. hydroxyl

**B. carbonyl**

C. carboxyl

D. aromatic

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

52. Organic acids will contain

- A. a carboxyl group.
- B. a carbonyl group.
- C. an amino group.
- D. a hydroxyl group.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

53. An example of an aromatic substance is

- A. hexane.
- B. cyclohexane.
- C. fructose.
- D. benzene.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

### **True / False Questions**

54. Only L-stereoisomers are absorbed by the digestive tract and used to synthesize organic molecules.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

### Multiple Choice Questions

55. Molecules with the same atoms, in the same sequence, but arranged differently in space are called

- A. structural isomers.
- B. stereoisomers.**
- C. functional groups.
- D. aromatic molecules.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

56. Molecules that are mirror images of each other are

- A. enantiomers.**
- B. geometric isomers.
- C. cis/trans isomers.
- D. structural isomers.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.04*

*Section: 02.01*

*Topic: Chemistry*

**True / False Questions**

57. Fats and carbohydrates are the primary energy stores in the body.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

58. Glucose, galactose, and fructose can be considered structural isomers of each other.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

59. Fructose is a ketone.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### Multiple Choice Questions

60. \_\_\_\_\_ are molecules with the same ratio of atoms but different arrangements of atoms.

- A. Isotopes
- B. Structural isomers**
- C. Stereoisomers
- D. Radioactive isotopes

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### True / False Questions

61. Covalent bonds are formed between monosaccharides through dehydration synthesis.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### Multiple Choice Questions

62. The addition of water with the proper enzymes to a molecule is called

- A. dehydration synthesis.
- B. condensation.
- C. hydrolysis.
- D. combustion.

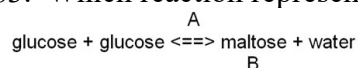
*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

63. Which reaction represents a dehydration synthesis reaction?



- A. Reaction A
- B. Reaction B

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### True / False Questions

64. Carbohydrate molecules have a ratio of twice as many oxygen atoms to carbon atoms.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### Multiple Choice Questions

65. Sucrose is a disaccharide that is composed of \_\_\_\_\_ and \_\_\_\_\_.
- A. glucose, glucose
  - B. glucose, galactose
  - C. glucose, fructose
  - D. fructose, galactose

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

66. Glycogen
- A. is more highly branched than plant starch.
  - B. is a glycoprotein found in the liver.
  - C. is a glycolipid found in skeletal muscles.
  - D. is composed of alternating glucose and galactose molecules.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

67. An example of a monosaccharide is

A. maltose.

B. sucrose.

C. glucose.

D. glycogen.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

**True / False Questions**

68. Glucose is stored as a polysaccharide to prevent osmosis of water into the cells.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

**Multiple Choice Questions**

69. Which of the following is NOT a disaccharide?

**A.** fructose

B. sucrose

C. maltose

D. lactose

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

70. Which of the following polysaccharides cannot be digested by animals themselves?

- A. glycogen
- B. cellulose**
- C. starch
- D. All apply.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### **True / False Questions**

71. Unsaturated fatty acids contain more hydrogen atoms than saturated fatty acids of the same length.

**FALSE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

72. Rapid, uncontrolled hydrolysis of body fats can result in ketoacidosis.

**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

73. Corticosteroids are a type of lipid commonly found in cell membranes.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

74. Steroids are derived from cholesterol.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

### **Multiple Choice Questions**

75. In order to maintain proper health, total dietary fat intake should not exceed \_\_\_\_\_ of total dietary energy intake.

A. 10%

B. 20%

**C. 30%**

D. 40%

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

76. Which of the following is NOT a type of lipid?

- A. prostaglandins
- B. triglycerides
- C. cholesterol
- D. glycogen**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

77. Lipids containing glycerol would include \_\_\_\_\_ and \_\_\_\_\_.

- A. triglycerides, steroids
- B. prostaglandins, phospholipids
- C. triglycerides, phospholipids**
- D. steroids, prostaglandins

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

78. \_\_\_\_\_ are liver synthesized derivatives of free fatty acids that can be used as an immediate source of energy by many organs.

- A. Glycerols
- B. Ketone bodies**
- C. Steroids
- D. Cholesterols

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

79. \_\_\_\_\_ are fatty acids with a cyclic hydrocarbon group.

- A. Triglycerides
- B. Prostaglandins**
- C. Proteins
- D. Carbohydrates

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

80. A molecule that is part polar and part nonpolar is called

- A. an enantiomer.
- B. a ketone body.
- C. unsaturated.
- D. amphipathic.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

81. This group of organic compounds acts as surfactants:

- A. carbohydrates
- B. phospholipids**
- C. nucleic acids
- D. prostaglandins

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

82. In the formation of triglycerides,
- A. hydroxyl and carbonyl groups interact.
  - B. amino and carbonyl groups interact.
  - C. carboxyl and amino groups interact.
  - D. carboxyl and hydroxyl groups interact.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.06*

*Section: 02.02*

*Topic: Chemistry*

83. Which of the following is NOT true of unsaturated fatty acids?
- A. They contain one or more double bonds.
  - B. They are usually liquid at room temperature.
  - C. They contain a maximal number of hydrogen atoms.**
  - D. They contain less than the maximum number of hydrogen atoms.

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

84. Which of the following is NOT true of phospholipids?
- A. They are glycolipids originally isolated from the prostate gland.**
  - B. They are major components of the cell membrane.
  - C. They have a polar head and a nonpolar tail.
  - D. They are amphipathic molecules.

*Blooms Level: 2. Understand*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

85. Ketosis

- A. occurs when stored fats are rapidly degraded by the body.
- B. stimulates an increased blood pH.
- C. may lead to alkalosis.
- D. occurs as the concentration of ketones in the urine decreases.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

86. Which of the following describes a trans-fat?

- A. Has carbon-carbon single bonds.
- B. Has carbon-carbon double bonds with hydrogens on opposite sides of the bonds.
- C. Has carbon-carbon double bonds with hydrogens on the same side of the bonds.
- D. The fatty acids form a bent chain.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

87. Which of the following is NOT true of steroids?

- A. They have three 6-carbon rings joined to one 5-carbon ring.
- B. They contain a variety of functional groups.
- C. They are derived from palmitate.
- D. They differ in the position of the double covalent bonds between the carbon atoms in the rings.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

88. Which of the following is NOT a derivative of cholesterol?

- A. corticosteroids
- B. vitamin D<sub>3</sub>
- C. aldosterone
- D.** lecithin

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Section: 02.02*

*Topic: Chemistry*

89. Phospholipid molecules will form aggregates called \_\_\_\_\_ when placed in water.

- A. surfactants
- B. ketone bodies
- C. prostaglandins
- D.** micelles

*Blooms Level: 1. Remember*

*Learning Outcome: 02.07*

*Section: 02.02*

*Topic: Chemistry*

90. What characteristic of phospholipids allows them to form the double layer seen in cell membranes?

- A.** They are amphipathic.
- B. They are totally nonpolar.
- C. They are soluble in water.
- D. They are totally hydrophobic.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.07*

*Section: 02.02*

*Topic: Chemistry*

**True / False Questions**

91. All amino acids contain carboxyl and amino groups.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.05*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Chemistry*

92. The specific sequence of amino acids in a polypeptide is known as the primary protein structure.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

93. The white part of a cooked egg is due to denatured albumin proteins.

**TRUE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

### Multiple Choice Questions

94. \_\_\_\_\_ is a structural protein found in tendons and ligaments.

- A. Collagen
- B. Keratin
- C. Myosin
- D. Fibrin

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

95. Peptide bonds are formed by the process of

- A. ketosis.
- B. hydrolysis.
- C. dehydration synthesis.
- D. aromatization.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Chemistry*

96. The secondary structure of proteins is/are

- A. the linear arrangement of amino acids in the molecule.
- B. alpha helix coils and beta-pleated sheet folds of a protein strand.
- C. due to the interaction between protein subunits.
- D. stabilized when a protein is denatured.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

97. The primary structure of proteins is/are  
A. the linear arrangement of amino acids in the molecule.  
B. alpha helix coils and beta-pleated sheet folds of a protein strand.  
C. due to the interaction between protein subunits.  
D. stabilized when a protein is denatured.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

98. The subunit of protein is the  
A. fatty acid.  
B. nucleic acid.  
C. amino acid.  
D. carboxylic acid.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Chemistry*

99. How many different amino acids are known?  
A. 10  
B. 25  
C. 30  
D. 20

*Blooms Level: 1. Remember*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Chemistry*

100. What holds a protein in its tertiary structure?

- A. hydrogen bonds between nearby amino acids
- B. weak chemical bonds between widely spaced amino acids
- C. disulfide bonds between sulfur groups on cysteines
- D.** Both weak chemical bonds between widely spaced amino acids and disulfide bonds between sulfur groups on cysteines are correct.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

101. How many amino acids are present for a polypeptide chain to be called a protein?

- A. 3
- B. 30
- C. 50
- D.** 100

*Blooms Level: 1. Remember*

*Learning Outcome: 02.08*

*Section: 02.03*

*Topic: Chemistry*

### **True / False Questions**

102. Proteins that combine with other molecules are said to be condensed.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

103. The specific shape of a protein determines its function.

**TRUE**

*Blooms Level: 2. Understand*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

### **Multiple Choice Questions**

104. A protein that is combined with another type of molecule like a carbohydrate is

- A.** conjugated.
- B. denatured.
- C. hydrolyzed.
- D. complemented.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

105. Which of the following is NOT a function of proteins in the body?

- A. carriers for membrane transport
- B. enzymes
- C.** compose genes
- D. receptors for regulator molecules

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

106. Keratin and collagen are considered \_\_\_\_\_ proteins.

A. functional

B. structural

C. fibrous

**D.** Both structural and fibrous are correct.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.09*

*Section: 02.03*

*Topic: Chemistry*

### **True / False Questions**

107. In DNA, cytosine forms a complementary base pair with adenine.

**FALSE**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.11*

*Section: 02.04*

*Topic: Chemistry*

### Multiple Choice Questions

108. The nitrogenous base adenine is a

- A. purine.
- B. pyrimidine.
- C. steroid.
- D. prostaglandin.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

109. Which of the following is NOT a component of DNA?

- A. phosphate
- B. deoxyribose sugar
- C. guanine
- D. uracil

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

110. The human genome refers to

- A. all living human beings.
- B. the total variations in human cells.
- C. all of the genes in the cell.
- D. human mutations caused by gene defects.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

111. The "spiral staircase" structure of DNA is referred to as the

- A. tertiary structure.
- B. spiral structure.
- C. the double helix.
- D. the twist of life.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

112. Which of the following is NOT one of the three types of RNA?

- A. dRNA
- B. tRNA
- C. rRNA
- D. mRNA

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

113. The base that is NOT found in RNA is

- A. thymine.
- B. guanine.
- C. cytosine.
- D. uracil.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

114. Which of the following is NOT a difference between DNA and RNA?

- A. They have different sugars.
- B. RNA is a single strand, while DNA is a double strand.
- C. DNA has thymine, while RNA has uracil.
- D. They both can leave the nucleus to perform their functions.**

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

115. The backbone of a DNA molecule is a chain of

- A. alternating deoxyribose sugar and phosphate.**
- B. alternating phosphate and nitrogen.
- C. alternating nitrogenous bases.
- D. alternating deoxyribose and ribose sugars.

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*

116. Which of the following is NOT a function of a purine-containing nucleotide?

- A. neurotransmitter
- B. hormone**
- C. energy carrier
- D. coenzymes

*Blooms Level: 1. Remember*

*Learning Outcome: 02.10*

*Section: 02.04*

*Topic: Chemistry*