

Student: \_\_\_\_\_

1. Which of the following is NOT a lipid?
  - A. olive oil
  - B. fat
  - C. amino acid
  - D. steroid
  
2. Saturated fats differ from unsaturated fats in that saturated fats
  - A. are longer.
  - B. lack carbon-carbon double bonds.
  - C. have fewer double bonds.
  - D. cannot be used for an energy source.
  
3. A subunit of protein is a(n)
  - A. amino acid.
  - B. nucleic acid.
  - C. fatty acid.
  - D. phospholipid.
  
4. Which of the following types of molecules contain the most energy per gram?
  - A. sugar
  - B. carbohydrate
  - C. saturated fat
  - D. starch
  
5. Which of the following is a function of proteins?
  - A. Contain information for the cell.
  - B. Serve as a subunit in the structure of fat.
  - C. Reduce the weight of an individual.
  - D. Speed up certain chemical reactions.
  
6. A fatty acid having double bonds between carbon atoms is a(n)
  - A. phospholipid.
  - B. animal fat.
  - C. unsaturated fat.
  - D. saturated fat.
  
7.  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-COOH}$  is a(n)
  - A. fatty acid.
  - B. amino acid.
  - C. glycerol.
  - D. steroid.
  
8. Which of the following is made primarily of protein?
  - A. skin
  - B. tendon
  - C. enzyme
  - D. carbohydrates
  
9. Storage of energy is a MAJOR function of
  - A. protein.
  - B. fats.
  - C. steroids.
  - D. nucleic acids.
  
10. Triglycerides contain three fatty acids and
  - A. one glycerol.
  - B. two glycerols.
  - C. three glycerols.
  - D. four glycerols.
  
11. Cell energy can be extracted from which of these?
  - A. iron
  - B. water
  - C. carbohydrates
  - D. All of these answers are true.
  
12. An example of an inorganic molecule is

- A.  $C_6H_{12}O_6$ .
- B. HCl.
- C.  $C_4H_8O_4$ .
- D.  $C_{12}H_{22}O_{11}$ .

13. A number of simple sugars may combine to form

- A. protein.
- B. complex carbohydrates.
- C. amino acids.
- D. fat.

14. Polypeptides are composed of many

- A. amino acids.
- B. carbohydrates.
- C. nucleic acids.
- D. fatty acids.

15. An example of a carbohydrate is

- A.  $C_7H_{14}O_7$ .
- B.  $C_7H_{12}O_7$ .
- C.  $C_7H_{14}O_{28}$ .
- D.  $C_7H_7O_7$ .

16. One way an amino acid differs from a lipid is that the amino acids contain

- A. carbon.
- B. hydrogen.
- C. nitrogen.
- D. oxygen.

17. A fat is said to be saturated if

- A. there are many double bonds present in the molecule.
- B. there are only single bonds between each pair of carbons.
- C. the fat molecule cannot contain any more covalent bonds.
- D. there are as many double bonds present as possible.

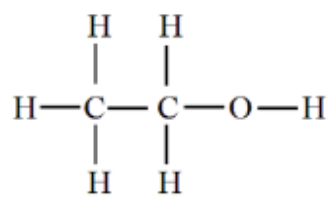
18. The functional group at the end of a fatty acid has the following formula

- A.  $-COOR$ .
- B.  $-COOH$ .
- C.  $-COON$ .
- D.  $CH_2O$ .

19. This is a(n) \_\_\_\_\_ reaction.  $C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6 + C_6H_{12}O_6$

- A. hydrolysis
- B. dehydration synthesis
- C. acid-base
- D. ionic

20. The functional group on the molecule below is



- A.  $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H}-\text{C}-\text{C} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$
- B.  $\begin{array}{c} \text{H} \\ | \\ -\text{C}-\text{H} \\ | \\ \text{H} \end{array}$
- C.  $\begin{array}{c} | \quad | \\ -\text{C}-\text{C} \\ | \quad | \end{array}$
- D.  $-\text{O}-\text{H}$

21. Molecules that resemble fats but contain phosphate functional groups are called

- A. steroids.
- B. polypeptides.
- C. phospholipids.
- D. nucleic acid.

22. Carbohydrates are a source of

- A. protein.
- B. energy.
- C. glycerol.
- D. fatty acids.

23. An example of an inorganic molecule is

- A.  $\text{CaCl}_2$ .
- B.  $\text{C}_2\text{H}_6$ .
- C.  $\text{C}_2\text{H}_5\text{OH}$ .
- D.  $\text{C}_3\text{H}_5(\text{OH})_3$ .

24. Which reaction represents a dehydration synthesis?

- A.  $\text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6 \rightarrow \text{C}_{18}\text{H}_{32}\text{O}_{16} + 2\text{H}_2\text{O}$
- B.  $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$
- C.  $\text{NaOH} + \text{H}_2\text{O} \rightarrow \text{Na}^+\text{OH}^- + \text{H}_2\text{O}$
- D. triglyceride  $\rightarrow$  glycerol + 3 fatty acids +  $3\text{H}_2\text{O}$

25. A complex carbohydrate consists of repeated units of

- A. monosaccharides.
- B. fatty acids.
- C. amino acids.
- D. nucleotides.

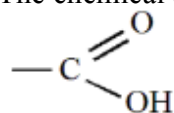
26. Which of the following is neither a simple nor a complex carbohydrate?

- A.  $\text{C}_6\text{H}_{12}\text{O}_6$
- B.  $\text{C}_4\text{H}_8\text{O}_4$
- C.  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
- D.  $\text{C}_2\text{H}_4\text{O}$

27. A protein

- A. is a macromolecule.
- B. consists of many linked amino acids.
- C. may be made of two or more polypeptides.
- D. is correctly described by all three of these answers.

28. The chemical arrangement in the figure below is on the end of a long molecule of a(n)



- A. steroid.
- B. fatty acid.
- C. carbohydrate.
- D. unsaturated fat.

29. Enzymes are made from

- A. fats.
- B. protein.
- C. cytoplasm.
- D. nucleoplasm.

30. Energy can be furnished to a cell by extracting it directly from

- A. enzymes.
- B. minerals.
- C. coenzymes.
- D. fats.

31. Molecules that do **not** dissolve in water very easily are characteristically

- A. acids.
- B. fats.
- C. vitamins.
- D. carbohydrates.

32. glycerol + 3 fatty acids  $\rightarrow$  triglyceride +  $3\text{H}_2\text{O}$  This is a(n) \_\_\_\_\_ reaction.

- A. hydrolysis  
B. dehydration synthesis  
C. unbalanced  
D. acid-base
33. An organic molecule contains two or more atoms of
- A. carbon.  
B. hydrogen.  
C. oxygen.  
D. All of these answers are true.
34. The chemistry of **living** organisms is called \_\_\_\_\_ chemistry.
- A. general  
B. organic  
C. inorganic  
D. biological
35.  $C_{12}H_{24}O_{12}$ ; this formula represents a
- A. lipid.  
B. protein.  
C. carbohydrate.  
D. phospholipid.
36. The definition of a saturated fat is that it can hold no more atoms of
- A. carbon.  
B. hydrogen.  
C. oxygen.  
D. All of these answers are true.
37. A(n) \_\_\_\_\_ is NOT formed by dehydration synthesis.
- A. complex carbohydrate  
B. polypeptide  
C. triglyceride  
D. amino acid
38. \_\_\_\_\_ is NOT a function of a fat.
- A. Providing insulation  
B. Storing energy  
C. Producing enzymes  
D. Shock absorption
39. Organisms usually store food in the form of a
- A. lipid.  
B. vitamin.  
C. protein.  
D. amino acid.
40. Which of the following could be a fat?
- A.  $C_2H_5OH$   
B.  $C_6H_{12}O_6$   
C.  $C_2H_5NO_2$   
D.  $C_{51}H_{97}O_6$
41. Organic molecules always
- A. contain carbon.  
B. contain carbon, hydrogen, and oxygen respectively in a 1:2:1 ratio.  
C. are produced by living organisms.  
D. dissolve in water.
42. Which of the following shows the correct linkage of amino acids in a protein?
- A. amino group of one bonded to the amino group of the next  
B. acid group of one bonded to acid group of the next  
C. acid group of one bonded to amino group of the next  
D. All of these answers are correct.
43. Which of the following is glycerol?
- A.  $C_3H_5(OH)_3$   
B.  $C_6H_{12}O_6$   
C.  $C_{14}H_{28}O$   
D.  $C_2H_5O_2N$

44. Which is NOT a major function of proteins?

- A. Provides cell structure.
- B. Stores energy for the cell.
- C. Functions as regulator molecules in cellular activity.
- D. Functions as carrier molecules.

45. The building material for cells is furnished from what organic molecules?

- A. water
- B. minerals
- C. lipids
- D. nitrogen

46. A phospholipid is similar to a fat but has

- A. a glow when placed in a dark room.
- B. no oxygen.
- C. a phosphate group.
- D. no carbon in it.

47. Which of these would most likely provide energy and support for a plant cell?

- A. fatty acids
- B. inorganic compounds
- C. steroids
- D. carbohydrates

48. If a glycerol molecule and three attached fatty acids form a fat, it is called a

- A. triglyceride.
- B. diglyceride.
- C. monoglyceride.
- D. tripeptide.

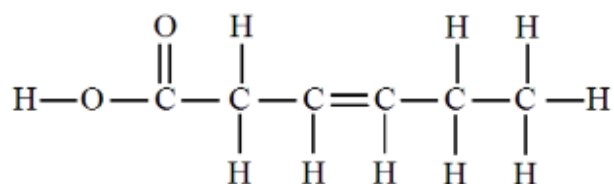
49. There are five types of lipoproteins in the body:

- A. triglycerides, diglycerides, monoglycerides, chylomicrons, and cholesterol.
- B. triglycerides, very-low-density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and cholesterol.
- C. chylomicrons, very-low density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and Lipoprotein a-Lp (a).
- D. lipids, carbohydrates, proteins, nucleic acids, and Lipoprotein a-Lp(a).

50. These phospholipids are found in cell membrane and also help in the emulsification of fats. They help to separate large portions of fat into smaller units. This allows the fat to mix with other materials.

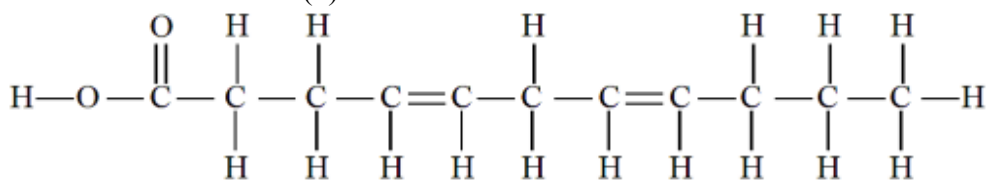
- A. triglycerides
- B. lecithins
- C. steroids
- D. linoleic acid

51. The molecule below is a(n)



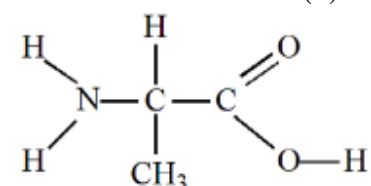
- A. glycerol.
- B. polypeptide.
- C. saturated fatty acid.
- D. unsaturated fatty acid.

52. The molecule below is a(n)



- A. amino acid.
- B. carbohydrate.
- C. lipid.
- D. nucleic acid.

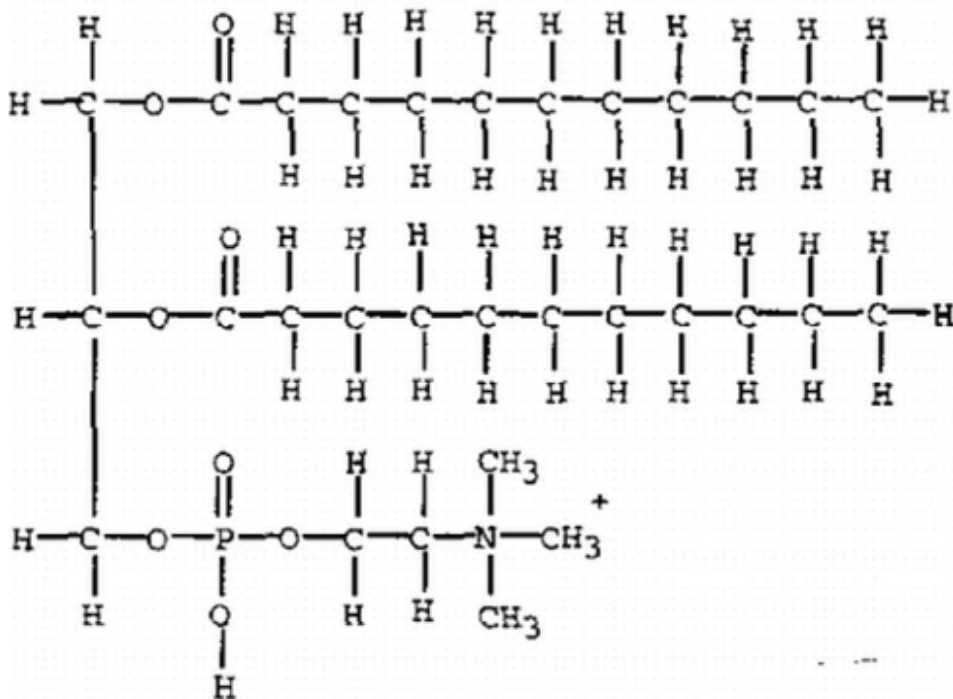
53. The molecule below is a(n)



- A. amino acid.

- B. carbohydrate.
- C. lipid.
- D. nucleic acid.

54. Which one of the following is false concerning the molecule below?

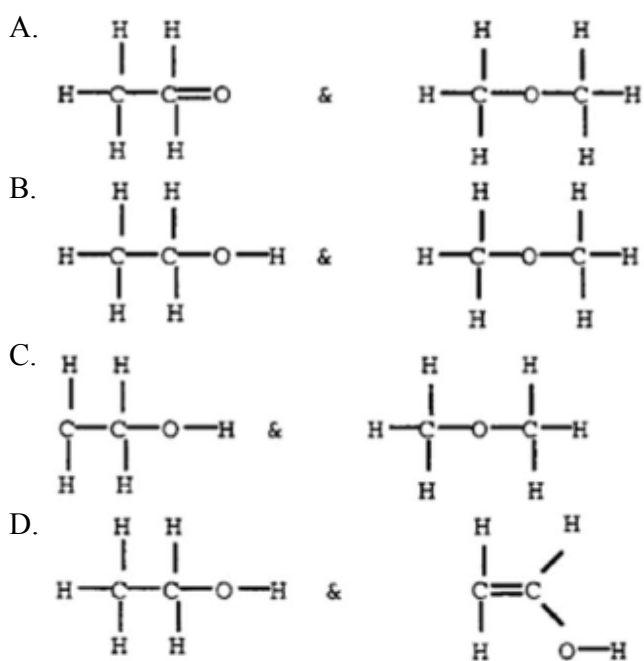


- A. This molecule represents a major component of cell membranes.
- B. This molecule is a lipid.
- C. This molecule was formed by dehydration synthesis.
- D. This molecule is composed of amino acids.

55. \_\_\_\_ is a sugar.

- A. Sucrase
- B. Pentose
- C.  $C_{27}H_{46}O$
- D.  $COOH-CH_2-NH_3$

56. \_\_\_\_ represent isomers.



57. Which association is NOT correct?

- A. lipid-steroid
- B. nucleic acid-DNA
- C. monosaccharide-glucose
- D. protein-nucleotide

58. The pleating or coiling of a protein is known as the protein's \_\_\_\_ structure.

- A. primary
- B. secondary
- C. tertiary
- D. quaternary

59. Which of the following statements is FALSE concerning the bonding of amino acids?

- A. The bond formed between two amino acids is called a peptide bond.
- B. When two amino acids combine, the amino group of one molecule will combine with the acid group of the second molecule.
- C. The addition of one water molecule is required to combine two amino acids.
- D. A series of amino acids bonded together is a polypeptide.

60.

Which of the following rows correctly matches organic molecules with their subunits?

	Protein	Fat	Carbohydrate
1	Nucleotide	glycerol + fatty acid	simple sugar
2	Steroid	amino acid	glycerol + fatty acid
3	Amino acid	glycerol + fatty acid	simple sugar
4	Steroid	simple sugar	glycerol + fatty acid

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

61. A protein that has had its physical and chemical properties changed is said to be

- A. denatured.  
B. dysfunctional.  
C. hydrolyzed.  
D. saturated.

62. The bonding of four simple sugars will

- A. produce three water molecules.  
B. produce four water molecules.  
C. utilize three water molecules.  
D. utilize four water molecules.

63. \_\_\_\_ contains double bonds.

- A. CH<sub>4</sub>  
B. H<sub>2</sub>O  
C. CO<sub>2</sub>  
D. NH<sub>3</sub>

64. A nucleotide contains

- A. glycerol and fatty acids.  
B. a base, sugar, and phosphate group.  
C. amino acids.  
D. an acid, base, and salt.

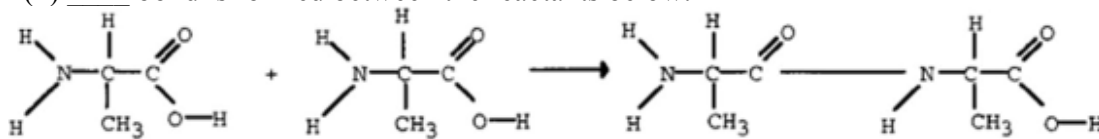
65. A(n) \_\_\_\_ is a polymer.

- A. monosaccharide  
B. amino acid  
C. nucleotide  
D. polypeptide

66. A lipid molecule composed of interlocking carbon rings belongs most likely in which group?

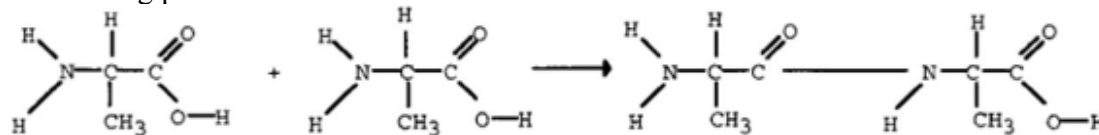
- A. phospholipid  
B. steroid  
C. unsaturated fat  
D. glycerol

67. A(n) \_\_\_\_ bond is formed between the reactants below.



- A. ionic  
B. hydrogen  
C. peptide  
D. polar

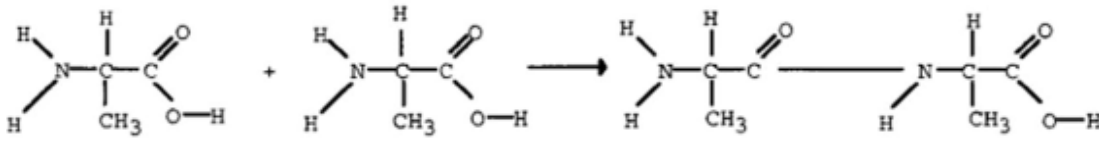
68. The missing product below is



- A. O<sub>2</sub>  
B. CO<sub>2</sub>  
C. H<sub>2</sub>O  
D. NH<sub>2</sub>-CH-COOH  
|  
CH<sub>3</sub>

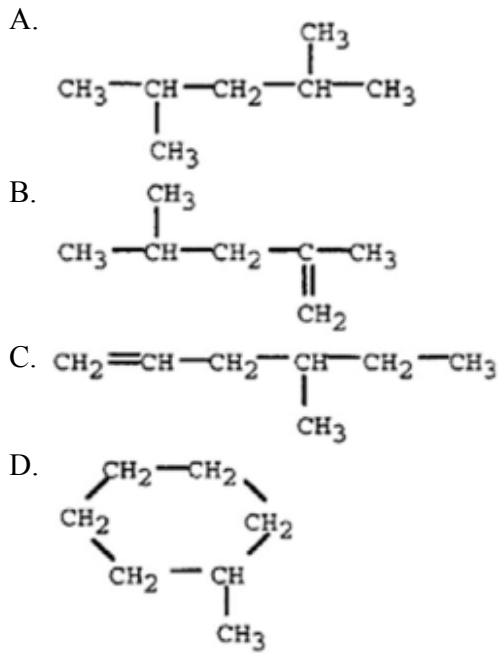
69.

The reaction below represents a \_\_\_\_ reaction.

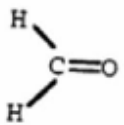


- A. dehydration synthesis  
 B. hydrolysis  
 C. unbalanced  
 D. equilibrium

70. Which one of the following is NOT an isomer of the others?



71. The empirical formula for the structural formula below is



- A. COH.  
 B. C<sub>4</sub>HO<sub>2</sub>.  
 C. CH<sub>2</sub>O.  
 D. CHO<sub>2</sub>.

72. Cell membranes, muscle cells, and tendons contain \_\_\_\_ proteins and enzymes, and some hormones are \_\_\_\_ proteins.

- A. monomer, polymer  
 B. denatured, functional  
 C. structural, regulator  
 D. saturated, unsaturated

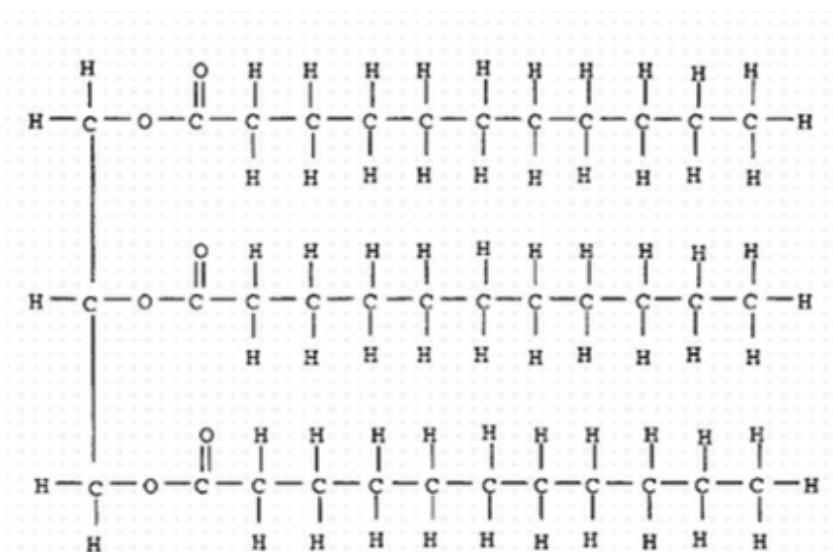
73. A sugar with three carbon atoms is a

- A. triose sugar.  
 B. trisaccharide.  
 C. triglyceride.  
 D. tripeptide.

74. Molecules with the same empirical formula but different structural formulas are

- A. polymers.  
 B. steroids.  
 C. isomers.  
 D. enzymes.

75. The molecule below



- A. was probably produced by a plant.

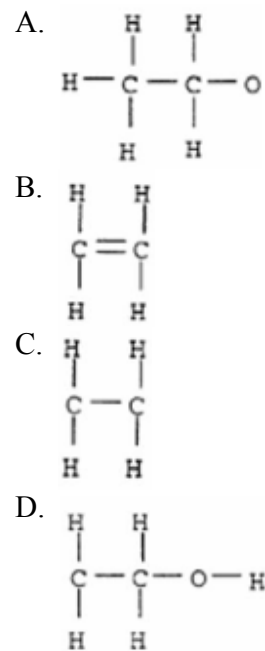


- B. is liquid at room temperature.
- C. was formed by three separate hydrolysis reactions.
- D. contains more energy per gram than a carbohydrate.

76. Which of the following statements about carbohydrates is INCORRECT?

- A. Carbohydrates are a good source of energy.
- B. Carbohydrates contain approximately 2 hydrogens per carbon in the molecule.
- C. Most carbohydrates dissolve in water.
- D. Carbohydrates contain carbon, hydrogen, and oxygen atoms.

77. Which one of the following is a correct molecular formula?



78. Which of the following statements about fats is INCORRECT?

- A. Fats are a good source of energy.
- B. Fats contain approximately 2 hydrogens per carbon in the molecule.
- C. Most fats do not dissolve in water.
- D. Fats contain nitrogen, carbon, hydrogen, and oxygen atoms.

79. Which one of the following is not a difference between organic and inorganic compounds?

- A. Organic compounds are generally much larger than inorganic compounds.
- B. Organic compounds contain carbon atoms bonded to one another.
- C. Organic compounds are found in living things and inorganic compounds are not.
- D. Organic compounds are often polymers while inorganic compounds are not.

80. You find a new organic molecule that is water soluble and contains the elements carbon, nitrogen, hydrogen, and oxygen. It is probably a

- A. protein.
- B. fat.
- C. carbohydrate.
- D. phospholipid.

81. If you wanted to manufacture a fat, which one of the following would be necessary?

- A. water
- B. amino acids
- C. vitamins
- D. glycerol

82. An organic molecule with the empirical formula  $C_6H_{12}O_6$

- A. may have many structural formulae.
- B. is a carbohydrate.
- C. is commonly referred to as a sugar.
- D. All the choices are correct.

83. An organic molecule with the formula  $C_6H_{12}O_6$  may have many structural formulae. These different three-dimensional forms of the same molecule are known as

- A. isomers.
- B. isotopes.
- C. isotones.
- D. All the choices are correct.

84. What name is given to this combination of elements often found attached to protein subunits?



- A. alcohol
- B. amine
- C. methyl
- D. carboxylic acid

85. Which components must be removed during a dehydration synthesis reaction?
- A. -H and -OH
  - B. -N= and -OH
  - C. -OH and —COOH
  - D. —COOH and -H
86. In the movie *Hannibal*, Anthony Hopkins feeds on humans! Pretty scary, huh? What do you call the chemical reactions that resulted in the digestion of human flesh?
- A. dehydration
  - B. hydrolysis
  - C. oxidation-reduction
  - D. phosphorylation
87. Anabolic steroids used by some athletes are compounds that would be classified as
- A. carbohydrates.
  - B. nucleic acids.
  - C. lipids.
  - D. proteins.
88. Which of the following is most likely a regulatory molecule?
- A. hair
  - B. muscle protein
  - C. steroid
  - D. calcium
89. When four polypeptides are joined together by covalent bonds, they form a new, biologically active molecule that displays \_\_\_\_\_ structure.
- A. primary
  - B. secondary
  - C. tertiary
  - D. quaternary
90. As the baby's body temperature rose, I became very concerned that the increase in heat energy would
- A. cause the baby's proteins to denature.
  - B. force me to place her in a lukewarm bath to help remove the excess heat energy in a slow, controlled fashion.
  - C. require me to give a non-aspirin medication that would help control fever.
  - D. All the choices are correct.
91. So if I *really* want to know the details about my chances of arteriosclerosis I should be paying closest attention to my
- A. total amount of serum cholesterol.
  - B. RNA.
  - C. relative amounts of HDLs and LDLs.
  - D. total amount of VLDLs.
92. Which of the following would be considered a macromolecule?
- A. CO<sub>2</sub>
  - B. ammonia
  - C. egg protein
  - D. hydrochloric acid
93. In a nucleotide, the nitrogenous base is bonded to
- A. an acid.
  - B. a sugar.
  - C. a phosphate.
  - D. itself.
94. In a nucleotide, the sugar is bonded to a
- A. sugar.
  - B. codon.
  - C. salt.
  - D. base and phosphate.
95. A nucleotide is composed of the following molecules arranged in this order:
- A. three amino acids covalently bonded in a series.
  - B. three fatty acids individually bonded to three different places on glycerol.
  - C. a base bonded to a sugar bonded to a phosphate.
  - D. mRNA bonded to tRNA bonded to an amino acid.
96. Which of the following best describes the structure of DNA?
- A. single helix
  - B. protein coil
  - C. double helix
  - D. globular RNA

97. The backbone of a double helix is

- A. sugar-phosphate.
- B. hydrogen bonds.
- C. base-pairing.
- D. All of these answers are true.

98. DNA is

- A. a single chain of nucleotides containing deoxyribose.
- B. mainly found in the cytoplasm.
- C. composed of amino acids.
- D. a coiled double chain of nucleotides.

99. Which of these is responsible for carrying a specific amino acid to the ribosome during protein synthesis?

- A. DNA
- B. mRNA
- C. tRNA
- D. ribosome

100. Which of these is a component of ribosomes?

- A. DNA
- B. rRNA
- C. tRNA
- D. ribosome

101. Which of these is a copy of DNA that is used to direct the synthesis of a specific protein?

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

102. Which of these molecules is typically double-stranded?

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

103. Fats are

- A. polar molecules.
- B. nonpolar molecules.
- C. hydrophilic.
- D. both B and C.

104. What role do chaperone proteins play?

- A. They make sure that nucleotides are in the right position.
- B. Make sure that proteins are folded correctly.
- C. Are caps on lipids.
- D. Control the movement of water throughout the cell.

### 3 KEY

1. Which of the following is NOT a lipid?

- A. olive oil
- B. fat
- C. amino acid**
- D. steroid

*Blooms Level: 1. Remember  
Enger - Chapter 03 #1  
Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.05  
Topic: Chemistry*

2. Saturated fats differ from unsaturated fats in that saturated fats

- A. are longer.
- B. lack carbon-carbon double bonds.**
- C. have fewer double bonds.
- D. cannot be used for an energy source.

*Blooms Level: 2. Understand  
Enger - Chapter 03 #2  
Learning Outcome: List the major group of organic molecules associated with living things.  
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry*

3. A subunit of protein is a(n)

- A. amino acid.**
- B. nucleic acid.
- C. fatty acid.
- D. phospholipid.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #3  
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry*

4. Which of the following types of molecules contain the most energy per gram?

- A. sugar
- B. carbohydrate
- C. saturated fat**
- D. starch

*Blooms Level: 2. Understand  
Enger - Chapter 03 #4  
Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.02  
Topic: Chemistry*

5. Which of the following is a function of proteins?

- A. Contain information for the cell.
- B. Serve as a subunit in the structure of fat.
- C. Reduce the weight of an individual.
- D. Speed up certain chemical reactions.**

*Blooms Level: 1. Remember  
Enger - Chapter 03 #5  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.03  
Topic: Chemistry*

6. A fatty acid having double bonds between carbon atoms is a(n)

- A. phospholipid.
- B. animal fat.
- C. unsaturated fat.**
- D. saturated fat.

*Blooms Level: 2. Understand  
Enger - Chapter 03 #6  
Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.05  
Topic: Chemistry*

7.  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-COOH}$  is a(n)

- A. fatty acid.**
- B. amino acid.
- C. glycerol.
- D. steroid.

*Blooms Level: 5. Evaluate  
Enger - Chapter 03 #7  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.01  
Topic: Chemistry*

8. Which of the following is made primarily of protein?

- A. skin
- B. tendon
- C. enzyme**

D. carbohydrates

*Blooms Level: 2. Understand  
Enger - Chapter 03 #8  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry*

9. Storage of energy is a MAJOR function of

- A. protein.
- B.** fats.
- C. steroids.
- D. nucleic acids.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #9  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry*

10. Triglycerides contain three fatty acids and

- A.** one glycerol.
- B. two glycerols.
- C. three glycerols.
- D. four glycerols.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #10  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry*

11. Cell energy can be extracted from which of these?

- A. iron
- B. water
- C.** carbohydrates
- D. All of these answers are true.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #11  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry*

12. An example of an inorganic molecule is

- A.  $C_6H_{12}O_6$ .
- B.** HCl.
- C.  $C_4H_8O_4$ .
- D.  $C_{12}H_{22}O_{11}$ .

*Blooms Level: 1. Remember  
Enger - Chapter 03 #12  
Learning Outcome: Distinguish between molecules that are organic and inorganic.  
Section: 03.01  
Topic: Chemistry*

13. A number of simple sugars may combine to form

- A. protein.
- B.** complex carbohydrates.
- C. amino acids.
- D. fat.

*Blooms Level: 2. Understand  
Enger - Chapter 03 #13  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry*

14. Polypeptides are composed of many

- A.** amino acids.
- B. carbohydrates.
- C. nucleic acids.
- D. fatty acids.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #14  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry*

15. An example of a carbohydrate is

- A.**  $C_7H_{14}O_7$ .
- B.  $C_7H_{12}O_7$ .
- C.  $C_7H_{14}O_{28}$ .
- D.  $C_7H_7O_7$ .

*Blooms Level: 2. Understand  
Enger - Chapter 03 #15  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry*

16. One way an amino acid differs from a lipid is that the amino acids contain

- A. carbon.
- B. hydrogen.
- C. nitrogen.**
- D. oxygen.

Blooms Level: 2. Understand  
Enger - Chapter 03 #16

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.03

Section: 03.06

Topic: Chemistry

17. A fat is said to be saturated if

- A. there are many double bonds present in the molecule.
- B. there are only single bonds between each pair of carbons.**
- C. the fat molecule cannot contain any more covalent bonds.
- D. there are as many double bonds present as possible.

Blooms Level: 2. Understand  
Enger - Chapter 03 #17

Learning Outcome: Describe the function played by each of the major groups of organic molecules.

Section: 03.05

Topic: Chemistry

18. The functional group at the end of a fatty acid has the following formula

- A. —COOR.
- B. —COOH.**
- C. —COON.
- D. CH<sub>2</sub>O.

Blooms Level: 1. Remember  
Enger - Chapter 03 #18

Learning Outcome: Recognize the main functional groups.

Section: 03.01

Topic: Chemistry

19. This is a(n) \_\_\_\_\_ reaction.  $C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6 + C_6H_{12}O_6$

- A. hydrolysis**
- B. dehydration synthesis
- C. acid-base
- D. ionic

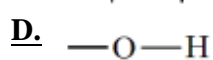
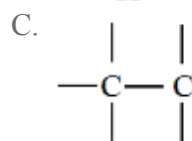
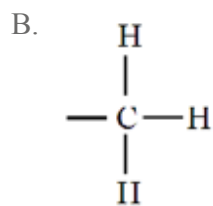
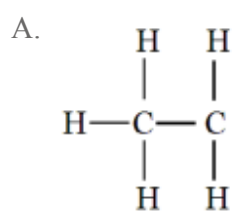
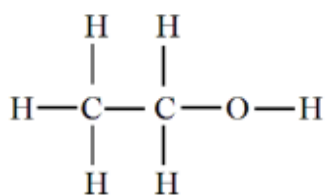
Blooms Level: 3. Apply  
Enger - Chapter 03 #19

Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.

Section: 03.02

Topic: Chemistry

20. The functional group on the molecule below is



Blooms Level: 5. Evaluate  
Enger - Chapter 03 #20

Learning Outcome: Draw an example of a carbon skeleton.  
Learning Outcome: Recognize the main functional groups.

Section: 03.01

Topic: Chemistry

21. Molecules that resemble fats but contain phosphate functional groups are called

- A. steroids.
- B. polypeptides.
- C. phospholipids.**
- D. nucleic acid.

Blooms Level: 1. Remember

Enger - Chapter 03 #21  
 Learning Outcome: List the major group of organic molecules associated with living things.  
 Section: 03.05  
 Topic: Chemistry

22. Carbohydrates are a source of

- A. protein.
- B.** energy.
- C. glycerol.
- D. fatty acids.

Blooms Level: 1. Remember  
 Enger - Chapter 03 #22  
 Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
 Section: 03.02  
 Topic: Chemistry

23. An example of an inorganic molecule is

- A.**  $\text{CaCl}_2$ .
- B.  $\text{C}_2\text{H}_6$ .
- C.  $\text{C}_2\text{H}_5\text{OH}$ .
- D.  $\text{C}_3\text{H}_5(\text{OH})_3$ .

Blooms Level: 1. Remember  
 Enger - Chapter 03 #23  
 Learning Outcome: Distinguish between molecules that are organic and inorganic.  
 Section: 03.01  
 Topic: Chemistry

24. Which reaction represents a dehydration synthesis?

- A.**  $\text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6 \rightarrow \text{C}_{18}\text{H}_{32}\text{O}_{16} + 2\text{H}_2\text{O}$
- B.  $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$
- C.  $\text{NaOH} + \text{H}_2\text{O} \rightarrow \text{Na}^+\text{OH}^- + \text{H}_2\text{O}$
- D. triglyceride  $\rightarrow$  glycerol + 3 fatty acids +  $3\text{H}_2\text{O}$

Blooms Level: 5. Evaluate  
 Enger - Chapter 03 #24  
 Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.  
 Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.  
 Section: 03.02  
 Topic: Chemistry

25. A complex carbohydrate consists of repeated units of

- A.** monosaccharides.
- B. fatty acids.
- C. amino acids.
- D. nucleotides.

Blooms Level: 1. Remember  
 Enger - Chapter 03 #25  
 Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
 Section: 03.02  
 Topic: Chemistry

26. Which of the following is neither a simple nor a complex carbohydrate?

- A.  $\text{C}_6\text{H}_{12}\text{O}_6$
- B.  $\text{C}_4\text{H}_8\text{O}_4$
- C.  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
- D.**  $\text{C}_2\text{H}_4\text{O}$

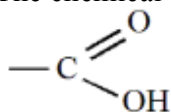
Blooms Level: 2. Understand  
 Enger - Chapter 03 #26  
 Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
 Section: 03.02  
 Topic: Chemistry

27. A protein

- A. is a macromolecule.
- B. consists of many linked amino acids.
- C. may be made of two or more polypeptides.
- D.** is correctly described by all three of these answers.

Blooms Level: 1. Remember  
 Enger - Chapter 03 #27  
 Learning Outcome: List the major group of organic molecules associated with living things.  
 Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
 Section: 03.03  
 Topic: Chemistry

28. The chemical arrangement in the figure below is on the end of a long molecule of a(n)



- A. steroid.
- B.** fatty acid.
- C. carbohydrate.
- D. unsaturated fat.

Blooms Level: 1. Remember

29. Enzymes are made from

- A. fats.
- B.** protein.
- C. cytoplasm.
- D. nucleoplasm.

Blooms Level: 1. Remember

Enger - Chapter 03 #29

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry

30. Energy can be furnished to a cell by extracting it directly from

- A. enzymes.
- B. minerals.
- C. coenzymes.
- D.** fats.

Blooms Level: 1. Remember

Enger - Chapter 03 #30

Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

31. Molecules that do **not** dissolve in water very easily are characteristically

- A. acids.
- B.** fats.
- C. vitamins.
- D. carbohydrates.

Blooms Level: 1. Remember

Enger - Chapter 03 #31

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

32. glycerol + 3 fatty acids  $\rightarrow$  triglyceride + 3 H<sub>2</sub>O This is a(n) \_\_\_\_ reaction.

- A. hydrolysis
- B.** dehydration synthesis
- C. unbalanced
- D. acid-base

Blooms Level: 2. Understand

Enger - Chapter 03 #32

Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.  
Section: 03.05  
Topic: Chemistry

33. An organic molecule contains two or more atoms of

- A.** carbon.
- B. hydrogen.
- C. oxygen.
- D. All of these answers are true.

Blooms Level: 1. Remember

Enger - Chapter 03 #33

Learning Outcome: Distinguish between molecules that are organic and inorganic.  
Section: 03.01  
Topic: Chemistry

34. The chemistry of **living** organisms is called \_\_\_\_\_ chemistry.

- A. general
- B. organic
- C. inorganic
- D.** biological

Blooms Level: 1. Remember

Enger - Chapter 03 #34

Learning Outcome: Distinguish between molecules that are organic and inorganic.  
Section: 03.01  
Topic: Chemistry

35. C<sub>12</sub>H<sub>24</sub>O<sub>12</sub>; this formula represents a

- A. lipid.
- B. protein.
- C.** carbohydrate.
- D. phospholipid.

Blooms Level: 1. Remember

Enger - Chapter 03 #35

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry

36. The definition of a saturated fat is that it can hold no more atoms of

- A. carbon.
- B.** hydrogen.



- C. oxygen.  
D. All of these answers are true.

*Blooms Level: 1. Remember*  
*Enger - Chapter 03 #36*  
*Learning Outcome: List the major group of organic molecules associated with living things.*  
*Section: 03.05*  
*Topic: Chemistry*

37. A(n) \_\_\_\_\_ is NOT formed by dehydration synthesis.

- A. complex carbohydrate  
B. polypeptide  
C. triglyceride  
**D. amino acid**

*Blooms Level: 2. Understand*  
*Enger - Chapter 03 #37*  
*Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.*  
*Section: 03.01*  
*Topic: Chemistry*

38. \_\_\_\_\_ is NOT a function of a fat.

- A. Providing insulation  
B. Storing energy  
**C. Producing enzymes**  
D. Shock absorption

*Blooms Level: 1. Remember*  
*Enger - Chapter 03 #38*  
*Learning Outcome: Describe the function played by each of the major groups of organic molecules.*  
*Section: 03.05*  
*Topic: Chemistry*

39. Organisms usually store food in the form of a

- A. lipid.**  
B. vitamin.  
C. protein.  
D. amino acid.

*Blooms Level: 1. Remember*  
*Enger - Chapter 03 #39*  
*Learning Outcome: Describe the function played by each of the major groups of organic molecules.*  
*Section: 03.05*  
*Topic: Chemistry*

40. Which of the following could be a fat?

- A.  $C_2H_5OH$   
B.  $C_6H_{12}O_6$   
C.  $C_2H_5NO_2$   
**D.  $C_{51}H_{97}O_6$**

*Blooms Level: 2. Understand*  
*Enger - Chapter 03 #40*  
*Learning Outcome: Give examples of each of the major groups of organic molecules.*  
*Section: 03.05*  
*Topic: Chemistry*

41. Organic molecules always

- A. contain carbon.**  
B. contain carbon, hydrogen, and oxygen respectively in a 1:2:1 ratio.  
C. are produced by living organisms.  
D. dissolve in water.

*Blooms Level: 1. Remember*  
*Enger - Chapter 03 #41*  
*Learning Outcome: Distinguish between molecules that are organic and inorganic.*  
*Section: 03.01*  
*Topic: Chemistry*

42. Which of the following shows the correct linkage of amino acids in a protein?

- A. amino group of one bonded to the amino group of the next  
B. acid group of one bonded to acid group of the next  
**C. acid group of one bonded to amino group of the next**  
D. All of these answers are correct.

*Blooms Level: 2. Understand*  
*Enger - Chapter 03 #42*  
*Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.*  
*Section: 03.03*  
*Topic: Chemistry*

43. Which of the following is glycerol?

- A.  $C_3H_5(OH)_3$**   
B.  $C_6H_{12}O_6$   
C.  $C_{14}H_{28}O$   
D.  $C_2H_5O_2N$

*Blooms Level: 1. Remember*  
*Enger - Chapter 03 #43*  
*Learning Outcome: Give examples of each of the major groups of organic molecules.*  
*Section: 03.05*

Topic: Chemistry

44. Which is NOT a major function of proteins?

- A. Provides cell structure.
- B.** Stores energy for the cell.
- C. Functions as regulator molecules in cellular activity.
- D. Functions as carrier molecules.

Blooms Level: 1. Remember  
Enger - Chapter 03 #44

Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry

45. The building material for cells is furnished from what organic molecules?

- A. water
- B. minerals
- C.** lipids
- D. nitrogen

Blooms Level: 1. Remember  
Enger - Chapter 03 #45

Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

46. A phospholipid is similar to a fat but has

- A. a glow when placed in a dark room.
- B. no oxygen.
- C.** a phosphate group.
- D. no carbon in it.

Blooms Level: 2. Understand  
Enger - Chapter 03 #46

Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.05  
Topic: Chemistry

47. Which of these would most likely provide energy and support for a plant cell?

- A. fatty acids
- B. inorganic compounds
- C. steroids
- D.** carbohydrates

Blooms Level: 2. Understand  
Enger - Chapter 03 #47

Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry

48. If a glycerol molecule and three attached fatty acids form a fat, it is called a

- A.** triglyceride.
- B. diglyceride.
- C. monoglyceride.
- D. tripeptide.

Blooms Level: 5. Evaluate  
Enger - Chapter 03 #48

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

49. There are five types of lipoproteins in the body:

- A. triglycerides, diglycerides, monoglycerides, chylomicrons, and cholesterol.
- B. triglycerides, very-low-density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and cholesterol.
- C.** chylomicrons, very-low density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and Lipoprotein a-Lp (a).
- D. lipids, carbohydrates, proteins, nucleic acids, and Lipoprotein a-Lp(a).

Blooms Level: 1. Remember  
Enger - Chapter 03 #49

Learning Outcome: List the major group of organic molecules associated with living things.  
Section: 03.05  
Topic: Chemistry

50. These phospholipids are found in cell membrane and also help in the emulsification of fats. They help to separate large portions of fat into smaller units. This allows the fat to mix with other materials.

- A. triglycerides
- B.** lecithins
- C. steroids
- D. linoleic acid

Blooms Level: 1. Remember  
Enger - Chapter 03 #50

Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

51.

The molecule below is a(n)



- A. Sucrase  
**B.** Pentose  
 C.  $C_{27}H_{46}O$   
 D.  $COOH-CH_2-NH_3$

Blooms Level: 1. Remember

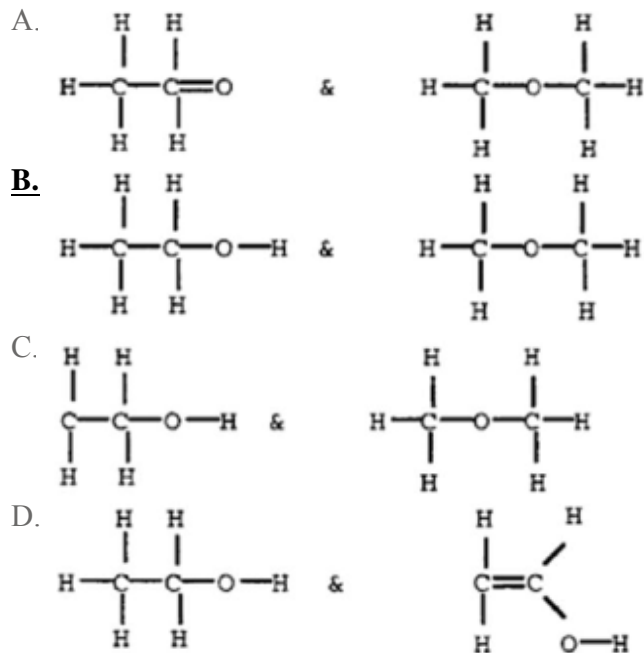
Enger - Chapter 03 #55

Learning Outcome: Give examples of each of the major groups of organic molecules.

Section: 03.02

Topic: Chemistry

56. \_\_\_\_ represent isomers.



Blooms Level: 5. Evaluate

Enger - Chapter 03 #56

Learning Outcome: State the features of a carbon atom that make it able to bond in chains and rings.

Section: 03.01

Topic: Chemistry

57. Which association is NOT correct?

- A. lipid-steroid  
 B. nucleic acid-DNA  
 C. monosaccharide-glucose  
**D.** protein-nucleotide

Blooms Level: 2. Understand

Enger - Chapter 03 #57

Learning Outcome: Give examples of each of the major groups of organic molecules.

Section: 03.04

Topic: Chemistry

58. The pleating or coiling of a protein is known as the protein's \_\_\_\_ structure.

- A. primary  
**B.** secondary  
 C. tertiary  
 D. quaternary

Blooms Level: 2. Understand

Enger - Chapter 03 #58

Learning Outcome: Describe how organic molecules such as proteins can have primary, secondary, tertiary, and quaternary structures.

Section: 03.03

Topic: Chemistry

59. Which of the following statements is FALSE concerning the bonding of amino acids?

- A. The bond formed between two amino acids is called a peptide bond.  
 B. When two amino acids combine, the amino group of one molecule will combine with the acid group of the second molecule.  
**C.** The addition of one water molecule is required to combine two amino acids.  
 D. A series of amino acids bonded together is a polypeptide.

Blooms Level: 2. Understand

Enger - Chapter 03 #59

Learning Outcome: Describe the function played by each of the major groups of organic molecules.

Section: 03.03

Topic: Chemistry

60. Which of the following rows correctly matches organic molecules with their subunits?

	Protein	Fat	Carbohydrate
1	Nucleotide	glycerol + fatty acid	simple sugar
2	Steroid	amino acid	glycerol + fatty acid
3	Amino acid	glycerol + fatty acid	simple sugar
4	Steroid	simple sugar	glycerol + fatty acid

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

Blooms Level: 5. Evaluate

Enger - Chapter 03 #60

Learning Outcome: Give examples of each of the major groups of organic molecules.

Section: 03.02

Section: 03.03

61. A protein that has had its physical and chemical properties changed is said to be

- A. denatured.
- B. dysfunctional.
- C. hydrolyzed.
- D. saturated.

Blooms Level: 1. Remember  
Enger - Chapter 03 #61

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry

62. The bonding of four simple sugars will

- A. produce three water molecules.
- B. produce four water molecules.
- C. utilize three water molecules.
- D. utilize four water molecules.

Blooms Level: 5. Evaluate  
Enger - Chapter 03 #62

Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.  
Section: 03.02  
Topic: Chemistry

63. \_\_\_\_ contains double bonds.

- A. CH<sub>4</sub>
- B. H<sub>2</sub>O
- C. CO<sub>2</sub>
- D. NH<sub>3</sub>

Blooms Level: 2. Understand  
Enger - Chapter 03 #63

Learning Outcome: Describe how single and double covalent bonds are formed in organic molecules.  
Section: 03.01  
Topic: Chemistry

64. A nucleotide contains

- A. glycerol and fatty acids.
- B. a base, sugar, and phosphate group.
- C. amino acids.
- D. an acid, base, and salt.

Blooms Level: 1. Remember  
Enger - Chapter 03 #64

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry

65. A(n) \_\_\_\_ is a polymer.

- A. monosaccharide
- B. amino acid
- C. nucleotide
- D. polypeptide

Blooms Level: 1. Remember  
Enger - Chapter 03 #65

Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.  
Section: 03.01  
Topic: Chemistry

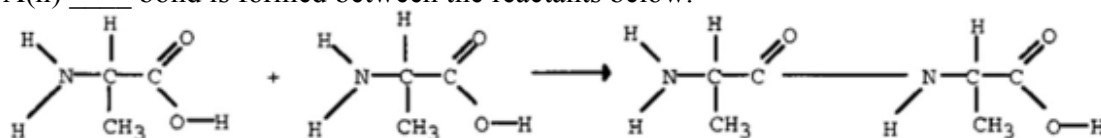
66. A lipid molecule composed of interlocking carbon rings belongs most likely in which group?

- A. phospholipid
- B. steroid
- C. unsaturated fat
- D. glycerol

Blooms Level: 2. Understand  
Enger - Chapter 03 #66

Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry

67. A(n) \_\_\_\_ bond is formed between the reactants below.

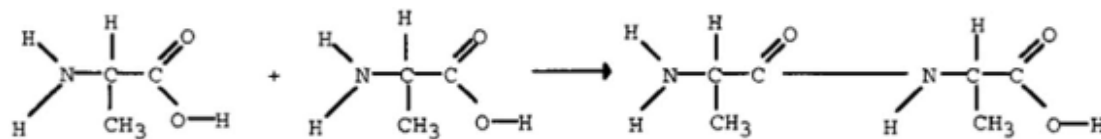


- A. ionic
- B. hydrogen
- C. peptide
- D. polar

Blooms Level: 5. Evaluate  
Enger - Chapter 03 #67

Learning Outcome: Describe how single and double covalent bonds are formed in organic molecules.  
Section: 03.01  
Topic: Chemistry

68. The missing product below is



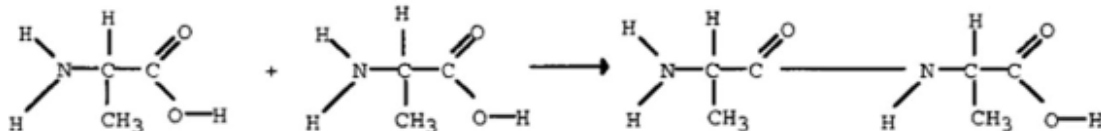
- A. O<sub>2</sub>  
 B. CO<sub>2</sub>  
**C. H<sub>2</sub>O**  
 D.  $\text{NH}_2\text{-CH}(\text{CH}_3)\text{-COOH}$

Blooms Level: 5. Evaluate  
 Enger - Chapter 03 #68

Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.

Section: 03.01  
 Topic: Chemistry

69. The reaction below represents a \_\_\_\_ reaction.



- A. dehydration synthesis**  
 B. hydrolysis  
 C. unbalanced  
 D. equilibrium

Blooms Level: 5. Evaluate  
 Enger - Chapter 03 #69

Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.

Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.

Section: 03.01  
 Topic: Chemistry

70. Which one of the following is NOT an isomer of the others?

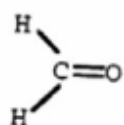
- A.**
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3\text{-CH-CH}_2\text{-CH-CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
- B.
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3\text{-CH-CH}_2\text{-C-CH}_3 \\ || \\ \text{CH}_2 \end{array}$$
- C.
- $$\begin{array}{c} \text{CH}_2=\text{CH-CH}_2\text{-CH-CH}_2\text{-CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
- D.
- $$\begin{array}{c} \text{CH}_2\text{-CH}_2 \\ | \quad | \\ \text{CH}_2\text{-CH}_2 \\ | \\ \text{CH} \\ | \\ \text{CH}_3 \end{array}$$

Blooms Level: 5. Evaluate  
 Enger - Chapter 03 #70

Learning Outcome: State the features of a carbon atom that make it able to bond in chains and rings.

Section: 03.01  
 Topic: Chemistry

71. The empirical formula for the structural formula below is



- A. COH.  
 B. C<sub>4</sub>HO<sub>2</sub>.  
**C. CH<sub>2</sub>O.**  
 D. CHO<sub>2</sub>.

Blooms Level: 3. Apply

Enger - Chapter 03 #71

Learning Outcome: Describe how single and double covalent bonds are formed in organic molecules.

Learning Outcome: State the features of a carbon atom that make it able to bond in chains and rings.

Section: 03.01

Topic: Chemistry

72. Cell membranes, muscle cells, and tendons contain \_\_\_\_ proteins and enzymes, and some hormones are \_\_\_\_ proteins.

- A. monomer, polymer  
 B. denatured, functional  
**C. structural, regulator**  
 D. saturated, unsaturated

Blooms Level: 1. Remember  
 Enger - Chapter 03 #72

Learning Outcome: List the major group of organic molecules associated with living things.

73. A sugar with three carbon atoms is a

- A.** triose sugar.
- B. trisaccharide.
- C. triglyceride.
- D. tripeptide.

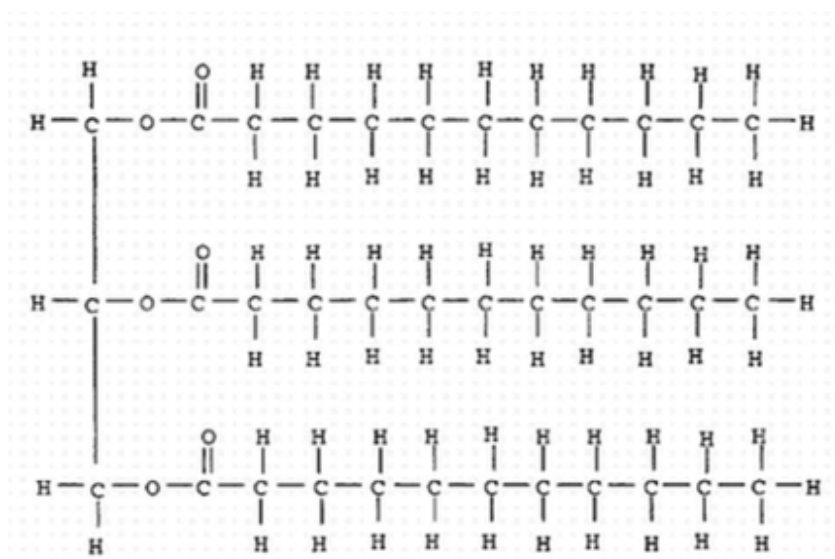
Blooms Level: 2. Understand  
Enger - Chapter 03 #73  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry

74. Molecules with the same empirical formula but different structural formulas are

- A. polymers.
- B. steroids.
- C.** isomers.
- D. enzymes.

Blooms Level: 1. Remember  
Enger - Chapter 03 #74  
Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.  
Section: 03.01  
Topic: Chemistry

75. The molecule below



- A. was probably produced by a plant.
- B. is liquid at room temperature.
- C. was formed by three separate hydrolysis reactions.
- D.** contains more energy per gram than a carbohydrate.

Blooms Level: 5. Evaluate  
Enger - Chapter 03 #75  
Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.  
Section: 03.01  
Topic: Chemistry

76. Which of the following statements about carbohydrates is INCORRECT?

- A. Carbohydrates are a good source of energy.
- B. Carbohydrates contain approximately 2 hydrogens per carbon in the molecule.
- C. Most carbohydrates dissolve in water.
- D.** Carbohydrates contain argon, carbon, hydrogen, and oxygen atoms.

Blooms Level: 1. Remember  
Enger - Chapter 03 #76  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Section: 03.02  
Topic: Chemistry

77. Which one of the following is a correct molecular formula?

- A.  $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H}-\text{C}-\text{C}-\text{O} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$
- B.**  $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{C}=\text{C} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$
- C.  $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{C}-\text{C} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$
- D.  $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{C}-\text{C}-\text{O}-\text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$

Blooms Level: 5. Evaluate

Enger - Chapter 03 #77

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.01

Topic: Chemistry

78. Which of the following statements about fats is INCORRECT?

- A. Fats are a good source of energy.
- B. Fats contain approximately 2 hydrogens per carbon in the molecule.
- C. Most fats do not dissolve in water.
- D.** Fats contain nitrogen, carbon, hydrogen, and oxygen atoms.

Blooms Level: 2. Understand

Enger - Chapter 03 #78

Learning Outcome: Describe the function played by each of the major groups of organic molecules.

Section: 03.05

Topic: Chemistry

79. Which one of the following is not a difference between organic and inorganic compounds?

- A. Organic compounds are generally much larger than inorganic compounds.
- B. Organic compounds contain carbon atoms bonded to one another.
- C.** Organic compounds are found in living things and inorganic compounds are not.
- D. Organic compounds are often polymers while inorganic compounds are not.

Blooms Level: 1. Remember

Enger - Chapter 03 #79

Learning Outcome: Distinguish between molecules that are organic and inorganic.

Section: 03.01

Topic: Chemistry

80. You find a new organic molecule that is water soluble and contains the elements carbon, nitrogen, hydrogen, and oxygen. It is probably a

- A.** protein.
- B. fat.
- C. carbohydrate.
- D. phospholipid.

Blooms Level: 5. Evaluate

Enger - Chapter 03 #80

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.03

Topic: Chemistry

81. If you wanted to manufacture a fat, which one of the following would be necessary?

- A. water
- B. amino acids
- C. vitamins
- D.** glycerol

Blooms Level: 3. Apply

Enger - Chapter 03 #81

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.05

Topic: Chemistry

82. An organic molecule with the empirical formula  $C_6H_{12}O_6$

- A. may have many structural formulae.
- B. is a carbohydrate.
- C. is commonly referred to as a sugar.
- D.** All the choices are correct.

Blooms Level: 1. Remember

Enger - Chapter 03 #82

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.02

Topic: Chemistry

83. An organic molecule with the formula  $C_6H_{12}O_6$  may have many structural formulae. These different three-dimensional forms of the same molecule are known as

- A.** isomers.
- B. isotopes.
- C. isotones.
- D. All the choices are correct.

Blooms Level: 2. Understand

Enger - Chapter 03 #83

Learning Outcome: State the features of a carbon atom that make it able to bond in chains and rings.

Section: 03.01

Topic: Chemistry

84. What name is given to this combination of elements often found attached to protein subunits?



- A. alcohol
- B.** amine
- C. methyl
- D. carboxylic acid

Blooms Level: 1. Remember

Enger - Chapter 03 #84

Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.

Section: 03.03

Topic: Chemistry

85. Which components must be removed during a dehydration synthesis reaction?



- A.** -H and -OH
- B. -N= and -OH
- C. -OH and —COOH
- D. —COOH and -H

Blooms Level: 5. Evaluate  
 Enger - Chapter 03 #85  
 Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.  
 Section: 03.01  
 Topic: Chemistry

86. In the movie *Hannibal*, Anthony Hopkins feeds on humans! Pretty scary, huh? What do you call the chemical reactions that resulted in the digestion of human flesh?

- A. dehydration
- B.** hydrolysis
- C. oxidation-reduction
- D. phosphorylation

Blooms Level: 2. Understand  
 Enger - Chapter 03 #86  
 Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.  
 Section: 03.01  
 Topic: Chemistry

87. Anabolic steroids used by some athletes are compounds that would be classified as

- A. carbohydrates.
- B. nucleic acids.
- C.** lipids.
- D. proteins.

Blooms Level: 2. Understand  
 Enger - Chapter 03 #87  
 Learning Outcome: Give examples of each of the major groups of organic molecules.  
 Section: 03.05  
 Topic: Chemistry

88. Which of the following is most likely a regulatory molecule?

- A. hair
- B. muscle protein
- C.** steroid
- D. calcium

Blooms Level: 2. Understand  
 Enger - Chapter 03 #88  
 Learning Outcome: Distinguish between molecules that are organic and inorganic.  
 Section: 03.01  
 Topic: Chemistry

89. When four polypeptides are joined together by covalent bonds, they form a new, biologically active molecule that displays \_\_\_\_\_ structure.

- A. primary
- B. secondary
- C. tertiary
- D.** quaternary

Blooms Level: 2. Understand  
 Enger - Chapter 03 #89  
 Learning Outcome: Describe how organic molecules such as proteins can have primary, secondary, tertiary, and quaternary structures.  
 Section: 03.03  
 Topic: Chemistry

90. As the baby's body temperature rose, I became very concerned that the increase in heat energy would

- A. cause the baby's proteins to denature.
- B. force me to place her in a lukewarm bath to help remove the excess heat energy in a slow, controlled fashion.
- C. require me to give a non-aspirin medication that would help control fever.
- D.** All the choices are correct.

Blooms Level: 3. Apply  
 Enger - Chapter 03 #90  
 Learning Outcome: Describe how organic molecules such as proteins can have primary, secondary, tertiary, and quaternary structures.  
 Section: 03.03  
 Topic: Chemistry

91. So if I *really* want to know the details about my chances of arteriosclerosis I should be paying closest attention to my

- A. total amount of serum cholesterol.
- B. RNA.
- C.** relative amounts of HDLs and LDLs.
- D. total amount of VLDLs.

Blooms Level: 3. Apply  
 Enger - Chapter 03 #91  
 Learning Outcome: Give examples of each of the major groups of organic molecules.  
 Section: 03.05  
 Topic: Chemistry

92. Which of the following would be considered a macromolecule?

- A. CO<sub>2</sub>
- B. ammonia
- C.** egg protein
- D. hydrochloric acid

Blooms Level: 1. Remember  
 Enger - Chapter 03 #92

*Learning Outcome: Distinguish between molecules that are organic and inorganic.  
Section: 03.01  
Topic: Chemistry*

93. In a nucleotide, the nitrogenous base is bonded to

- A. an acid.
- B.** a sugar.
- C. a phosphate.
- D. itself.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #93*

*Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

94. In a nucleotide, the sugar is bonded to a

- A. sugar.
- B. codon.
- C. salt.
- D.** base and phosphate.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #94*

*Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

95. A nucleotide is composed of the following molecules arranged in this order:

- A. three amino acids covalently bonded in a series.
- B. three fatty acids individually bonded to three different places on glycerol.
- C.** a base bonded to a sugar bonded to a phosphate.
- D. mRNA bonded to tRNA bonded to an amino acid.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #95*

*Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

96. Which of the following best describes the structure of DNA?

- A. single helix
- B. protein coil
- C.** double helix
- D. globular RNA

*Blooms Level: 1. Remember  
Enger - Chapter 03 #96*

*Learning Outcome: Give examples of each of the major groups of organic molecules.  
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

97. The backbone of a double helix is

- A.** sugar-phosphate.
- B. hydrogen bonds.
- C. base-pairing.
- D. All of these answers are true.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #97*

*Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

98. DNA is

- A. a single chain of nucleotides containing deoxyribose.
- B. mainly found in the cytoplasm.
- C. composed of amino acids.
- D.** a coiled double chain of nucleotides.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #98*

*Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

99. Which of these is responsible for carrying a specific amino acid to the ribosome during protein synthesis?

- A. DNA
- B. mRNA
- C.** tRNA
- D. ribosome

*Blooms Level: 1. Remember  
Enger - Chapter 03 #99*

*Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

100. Which of these is a component of ribosomes?

- A. DNA
- B.** rRNA
- C. tRNA

D. ribosome

*Blooms Level: 1. Remember  
Enger - Chapter 03 #100  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

101. Which of these is a copy of DNA that is used to direct the synthesis of a specific protein?

- A.** mRNA
- B. rRNA
- C. tRNA
- D. ribosome

*Blooms Level: 1. Remember  
Enger - Chapter 03 #101  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

102. Which of these molecules is typically double-stranded?

- A. mRNA
- B. rRNA
- C. tRNA
- D.** DNA

*Blooms Level: 1. Remember  
Enger - Chapter 03 #102  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.04  
Topic: Chemistry*

103. Fats are

- A. polar molecules.
- B. nonpolar molecules.
- C. hydrophilic.
- D.** both B and C.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #103  
Learning Outcome: Describe the function played by each of the major groups of organic molecules.  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.05  
Topic: Chemistry*

104. What role do chaperone proteins play?

- A. They make sure that nucleotides are in the right position.
- B.** Make sure that proteins are folded correctly.
- C. Are caps on lipids.
- D. Control the movement of water throughout the cell.

*Blooms Level: 1. Remember  
Enger - Chapter 03 #104  
Learning Outcome: Give examples of each of the major groups of organic molecules.  
Section: 03.03  
Topic: Chemistry*

### **3 Summary**

<u>Category</u>	<u># of Questions</u>
Blooms Level: 1. Remember	53
Blooms Level: 2. Understand	27
Blooms Level: 3. Apply	5
Blooms Level: 5. Evaluate	19
Enger - Chapter 03	104
Learning Outcome: Describe how organic molecules such as proteins can have primary, secondary, tertiary, and quaternary structures.	3
Learning Outcome: Describe how single and double covalent bonds are formed in organic molecules.	3
Learning Outcome: Describe the function played by each of the major groups of organic molecules.	18
Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.	4
Learning Outcome: Distinguish between molecules that are organic and inorganic.	8
Learning Outcome: Draw an example of a carbon skeleton.	5
Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.	7
Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.	3
Learning Outcome: Give examples of each of the major groups of organic molecules.	28
Learning Outcome: List the major group of organic molecules associated with living things.	11
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.	17
Learning Outcome: Recognize the main functional groups.	7
Learning Outcome: State the features of a carbon atom that make it able to bond in chains and rings.	4
Section: 03.01	29
Section: 03.02	17
Section: 03.03	21
Section: 03.04	12
Section: 03.05	29
Section: 03.06	1
Topic: Chemistry	104