Chapter 03
Organic Molecules-The Molecules of Life

Multiple Choice Questions

1. Which of the following is NOT a lipid?
A. olive oil
B. fat
C. amino acid
D. steroid

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
Learning Outcome: List the major group of organic molecules associated with living things.
Section: 03.05
Topic: Chemistry

7. CH_3-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-CH_2-COOH is a(n)
A. fatty acid.
B. amino acid.
C. glycerol.
D. steroid.

Bloom's Level: 5. Evaluate
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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. $C_{12}H_{22}O_{11}$.

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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. $C_7H_7O_7$.

Bloom's Level: 2. Understand
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.

Bloom's Level: 2. Understand
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.

Bloom's Level: 2. Understand
Learning Outcome: Describe the function played by each of the major groups of organic molecules.
Section: 03.05
Topic: Chemistry

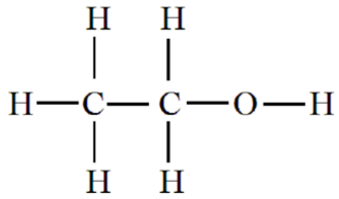
18. The functional group at the end of a fatty acid has the following formula
A. —COOR.
B. —COOH.
C. —COON.
D. CH_2O.

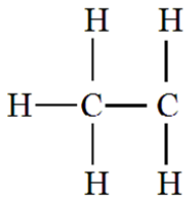
Bloom's Level: 1. Remember
Learning Outcome: Recognize the main functional groups.
Section: 03.01
Topic: Chemistry

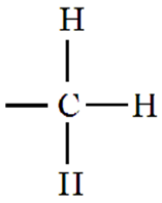
19. This is a(n) ____ reaction. $C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6 + C_6H_{12}O_6$
A. hydrolysis
B. dehydration synthesis
C. acid-base
D. ionic

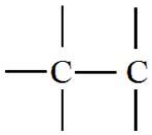
Bloom's Level: 3. Apply
Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.
Section: 03.02
Topic: Chemistry

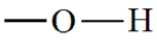
20. The functional group on the molecule below is



A. 

B. 

C. 

D. 

Bloom's Level: 5. Evaluate
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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. $CaCl_2$.
B. C_2H_6.
C. C_2H_5OH.
D. $C_3H_5(OH)_3$.

Bloom's Level: 1. Remember
Learning Outcome: Distinguish between molecules that are organic and inorganic.
Section: 03.01
Topic: Chemistry

24. Which reaction represents a dehydration synthesis?
A. $C_6H_{12}O_6 + C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{18}H_{32}O_{16} + 2H_2O$
B. $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$
C. $NaOH + H_2O \rightarrow Na^+OH^- + H_2O$
D. triglyceride $\rightarrow$ glycerol + 3 fatty acids + $3H_2O$

Bloom's Level: 5. Evaluate
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.

Bloom's Level: 1. Remember
Learning Outcome: Recognize the basic subunit of each of the major groups of organic molecules.
Section: 03.02
Topic: Chemistry

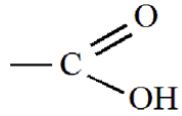
26. Which of the following is neither a simple nor a complex carbohydrate?
A. $C_6H_{12}O_6$
B. $C_4H_8O_4$
C. $C_{12}H_{22}O_{11}$
D. C_2H_4O

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
Learning Outcome: Recognize the main functional groups.
Section: 03.01
Topic: Chemistry

29. Enzymes are made from
A. fats.
B. protein.
C. cytoplasm.
D. nucleoplasm.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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_2O This is a(n) ____ reaction.
A. hydrolysis
B. dehydration synthesis
C. unbalanced
D. acid-base

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
Learning Outcome: Distinguish between molecules that are organic and inorganic.
Section: 03.01
Topic: Chemistry

35. $C_{12}H_{24}O_{12}$; this formula represents a
A. lipid.
B. protein.
C. carbohydrate.
D. phospholipid.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 2. Understand
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

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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. $C_{51}H_{97}O_6$

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
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. $C_2H_5O_2N$

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 5. Evaluate
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.05
Topic: Chemistry

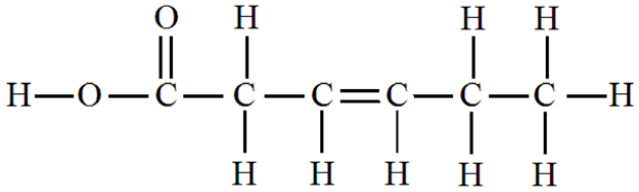
49. There are five types of lipoproteins in the body:
A. triglycerides, diglycerides, monoglycerides, chylomicrons, and cholesterol.
B. triglycerides, very-low-density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and cholesterol.
C. chylomicrons, very-low density 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).

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
Learning Outcome: Describe the function played by each of the major groups of organic molecules.
Section: 03.05
Topic: Chemistry

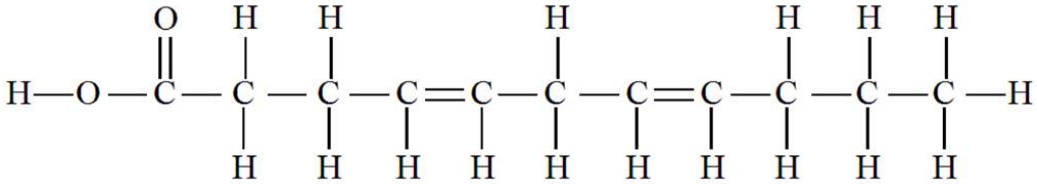
51. The molecule below is a(n)



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

Bloom's Level: 5. Evaluate
Learning Outcome: Draw an example of a carbon skeleton.
Learning Outcome: Recognize the main functional groups.
Section: 03.01
Section: 03.05
Topic: Chemistry

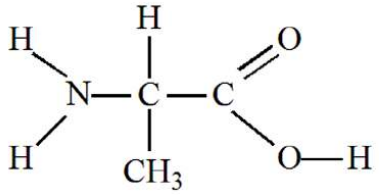
52. The molecule below is a(n)



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

Bloom's Level: 5. Evaluate
Learning Outcome: Draw an example of a carbon skeleton.
Learning Outcome: Recognize the main functional groups.
Section: 03.05
Topic: Chemistry

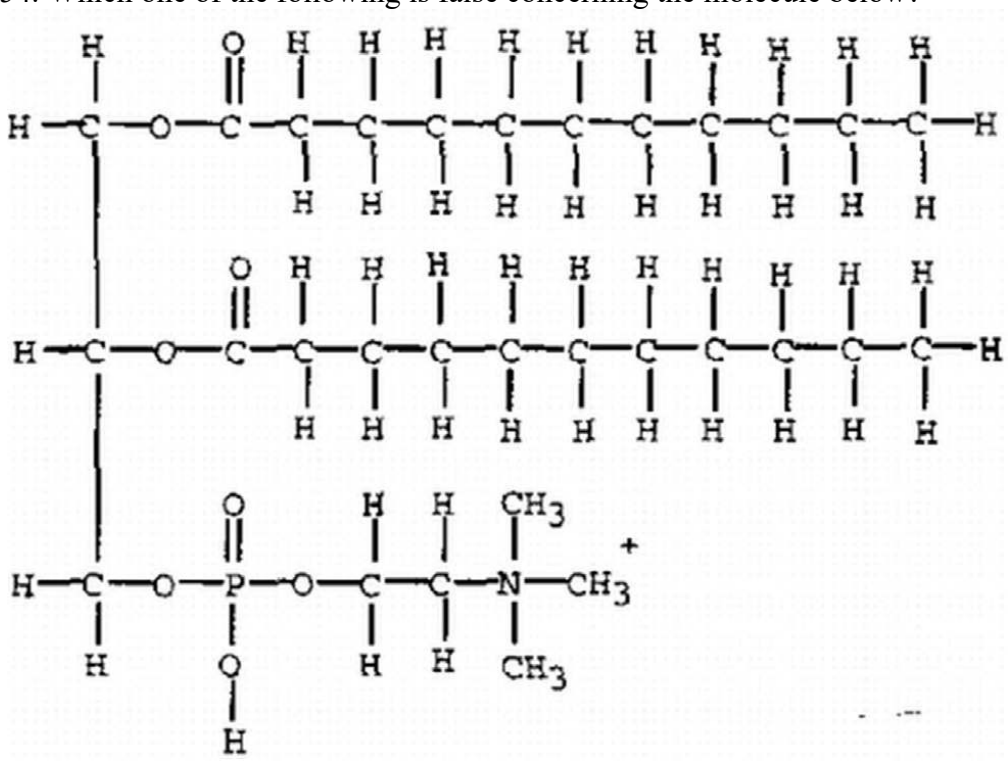
53. The molecule below is a(n)



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

Bloom's Level: 5. Evaluate
Learning Outcome: Draw an example of a carbon skeleton.
Learning Outcome: Recognize the main functional groups.
Section: 03.03
Topic: Chemistry

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.

Bloom's Level: 5. Evaluate
Learning Outcome: Draw an example of a carbon skeleton.
Learning Outcome: Recognize the main functional groups.
Section: 03.03
Topic: Chemistry

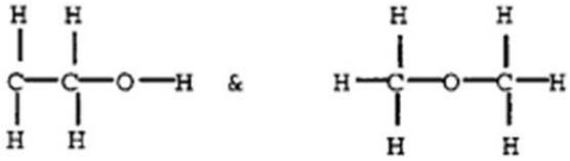
55. ____ is a sugar.
A. Sucrase
B. Pentose
C. $C_{27}H_{46}O$
D. $COOH\text{-}CH_2\text{-}NH_3$

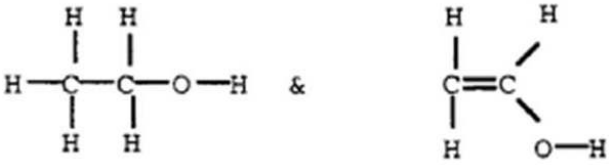
Bloom's Level: 1. Remember
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.02
Topic: Chemistry

56. ____ represent isomers.

A. 

B. 

C. 

D. 

Bloom's Level: 5. Evaluate
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

Bloom's Level: 2. Understand
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 2. Understand
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

Bloom's Level: 5. Evaluate
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.02
Section: 03.03
Section: 03.05
Topic: Chemistry

61. A protein that has had its physical and chemical properties changed is said to be
A. denatured.
B. dysfunctional.
C. hydrolyzed.
D. saturated.

Bloom's Level: 1. Remember
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.

Bloom's Level: 5. Evaluate
Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.
Section: 03.02
Topic: Chemistry

63. ____ contains double bonds.
A. CH_4
B. H_2O
C. CO_2
D. NH_3

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.04
Topic: Chemistry

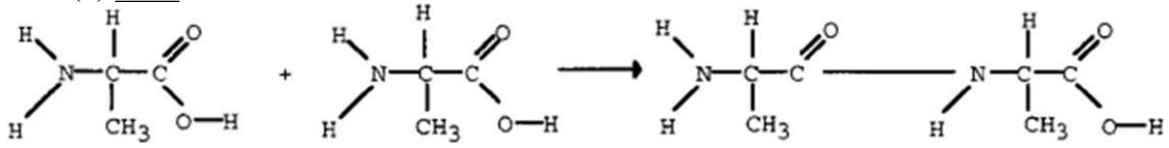
65. A(n) ____ is a polymer.
A. monosaccharide
B. amino acid
C. nucleotide
D. polypeptide

Bloom's Level: 1. Remember
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

Bloom's Level: 2. Understand
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.05
Topic: Chemistry

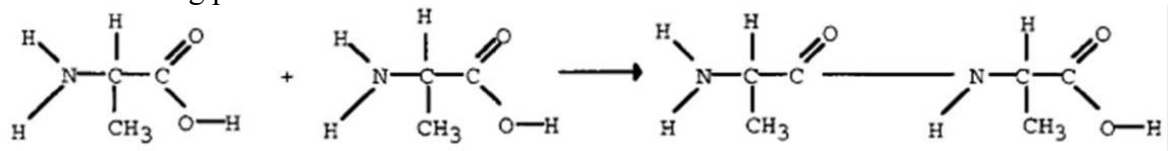
67. A(n) ____ bond is formed between the reactants below.

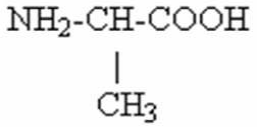


A. ionic
B. hydrogen
C. peptide
D. polar

Bloom's Level: 5. Evaluate
Learning Outcome: Describe how single and double covalent bonds are formed in organic molecules.
Section: 03.01
Topic: Chemistry

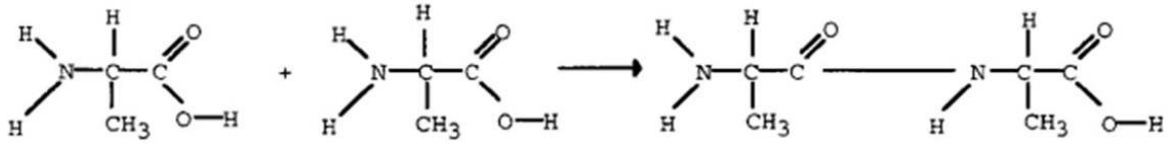
68. The missing product below is



A. O_2
B. CO_2
C. H_2O
D. 

Bloom's Level: 5. Evaluate
Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.
Section: 03.01
Topic: Chemistry

69. The reaction below represents a ____ reaction.

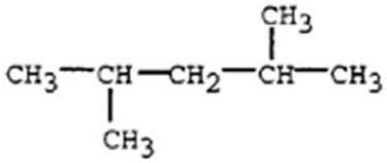


A. dehydration synthesis
B. hydrolysis
C. unbalanced
D. equilibrium

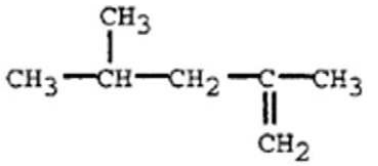
Bloom's Level: 5. Evaluate
Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.
Learning Outcome: Explain the difference between dehydration synthesis and hydrolysis.
Section: 03.01
Topic: Chemistry

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

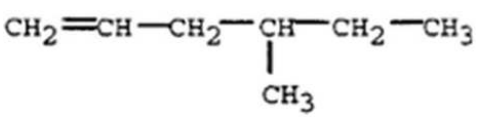
A.



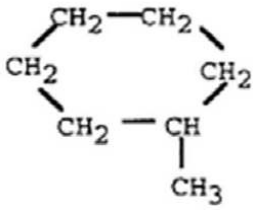
B.



C.

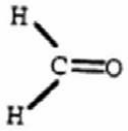


D.



Bloom's Level: 5. Evaluate
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_4HO_2.
C. CH_2O.
D. CHO_2.

Bloom's Level: 3. Apply
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

Bloom's Level: 1. Remember
Learning Outcome: List the major group of organic molecules associated with living things.
Section: 03.01
Section: 03.03
Topic: Chemistry

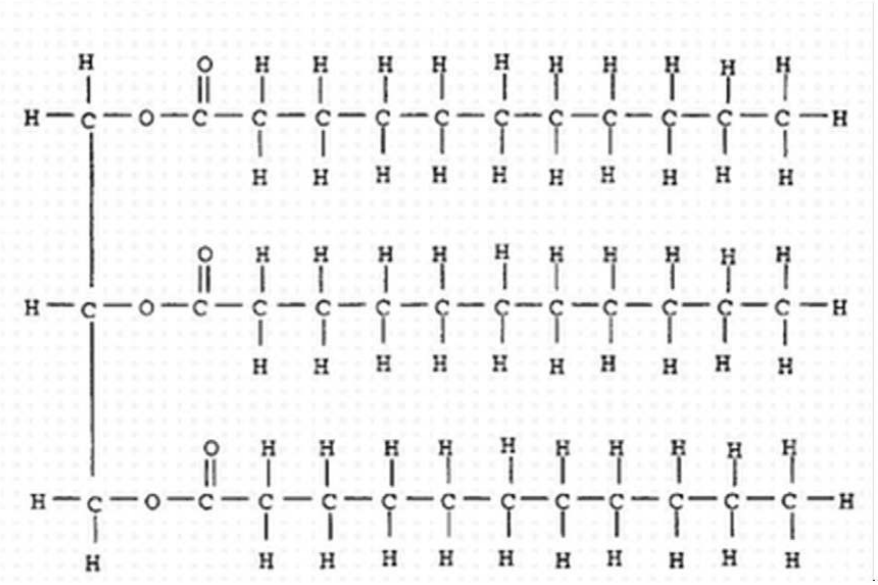
73. A sugar with three carbon atoms is a
A. triose sugar.
B. trisaccharide.
C. triglyceride.
D. tripeptide.

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
Learning Outcome: Explain why certain organic molecules are considered monomers and others polymers.
Section: 03.01
Topic: Chemistry

75. The molecule below



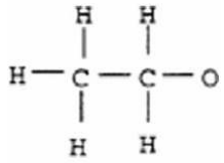
A. was probably produced by a plant.
B. is liquid at room temperature.
C. was formed by three separate hydrolysis reactions.
D. contains more energy per gram than a carbohydrate.

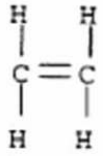
Bloom's Level: 5. Evaluate
Learning Outcome: Diagram simple dehydration synthesis and hydrolysis reactions.
Section: 03.01
Topic: Chemistry

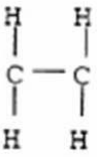
76. Which of the following statements about carbohydrates is INCORRECT?
A. Carbohydrates are a good source of energy.
B. Carbohydrates contain approximately 2 hydrogens per carbon in the molecule.
C. Most carbohydrates dissolve in water.
D. Carbohydrates contain argon, carbon, hydrogen, and oxygen atoms.

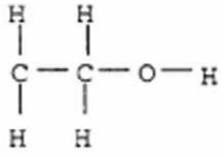
Bloom's Level: 1. Remember
Learning Outcome: Describe the function played by each of the major groups of organic molecules.
Section: 03.02
Topic: Chemistry

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

A. 

B. 

C. 

D. 

Bloom's Level: 5. Evaluate
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.

Bloom's Level: 2. Understand
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 5. Evaluate
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

Bloom's Level: 3. Apply
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 2. Understand
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?
$-NH_2$
A. alcohol
B. amine
C. methyl
D. carboxylic acid

Bloom's Level: 1. Remember
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

Bloom's Level: 5. Evaluate
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 2. Understand
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

Bloom's Level: 2. Understand
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

Bloom's Level: 2. Understand
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.

Bloom's Level: 3. Apply
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.

Bloom's Level: 3. Apply
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_2
B. ammonia
C. egg protein
D. hydrochloric acid

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
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.

Bloom's Level: 1. Remember
Learning Outcome: Give examples of each of the major groups of organic molecules.
Section: 03.03
Topic: Chemistry