

Chapter 02 - The Chemistry of Biology

Chapter 02
The Chemistry of Biology

Multiple Choice Questions

1. Anything that occupies space and has mass is called
- A. an electron.
 - B. living.
 - C. matter.**
 - D. energy.
 - E. space.

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Learning Outcome: 02.02 Characterize elements and their isotopes.

Topic: Basic Chemistry

2. The electrons of an atom are
- A. always equal to the number of neutrons in an atom.
 - B. found in the nucleus.
 - C. used to determine atomic number.
 - D. positively charged.
 - E. moving in pathways called orbitals.**

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

3. All of the following pertain to $^{14}_6\text{C}$ *except* it

- A. has 6 protons.
- B. has 6 electrons.
- C.** has 14 neutrons.
- D. is an isotope of carbon.
- E. mass number is 14.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Learning Outcome: 02.05 Describe electron orbitals and energy shells and how they are filled.

Topic: Basic Chemistry

4. The subatomic particles that surround the nucleus are the

- A.** electrons.
- B. protons.
- C. neutrons.
- D. protons and neutrons.
- E. protons and electrons.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Topic: Basic Chemistry

5. Cations are

- A. charged subatomic particles.
- B. atoms that have gained electrons.
- C. radioactive isotopes.
- D.** capable of forming ionic bonds with anions.
- E. atoms without protons.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.06 Explain how elements make chemical bonds to form molecules and compounds.

Learning Outcome: 02.10 Describe ionization and distinguish between anions and cations.

Topic: Basic Chemistry

6. Isotopes are atoms of the same element that differ in their
- A. neutron number.
 - B. electron number.
 - C. proton number.
 - D. atomic number.
 - E. chemical properties.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.02 Characterize elements and their isotopes.

Topic: Basic Chemistry

7. What is the maximum number of electrons in the second energy shell of an atom?
- A. 2
 - B. 4
 - C. 8
 - D. 18
 - E. 32

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.05 Describe electron orbitals and energy shells and how they are filled.

Topic: Basic Chemistry

8. Two or more atoms bonded together are called a/an
- A. ion.
 - B. isotope.
 - C. element.
 - D. electrolyte.
 - E. molecule.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.06 Explain how elements make chemical bonds to form molecules and compounds.

Learning Outcome: 02.07 State the relationship among an atom, molecule, and compound.

Topic: Basic Chemistry

9. What would be the valence number of electrons in the sulfur atom $^{32}_{16}\text{S}$?

- A. 2
- B. 6**
- C. 8
- D. 16
- E. 32

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.05 Describe electron orbitals and energy shells and how they are filled.

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

Topic: Basic Chemistry

10. Polar molecules are composed of covalently bonded

- A. identical atoms.
- B. carbon atoms.
- C. ions.
- D. atoms of different electronegativity.**
- E. atoms of identical electronegativity.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.

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

Topic: Basic Chemistry

11. Reactions involving electron release are called _____ reactions.

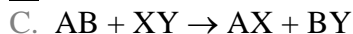
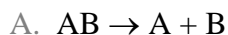
- A. oxidation.**
- B. reduction.
- C. ionization.
- D. decomposition.
- E. dissolution.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.11 Compare oxidation and reduction and their effects.

Topic: Basic Chemistry

12. Which of the following represents a synthesis reaction?



E. None of the choices are correct.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.06 Explain how elements make chemical bonds to form molecules and compounds.

Learning Outcome: 02.12 Classify different forms of chemical shorthand and types of reactions.

Topic: Basic Chemistry

13. The important solvent associated with living things is

A. carbon dioxide.

B. sodium chloride.

C. ethyl alcohol.

D. benzene.

E. water.

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

14. Which term does *not* belong in this list?

A. lactic acid

B. vinegar

C. hydrogen ion donor

D. pH 8

E. acidic

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral levels.

Topic: Basic Chemistry

15. A solution of pH 7 compared to a solution of pH 9

- A. is more basic.
- B. has no OH^- ions.
- C.** has more H^+ ions.
- D. has a higher pH.
- E. All of the choices are correct.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral levels.

Topic: Basic Chemistry

16. What do H_2O , NaCl , CO_2 , and HCl all have in common?

- A. all are salts
- B. all are acids
- C. all are gases
- D.** all are inorganic
- E. all are solutes

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.

Topic: Basic Chemistry

17. Which of the following functional groups is *mismatched* to the organic compound?

- A.** phosphate - carbohydrates
- B. sulfhydryl - proteins
- C. amino - proteins
- D. hydroxyl - alcohols
- E. carboxyl - fatty acids

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.

Learning Outcome: 02.17 Identify functional groups and know some examples.

Learning Outcome: 02.19 Define carbohydrate and know the functional groups that characterize carbohydrates.

Topic: Basic Chemistry

Topic: Biochemistry

18. The building blocks of an enzyme are

- A. nucleotides.
- B. glycerol and fatty acids.
- C. monosaccharides.
- D. phosphate, glycerol, fatty acids.
- E.** amino acids.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.18 Define what macromolecules, polymers, and monomers are.

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Learning Outcome: 02.27 Summarize some of the essential functions of proteins.

Topic: Biochemistry

19. All of the following are monosaccharides *except*

- A. glucose.
- B.** glycogen.
- C. fructose.
- D. ribose.
- E. deoxyribose.

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

20. All of the following are lipids *except*:

- A. cholesterol
- B.** starch
- C. phospholipid
- D. wax
- E. triglyceride

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

21. A monosaccharide with 5 carbon atoms will have _____ hydrogen atoms and _____ oxygen atoms.

- A.** 10, 5
- B. 5, 10
- C. 5, 5
- D. 10, 10
- E. 2, 1

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.19 Define carbohydrate and know the functional groups that characterize carbohydrates.

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

Topic: Biochemistry

22. One nucleotide contains

- A. one phosphate.
- B. one pentose.
- C. one nitrogen base.
- D.** All of the choices are correct.
- E. None of the choices are correct.

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

23. Which of the following would have glycosidic bonds?

- A. triglycerides
- B. monosaccharides
- C. polypeptides
- D.** polysaccharides
- E. ATP

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

24. All of the following are polysaccharides, *except*:

- A. dextran in some bacterial slime layers
- B. agar used to make solid culture media
- C. a cell's glycocalyx
- D. cellulose in certain cell walls
- E. prostaglandins in inflammation**

ASM Topic: Module 02 Structure and Function

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

Learning Outcome: 02.21 Discuss the functions of carbohydrates in cells.

Topic: Biochemistry

25. What part of a phospholipid forms hydrophobic tails?

- A. fatty acids**
- B. glycerol
- C. phosphate
- D. alcohol
- E. All of the choices are correct.

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

26. An amino acid contains all of the following *except*:

- A. an amino grou.
- B. a carboxyl group
- C. a variable R group
- D. a carbon atom
- E. a nitrogenous base**

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Topic: Biochemistry

27. Which pertains to DNA but *not* to RNA?

- A. contains ribose
- B. contains adenine
- C. contains thymine**
- D. contains uracil
- E. contains nucleotides

ASM Topic: Module 02 Structure and Function

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

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

Topic: Biochemistry

28. ATP is best described as

- A. an enzyme.
- B. a double helix.
- C. an electron carrier.
- D. the energy molecule of cells.**
- E. All of the choices are correct.

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

29. Which is *not* true about enzymes?

- A. found in all cells
- B. are catalysts
- C. participate in the cell's chemical reactions
- D. can be denaturated by heat and other agents
- E. have high-energy bonds between phosphates**

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Learning Outcome: 02.26 Characterize the four levels of protein structure and describe the pattern of folding.

Topic: Biochemistry

30. Which amino acid contains sulfur atoms that form covalent disulfide bonds in its tertiary structure?

- A. valine
- B. cysteine**
- C. serine
- D. alanine
- E. tyrosine

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Learning Outcome: 02.26 Characterize the four levels of protein structure and describe the pattern of folding.

Topic: Biochemistry

31. The nucleic acid that delivers the correct amino acid for protein synthesis is

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

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

32. The purine bases in nucleic acids include

- A. thymine and cytosine.
- B. guanine and adenine.**
- C. cytosine and guanine.
- D. adenine and thymine.
- E. ribose and deoxyribose.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

33. A weak, attractive force between nearby molecules is called a/an

- A. hydrogen bond.
- B. covalent bond.
- C. ionic bond.
- D. peptide bond.
- E. glycosidic bond.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.

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

Topic: Basic Chemistry

34. A student forgot to label a beaker containing a DNA solution and a beaker containing a glucose solution. If chemical analysis was performed to identify the contents of each beaker, which of the following would be found in the beaker of DNA but *not* in the beaker with glucose?

- A. amino acids
- B. hydrogen and oxygen atoms
- C. nitrogen and phosphorus
- D. fatty acids
- E. carbon atoms

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.19 Define carbohydrate and know the functional groups that characterize carbohydrates.

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

Topic: Biochemistry

35. $C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11} + H_2O$ represents

- A. formation of a peptide bond.
- B. a decomposition reaction.
- C. denaturation.
- D. formation of a polysaccharide.
- E. dehydration synthesis.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.12 Classify different forms of chemical shorthand and types of reactions.

Learning Outcome: 02.18 Define what macromolecules, polymers, and monomers are.

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

Topic: Basic Chemistry

Topic: Biochemistry

36. The atomic number equals the number of _____ an atom possesses.

- A. neutrons
- B. protons**
- C. protons plus electrons
- D. neutrons plus protons
- E. electrons plus protons

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.03 Explain the differences between atomic number, mass number, and atomic weight.

Topic: Basic Chemistry

37. If carbon has an atomic number of 6 and an atomic mass of 14, how many neutrons does it have?

- A. 6
- B. 7
- C. 8**
- D. 14
- E. impossible to determine

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Learning Outcome: 02.03 Explain the differences between atomic number, mass number, and atomic weight.

Topic: Basic Chemistry

38. The neutrons of an atom are

- A. always equal to the number of protons in an atom.
- B. found in the nucleus.**
- C. used to determine atomic number.
- D. positively charged.
- E. moving in pathways called orbitals.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Topic: Basic Chemistry

39. Which of the following represents an exchange reaction?

- A. $AB \rightarrow A + B$
- B. $A + B \rightarrow AB$
- C. $X + Y \rightarrow XYD$
- D.** $AB + XY \leftrightarrow AX + BY$
- E. None of the choices are correct.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.12 Classify different forms of chemical shorthand and types of reactions.

Topic: Basic Chemistry

40. Jim needs to prepare one liter of a 4% NaCl solution. How much NaCl should he weigh out?

- A. 0.4 grams
- B. 4.0 grams
- C.** 40 grams
- D. 400 grams
- E. None of the choices are correct.

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

41. How many times more acidic is a solution with a pH of 3 than a solution with a pH of 6?

- A. 3
- B. 10
- C.** 1000
- D. 36
- E. 63

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral levels.

Topic: Basic Chemistry

42. Which of the following carbohydrates is found in dairy products?

- A. lactose
- B. sucrose
- C. maltose
- D. glucose
- E. fructose

ASM Topic: Module 02 Structure and Function

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

Learning Outcome: 02.21 Discuss the functions of carbohydrates in cells.

Topic: Biochemistry

43. Which of the following is the stored form of carbohydrates in animals?

- A. glycogen
- B. maltose
- C. starch
- D. cellulose
- E. galactose

ASM Topic: Module 02 Structure and Function

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

Learning Outcome: 02.21 Discuss the functions of carbohydrates in cells.

Topic: Biochemistry

44. All of the following are correct about triglycerides, *except*:

- A. they are insoluble in water
- B. they are a concentrated source of energy
- C. when they are unsaturated they are solid
- D. they dissolve in nonpolar solvents
- E. they are digested by lipases

ASM Topic: Module 02 Structure and Function

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

Learning Outcome: 02.24 Discuss major functions of lipids in cells.

Topic: Biochemistry

45. The type of chemical bond linking amino acids together is a(n):

- A. glycosidic bond
- B. peptide bond**
- C. ester bond
- D. ionic bond
- E. hydrogen bond

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Topic: Biochemistry

46. The alpha helix and beta pleated sheet are examples of:

- A. primary structures
- B. secondary structures**
- C. tertiary structures
- D. quaternary structures
- E. gamma structures

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.26 Characterize the four levels of protein structure and describe the pattern of folding.

Topic: Biochemistry

47. The polynucleotide strands of DNA are linked along their length by _____ bonds between the bases.

- A. covalent
- B. ionic
- C. Van der Waals
- D. double
- E. hydrogen**

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.

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

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

Topic: Biochemistry

48. Which of the following examples are NOT hydrophobic?

- A.** Glucose
- B. Vegetable oil
- C. Butter
- D. Cholesterol
- E. Choices B, C, and D are correct

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.14 Differentiate between hydrophilic and hydrophobic.

Learning Outcome: 02.19 Define carbohydrate and know the functional groups that characterize carbohydrates.

Learning Outcome: 02.24 Discuss major functions of lipids in cells.

Topic: Biochemistry

True / False Questions

49. A covalent bond is formed between an anion and a cation.

FALSE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.06 Explain how elements make chemical bonds to form molecules and compounds.

Learning Outcome: 02.10 Describe ionization and distinguish between anions and cations.

Topic: Biochemistry

50. Electrons that participate in chemical bonding are typically located closest to the nucleus.

FALSE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.05 Describe electron orbitals and energy shells and how they are filled.

Learning Outcome: 02.06 Explain how elements make chemical bonds to form molecules and compounds.

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

Topic: Basic Chemistry

51. Only charged atoms can form ionic bonds.

TRUE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.08 Identify the differences between covalent, ionic, and hydrogen bonds.

Learning Outcome: 02.10 Describe ionization and distinguish between anions and cations.

Topic: Basic Chemistry

52. Water molecules are nonpolar molecules.

FALSE

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

53. Polar molecules have more reactivity compared to nonpolar molecules.

TRUE

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

54. Elements have predictable chemical properties.

TRUE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.02 Characterize elements and their isotopes.

Topic: Basic Chemistry

55. The concentration of a solution expresses the amount of solvent present.

FALSE

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

56. If solution A has a lower pH compared to solution B, then solution A is more acidic than solution B.

TRUE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.15 Describe the pH scale and how it was derived; define acid, base, and neutral levels.

Topic: Basic Chemistry

57. The only part of an amino acid that differs from other amino acids is its R group.

TRUE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Topic: Biochemistry

58. All proteins are enzymes.

FALSE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.27 Summarize some of the essential functions of proteins.

Topic: Biochemistry

59. Replication is the cellular mechanism for making a copy of its DNA.

TRUE

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

60. Nucleic acids have primary, secondary, tertiary, and quaternary levels of organization.

FALSE

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.26 Characterize the four levels of protein structure and describe the pattern of folding.

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

Topic: Biochemistry

Fill in the Blank Questions

61. The total number of protons and neutrons of an element establishes its _____ number.

mass

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.03 Explain the differences between atomic number, mass number, and atomic weight.

Topic: Basic Chemistry

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

ions

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.03 Describe ionization and distinguish between anions and cations.

Topic: Basic Chemistry

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

nucleus

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.01 Describe the properties of atoms and identify the relationships of the particles that they contain.

Topic: Basic Chemistry

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

solute or
solvent

ASM Topic: Module 02 Structure and Function

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

Topic: Basic Chemistry

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

carbon

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.16 Describe the chemistry of carbon and the difference between inorganic and organic compounds.

Topic: Basic Chemistry

Topic: Biochemistry

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

Peptide

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

Topic: Biochemistry

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

saturated

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.24 Discuss major functions of lipids in cells.

Topic: Biochemistry

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

ASM Topic: Module 02 Structure and Function

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

Topic: Biochemistry

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

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

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

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

Short Answer Questions

Chapter 02 - The Chemistry of Biology

71. Certain antibiotics are effective against bacteria that cause human infections because they target prokaryotic ribosomes. Discuss, in detail, how the drug attacking a pathogen's ribosomes will affect the cell. Discuss at least 3 specific detrimental results.

ASM Objective: 02.02 Bacteria have unique cell structures that can be targets for antibiotics, immunity, and phage infection.

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

Learning Outcome: 02.27 Summarize some of the essential functions of proteins.

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

Topic: Biochemistry

72. Explain what radioisotopes are, and describe how they can be used to monitor the uptake of a specific biochemical by a microbial culture.

ASM Topic: Module 02 Structure and Function

Learning Outcome: 02.02 Characterize elements and their isotopes.

Topic: Basic Chemistry

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

ASM Objective: 04.02 Although the central dogma is universal in all cells, the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.

ASM Topic: Module 02 Structure and Function

ASM Topic: Module 04 Information Flow

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

Topic: Biochemistry

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

ASM Topic: Module 02 Structure and Function

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

Learning Outcome: 02.18 Define what macromolecules, polymers, and monomers are.

Learning Outcome: 02.19 Define carbohydrate and know the functional groups that characterize carbohydrates.

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

Learning Outcome: 02.25 Describe the structure of peptides and polypeptides and how their bonds form.

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Topic: Biochemistry