Chapter 02
The Origin and Chemistry of Life

Multiple Choice Questions

1. Spontaneous generation was first proposed as
A. a concept to explain the formation of the first living cells on earth.
B. a concept to explain the evolution of simple chemicals into complex macromolecules.
C. an explanation for the appearance of maggots and mice from rotting material, fish from leaves that fall into water, etc.
D. an explanation by Pasteur accounting for the germination of spores in broth.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Spontaneous Generation of Life?
Topic: Spontaneous Generation of Life?

2. Pasteur's work with spontaneous generation showed that
A. life could not have evolved from non-living chemistry on the early earth.
B. mice came from mother mice and maggots from mother flies.
C. simple chemicals could become complex organic macromolecules without any living cell involved.
D. broth did not ferment spontaneously but required contamination with organisms.

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Section: Spontaneous Generation of Life?
Topic: Spontaneous Generation of Life?

3. The hypothesis that simple chemicals may have naturally become complex macromolecules by natural physical forces was first proposed by
A. Stanley Miller.
B. Graham CairnsSmith.
C. Alexander Oparin and J.B.S. Haldane.
D. Sidney Fox.

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Section: Spontaneous Generation of Life?
Topic: Spontaneous Generation of Life?

4. A solution that has a pH of 5 has
A. a concentration of H^+ 20 times higher than water.
B. a concentration of H^+ 100 times higher than water.
C. a concentration of H^+ the same as water.
D. a concentration of H^+ 20 times lower than water.
E. a concentration of H^+ 100 times lower than water.

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Gradable: automatic
Section: Water and Life
Topic: Water and Life

5. A dissolved substance that has the ability to either remove or add H^+ and OH^- ions to resist pH changes is
A. a solution.
B. pure water.
C. a buffer.
D. a solvent.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Water and Life
Topic: Water and Life

6. Most organic molecules are associated with living organisms. Which of the following statements is NOT related to the general distinctions between these types of molecules?
A. Carbon dioxide (CO_2) lacks hydrogen atoms found in most organic molecules and therefore is usually not considered to be "organic."
B. Formaldehyde (CH_2O) is a small molecule compared to most organic molecules but does have carbon and hydrogen covalently bonded together and therefore is considered to be "organic."
C. Salt (Na^+Cl) is not an organic molecule but is important to the life of many organisms.
D. Organic carbon atoms are more diverse than inorganic carbon molecules that form the molecular structure of soot or a diamond from pure carbon.
E. All of the choices are correct.

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

7. Perhaps a better description of an organic compound is that an organic compound is any substance
A. derived from living matter.
B. containing carbon.
C. found within a cell.
D. consumed by animals.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

8. Carbohydrates are categorized into
A. organic and inorganic carbohydrates.
B. saturated and unsaturated carbohydrates.
C. monosaccharides, disaccharides and polysaccharides.
D. primary, secondary, tertiary and quaternary carbohydrates.
E. monomer and polymer carbohydrates.

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

9. Which of the following is a "structural" carbohydrate molecule?
A. Sucrose
B. Glycogen
C. Cellulose
D. Glucose

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

10. Which of the carbohydrates given below is a major component of the cuticle of arthropods (e.g., insects, crayfish, etc.)?
A. Starch
B. Chitin
C. Cellulose
D. Glycogen

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

11. Which of the following carbohydrates is used in animal muscle and liver cells for energy storage?
A. Starch
B. Chitin
C. Cellulose
D. Glycogen

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

12. Which of the following is the most abundant carbohydrate in the world?
A. Cellulose
B. Glycogen
C. Fructose
D. Glucose

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

13. Polysaccharide are polymers made up of which kind of monomers?
A. Simple sugars
B. Amino acids
C. Nucleotides
D. Alternating sugar and phosphate groups
E. Fatty acids and glycerol

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

14. The three principal groups of lipids are neutral fats, phospholipids, and
A. glycogen.
B. steroids.
C. amino acids.
D. fatty acids.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

15. Neutral fats are
A. stored as glycogen.
B. not stored.
C. made of fatty acids and glycerol.
D. made of chains of fatty acids linked together by water molecules.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

16. Lipids are polymers made of which monomers?
A. Glucose or modified glucose molecules
B. Amino acids
C. Alternating sugar and phosphate groups
D. Fatty acids and glycerol

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

17. A dehydration synthesis reaction is also
A. a condensation reaction.
B. a hydrolysis reaction.
C. an isomeric reaction.
D. a reaction that does not require enzymes.

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Gradable: automatic
Section: Chemical Evolution
Section: Organic Molecular Structure of Living Systems
Topic: Chemical Evolution
Topic: Organic Molecular Structure of Living Systems

18. Which of the lipid groups below is structurally unlike the others?
A. Steroids
B. Neutral fats
C. Triglycerides
D. Phospholipids

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

19. Which of the following lipids forms a bilayer between two fluid regions, such as in the plasma membrane of a cell?
A. Steroids
B. Waxes
C. Phospholipids
D. Lipoproteins

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

20. Which of the following is NOT a steroid?
A. Vitamin D
B. Adrenocortical hormones
C. Sex hormones
D. Cholesterol
E. All of the choices are steroids

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
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21. Cholesterol belongs to which of the following groups?
A. Steroids
B. Neutral fats
C. Carbohydrates
D. Phospholipids

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
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22. If an animal needs to store high-energy compounds for long-term use with the least amount of extra body weight, which would be the best molecule for storage?
A. Fructose and glucose in the form of honey
B. High-calorie fat molecules
C. Starch
D. Glycogen with extensive side branches of glucose

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

23. A protein is a polymer made up of which kind of monomers?
A. Glucose or modified glucose molecules
B. Amino acids
C. Nucleotides
D. Fatty acids and glycerol

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

24. A peptide bond is found in which type of biological molecule?
A. Carbohydrate
B. Lipid
C. Protein
D. Simple sugar

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

25. A chain consisting of a number of amino acids is a
A. quaternary structure.
B. dipeptide.
C. polypeptide.
D. None of the choices are correct.

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

26. In a protein, the folding of a polypeptide into a three-dimensional structure, usually stabilized by covalent bonds between the side groups of the amino acids, is the
A. primary structure.
B. secondary structure.
C. tertiary structure.
D. quaternary structure.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

27. The alpha helix is found at which level of protein organization?
A. Primary structure
B. Secondary structure
C. Tertiary structure
D. Quaternary structure

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

28. The splitting of one compound into two by the addition of water is called
A. covalent.
B. ionic formation.
C. hydrolysis.
D. condensation.

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Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

29. You eat eggs for breakfast and return in the evening to dirty dishes with "dried on" yellow streaks. After soaking awhile, the egg yolk protein molecules easily "wash off." What happened?
A. Heating denatured the egg protein molecules, hydrolysis reactions then formed bonds in the dried egg yolk, and soaking in water eventually resulted in condensation reactions where water broke these bonds
B. Heating denatured the egg protein molecules, unorganized condensation reactions formed bonds in the drying egg, and soaking in water resulted in hydrolysis reactions where water broke these bonds
C. Egg monomers were fused to become one polymer, which was easily dissolved by water back into monomers
D. Addition of water converted organic molecules into inorganic molecules

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Bloom's Level: 3. Apply
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

30. At the molecular level, a cell's ability to vary in its operational tolerance to temperature, etc., is most closely related to
A. enzyme activity and protein denaturation.
B. ATP efficiency.
C. replication of nucleic acids.
D. extent of saturation of fatty acids.

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Bloom's Level: 2. Understand
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

31. DNA and RNA are polymers composed of repeated units called
A. nucleotides.
B. bases.
C. sugars.
D. None of the choices are correct.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

32. A nucleic acid is a polymer made up of which kind of monomers?
A. Amino acids
B. Nucleotides
C. Glucose or modified glucose molecules
D. Alternating sugar and phosphate groups

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

33. Nucleic acids are important because they
A. act as buffers.
B. are the basic units of neutral fats.
C. direct the synthesis of proteins.
D. None of the choices are correct.

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Bloom's Level: 2. Understand
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

34. Which of these statements is true about DNA?
A. It is the genetic material of the cell
B. It forms a protein
C. It is pure amino acid
D. It contains no sugar

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

35. Fish sperm is mostly made of male DNA. A chemical test would find high amounts of
A. nitrogenous bases, sugar, and phosphate groups.
B. phospholipids and steroids.
C. amino acids and unsaturated fats.
D. triglycerides and ATP.
E. globular proteins and stored fats.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
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36. Prions are infectious
A. carbohydrates.
B. proteins.
C. lipids.
D. Prions are not actually infectious.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

37. Which of the following forms of energy is NOT one of those thought to have been involved in the production of large organic molecules in the primitive reducing atmosphere?
A. Radioactivity
B. Electrical energy
C. Radiation from the sun
D. Sound

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Bloom's Level: 2. Understand
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

38. The term "reducing atmosphere" for the early earth means that the atmosphere
A. was much thinner around the surface of the earth than now.
B. contained only two or three kinds of gases.
C. contained little or no free oxygen.
D. contained little or no free nitrogen.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

39. Who first performed an experiment that proved that amino acids could be produced in the laboratory from a reducing atmosphere and electrical sparks?
A. Stanley Miller and Harold Urey
B. Graham CairnsSmith
C. Thomas Cech
D. Alexander Oparin and J.B.S. Haldane

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Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

40. Which of the following is a correct statement about oxidation reduction reactions?
A. Reduction is the loss of electrons
B. Reduction is the loss of hydrogen atoms
C. Oxidation is the loss of electrons or hydrogen atoms
D. Reduction and oxidation sometimes occur together, but not always

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

41. Which of the following kinds of molecules is thought to have been absent from the primitive reducing atmosphere?
A. Water vapor (H_2O)
B. Carbon dioxide (CO_2)
C. Oxygen (O_2)
D. Nitrogen (N_2)

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
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42. An alternative environment to the "hot dilute soup" and clay hypothesis that offers a possible source of energy and molecules for the origin of life is/are the
A. frozen Antarctic ice sheets.
B. surface of Mars.
C. hydrothermal vents in ocean bottoms.
D. Earth mantle and core.

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

43. Water has which of the following important characteristics that explain its key role in living systems?
A. High specific heat capacity
B. High surface tension
C. Is an excellent solvent
D. All of the choices are correct

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Water and Life
Topic: Water and Life

44. A molecule of RNA that has enzymatic or catalytic properties is called a _____.
A. deoxyribose
B. nucleotide
C. ribonucleic acid
D. ribozyme

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Origin of Living Systems
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45. The fact that nucleic acids are very complicated molecules suggests that
A. the RNA-first hypothesis is impossible.
B. the protein-first hypothesis is therefore the only plausible hypothesis.
C. no natural system could ever generate them.
D. None of the choices are correct.

Accessibility: Keyboard Navigation
Bloom's Level: 3. Apply
Gradable: automatic
Section: Origin of Living Systems
Topic: Origin of Living Systems

46. The ancestral protocells
A. may have contained RNA or DNA as their genetic material.
B. may have evolved before the development of a true cell.
C. may have had a lipid and protein membrane surrounding them, forming a proteinoid microsphere.
D. may have contained a biochemical pathway for energy metabolism.
E. All of the choices are correct.

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Bloom's Level: 5. Evaluate
Gradable: automatic
Section: Origin of Living Systems
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47. Biological evolution differs from chemical evolution in that biological evolution would have been possible only after the development of
A. true cells capable of replication.
B. nucleic acids.
C. enzymes.
D. a metabolic pathway.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
Section: Origin of Living Systems
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Topic: Chemical Evolution
Topic: Origin of Living Systems
Topic: Precambrian Life

48. Heating dry mixtures of amino acids and then mixing them with water forms small
A. strands of DNA.
B. living cells.
C. proteinoid microspheres.
D. plasma membranes.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Chemical Evolution
Topic: Chemical Evolution

49. If the hypothesis that protocells were based on an "RNA world" is correct, what would be necessary to shift to a "DNA world"?
A. An enzyme or reaction capable of removing one oxygen from ribose in nucleotides
B. Enzymes for reverse transcription of RNA into DNA
C. New enzymes to replicate the DNA
D. New enzymes for transcribing DNA back to RNA
E. All are necessary to switch to a "DNA world."

Accessibility: Keyboard Navigation
Bloom's Level: 4. Analyze
Gradable: automatic

50. Scientists once assumed that the earliest protocells would have been autotrophs. This concept appears to be
A. correct, since heterotrophs would depend upon eating autotrophs.
B. correct, since glycolysis and fermentation only occur after oxygen is present from photosynthesis.
C. incorrect, since the primordial soup likely contained many preformed food molecules suitable for heterotrophic metabolism.
D. incorrect, since glycolysis and fermentation require complex enzymes for catalytic reactions.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Origin of Living Systems
Topic: Origin of Living Systems

51. Prokaryotic cells are represented by fossils that are dated back as far as _____ billion years ago.
A. 1.5.
B. 2.8.
C. 3.8.
D. 4.8.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Origin of Living Systems
Topic: Origin of Living Systems

52. The Precambrian-Cambrian boundary is
A. A point that separates reduction environments from oxidation environments
B. The separation point between prokaryotes and eukaryotes
C. A point of dramatically increased fossilization, although it is likely that many animal groups existed before this time
D. The shift-over from plants to animal life

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Precambrian Life
Topic: Precambrian Life

53. The first eukaryotic cells probably arose about _____ billion years ago.
A. 1.5
B. 2.5
C. 3.5
D. 4.5

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Precambrian Life
Topic: Precambrian Life

54. Which pairing of occurrence and date is correct?
A. Beginning of Cambrian — 600 million years ago
B. Origin of life — 3.8 billion years ago
C. Origin of eukaryotic cells — 1.5 billion years ago
D. All the choices are correct

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Bloom's Level: 1. Remember
Gradable: automatic
Section: Precambrian Life
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55. Our current understanding of the origin of eukaryotic organelles such as mitochondria is that they
A. were copies of a cell nucleus that failed to be separated by cytokinesis.
B. are prokaryotes that were taken into a cell and now live there symbiotically.
C. are variations of the plasma membrane.
D. are new forms of life that arose inside other cells.

Accessibility: Keyboard Navigation
Bloom's Level: 1. Remember
Gradable: automatic
Section: Precambrian Life
Topic: Precambrian Life

Fill in the Blank Questions

56. The term _____ refers broadly to compounds that contain carbon.
organic

Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

57. The most important of the energy-storing carbohydrate monomers is the molecule _____.
glucose

Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

58. The molecule _____ is an important form for storing sugar in animals and is found mainly in the liver and muscle cells of animals.
glycogen

Bloom's Level: 1. Remember
Gradable: automatic
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

59. A(n) _____ fatty acid has two or more carbon atoms joined by double bonds.
unsaturated

Bloom's Level: 1. Remember
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

60. Amino acids are linked together to form proteins by _____ bonds.
peptide

Bloom's Level: 1. Remember
Section: Organic Molecular Structure of Living Systems
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61. The alpha-helix is an example of the _____ structure of a protein.
secondary

Bloom's Level: 1. Remember
Section: Organic Molecular Structure of Living Systems
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62. When hemoglobin takes up or releases oxygen, it undergoes a change in its _____ structure.
quaternary

Bloom's Level: 1. Remember
Section: Organic Molecular Structure of Living Systems
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63. Submarine hot springs where seawater seeps through cracks in the bottom and comes close to the hot magma are called _____ _____.
hydrothermal vents

Bloom's Level: 1. Remember
Section: Chemical Evolution
Topic: Chemical Evolution

64. Most biological polymerizations are _____ dehydration reactions in which monomers are linked together by removal of water.
condensation

Bloom's Level: 1. Remember
Section: Chemical Evolution
Topic: Chemical Evolution

65. Sidney Fox studied the synthesis of polypeptides into polymers which in water formed small spherical bodies called _____ _____.
proteinoid microspheres

Bloom's Level: 1. Remember
Section: Chemical Evolution
Topic: Chemical Evolution

66. A critical answer to the chicken-or-the-egg problem formed by the nucleic-acid-or-enzyme-first dilemma is perhaps solved by the discovery of catalytic RNA called _____.
ribozymes

Bloom's Level: 1. Remember
Section: Origin of Living Systems
Topic: Origin of Living Systems

67. The earliest source of reduced compounds for oxidative metabolism was probably _____ _____.
hydrogen sulfide

Bloom's Level: 1. Remember
Section: Origin of Living Systems
Topic: Origin of Living Systems

68. Bacteria contain a single, large molecule of DNA in the _____ region.
nucleoid

Bloom's Level: 1. Remember
Section: Origin of Living Systems
Topic: Origin of Living Systems

69. The _____ theory proposes that pre-eukaryotes are the result of anaerobic bacteria ingesting aerobic bacteria and subsequently a symbiotic relationship was formed.
endosymbiotic

Bloom's Level: 1. Remember
Section: Precambrian Life
Topic: Precambrian Life

Essay Questions

70. Describe the first evidence for chemical evolution that came from Stanley Miller's experiment.

Answers will vary.

Bloom's Level: 2. Understand
Section: Chemical Evolution
Topic: Chemical Evolution

71. This chapter began with Pasteur disproving spontaneous generation, the theory that life could arise from non-living material. Then Miller and Urey test the Oparin-Haldane hypothesis and suggest that life once did arise from non-living chemicals. Are these experiments contradictory? Explain how the science community recognize both as valid.

Answers will vary.

Bloom's Level: 4. Analyze
Section: Chemical Evolution
Section: Spontaneous Generation of Life?
Topic: Chemical Evolution
Topic: Spontaneous Generation of Life?

72. The Miller-Urey experiments demonstrated the formation of larger molecules from simple molecules. Why is there still a need for concentration in order to make formation of a protocell more likely?

Answers will vary.

Bloom's Level: 2. Understand
Section: Chemical Evolution
Topic: Chemical Evolution

73. Assumptions that the earliest life forms had to make their own food have been replaced with the belief that the earliest microorganisms were definitely primary heterotrophs. How could these earliest cells have lived if they did not make their own food, and why do we feel certain that they were not photosynthetic?

Answers will vary.

Bloom's Level: 2. Understand
Section: Chemical Evolution
Topic: Chemical Evolution

74. What evidence do scientists have that the earth's primeval atmosphere was a reducing atmosphere?

Answers will vary.

Bloom's Level: 4. Analyze
Section: Chemical Evolution
Topic: Chemical Evolution

75. Why can't we set up an experiment that would again duplicate the conditions that were present at the early origin of protocells?

Answers will vary.

Bloom's Level: 4. Analyze
Section: Origin of Living Systems
Topic: Origin of Living Systems

76. Describe the chicken-or-the-egg dilemma with enzymes and hereditary molecules, and detail how the "RNA world" proposal offers a solution.

Answers will vary.

Bloom's Level: 4. Analyze
Section: Origin of Living Systems
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77. What are the essential properties of a "protocell"?

Answers will vary.

Bloom's Level: 2. Understand
Section: Origin of Living Systems
Topic: Origin of Living Systems

78. Describe the symbiotic theory of the origin of eukaryotes.

Answers will vary.

Bloom's Level: 2. Understand
Section: Precambrian Life
Topic: Precambrian Life

79. What may have been the "reason" for the "Cambrian explosion"?

Answers will vary.

Bloom's Level: 2. Understand
Section: Precambrian Life
Topic: Precambrian Life

80. What evidence leads researchers to believe that there was a diversity of animal life before the Cambrian if we cannot find extensive fossils of earlier animals?

Answers will vary.

Bloom's Level: 1. Remember
Section: Precambrian Life
Topic: Precambrian Life

81. Compare and contrast the prokaryotic and eukaryotic cellular structures.

Answers will vary.

Bloom's Level: 2. Understand
Section: Origin of Living Systems
Section: Precambrian Life
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Topic: Precambrian Life

82. If eukaryotes are more complex than prokaryotes, then why are there prokaryotes living today?

Answers will vary.

Bloom's Level: 3. Apply
Section: Origin of Living Systems
Topic: Origin of Living Systems

83. Does the recognition of prokaryotes as two major lineages, Archaebacteria and Eubacteria, result in any major changes to the internal taxonomic arrangement of the fungi, protozoan groups, plants and animals?

Answers will vary.

Bloom's Level: 4. Analyze
Section: Origin of Living Systems
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