Chapter 02 The Origin and Chemistry of Life

Student: _____

1. Spontaneous generation was first proposed as

A.
B.
C.
D.

2. Pasteur's work with spontaneous generation showed that

A.
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3. The hypothesis that simple chemicals may have naturally become complex macromolecules by natural physical forces was first proposed by

A.
B.
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D.

4. A solution that has a pH of 5 has

A.
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C.
D.
E.

5. A dissolved substance that has the ability to either remove or add H^+ and OH^- ions to resist pH changes is

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B.
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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.
B.
C.
D.
E.

7. Perhaps a better description of an organic compound is that an organic compound is any substance

A.
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C.
D.

8. Carbohydrates are categorized into

A.
B.
C.
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E.

9. Which of the following is a "structural" carbohydrate molecule?

A.
B.
C.
D.

10. Which of the carbohydrates given below is a major component of the cuticle of arthropods (e.g., insects, crayfish, etc.)?

A.
B.
C.
D.

11. Which of the following carbohydrates is used in animal muscle and liver cells for energy storage?

A.
B.
C.
D.

12. Which of the following is the most abundant carbohydrate in the world?

A.
B.
C.
D.

13. Polysaccharide are polymers made up of which kind of monomers?

A.
B.
C.
D.
E.

14. The three principal groups of lipids are neutral fats, phospholipids, and

A.
B.
C.
D.

15. Neutral fats are

A.
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C.
D.

16. Lipids are polymers made of which monomers?

A.
B.
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17. A dehydration synthesis reaction is also

A.
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18. Which of the lipid groups below is structurally unlike the others?

A.
B.
C.
D.

19. Which of the following lipids forms a bilayer between two fluid regions, such as in the plasma membrane of a cell?

A.
B.
C.
D.

20. Which of the following is NOT a steroid?

A.
B.
C.
D.
E.

21. Cholesterol belongs to which of the following groups?

A.
B.
C.
D.

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.
B.
C.
D.

23. A protein is a polymer made up of which kind of monomers?

A.
B.
C.
D.

24. A peptide bond is found in which type of biological molecule?

A.
B.
C.
D.

25. A chain consisting of a number of amino acids is a

A.
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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.
B.
C.
D.

27. The alpha helix is found at which level of protein organization?

A.
B.
C.
D.

28. The splitting of one compound into two by the addition of water is called

A.
B.
C.
D.

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.
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30. At the molecular level, a cell's ability to vary in its operational tolerance to temperature, etc., is most closely related to

A.
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C.
D.

31. DNA and RNA are polymers composed of repeated units called

A.
B.
C.
D.

32. A nucleic acid is a polymer made up of which kind of monomers?

A.
B.
C.
D.

33. Nucleic acids are important because they

A.
B.
C.
D.

34. Which of these statements is true about DNA?

A.
B.
C.
D.

35. Fish sperm is mostly made of male DNA. A chemical test would find high amounts of

A.
B.
C.
D.
E.

36. Prions are infectious

A.
B.
C.
D.

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.
B.
C.
D.

38. The term "reducing atmosphere" for the early earth means that the atmosphere

A.
B.
C.
D.

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.
B.
C.
D.

40. Which of the following is a correct statement about oxidation reduction reactions?

A.
B.
C.
D.

41. Which of the following kinds of molecules is thought to have been absent from the primitive reducing atmosphere?

A.
B.
C.
D.

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.
B.
C.
D.

43. Water has which of the following important characteristics that explain its key role in living systems?

A.
B.
C.
D.

44. A molecule of RNA that has enzymatic or catalytic properties is called a _____.

A.
B.
C.
D.

45. The fact that nucleic acids are very complicated molecules suggests that

A.
B.
C.
D.

46. The ancestral protocells

A.
B.
C.
D.
E.

47. Biological evolution differs from chemical evolution in that biological evolution would have been possible only after the development of

A.
B.
C.
D.

48. Heating dry mixtures of amino acids and then mixing them with water forms small

A.
B.
C.
D.

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.
B.
C.
D.
E.

50. Scientists once assumed that the earliest protocells would have been autotrophs. This concept appears to be

A.
B.
C.
D.

51. Prokaryotic cells are represented by fossils that are dated back as far as _____ billion years ago.

A.
B.
C.
D.

52. The Precambrian-Cambrian boundary is

A.
B.
C.
D.

53. The first eukaryotic cells probably arose about _____ billion years ago.

A.
B.
C.
D.

54. Which pairing of occurrence and date is correct?

A.
B.
C.
D.

55. Our current understanding of the origin of eukaryotic organelles such as mitochondria is that they

A.
B.
C.
D.

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

_____

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

_____

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

_____

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

_____

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

_____

61. The alpha-helix is an example of the _____ structure of a protein.

_____

62. When hemoglobin takes up or releases oxygen, it undergoes a change in its _____ structure.

_____

63. Submarine hot springs where seawater seeps through cracks in the bottom and comes close to the hot magma are called _____ _____.

_____

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

_____

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

_____

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 _____.

_____

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

_____

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

_____

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

_____

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

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.

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?

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?

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

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

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

77. What are the essential properties of a "protocell"?

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

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

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?

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

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

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?

Chapter 02 The Origin and Chemistry of Life Key

1. Spontaneous generation was first proposed as

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #1
Section: Spontaneous Generation of Life?
Topic: Spontaneous Generation of Life?

2. Pasteur's work with spontaneous generation showed that

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #2
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #3
Section: Spontaneous Generation of Life?
Topic: Spontaneous Generation of Life?

4. A solution that has a pH of 5 has

A.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 3. Apply
Gradable: automatic
Hickman - Chapter 02 #4
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #5
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.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 4. Analyze
Gradable: automatic
Hickman - Chapter 02 #6
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #7
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

8. Carbohydrates are categorized into

A.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #8
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #9
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #10
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #11
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #12
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.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #13
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #14
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

15. Neutral fats are

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #15
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

16. Lipids are polymers made of which monomers?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #16

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

17. A dehydration synthesis reaction is also

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #17
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 2. Understand
Gradable: automatic
Hickman - Chapter 02 #18
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #19
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

20. Which of the following is NOT a steroid?

A.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #20
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

21. Cholesterol belongs to which of the following groups?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #21
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #22
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #23
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #24
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #25
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.
B.
C.
D.

Accessibility: Keyboard Navigation

Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #26
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #27
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #28
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 3. Apply
Gradable: automatic
Hickman - Chapter 02 #29
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 2. Understand
Gradable: automatic
Hickman - Chapter 02 #30
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #31
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #32
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

33. Nucleic acids are important because they

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 2. Understand

Gradable: automatic
Hickman - Chapter 02 #33
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

34. Which of these statements is true about DNA?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #34
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.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #35
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

36. Prions are infectious

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #36
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 2. Understand
Gradable: automatic
Hickman - Chapter 02 #37
Section: Chemical Evolution
Topic: Chemical Evolution

38. The term "reducing atmosphere" for the early earth means that the atmosphere

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #38
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #39
Section: Chemical Evolution
Topic: Chemical Evolution

40. Which of the following is a correct statement about oxidation reduction reactions?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #40
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #41
Section: Chemical Evolution
Topic: Chemical Evolution

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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #42
Section: Chemical Evolution
Topic: Chemical Evolution

43. Water has which of the following important characteristics that explain its key role in living systems?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #43
Section: Water and Life
Topic: Water and Life

44. A molecule of RNA that has enzymatic or catalytic properties is called a _____.

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #44
Section: Origin of Living Systems
Topic: Origin of Living Systems

45. The fact that nucleic acids are very complicated molecules suggests that

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 3. Apply
Gradable: automatic
Hickman - Chapter 02 #45
Section: Origin of Living Systems
Topic: Origin of Living Systems

46. The ancestral protocells

A.
B.
C.
D.
E.

Accessibility: Keyboard Navigation

Blooms Level: 5. Evaluate
Gradable: automatic
Hickman - Chapter 02 #46
Section: Origin of Living Systems
Topic: Origin of Living Systems

47. Biological evolution differs from chemical evolution in that biological evolution would have been possible only after the development of

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #47
Section: Chemical Evolution
Section: Origin of Living Systems
Section: Precambrian Life
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #48
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.
B.
C.
D.
E.

Accessibility: Keyboard Navigation
Blooms Level: 4. Analyze
Gradable: automatic
Hickman - Chapter 02 #49

50. Scientists once assumed that the earliest protocells would have been autotrophs. This concept appears to be

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #50
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.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #51
Section: Origin of Living Systems
Topic: Origin of Living Systems

52. The Precambrian-Cambrian boundary is

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #52
Section: Precambrian Life
Topic: Precambrian Life

53. The first eukaryotic cells probably arose about _____ billion years ago.

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember

Gradable: automatic
Hickman - Chapter 02 #53
Section: Precambrian Life
Topic: Precambrian Life

54. Which pairing of occurrence and date is correct?

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #54
Section: Precambrian Life
Topic: Precambrian Life

55. Our current understanding of the origin of eukaryotic organelles such as mitochondria is that they

A.
B.
C.
D.

Accessibility: Keyboard Navigation
Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #55
Section: Precambrian Life
Topic: Precambrian Life

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

organic

Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #56
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

Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #57
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

Blooms Level: 1. Remember
Gradable: automatic
Hickman - Chapter 02 #58
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

Blooms Level: 1. Remember
Hickman - Chapter 02 #59
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

Blooms Level: 1. Remember
Hickman - Chapter 02 #60
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

61. The alpha-helix is an example of the _____ structure of a protein.

secondary

Blooms Level: 1. Remember
Hickman - Chapter 02 #61
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

62. When hemoglobin takes up or releases oxygen, it undergoes a change in its _____ structure.

quaternary

Blooms Level: 1. Remember
Hickman - Chapter 02 #62
Section: Organic Molecular Structure of Living Systems
Topic: Organic Molecular Structure of Living Systems

63. Submarine hot springs where seawater seeps through cracks in the bottom and comes close to the hot magma are called _____ _____.

hydrothermal vents

Blooms Level: 1. Remember
Hickman - Chapter 02 #63
Section: Chemical Evolution
Topic: Chemical Evolution

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

condensation

Blooms Level: 1. Remember
Hickman - Chapter 02 #64
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

Blooms Level: 1. Remember
Hickman - Chapter 02 #65
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

Blooms Level: 1. Remember
Hickman - Chapter 02 #66
Section: Origin of Living Systems
Topic: Origin of Living Systems

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

hydrogen sulfide

Blooms Level: 1. Remember
Hickman - Chapter 02 #67
Section: Origin of Living Systems
Topic: Origin of Living Systems

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

nucleoid

Blooms Level: 1. Remember
Hickman - Chapter 02 #68
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

Blooms Level: 1. Remember
Hickman - Chapter 02 #69
Section: Precambrian Life
Topic: Precambrian Life

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

Answers will vary.

Blooms Level: 2. Understand
Hickman - Chapter 02 #70
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.

Blooms Level: 4. Analyze
Hickman - Chapter 02 #71
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.

Blooms Level: 2. Understand
Hickman - Chapter 02 #72
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.

Blooms Level: 2. Understand
Hickman - Chapter 02 #73
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.

Blooms Level: 4. Analyze
Hickman - Chapter 02 #74
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.

Blooms Level: 4. Analyze
Hickman - Chapter 02 #75
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.

Blooms Level: 4. Analyze
Hickman - Chapter 02 #76
Section: Origin of Living Systems
Topic: Origin of Living Systems

77. What are the essential properties of a "protocell"?

Answers will vary.

Blooms Level: 2. Understand
Hickman - Chapter 02 #77
Section: Origin of Living Systems
Topic: Origin of Living Systems

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

Answers will vary.

Blooms Level: 2. Understand
Hickman - Chapter 02 #78
Section: Precambrian Life
Topic: Precambrian Life

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

Answers will vary.

Blooms Level: 2. Understand
Hickman - Chapter 02 #79
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.

Blooms Level: 1. Remember
Hickman - Chapter 02 #80
Section: Precambrian Life
Topic: Precambrian Life

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

Answers will vary.

Blooms Level: 2. Understand
Hickman - Chapter 02 #81
Section: Origin of Living Systems
Section: Precambrian Life
Topic: Origin of Living Systems
Topic: Precambrian Life

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

Answers will vary.

Blooms Level: 3. Apply
Hickman - Chapter 02 #82
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.

Blooms Level: 4. Analyze
Hickman - Chapter 02 #83
Section: Origin of Living Systems
Topic: Origin of Living Systems

Chapter 02 The Origin and Chemistry of Life Summary