Chapter 1

Chemistry in Our World

**Section 1.1**

Multiple Choice Questions

1. Chemistry is the study of \_\_\_\_\_.

a. mass

b. properties

c. energy

d. matter

e. None of the above.

Answer: d

Section 1.1

Difficulty Level: easy

2. A physical change is \_\_\_\_\_.

a. a transformation of matter that occurs without any change in chemical composition

b. a process that produces substances with new chemical compositions

c. sometimes a chemical change

d. rarely a chemical change

e. None of the above.

Answer: a

Section 1.1

Difficulty Level: easy

3. A chemical change is \_\_\_\_\_.

a. a transformation of matter that occurs without any change in chemical composition

b. a process that produces substances with new chemical compositions

c. a change from a solid melting to a liquid

d. a liquid evaporating into a gas

e. None of the above.

Answer: b

Section 1.1

Difficulty Level: easy

4. Which of the following is an example of a physical change?

a. Wood burning in a fireplace.

b. An egg cooking on the stove.

c. Ice melting into water.

d. A wound that heals.

e. All of the above.

Answer: c

Section 1.1

Difficulty Level: hard

5. Which of the following is an example of a chemical change?

a. Water freezing.

b. Water boiling.

c. Butter melting.

d. Metal that is rusting.

e. All of the above.

Answer: d

Section 1.1

Difficulty Level: hard

6. The active ingredients found in soap are \_\_\_\_\_\_.

a. polymers

b. surfactants

c. macronutrients

d. bleach

e. None of the above.

Answer: b

Section 1.1

Difficulty Level: medium

7. The compounds found much within our clothing are \_\_\_\_\_\_.

a. polymers

b. surfactants

c. macronutrients

d. cellulose

e. None of the above.

Answer: a

Section 1.1

Difficulty Level: medium

8. Vitamins are \_\_\_\_\_\_.

a. macronutrients

b. micronutrients

c. antipyretics

d. antibiotics

e. None of the above.

Answer: b

Section 1.1

Difficulty Level: medium

9. Minerals are \_\_\_\_\_\_.

a. macronutrients

b. micronutrients

c. antipyretics

d. antibiotics

e. None of the above.

Answer: b

Section 1.1

Difficulty Level: medium

10. Fats and oils are \_\_\_\_\_\_.

a. macronutrients

b. micronutrients

c. antipyretics

d. antibiotics

e. None of the above.

Answer: a

Section 1.1

Difficulty Level: medium

11. Proteins and carbohydrates are \_\_\_\_\_\_.

a. macronutrients

b. micronutrients

c. antipyretics

d. antibiotics

e. None of the above.

Answer: a

Section 1.1

Difficulty Level: medium

12. Fever reducers are \_\_\_\_\_\_.

a. macronutrients

b. micronutrients

c. antipyretics

d. antibiotics

e. None of the above.

Answer: c

Section 1.1

Difficulty Level: medium

13. Statins are a class of drugs that raise cholesterol.

A. True

B. False

Answer: b

Section 1.1

Difficulty Level: easy

14. Analgesics are drugs used to reduce pain.

A. True

B. False

Answer: a

Section 1.1

Difficulty Level: easy

15. Antibiotics are drugs used to reduce pain.

A. True

B. False

Answer: b

Section 1.1

Difficulty Level: easy

16. When a wound heals that is an example of a chemical change.

A. True

B. False

Answer: a

Section 1.1

Difficulty Level: hard

17. Burning excess calories while exercising is an example of a physical change.

A. True

B. False

Answer: b

Section 1.1

Difficulty Level: hard

18. Purifying a liquid by distillation is a physical change.

A. True

B. False

Answer: a

Section 1.1

Difficulty Level: hard

19. Food chemists primarily address nutrition but rarely do they address safety.

A. True

B. False

Answer: b

Section 1.1

Difficulty Level: hard

20. Which of the following involves chemistry?

a. Dry cleaning.

b. Agriculture.

c. Medicine.

d. Dyeing and printing

e. All of the above.

Answer: e

Section 1.1

Difficulty Level: medium

**Section 1.2**

21. Paracelsus claimed that it is the dosage that makes a substance a poison or a remedy.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: medium

22. There is no risk associated with the use of aspirin.

A. True

B. False

Answer: b

Section 1.2

Difficulty Level: medium

23. Drinking too much water, too intensely, over too short a time, can kill.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: medium

24. Aspirin is \_\_\_\_\_.

a. chemically known as acetylsalicylic acid

b. an analgesic

c. an antipyretic

d. All of the above.

e. None of the above.

Answer: d

Section 1.2

Difficulty Level: hard

25. BPA \_\_\_\_\_.

a. is an abbreviation for bisphenol-A

b. is added to plastics and resins to improve and strengthen their physical properties

c. presents a risk to fetuses and newborns

d. All of the above.

e. None of the above.

Answer: d

Section 1.2

Difficulty Level: hard

26. Caffeine is a \_\_\_\_\_.

a. natural chemical

b. synthetic chemical

c. polymer

d. pollutant

e. None of the above.

Answer: a

Section 1.2

Difficulty Level: hard

27. Aspirin is a \_\_\_\_\_.

a. natural chemical

b. synthetic chemical

c. polymer

d. pollutant

e. None of the above.

Answer: b

Section 1.2

Difficulty Level: hard

28. BPA is a \_\_\_\_\_.

a. natural chemical

b. synthetic chemical

c. polymer

d. pollutant

e. None of the above.

Answer: b

Section 1.2

Difficulty Level: hard

29. BPA is safe for the human body in any dosage.

A. True

B. False

Answer: b

Section 1.2

Difficulty Level: medium

30. By 2009, BPA was found in over 3 million tons of plastics and resins.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: medium

31. The word chemical is often associated negatively by the media.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: easy

32. Excess amounts of aspirin in too short a time can kill.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: easy

33. Aspirin is effective at \_\_\_\_\_.

a. inhibiting blood clotting

b. pain relief

c. reducing fevers

d. All of the above.

e. None of the above.

Answer: a

Section 1.2

Difficulty Level: medium

34. All natural chemicals are safe for the human body to ingest at any dosage.

A. True

B. False

Answer: b

Section 1.2

Difficulty Level: easy

35. Very small amounts of some substances taken into our bodies over long periods of time may pose risks.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: easy

36. Small daily doses of aspirin are often prescribed to help \_\_\_\_\_\_.

a. lower cholesterol

b. prevent heart attacks

c. raise cholesterol

d. kill infections

e. None of the above

Answer: b

Section 1.2

Difficulty Level: medium

37. The estimated worldwide production of acetylsalicylic acid is \_\_\_\_ tons.

a. 45

b. 4,500

c. 450

d. 45,000

e. None of the above

Answer: d

Section 1.2

Difficulty Level: medium

38. An antibiotic taken in too high a dose can be fatal.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: easy

39. There is a 50% chance of dying if a person drinks 70 cups of coffee in one sitting.

A. True

B. False

Answer: a

Section 1.2

Difficulty Level: easy

40. Mice studies have not shown caffeine to be lethal in large enough dosages.

A. True

B. False

Answer: b

Section 1.2

Difficulty Level: easy

**Section 1.3**

41. Trees are examples of renewable resources.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: easy

42. Water is an example of a renewable resource.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: easy

43. Fossil fuels are examples of renewable resources.

A. True

B. False

Answer: b

Section 1.3

Difficulty Level: easy

44. Food crops are examples of renewable resources.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: easy

45. Green chemistry is the general chemical practice that aims at depleting resources and increasing toxic waste.

A. True

B. False

Answer: b

Section 1.3

Difficulty Level: easy

46. Recycling is a part of the life-cycle assessment.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: medium

47. Improper manufacturing of a good could be damaging to the environment.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: medium

48. Disposing of used oil into a sinkhole is responsible life-cycle assessment.

A. True

B. False

Answer: b

Section 1.3

Difficulty Level: medium

49. Renewable resources, such as fresh water, are susceptible to abuse.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: medium

50. Bleaches that use oxygen in place of chlorine help avoid harmful environmental waste.

A. True

B. False

Answer: a

Section 1.3

Difficulty Level: medium

51. Consumers living in highly developed countries consume over \_\_\_\_ the planet’s energy.

a. 25%

b. 66%

c. 50%

d. 75%

e. None of the above.

Answer: c

Section 1.3

Difficulty Level: hard

52. Consumers living in highly developed countries generate approximately \_\_\_\_ the planet’s pollution and waste products.

a. 25%

b. 66%

c. 50%

d. 75%

e. None of the above.

Answer: d

Section 1.3

Difficulty Level: hard

53. Consumer spending in the United States represents over \_\_\_\_ of the nation’s economy.

a. 25%

b. 66%

c. 50%

d. 75%

e. None of the above.

Answer: b

Section 1.3

Difficulty Level: hard

54. Fossil fuels, such as coal and petroleum, will \_\_\_\_\_ in their overall total amounts over time with continued use.

a. decrease

b. increase

c. remain the same

d. All of the above.

e. None of the above.

Answer: a

Section 1.3

Difficulty Level: medium

55. Consuming resources faster than they can be replaced will lead to \_\_\_\_\_ of natural resources.

a. renewal

b. depletion

c. destruction

d. recycling

e. none of the above

Answer: b

Section 1.3

Difficulty Level: medium

56. Life-cycle assessments require the application of chemistry to the \_\_\_\_ of environmentally friendly consumer products.

a. design

b. production

c. use

d. disposal

e. All of the above

Answer: e

Section 1.3

Difficulty Level: hard

57. Which of the following is an example of green chemistry?

a. Using less harsh chemicals for cleaning.

b. Discarding old batteries into a landfill.

c. Discarding used oil into the backyard.

d. Throwing cell phone batteries into the trashcan.

e. None of the above.

Answer: a

Section 1.3

Difficulty Level: medium

58. To help us expand our use of solar energy, chemists are developing new materials used for \_\_\_\_\_\_.

a. trash disposal

b. medicines

c. manufacturing

d. solar panels

e. None of the above.

Answer: d

Section 1.3

Difficulty Level: easy

59. An increased use of nuclear energy should \_\_\_\_\_.

a. decrease the consumption of fossil fuels

b. increase the consumption of fossil fuels

c. have no affect on the consumption of fossil fuels

d. help preserve our renewable resources

e. None of the above.

Answer: a

Section 1.3

Difficulty Level: easy

60. Laundry wash that uses ingredients derived from \_\_\_\_\_\_ decreases suds and toxicity level.

a. animals

b. bone

c. plants

d. sunlight

e. None of the above.

Answer: c

Section 1.3

Difficulty Level: easy

**Section 1.4**

61. Science is from the Latin *scire*, meaning “to \_\_\_\_\_”.

a. think

b. act

c. be

d. know

e. observe

Answer: d

Section 1.4

Difficulty Level: medium

62. Which choice describes research and development?

a. A tentative explanation for a relatively small set of observations.

b. A generally accepted principle based on a large set of confirmed observations.

c. The process by which science operates, involving the development of explanations for observations of the universe.

d. Fundamental research that increases our understanding of the world.

e. Gathering knowledge with the goal of creating new products or improving existing ones.

Answer: e

Section 1.4

Difficulty Level: hard

63. Which choice describes basic research?

a. A tentative explanation for a relatively small set of observations.

b. A generally accepted principle based on a large set of confirmed observations.

c. The process by which science operates, involving the development of explanations for observations of the universe.

d. Fundamental research that increases our understanding of the world.

e. Gathering knowledge with the goal of creating new products or improving existing ones.

Answer: d

Section 1.4

Difficulty Level: hard

64. Which choice describes a theory?

a. A tentative explanation for a relatively small set of observations.

b. A generally accepted principle based on a large set of confirmed observations.

c. The process by which science operates, involving the development of explanations for observations of the universe.

d. Fundamental research that increases our understanding of the world.

e. Gathering knowledge with the goal of creating new products or improving existing ones.

Answer: b

Section 1.4

Difficulty Level: hard

65. Which choice describes a hypothesis?

a. A tentative explanation for a relatively small set of observations.

b. A generally accepted principle based on a large set of confirmed observations.

c. The process by which science operates, involving the development of explanations for observations of the universe.

d. Fundamental research that increases our understanding of the world.

e. Gathering knowledge with the goal of creating new products or improving existing ones.

Answer: a

Section 1.4

Difficulty Level: hard

66. Which choice describes the scientific method?

a. A tentative explanation for a relatively small set of observations.

b. A generally accepted principle based on a large set of confirmed observations.

c. The process by which science operates, involving the development of explanations for observations of the universe.

d. Fundamental research that increases our understanding of the world.

e. Gathering knowledge with the goal of creating new products or improving existing ones.

Answer: c

Section 1.4

Difficulty Level: hard

67. Chemists can \_\_\_\_\_.

a. analyze substances to determine their chemical compositions and properties

b. synthesize new compounds

c. understand and control chemical processes,

d. formulate many types of new products, including medicines, cosmetics, foods, cleaning products, agricultural chemicals, and paints.

e. All of the above.

Answer: e

Section 1.4

Difficulty Level: medium

68. The first step in the scientific method is to \_\_\_\_.

a. interpret findings

b. make a hypothesis

c. conduct experiments

d. observe and formulate a question

e. None of the above.

Answer: d

Section 1.4

Difficulty Level: medium

69. The second step in the scientific method is to \_\_\_\_.

a. interpret findings

b. make a hypothesis

c. conduct experiments

d. observe and formulate a question

e. None of the above.

Answer: b

Section 1.4

Difficulty Level: medium

70. The third step in the scientific method is to \_\_\_\_.

a. interpret findings

b. make a hypothesis

c. conduct experiments

d. observe and formulate a question

e. None of the above.

Answer: c

Section 1.4

Difficulty Level: medium

71. The fourth step in the scientific method is to \_\_\_\_.

a. interpret findings

b. make a hypothesis

c. conduct experiments

d. observe and formulate a question

e. None of the above.

Answer: a

Section 1.4

Difficulty Level: medium

72. If the results of an experiment do not support the hypothesis then nothing more is required of the scientist.

a. True

b. False

Answer: b

Section 1.4

Difficulty Level: easy

73. Performing experiments comes after making a hypothesis.

a. True

b. False

Answer: a

Section 1.4

Difficulty Level: easy

74. There is no difference between a theory and a hypothesis.

a. True

b. False

Answer: b

Section 1.4

Difficulty Level: easy

75. A hypothesis is formulated after observation.

a. True

b. False

Answer: a

Section 1.4

Difficulty Level: easy

76. A scientist formulates a hypothesis that is not supported by his/her experimental results. The scientist must then revise his/her hypothesis.

a. True

b. False

Answer: a

Section 1.4

Difficulty Level: easy

77. A scientist formulates a hypothesis that is supported by his/her experimental results. The scientist must then revise his/her hypothesis.

a. True

b. False

Answer: b

Section 1.4

Difficulty Level: easy

78. A theory is supported by a small set of confirmed observations.

a. True

b. False

Answer: b

Section 1.4

Difficulty Level: easy

79. A hypothesis is supported by a small set of confirmed observations.

a. True

b. False

Answer: a

Section 1.4

Difficulty Level: easy

80. A scientist formulates a hypothesis that is supported by his/her experimental results. The scientist must then perform additional experiments that further support his/her hypothesis.

a. True

b. False

Answer: a

Section 1.4

Difficulty Level: hard

**Section 1.5**

81. The SI unit for mass is the \_\_\_\_.

a. gram

b. meter

c. kilometer

d. kilogram

e. milligram

Answer: d

Section 1.5

Difficulty Level: easy

82. The SI unit for length is the \_\_\_\_.

a. gram

b. meter

c. kilometer

d. kilogram

e. milligram

Answer: b

Section 1.5

Difficulty Level: easy

83. The SI unit for time is the \_\_\_\_.

a. hour

b. minute

c. day

d. second

e. None of the above.

Answer: d

Section 1.5

Difficulty Level: easy

84. There are \_\_\_\_\_meters in one kilometer.

a. 1

b. 10

c. 100

d. 1,000

e. 1,000,000

Answer: d

Section 1.5

Difficulty Level: medium

85. There are \_\_\_\_\_meters in one decameter.

a. 1

b. 10

c. 100

d. 1,000

e. 1,000,000

Answer: b

Section 1.5

Difficulty Level: medium

86. There are \_\_\_\_\_grams in one centigram.

a. 0.1

b. 0.01

c. 0.001

d. 0.0001

e. None of the above.

Answer: b

Section 1.5

Difficulty Level: medium

87. There are \_\_\_\_\_grams in one decigram.

a. 0.1

b. 0.01

c. 0.001

d. 0.0001

e. None of the above.

Answer: a

Section 1.5

Difficulty Level: medium

88. There are \_\_\_\_\_grams in one milligram.

a. 0.1

b. 0.01

c. 0.001

d. 0.0001

e. None of the above.

Answer: c

Section 1.5

Difficulty Level: medium

89. There are \_\_\_\_\_grams in one microgram.

a. 0.1

b. 0.01

c. 0.0001

d. 0.000001

e. None of the above.

Answer: d

Section 1.5

Difficulty Level: medium

90. There are 2.54 cm in one inch. Given this information, \_\_\_\_ cm are in 15 inches.

a. 38.1

b. 86.4

c. 448

d. 76.2

e. 91.4

Answer: a

Section 1.5

Difficulty Level: medium

91. There are 2.54 cm in one inch. Given this information, \_\_\_\_ cm are in 4.9 yards.

a. 38.1

b. 86.4

c. 448

d. 76.2

e. 91.4

Answer: c

Section 1.5

Difficulty Level: medium

92. There are 2.54 cm in one inch. Given this information, \_\_\_\_ cm are in 1 yard.

a. 38.1

b. 86.4

c. 448

d. 76.2

e. 91.4

Answer: e

Section 1.5

Difficulty Level: medium

93. There are 2.54 cm in one inch. Given this information, \_\_\_\_ cm are in 34 inches.

a. 38.1

b. 86.4

c. 448

d. 76.2

e. 91.4

Answer: b

Section 1.5

Difficulty Level: medium

94. There are 0.0025 cm in 250 nanometers.

a. True

b. False

Answer: b

Section 1.5

Difficulty Level: hard

95. 1.55 kilograms is equal to 1,500 grams.

a. True

b. False

Answer: a

Section 1.5

Difficulty Level: easy

96. There are 2.2 pounds in one kilogram. A 175 pound man weighs 79.3 kilograms.

a. True

b. False

Answer: a

Section 1.5

Difficulty Level: hard

97. There are 2.2 pounds in one kilogram. A 110 pound person weighs 50,000 grams.

a. True

b. False

Answer: a

Section 1.5

Difficulty Level: hard

98. One kilogram weighs more than one pound.

a. True

b. False

Answer: a

Section 1.5

Difficulty Level: easy

99. 5 pounds weighs more than 2.0 kilograms.

a. True

b. False

Answer: a

Section 1.5

Difficulty Level: easy

100. 55 pounds weighs more than 25 kilograms

a. True

b. False

Answer: b

Section 1.5

Difficulty Level: easy