General, Organic, and Biochemistry, 10e **(Denniston)**
Chapter 1   Chemistry - Methods and Measurement

1) Which is the summary of a large amount of scientific information?
A) hypothesis
B) theory
C) scientific law
D) technology
E) scientific method

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

2) What method used by scientists is the systematic approach to the discovery of new information?
A) analytical method
B) hypothetical method
C) chemical method
D) technological method
E) scientific method

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

3) What is a hypothesis?
A) a fact that results from extensive experimentation and testing
B) the summary of a large quantity of information
C) the result of a single measurement or observation
D) an attempt to explain an observation, or a series of observations
E) an observation of a chemical reaction

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

4) Which statement concerning the scientific method is FALSE?
A) The scientific method is an organized approach to solving scientific problems.
B) The process of explaining observed behavior begins with a hypothesis.
C) Experimentation is conducted to either support or disprove a hypothesis.
D) A hypothesis becomes a theory when a single experiment supports it.
E) A theory explains scientific observations and data and can help predict new observations and data.

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

5) What type of change alters the appearance, but not the composition or identity of the substance undergoing the change?
A) theoretical
B) physical
C) analytical
D) chemical
E) nuclear

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

6) Which statement concerning changes in matter is FALSE?
A) A physical change alters the appearance of a substance, but not its identity.
B) A chemical change alters the identity of a substance.
C) A chemical change always results in the production of a new substance.
D) A chemical change is also called a chemical reaction.
E) Melting and freezing are chemical changes that change both the appearance of the substance as well as the identity of the substance.

Answer: E
Difficulty: 1 Easy
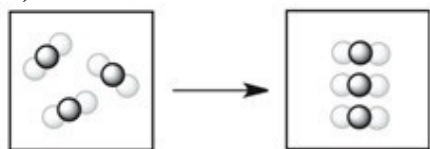Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
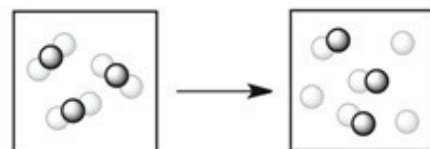Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

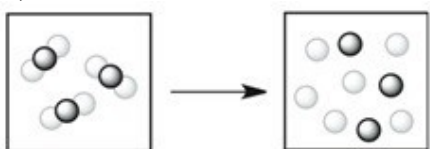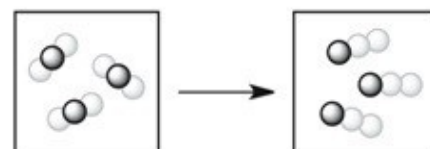7) Which process depicts a physical change?

A)

B)

C)

D)

E) None of the processes above depicts a physical change.

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Subtopic: Changes in Matter; Classification and States of Matter

8) What statement *best* describes an intensive property?
A) A property of a substance that does not depend on the quantity of the substance present.
B) A property of a substance that depends on the quantity of the substance present.
C) A property of a substance that depends on the mass of the substance, but not the volume of the substance.
D) A property of a substance that depends on the physical state (solid, liquid, or gas) of the substance.
E) A property of a substance that changes based on the mass of the material that is present.

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

9) Which statement concerning the classification of matter is FALSE?
A) All matter is either pure substance or a compound.
B) An element is a pure substance that generally cannot be changed into a simpler form of matter.
C) A compound is a pure substance made up of two or more different elements combined in a definite, reproducible way.
D) A pure substance is composed of only one type of component.
E) A mixture is the physical combination of two or more pure substances in which each substance retains its own identity.

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

10) When hydrogen (H_2) and chlorine (Cl_2) gases are mixed, hydrogen chloride (HCl) is produced. Hydrogen chloride is classified as what type of matter?
A) an element
B) a compound
C) a homogeneous mixture
D) a heterogeneous mixture
E) a solution

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter; Classification and States of Matter

11) Which of the following is NOT a type of mixture?
A) homogeneous
B) heterogeneous
C) solution
D) compound
E) All of the choices are correct.

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

12) Which of the following terms *best* describes the sample of matter in the diagram? Note: different colored circles represent atoms of different elements.

A) homogeneous mixture
B) pure substance
C) heterogeneous mixture
D) solution
E) None of the choices are correct.

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
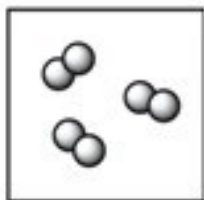Bloom's: Understand
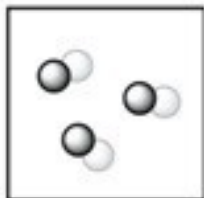Section number: 01.03
Subtopic: Classification and States of Matter

13) Which diagram represents a mixture? Note: different colored circles represent atoms of different elements.
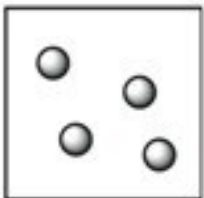
A)

B)

C)

D)

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Subtopic: Classification and States of Matter

14) Which of the following terms is most appropriate when classifying an apple?
A) pure substance
B) compound
C) heterogeneous mixture
D) homogeneous mixture
E) solution

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

15) 1 milligram is equivalent to how many grams?
A) 1000
B) 100
C) 0.1
D) 0.01
E) 0.001

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI)

16) A typical aspirin tablet contains 5.00 grains of pure aspirin analgesic compound. The rest of the tablet is starch. How many aspirin tablets can be made from 50.0 g of pure aspirin? [Use: 1.00 g = 15.4 grains]
A) 17 tablets
B) 154 tablets
C) 250 tablets
D) 649 tablets
E) 770 tablets

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

17) A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. What mass of the drug should the patient receive? [1 pound = 454 g]
A) 1.47 g
B) 2.98 g
C) 3.24 mg
D) 1470 mg
E) 6570 mg

Answer: B
Difficulty: 3 Hard
Topic: Study of Chemistry
Bloom's: Analyze
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

18) A patient weighs 146 pounds and is to receive a drug at a dosage of 45.0 mg per kg of body weight. The drug is supplied as a solution that contains 25.0 mg of drug per mL of solution. What volume of the drug should the patient receive? [1 pound = 454 g]
A) 0.579 mL
B) 119 mL
C) 362 mL
D) 579 mL
E) 119 L

Answer: B
Difficulty: 3 Hard
Topic: Study of Chemistry
Bloom's: Analyze
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

19) If one atom of carbon-14 weighs 14.0 atomic mass units and one atomic mass unit is equal to 1.66×10^{-24} grams, what is the mass of 25 atoms of carbon-14 in grams?
A) 5.81×10^{-22}
B) 5.81×10^{-21}
C) 581
D) 2.11×10^{26}
E) 2.11×10^{-21}

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

20) A student records the measurement 4.8 m. What type of measurement was made?
A) mass
B) volume
C) length
D) concentration
E) time

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

21) A patient needs 0.300 g of a solid drug preparation per day. How many 10.0 mg tablets must be given to the patient per day?
A) 3.00 tablets
B) 30.0 tablets
C) 33.0 tablets
D) 300. tablets
E) 330. tablets

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

22) What is the number 0.0062985632 written in scientific notation to three significant figures?
A) 0.006
B) 6.00×10^{-3}
C) 6.29×10^{-3}
D) 6.299×10^{-3}
E) 6.30×10^{-3}

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

23) What is the number 3,000 written in scientific notation using the proper number of significant figures?
A) 0.003×10^{-3}

B) 0.3×10^{4}

C) 3×10^{3}

D) 3×10^{-3}

E) 3.000×10^{3}

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

24) What is the number 0.9050 written in scientific notation using the proper number of significant figures?
A) 0.9×10^{4}

B) 9×10^{-1}

C) 9.05×10^{-1}

D) 9.050×10^{4}

E) 9.050×10^{-1}

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

25) How should the result of the calculation below be reported using scientific notation and the proper number of significant figures? $(4.3169 \times 10^4) \div (2.02 \times 10^3) = ?$
A) 2.14×101
B) 2.1371×101
C) 2.14×102
D) 2.14×107
E) 2.1371×109

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

26) Which of the following measured volumes has the most uncertainty?
A) 10 mL
B) 10.0 mL
C) 10.00 mL
D) 10.000 mL
E) All values have the same degree of uncertainty.

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

27) Where is the uncertainty in the number 101.2°C?
A) in the ones place
B) in the tens place
C) in the tenths place
D) in the hundredths place
E) There is no uncertainty in this number.

Answer: C
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

28) A flask contains 145.675 mL of a saline solution. If 24.2 mL of the saline solution are withdrawn from the flask, how should the volume of the saline solution that remains in the flask be reported?
A) 121.475 mL
B) 121.4 mL
C) 121.5 mL
D) 122 mL
E) 121 mL

Answer: C
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

29) Which physical property of an astronaut will change depending on whether he or she is on Earth or in orbit?
A) mass
B) weight
C) volume
D) all would change
E) none would change

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

30) What is the basic unit of volume in the metric system?
A) milliliter
B) cubic centimeter
C) liter
D) gram
E) millimeter

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

31) Which statement concerning energy is FALSE?
A) Energy is the amount of heat content in an object.
B) Potential energy is stored energy due to composition or position.
C) Kinetic energy is the energy associated with movement.
D) Heat, light, and electricity are different forms of energy.
E) Conversion of energy from one form to another is possible.

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

32) Which temperature would feel the hottest?
A) 100°C
B) 100°F
C) 100 K
D) All temperatures would feel equally hot.

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Analyze
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units); Temperature

33) A chemical reaction releases 44.3 kJ of heat. What is the equivalent amount of heat expressed in calories? [1 cal = 4.18 J]
A) 10.6 cal
B) 106 cal
C) 185 cal
D) 10,600 cal
E) 18,500 cal

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Measurements (Metric and SI Units)

34) A bolder at the top of a hill breaks free and rolls down the hill. Which statement *best* represents the change in energy that occurs in this process?
A) The potential energy of the bolder increases.
B) The potential energy of the bolder is converted to kinetic energy.
C) The kinetic energy of the bolder is converted to potential energy.
D) The chemical energy of the bolder is converted to kinetic energy.
E) No change in energy occurs; energy cannot be converted from one form to another.

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

35) What kind of energy is stored as the result of position or composition?
A) kinetic energy
B) activation energy
C) potential energy
D) theoretical energy
E) static energy

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

36) The concentration of a patient's blood sugar was determined to be 4850 micrograms per milliliter. Which correctly represents this measurement?
A) 4850 µg /ML
B) 4850 mg/mL
C) 4850 Mg/mL
D) 4850 µg/mL
E) 4850 mg/ML

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

37) What is density?
A) the ratio of the number of particles of a substance to the volume of the solution in which it is dissolved
B) the ratio of the mass of a substance to the volume of the substance
C) the ratio of the volume of a substance to the mass of the substance
D) the ratio of the moles of a substance to the volume of the solution in which it is dissolved
E) the measure of the amount of heat an object contains

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Density and Specific Gravity

38) If the density of blood is 1.060 g/mL, what is the mass of 6.56 pints of blood? [1 L = 2.113 pints]
A) 3.29 kg
B) 329 g
C) 2.93 g
D) 2930 g
E) 2.93 kg

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Density and Specific Gravity

39) What is the density of a solid object that has the following measurements?

mass = 189.6 g,   length = 9.80 cm,   width = 46.6 mm,   height = 0.111 m.
A) 0.267 g/mL
B) 0.374 g/mL
C) 2.67 g/mL
D) 3.74 g/mL
E) 50.7 g/mL

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units); Density and Specific Gravity

40) Air has an average density of 0.001226 g/mL. What volume of air would have a mass of 1.0 lb? [454 g = 1 pound]
A) 37 mL
B) 370 mL
C) 557 mL
D) 2.7×10^{-6} mL
E) 3.7×10^{2} L

Answer: E
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Density and Specific Gravity

41) Which branch of science primarily involves the study of matter and the changes it undergoes?
A) biology
B) technology
C) physics
D) chemistry
E) All of the choices are correct.

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

42) Which of the following terms is defined as anything that has mass and occupies space?
A) chemistry
B) element
C) matter
D) compound
E) volume

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

43) In which state does matter have an indefinite shape and definite volume?
A) solid
B) liquid
C) gas
D) All of the choices are correct.
E) None of the choices are correct.

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

44) In which state of matter are forces between particles least dominant?
A) solid
B) liquid
C) gas
D) All of the choices are correct.
E) None of the choices are correct.

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

45) Conversion of ice to liquid water or liquid water to steam is an example of what kind of change?
A) physical
B) chemical
C) molecular
D) analytical
E) Both physical and chemical are correct.

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

46) What type of change is represented by the decay of a fallen tree?
A) physical
B) chemical
C) molecular
D) analytical
E) All of the choices are correct.

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

47) The green color of the Statue of Liberty is due to a(an) _____ change to the copper metal.
A) elemental
B) physical
C) state
D) chemical
E) None of the choices are correct.

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

48) What type of property of matter is independent of the quantity of the substance?
A) chemical
B) physical
C) extensive
D) intensive
E) nuclear

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

49) What are the two classes of pure substances?
A) elements and atoms
B) compounds and molecules
C) elements and compounds
D) chemical and physical
E) homogeneous and heterogeneous

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

50) What does the prefix "centi-" mean?
A) 10-1
B) 10-2
C) 10-3
D) 102
E) 103

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

51) How many centimeters correspond to 15.68 kilometers?
A) 1.568×10^6 cm
B) 1.568×10^5 cm
C) 1.568×10^{-4} cm
D) 1568 cm
E) 1.569 cm

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Measurements (Metric and SI Units)

52) How many pounds are represented by 764.6 mg? [1 pound = 454 g]
A) 347.1 lb
B) 3.471×10^8 lb
C) 1.684×10^{-3} lb
D) 1.684 lb
E) 0.7646 lb

Answer: C
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

53) If a person smokes 10.0 packs of cigarettes a week and each cigarette contains 5.00 mg of tar, how many years will she have to smoke to inhale 0.250 pounds of tar? [20 cigarettes = 1 pack, 1 pound = 454 g and 1 year = 52 weeks]
A) 2.18 y
B) 2.18×10^{-2} y
C) 1.06 y
D) 28.6 y
E) 0.556 y

Answer: A
Difficulty: 3 Hard
Topic: Study of Chemistry
Bloom's: Analyze
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

54) The cost of a drug is 125 francs per gram. What is the cost in dollars per ounce? [$1 = 6.25 francs and 1 ounce = 28.4 g]
A) $0.70/oz
B) $568/oz
C) $27.5/oz
D) 2.22×10^{4}/oz
E) $4.65/oz

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

55) How many significant figures does the number 5.06305×10^4 contain?
A) 4
B) 5
C) 6
D) 7
E) 9

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

56) Provide the answer to the following problem using scientific notation and the proper number of significant digits: $(6.00 \times 10^{-2})(3.00 \times 10^{-4}) = ?$
A) 1.8×10-5
B) 1.80×10-5
C) 1.80×10-4
D) 18.00×10-4
E) 2×10-5

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

57) A student measures the mass of three separate samples of a solid: 104.45 g, 0.838 g, and 46 g. If the student mixes all three samples together, how should the total mass be properly reported?
A) 151.288
B) 151.28
C) 151.29
D) 151
E) 1.5×102

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

58) Which measurement represents the largest volume?
A) 4.6 L
B) 4.6×10^{-3} L
C) 46 cL
D) 460 mL
E) All represent the same volume.

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Analyze
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Measurements (Metric and SI Units)

59) What term is used to describe the summary of a large quantity of information?
A) hypothesis
B) theory
C) law
D) model
E) result

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

60) Which state of matter has neither a definite shape nor a definite volume?
A) liquid
B) solid
C) gas
D) vapor
E) Both gas and vapor are correct.

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

61) Which of the following is NOT a physical property of matter?
A) odor
B) compressibility
C) flash point
D) melting point
E) color

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

62) The distance between two hydrogen atoms in a hydrogen molecule (H2) is 7.461×10^{-11}m. What is the equivalent distance expressed in inches? [2.54 cm = 1 in]

A) 2×10^{-9} in

B) 1.895×10^{-12} in

C) 294×10^{-11} in

D) 2.937×10^{-9} in

E) 2.94×10^{-8} in

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

63) What kind of change always results in the formation of new materials?
A) molecular
B) exothermic
C) endothermic
D) physical
E) chemical

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

64) Which of the following is a chemical property?
A) flammability
B) color
C) hardness
D) temperature
E) melting point

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

65) Which one of the following is an example of an extensive property?
A) density
B) specific gravity
C) mass
D) hardness
E) boiling temperature

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

66) Which one of the following is an example of a pure substance?
A) ethanol
B) sugar water
C) salt and pepper
D) milk
E) sand

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

67) Air is a/an
A) element.
B) compound.
C) mixture.
D) molecule.
E) pure substance.

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

68) The speed of light is 186,000 miles per second. What is its speed in centimeters per second? [5280 feet = 1 mile; 12 inches = 1 foot; 2.54 cm = 1 inch]
A) 3.01×10^{11} cm/s
B) 3.15×10^{10} cm/s
C) 6.06×10^{12} cm/s
D) 3×10^{11} cm/s
E) 2.99×10^{10} cm/s

Answer: E
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

69) 1 centimeter equals how many millimeters?
A) 10-6
B) 10-3
C) 10
D) 104
E) 106

Answer: C
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Measurements (Metric and SI Units)

70) Round 0.052018 to three significant figures.
A) 0.05
B) 0.052
C) 0.0520
D) 0.05201
E) 0.05202

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

71) Select the answer that *best* expresses the result of the following calculation: 1.86 + 246.4 - 79.9208 = ?
A) 168
B) 168.3
C) 168.34
D) 168.339
E) 168.3392

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

72) What is the appropriate number of significant figures necessary to express the result of the calculation below? $(51.6) \times (3.1416)$
A) 1
B) 2
C) 3
D) 4
E) 5

Answer: C
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

73) What Celsius temperature corresponds to -4.6°F?
A) -20°C
B) -20.3°C
C) -23.0°C
D) -10.9°C
E) -68.4°C

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

74) What Fahrenheit temperature corresponds to -40.0°C?
A) -8°F
B) 16.8°F
C) -36.9°F
D) -40.0°F
E) -1.94°F

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

75) What Kelvin temperature corresponds to 98.6°F?
A) 310 K
B) 310.2 K
C) 31.00 K
D) 132.0 K
E) 199 K

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

76) Which temperature scale does not use a degree sign?
A) Celsius
B) Kelvin
C) Centigrade
D) Fahrenheit
E) Absolute zero

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

77) If the density of carbon tetrachloride is 1.59 g/mL, what is the volume in L, of 4.21 kg of carbon tetrachloride?
A) 0.149 L
B) 0.378 L
C) 2.65 L
D) 6.69 L
E) 6690 L

Answer: C
Difficulty: 3 Hard
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Density and Specific Gravity

78) What is the specific gravity of an object that weighs 13.35 g and has a volume of 25.00 mL? The density of water under the same conditions is 0.980 g/mL.
A) 1.335
B) 0.545 g/mL
C) 0.534 g/mL
D) 0.545
E) 0.980

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Density and Specific Gravity

79) Which of the following is FALSE concerning the gas state?
A) Gases have no definite shape.
B) Gases have no definite volume.
C) Particles are far apart from each other.
D) Particles are usually in a regular or organized pattern.
E) When gas molecules collide, they do not lose energy.

Answer: D
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

80) Which of the following is an example of physical change?
A) boiling water
B) burning paper
C) a metal losing electrons to become a cation
D) cooking eggs
E) lighting a match

Answer: A
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Changes in Matter

81) Which statement is FALSE?
A) Mass is an example of an extensive property.
B) Volume is an example of an extensive property.
C) Temperature is an example of an intensive property.
D) An intensive property is one that does not depend upon the amount of the substance.
E) An extensive property is synonymous with a physical property.

Answer: E
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Properties of Matter

82) NaCl is *best* classified as a/an
A) pure substance.
B) element.
C) compound.
D) homogeneous mixture.
E) Both pure substance and compound are correct.

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.03
Accessibility: Keyboard Navigation
Subtopic: Classification and States of Matter

83) Which of the following numbers has only one significant figure?
A) 3.0×10^1
B) 0.003
C) 3.00
D) 30.0
E) All of the choices are correct.

Answer: B
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

84) Give the answer to the following calculation to the correct number of significant figures. $(5.0 \times 10^{-4}) - (6 \times 10^{-5}) = ?$
A) 4.4×10^{-4}
B) 4.4×10^{-5}
C) 4×10^{-4}
D) 4×10^{-5}
E) 4.40×10^{-4}

Answer: A
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

85) The area of a rectangle is determined by the formula: area = length × width. If a rectangle has a length of 32.6 cm and a width of 72.6 cm, what is the area of the rectangle to the correct number of significant figures?

A) 2,400 cm2

B) 2,370 cm2

C) 2,367 cm2

D) 2,366.8 cm2

E) 2,366.76 cm2

Answer: B
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

86) Consider the following set of numbers. If the true value is 12.6 cm^2, which of the following *best* describes the set of numbers?

12.6 cm2, 12.5 cm^2, 12.6 cm^2
A) accurate but not precise
B) not accurate but precise
C) accurate and precise
D) neither accurate nor precise
E) More information is needed to determine if the measurements are accurate.

Answer: C
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

87) How many cm are in 3.5×10^{-2} km?

A) 3.5×10^{-1} cm

B) 3.5×10^{-7} cm

C) 3.5×10^{2} cm

D) 3.5×10^{5} cm

E) 3.5×10^{3} cm

Answer: E
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis; Measurements (Metric and SI Units)

88) Tire pressure in the U.S. is measured in lb/in^2. Convert 25 lb/in^2 to g/cm^2. 454 g = 1 lb, 2.54 cm = 1 in

A) 0.39 g/cm2

B) 1.8×103 g/cm^2

C) 4.7×103 g/cm^2

D) 3.0×104 g/cm^2

E) 2.4×102 g/cm^2

Answer: B
Difficulty: 3 Hard
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.06
Accessibility: Keyboard Navigation
Subtopic: Dimensional Analysis

89) What volume, in milliliters, will 2.00 g of air occupy if the density is 1.29 g/L?

A) 2.72×10^3 mL
B) 2.20 mL
C) 1.43 mL
D) 1.55×10^3 mL
E) 4.59×10^2 mL

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Apply
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Density and Specific Gravity

90) Concentration is a measure of the number or mass of particles of a substance that are contained in a specified volume.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

91) Hypotheses are not acceptable in the scientific method.

Answer: FALSE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

92) In the scientific method, a law carries more weight than a hypothesis.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

93) Each piece of data is the individual result of a single measurement.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.02
Accessibility: Keyboard Navigation
Subtopic: Scientific Method

94) The presence of some error is a natural consequence of any measurement.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

95) The number 0.0680 has 3 significant figures.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.05
Accessibility: Keyboard Navigation
Subtopic: Scientific Notation and Significant Figures

96) The terms mass and weight are identical.

Answer: FALSE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

97) Mass is the force resulting from the pull of gravity upon an object.

Answer: FALSE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.04
Accessibility: Keyboard Navigation
Subtopic: Measurements (Metric and SI Units)

98) Equal masses of glass and steel at the same temperature will have different heat energies.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

99) Energy may be defined as the heat content of an object.

Answer: FALSE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

100) One calorie is the amount of energy needed to raise the temperature of one gram of water one degree Celsius.

Answer: TRUE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Temperature

101) Density and specific gravity can be expressed in the same units.

Answer: FALSE
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Understand
Section number: 01.07
Accessibility: Keyboard Navigation
Subtopic: Density and Specific Gravity

102) What are the five phases of the Study Cycle?
A) study, flash cards, concept maps, class notes, solve problems
B) big ideas, flash cards, repetition, participation, assess
C) attend, review, study, repetition, assess
D) preview, attend, study, repetition, identify big ideas
E) preview, attend, review, study, assess

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.01
Accessibility: Keyboard Navigation
Subtopic: Learning Chemistry

103) According to the Study Cycle, what is the recommended study session frequency?
A) 1 long, intense session per week
B) 1-2 long, intense session per day
C) 3-5 short, intense sessions per week
D) 3-5 short, intense sessions per day
E) None of these choices are correct.

Answer: D
Difficulty: 2 Medium
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.01
Accessibility: Keyboard Navigation
Subtopic: Learning Chemistry

104) According to the Study Cycle, what is the recommended study session format?
A) Establish goal in first 1 min, study with focus for 10-20 min, take a 5-10 min break, and then review another 5 min.
B) Study with focus for 30-50 min, take a 10-20 min break, and then review another 10-20 min.
C) Study with focus for 50 min, take a 50 min break, and then review another 10-20 min.
D) Study with focus for 30-50 min, take a 10-20 min break, and then review another 30-50 min.
E) Establish goal in first 2-5 min, study with focus for 30-50 min, take a 5-10 min break, and then review another 5 min.

Answer: E
Difficulty: 1 Easy
Topic: Study of Chemistry
Bloom's: Remember
Section number: 01.01
Accessibility: Keyboard Navigation
Subtopic: Learning Chemistry