Chapter 1 Test Bank
Keys to Studying Chemistry: Definitions, Units, and Problem Solving

1. Which one of the following is a “substance” in the sense of the word as used in your textbook?
A. air
B. tap water
C. sea water
D. water
E. toothpaste

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

2. Select the best statement.
A. Physical changes may be reversed by changing the temperature.
B. Physical changes alter the composition of the substances involved.
C. Physical properties are not valid characteristics for identifying a substance.
D. Physical properties are mostly extensive in nature.
E. Physical changes are usually accompanied by chemical changes.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

3. Select the best statement.
A. Chemical changes provide the only valid basis for identification of a substance.
B. Chemical changes are easily reversed by altering the temperature of the system.
C. Chemical changes always produce substances different from the starting materials.
D. Chemical changes are associated primarily with extensive properties.
E. Chemical changes are accompanied by changes in the total mass of the substances involved.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

4. Which of the following is a chemical change?
A. boiling of water
B. melting wax
C. broiling a steak on a grill
D. condensing water vapor into rainfall
E. carving a piece of wood

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

5. Water vapor is less dense than ice because
A. molecules in the gas phase are in constant motion.
B. molecules in the gas phase have more potential energy than in solids.
C. molecules in the gas phase have more kinetic energy than in solids.
D. gaseous molecules have less mass.
E. molecules in the gas phase have more space between them than in solids.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand

Difficulty: Medium
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

6. During the swing of a frictionless pendulum, what energy form(s) remain constant?
A. kinetic energy only
B. potential energy only
C. both kinetic energy and potential energy
D. kinetic plus potential energy
E. None of these choices are correct.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Hard
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

7. The most significant contribution to modern science made by alchemists was
A. their fundamental work in the transmutation of the elements.
B. their widespread acceptance of observation and experimentation.
C. their systematic method of naming substances.
D. their understanding of the nature of chemical reactions.
E. their discovery of phlogiston.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

8. Select the best statement about chemistry before 1800.
A. Alchemy focused on objective experimentation rather than mystical explanations of processes.
B. The phlogiston theory laid a valuable theoretical basis for modern chemistry.
C. Lavoisier's quantitative work on the role of oxygen in combustion was the beginning of modern chemistry.
D. The interpretation of data by alchemists was not biased by their overall view of life.
E. Alchemists failed because they did not develop any practical chemical methods.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

9. Which of the following activities is not a part of good science?
A. proposing a theory
B. developing a hypothesis
C. making quantitative observations
D. designing experiments
E. indulging in speculation

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

10. A scientist made careful measurements of the pressure and temperature of many different gases.
Based on these measurements, he concluded that “the pressure of a fixed amount of gas, measured at constant volume, is directly proportional to its absolute temperature.” This statement is best described as a
A. theory.
B. hypothesis.
C. law.
D. experiment.
E. definition.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

11. A dictionary has the following definition for a word: "A tentative explanation that accounts for a set of facts." Which of the following words best fits that definition?
A. theory
B. hypothesis
C. law
D. experiment
E. definition

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

12. A detailed explanation of natural phenomena that is generally accepted and has been extensively tested is called a
A. theory.
B. hypothesis.
C. law.
D. fact.
E. postulate.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

13. The distance between carbon atoms in ethylene is 134 picometers. Which of the following expresses that distance in meters?
A. 1.34×10^{-13} m
B. 1.34×10^{-12} m
C. 1.34×10^{-10} m
D. 1.34×10^{-7} m
E. 1.34×10^{-6} m

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

14. The average distance from Earth to the Sun is 150 megameters. What is that distance in meters?
A. 1.5×10^{8} m
B. 1.5×10^{6} m
C. 1.5 × 105 m
D. 1.5×10^{3} m
E. 1.5×10^{-6} m

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

15. The mass of a sample is 550 milligrams. Which of the following expresses that mass in kilograms?
A. 5.5×10^{8} kg
B. 5.5×10^{5} kg
C. 5.5×10^{-4} kg

D. 5.5×10^{-6} kg
E. 5.5×10^{-1} kg

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

16. A dose of medication was prescribed to be 35 microliters. Which of the following expresses that volume in centiliters?
A. 3.5×10^{5} cL
B. 3.5×10^{4} cL
C. 3.5 cL
D. 3.5×10^{-4} cL
E. 3.5×10^{-3} cL

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

17. Which of the following represents the largest volume?
A. 10,000 μL
B. 1000 pL
C. 100 mL
D. 10 nL
E. 10 cm^3

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

18. You prepare 1000. mL of tea and transfer it to a 1.00-quart pitcher for storage. Which of the following statements is true?
A. The pitcher will be filled to 100% of its capacity with no tea spilled.
B. The pitcher will be filled to about 95% of its capacity.
C. The pitcher will be filled to about 50% of its capacity.
D. The pitcher will be completely filled and a small amount of tea will overflow.
E. The pitcher will be completely filled and most of the tea will overflow.

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

19. In an average year, the American chemical industry produces more than 9.5 million metric tons of sodium carbonate. Over half of this is used in the manufacture of glass while another third is used in the production of detergents and other chemicals. How many pounds of sodium carbonate are produced annually?
A. 2.1×10^{10} lb
B. 4.3×10^{9} lb
C. 1.1×10^{7} lb
D. 2.2×10^{6} lb
E. 2.1×10^{4} lb

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

20. A large pizza has a diameter of 15 inches. Express this diameter in centimeters.

A. 38 cm
B. 24 cm
C. 18 cm
D. 9.3 cm
E. 5.9 cm

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

21. The average distance between the Earth and the Moon is 240,000 miles. Express this distance in kilometers.
A. 6.1×10^5 km
B. 5.3×10^5 km
C. $3.9 \times l0^5$ km
D. 1.5×10^5 km
E. 9.4×10^4 km

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

22. The area of a 15-inch pizza is 176.7 in^2. Express this area in square centimeters.
A. 1140. cm^2
B. 448.8 cm^2
C. 96.8 cm^2
D. 69.57 cm^2
E. 27.39 cm^2

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

23. The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h?
A. 65,500 mi/h
B. 25,300 mi/h
C. 18,200 mi/h
D. 1,090 mi/h
E. 5.02×10^{-3} mi/h

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

24. The density of mercury, the only metal to exist as a liquid at room temperature, is 13.6 g/cm^3. What is that density in pounds per cubic inch?
A. 849 lb/in^3
B. 491 lb/in^3
C. 376 lb/in^3
D. 0.491 lb/in^3
E. 1.83×10^{-3} lb/in^3

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

25. Given that 1 inch = 2.54 cm, 1 cm^3 is equal to
A. 16.4 in^3.
B. 6.45 in^3.
C. 0.394 in^3.
D. 0.155 in^3.
E. 0.0610 in^3.

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

26. At a pressure of one billionth (10^{-9}) of atmospheric pressure, there are about 2.7×10^{10} molecules in one cubic centimeter of a gas. How many molecules is this per cubic meter?
A. 2.7×10^{16}
B. 2.7×10^{14}
C. 2.7×10^{12}
D. 2.7×10^{8}
E. 2.7×10^{4}

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

27. If the price of gold at the morning fixing in London was $5310 per lb, what would a kilogram of gold have cost in £ (pounds)? (Assume an exchange rate of $1.00 = £0.545)
A. £1310
B. £3510
C. £6370
D. £10400
E. £17100

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

28. Which of the following is not an SI base unit?
A. meter
B. ampere
C. second
D. gram
E. kelvin

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

29. The symbol for the SI base unit of mass is
A. mg.
B. g.
C. kg.
D. metric ton.
E. lb.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)

Topic: Study of Chemistry

30. Which of the following abbreviations of the given SI base unit is incorrect?
A. second: s
B. kilogram: kg
C. kelvin: K
D. mole: m
E. ampere: A

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

31. Which of the following abbreviations of the given SI base unit is incorrect?
A. second: s
B. kilogram: kg
C. meter: m
D. mole: mol
E. kelvin: k

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

32. The SI prefix mega- (M) means
A. 10^{-6}.
B. 10^{-3}.
C. 10^{3}.
D. 10^{6}.
E. 10^{9}.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

33. The SI unit of speed (velocity) is
A. km/h.
B. km/s.
C. m/h.
D. m/s.
E. None of these choices are correct.

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

34. The joule is the SI unit of energy and is equal to 1 kg m^2 s^{-2}. The erg is another energy unit, equal to 1 g cm^2 s^{-2}. Use unit conversion methods to work out how many ergs are in 1 joule.
A. 10^{-1} ergs
B. 10 ergs
C. 10^{2} ergs
D. 10^{5} ergs
E. 10^{7} ergs

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic

Subtopic: Measurement (SI Units)
Topic: Study of Chemistry

35. Which of the following correctly shows how to convert a density of 20.1 g cm^{-3} to units of kg m^{-3}?

A. $\frac{20.1\ \text{g}}{1\ \text{cm}^3} \times \frac{1000\ \text{kg}}{1\ \text{g}} \times \frac{1\ \text{cm}^3}{0.01\ \text{m}^3}$

B. $\frac{20.1\ \text{g}}{1\ \text{cm}^3} \times \frac{1\ \text{kg}}{1000\ \text{g}} \times \frac{1\ \text{cm}^3}{0.01\ \text{m}^3}$

C. $\frac{20.1\ \text{g}}{1\ \text{cm}^3} \times \frac{1\ \text{kg}}{1000\ \text{g}} \times \frac{0.01\ \text{cm}^3}{1\ \text{m}^3}$

D. $\frac{20.1\ \text{g}}{1\ \text{cm}^3} \times \frac{1\ \text{kg}}{1000\ \text{g}} \times \frac{(0.01\ \text{cm})^3}{(1\ \text{m})^3}$

E. $\frac{20.1\ \text{g}}{1\ \text{cm}^3} \times \frac{1\ \text{kg}}{1000\ \text{g}} \times \frac{(1\ \text{cm})^3}{(0.01\ \text{m})^3}$

Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

36. If the density of a certain spherical atomic nucleus is 1.0×10^{14} g cm^{-3} and its mass is 2.0×10^{-23} g, what is its radius in cm?
A. 3.6×10^{-13} cm
B. 2.0×10^{-37} cm
C. 4.8×10^{-38} cm
D. 2.2×10^{-19} cm
E. None of these choices are correct.

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Hard
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

37. Which of the following is an extensive property of oxygen?
A. boiling point
B. temperature
C. average kinetic energy of molecules
D. density
E. mass

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

38. A flask has a mass of 78.23 g when empty and 593.63 g when filled with water. When the same flask is filled with concentrated sulfuric acid, H_2SO_4, its mass is 1026.57 g. What is the density of concentrated sulfuric acid? (Assume water has a density of 1.00 g/cm^3 at the temperature of the measurement.)
A. 1.992 g/cm^3
B. 1.840 g/ cm^3
C. 1.729 g/ cm^3
D. 1.598 g/ cm^3
E. 0.543 g/ cm^3

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic

Subtopic: Properties of Matter
Topic: Study of Chemistry

39. Talc is a mineral that has low conductivity for heat and electricity and that is not attacked by acid. It is used as talcum powder and face powder. A sample of talc weighs 35.97 g in air and 13.65 g in mineral oil (d = 1.75 g/cm^3). What is the density of talc?
A. 4.61 g/cm^3
B. 2.82 g/cm^3
C. 2.63 g/cm^3
D. 2.44 g/cm^3
E. 1.61 g/cm^3

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Hard
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

40. Acetone, which is used as a solvent and as a reactant in the manufacture of Plexiglas®, boils at 56.1°C. What is the boiling point in degrees Fahrenheit?
A. 159°F
B. 133°F
C. 101°F
D. 69.0°F
E. 43.4°F

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

41. Isopropyl alcohol, commonly known as rubbing alcohol, boils at 82.4°C. What is the boiling point in kelvins?
A. 387.6 K
B. 355.6 K
C. 323.6 K
D. 190.8 K
E. –190.8 K

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

42. Acetic acid boils at 244.2°F. What is its boiling point in degrees Celsius?
A. 382.0°C
B. 167.7°C
C. 153.4°C
D. 117.9°C
E. 103.7°C

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

43. Which one of the following numbers contains a digit or digits which is/are not significant?
A. 970.0
B. 502
C. .300
D. .0043
E. 20.01

Accessibility: Keyboard Navigation

Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

44. Select the answer that expresses the result of this calculation with the correct number of significant figures.

$$\frac{13.602 \times 1.90 \times 3.06}{4.2 \times 1.4097} =$$

A. 13.3568
B. 13.357
C. 13.36
D. 13.4
E. 13

Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

45. Select the answer that expresses the result of this calculation with the correct number of significant figures and with correct units.
16.18 cm × 9.6114 g ÷ 1.4783 cm^2 =
A. 105.2 g/cm^3
B. 105.2 g/cm^2
C. 105.2 g/cm
D. 72.13 g/cm^2
E. 72.13 g/cm

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

46. Which measurement is expressed to 4 significant figures?
A. 0.423 kg
B. 24.049 cm
C. 1300 K
D. 82,306 m
E. 62.40 g

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

47. Express 96,342 m using 2 significant figures.
A. 9.60×10^4 m
B. 9.6×10^4 m
C. 9.60×10^{-4} m
D. 9.6×10^{-4} m
E. 96000. m

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

48. Select the answer with the correct number of decimal places for the following sum:
13.914 cm + 243.1 cm + 12.00460 cm =
A. 269.01860 cm
B. 269.0186 cm

C. 269.019 cm
D. 269.02 cm
E. 269.0 cm

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

49. The appropriate number of significant figures in the result of 15.234 × 15.208 is
A. 2.
B. 3.
C. 4.
D. 5.
E. 6.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

50. The appropriate number of significant figures in the result of 15.234 – 15.208 is
A. 1.
B. 2.
C. 3.
D. 4.
E. 5.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

51. The result of (3.8621 × 1.5630) – 5.98 is properly written as
A. 0.06.
B. 0.056.
C. 0.0565.
D. 0.05646.
E. 0.056462.

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

52. As chief chemist at Superior Analytical Products (SAP) you must design an experiment to determine the density of an unknown liquid to three (3) significant figures. The density is of the order of 1 g/cm^3. You have approximately 7 mL of the liquid and only graduated cylinders and balances are available for your use. Which of the following combinations of equipment will allow you to meet but not exceed your goal?
A. graduated cylinder with ±0.1 mL uncertainty; balance with ±0.1 g uncertainty
B. graduated cylinder with ±0.01 mL uncertainty; balance with ±0.1 g uncertainty
C. graduated cylinder with ±0.01 mL uncertainty; balance with ±0.01 g uncertainty
D. graduated cylinder with ±0.001 mL uncertainty; balance with ±0.001 g uncertainty
E. graduated cylinder with ±0.1 mL uncertainty; balance with ±0.001 g uncertainty

Accessibility: Keyboard Navigation
Bloom's: 3. Apply
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

53. A student makes several measurements of the density of an unknown mineral sample. She then reports the average value of these measurements. The number of significant figures she uses in her result should be a measure of its
A. accuracy.
B. precision.
C. systematic error.
D. determinate error.
E. human error.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

54. The difference between a student's experimental measurement of the density of sodium chloride and the known density of this compound reflects the _____ of the student's result.
A. accuracy
B. precision
C. random error
D. systematic error
E. indeterminate error

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

55. Bud N. Chemist must determine the density of a mineral sample. His four trials yield densities of 4.77 g/cm^3, 4.67 g/cm^3, 4.69 g/cm^3, and 4.81 g/cm^3. Independent studies found the correct density to be 4.75 g/cm^3. Which of the following statements represents the best analysis of the data?
A. Bud's results have much greater accuracy than precision.
B. Bud's results have much greater precision than accuracy.
C. Bud's results have high accuracy and high precision.
D. Bud's results have low accuracy and low precision.
E. Bud's equipment is faulty.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

56. As part of an experiment to determine the density of a new plastic developed in her laboratory, Sara Ann Dippity measures the volume of a solid sample. Her four trials yield volumes of 12.37 cm^3, 12.41 cm^3, 12.39 cm^3, and 12.38 cm^3. Measurements of other scientists in the lab give an average volume of 12.49 cm^3. Which of the following statements represents the best analysis of the data?
A. Sara's results have low precision and high accuracy.
B. Sara's results have high precision and high accuracy.
C. Sara's results have greater precision than accuracy.
D. Sara's results have greater accuracy than precision.
E. Sara has been using a faulty instrument to measure the volume.

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

57. Which of the following correctly expresses 52,030.2 m in scientific notation?
A. 5.20302×10^4 m
B. 5.20302×10^5 m
C. 5.203×10^4 m
D. 5.20×10^4 m

E. 5.2×10^4 m

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

58. Which of the following correctly expresses 0.000007913 g in scientific notation?
A. 7.913×10^6 g
B. 7.913×10^5 g
C. 7.913×10^{-5} g
D. 7.913×10^{-6} g
E. 7.913×10^{-9} g

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

59. Classify the following properties of hydrogen gas as either intensive or extensive.
a. the mass of the gas sample
extensive

b. the average speed of a molecule in the sample
intensive

c. temperature
intensive

d. density
intensive

e. number of molecules present
extensive

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

60. In each of the sets below, choose the one quantity or number which is exact.
a. i. the human population
ii. the distance in light years from the sun to Alpha Centauri, a nearby star
iii. the winning time for the 100 m dash in the Olympic Games
i

b. i. the weight of a particular one cent coin in g
ii. the boiling point of lead, in °C
iii. the number of cm in 1 yd
iii

c. i. the measured value of the speed of light (2.998 × 108 m/s)
ii. π (3.141)
iii. the volume of milk in a 1-gallon jug
ii

Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Dimensional Analysis
Topic: Study of Chemistry

61. The ripening of fruit, once picked, is an example of physical change.
FALSE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

62. An important aim in much chemical work is to use macroscopic measurements in order to gain an understanding of the microscopic world.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

63. The potential energy of a car moving on a level road does not depend on its speed.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

64. When a wooden match burns in air, chemical potential energy is converted to kinetic energy.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Classification and States of Matter
Topic: Study of Chemistry

65. When applying the scientific method, it is important to avoid any form of hypothesis.
FALSE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

66. When applying the scientific method, a model or theory should be based on experimental data.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

67. The numerical value of any temperature expressed in Celsius is always different from the numerical value of the same temperature in Fahrenheit.
FALSE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

68. The numerical value of any temperature expressed in Celsius is always different from the numerical value of the same temperature in kelvin.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

69. The number 6.0448, rounded to 3 decimal places, becomes 6.045.
TRUE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

70. The number 6.0448, rounded to 2 decimal places, becomes 6.05.
FALSE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

71. The weight of a coin measured as 1.96235 g on one balance is definitely more accurate than a weight measurement of 1.95 g on another balance.
FALSE

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Notation and Significant Figures
Topic: Study of Chemistry

72. Which of the following is a physical change?
A. milk turning sour
B. battery cables corroding
C. sugar turning brown when heated
D. liquid water being cooled and forming ice
E. an egg being hard-boiled

Accessibility: Keyboard Navigation
Bloom's: 2. Understand
Difficulty: Easy
Gradable: automatic
Subtopic: Properties of Matter
Topic: Study of Chemistry

73. Which of the following processes and concepts is not a part of the "scientific method"?
A. experiment
B. observation
C. model
D. speculation
E. law

Accessibility: Keyboard Navigation
Bloom's: 1. Remember
Difficulty: Medium
Gradable: automatic
Subtopic: Scientific Method
Topic: Study of Chemistry

Category	*# of Questions*
Accessibility: Keyboard Navigation	70

Bloom's: 1. Remember	20
Bloom's: 2. Understand	24
Bloom's: 3. Apply	29
Difficulty: Easy	37
Difficulty: Hard	3
Difficulty: Medium	33
Gradable: automatic	73
Subtopic: Classification and States of Matter	5
Subtopic: Dimensional Analysis	13
Subtopic: Measurement (SI Units)	12
Subtopic: Properties of Matter	14
Subtopic: Scientific Method	10
Subtopic: Scientific Notation and Significant Figures	19
Topic: Study of Chemistry	73