Chapter 1: Chemistry: The Science of Change

1. What is a unifying principle that explains a body of experimental observations?
   A) Law B) Hypothesis C) Theory D) Phenomena E) Prediction
   Ans: C Difficulty: Easy

2. What is defined as a tentative explanation for observations that are made that result in the formulation of this concept?
   A) Law B) Hypothesis C) Theory D) Phenomena E) Prediction
   Ans: B Difficulty: Easy

3. What is term used for findings that are summarized based on a pattern or trend?
   A) Law B) Hypothesis C) Theory D) Phenomena E) Prediction
   Ans: A Difficulty: Easy

4. 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
   Ans: E Difficulty: Easy

5. 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
   Ans: D Difficulty: Medium

6. Which of the following cannot be separated into a simpler substance by chemical means?
   A) Element
   B) Emulsion
   C) Compound
   D) Homogeneous mixture
   E) Heterogeneous mixture
   Ans: A Difficulty: Medium

7. If a liquid contains 60% sugar and 40% water throughout its composition then what is it called?
   A) Solute
   B) Compound
   C) Homogeneous mixture
   D) Heterogeneous mixture
   E) Solvent
   Ans: C Difficulty: Medium

8. Which of the following does not have a uniform composition throughout?
   A) Element
   B) Compound
   C) Homogeneous mixture
   D) Heterogeneous mixture
   E) Solvent
   Ans: D Difficulty: Easy

9. Which of the following is not an S.I. base unit?
A) Meter B) Ampere C) Second D) Gram E) Kelvin
Ans: D Difficulty: Medium

10. The S.I. base unit of mass is
A) mg B) g C) kg D) metric ton E) lb
Ans: C Difficulty: Medium

11. The S.I. prefix mega- (M) means
A) 10^{-6} B) 10^{-3} C) 10^{3} D) 10^{6} E) 10^{9}
Ans: D Difficulty: Easy

12. The SI prefixes *milli* and *mega* represent, respectively:
A) 10^{6} and 10^{-6}
B) 10^{-3} and 10^{6}
C) 10^{3} and 10^{-6}
D) 10^{-3} and 10^{9}
E) 10^{-6} and 10^{-3}
Ans: B Difficulty: Medium

13. How many micrograms are in 65.3kg?
A) 0.653 μg
B) 6.53×10^{7} μg
C) 6.53×10^{4} μg
D) 6.53×10^{-8} μg
E) 6.53×10^{10} μg
Ans: E Difficulty: Difficult

14. 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
Ans: E Difficulty: Difficult

15. How many milliliters is 0.0055 L?
A) 0.55 mL B) 5.5 mL C) 0.5 mL D) 0.0000055 mL E) 182 mL
Ans: B Difficulty: Medium

16. How many hertz is 600.11 MHz?
A) 6.0011×10^{-4} Hz
B) 60.011 Hz
C) 6.0011×10^{6} Hz
D) 6.0011×10^{-2} Hz
E) 6.0011×10^{8} Hz
Ans: E Difficulty: Medium

17. 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
    Ans: C Difficulty: Medium

18. Which of these quantities represents the largest mass?
    A) 2.0×10^{2} mg
    B) 0.0010 kg
    C) 1.0×10^{5} μg
    D) 2.0×10^{2} cg
    E) 10.0 dg
    Ans: D Difficulty: Difficult

19. 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
    Ans: C Difficulty: Difficult

20. The average distance between the Earth and the Moon is 240,000 miles. Express this distance in kilometers. (1 mi = 1609 m)
    A) 6.1×10^{5} km
    B) 5.3×10^{5} km
    C) 3.9×10^{5} km
    D) 1.5×10^{5} km
    E) 9.4×10^{4} km
    Ans: C Difficulty: Medium

21. How many inches are in 382.5 cm? (1 in = 2.54 cm)?
    A) 150.6 in B) 6.641×10^{-3} in C) 151 in D) 971.6 in E) 972 in
    Ans: A Difficulty: Medium

22. How many cubic inches are in 1.00 liter? (1 in = 2.54 cm)
    A) 61.0 in^3 B) 155 in^3 C) 394 in^3 D) 1.64×10^{4} in^3 E) none of them
    Ans: A Difficulty: Difficult

23. Convert 500. milliliters to quarts. (1L = 1.06 qt)
    A) 1.88 qt B) 0.472 qt C) 0.528 qt D) 4.72×10^{5} qt E) 5.28×10^{5} qt
    Ans: C Difficulty: Medium

24. 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
    Ans: E Difficulty: Difficult

25. A large pizza has a diameter of 15 inches. Express this diameter in centimeters. (1in = 2.54cm)
A) 38 cm B) 24 cm C) 18 cm D) 9.3 cm E) 5.9 cm
Ans: A Difficulty: Medium

26. The average distance between the Earth and the Moon is 240,000 miles. Express this distance in meters. (1mi = 1609m)
A) 6.1×10^5 m
B) 5.3×10^5 m
C) 3.9×10^9 m
D) 1.5×10^5 m
E) 9.4×10^4 m
Ans: C Difficulty: Medium

27. What is the volume in milliliters of a 32.0 oz can of juice? (1 fl oz = 29.6 mL)
A) 1.08 mL B) 947 mL C) 0.925 mL D) 0.95 mL E) 1.1 mL
Ans: B Difficulty: Medium

28. How many mm^3 are in $16.7cm^3$?
A) 1.67×10^{-5} mm^3
B) 1.67×10^{-8} mm^3
C) 1.67×10^7 mm^3
D) 1.67×10^4 mm^3
E) 1.67×10^{-4} mm^3
Ans: D Difficulty: Difficult

29. A patient in the hospital is running a temperature of 39.5°C, what is this in Fahrenheit?
A) 99°F B) 101.3°F C) 102.4°F D) 103.1°F E) 104°F
Ans: D Difficulty: Medium

30. If normal body temperature is 98.6 °F then what is this in Celsius?
A) 34°C B) 35.5°C C) 36.4°C D) 37°C E) 38.7°C
Ans: D Difficulty: Medium

31. Express 122°F in °C.
A) 50.0°C B) 64.4°C C) 67.8°C D) 162.0°C E) 219.6°C
Ans: A Difficulty: Medium

32. The boiling point for liquid helium is 4 K, what is the temperature in Fahrenheit?
A) –452.5°F B) –498.9°F C) –237.2°F D) 131.8°F E) 530.9°F
Ans: A Difficulty: Difficult

33. If the temperature is 38°F then what is the temperature in Kelvin?
A) 3.33 K B) 100.4 K C) 276.5 K D) 311.15 K E) 235.15 K
Ans: C Difficulty: Difficult

34. Dry ice (carbon dioxide) changes from a solid to a gas at –78.5°C. What is this temperature in °F?
    A) –173°F
    B) –12.6°F
    C) –109°F
    D) –75.6°F
    E) none of them are within 2°F of the right answer
    Ans: C Difficulty: Difficult

35. The boiling point for liquid nitrogen is 77 K, what is the temperature in Fahrenheit?
    A) –126.8°F B) –288.8°F C) –321.1°F D) 176.8°F E) 662.3°F
    Ans: C Difficulty: Difficult

36. 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
    Ans: B Difficulty: Medium

37. Isopropyl alcohol, commonly known as rubbing alcohol, boils at 82.4°C. What is the boiling point in Kelvin?
    A) 387.6 K B) 355.6 K C) 323.6 K D) 190.8 K E) -190.8 K
    Ans: B Difficulty: Medium

38. 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
    Ans: D Difficulty: Medium

39. What is the volume of a container that contains 14.3 g of a substance having a density of 0.988 g/cm^3?
    A) 14.1 cm^3 B) 0.0691 cm^3 C) 14.5 cm^3 D) 141 cm^3 E) 691 cm^3
    Ans: C Difficulty: Medium

40. If you have a graduated cylinder containing 15.5 mL and this volume changes to 95.2 mL after a metal with a mass of 7.95g is dropped into the graduated cylinder then what is the density of this metal?
    A) 0.0835 g/mL
    B) 0.513 g/mL
    C) 0.0718 g/mL
    D) 10.0 g/mL
    E) 9.97×10^{-2} g/mL
    Ans: E Difficulty: Difficult

41. 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?
(1 in = 2.54 cm; 1 lb = 454 g)

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

Ans: D Difficulty: Difficult

42. Radio waves travel at the speed of light which is 3.00×10^8 m/s. How many minutes does it take for a radio message to reach Earth from Saturn if Saturn is 7.9×10^8 km from Earth?

A) 4.4×10^{-2} min
B) 1.6×10^5 min
C) 4.0×10^{15} min
D) 44 min
E) 2.6 min

Ans: D Difficulty: Difficult

43. The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h? (1 mile = 1609 m)

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

Ans: B Difficulty: Difficult

44. Radio waves travel at the speed of light which is 3.00×10^8 m/s. How many kilometers will radio messages to outer space travel in exactly one year?

A) 9.46×10^{15} km
B) 7.30×10^8 km
C) 7.10×10^{10} km
D) 9.46×10^{12} km
E) 3.33×10^{-3} km

Ans: D Difficulty: Difficult

45. The diameter of Earth is 12.7 Mm. Express this diameter in centimeters.

A) 1.27×10^5 cm
B) 1.27×10^6 cm
C) 1.27×10^7 cm
D) 1.27×10^8 cm
E) 1.27×10^9 cm

Ans: E Difficulty: Difficult

46. Some molecules move with speeds approaching the "escape velocity" from Earth, which is 7.0 miles per second. What is this speed in cm/h? (1 mi = 1609 m)

A) 313 cm/h
B) 4.1×10^5 cm/h
C) 4.1×10^9 cm/h
D) 1.1×10^6 cm/h
E) 1.6×10^9 cm/h

Ans: C Difficulty: Difficult

47. The city of Los Angeles is now approximately 2400 miles south of Alaska. It is moving slowly northward as the San Andreas fault slides along. If Los Angeles is to arrive near Anchorage, Alaska, in 76 million years, at what average rate will it have to move in mm per month? (1 mi =1609 m)
A) 2.0×10^{-10} mm/mo.
B) 6.6×10^{-6} mm/mo.
C) 4.2 mm/mo.
D) 9.5 mm/mo.
E) 51 mm/mo.
Ans: C Difficulty: Difficult

48. Which of the following speeds is the greatest? (1 mi = 1609 m)
A) 40 mi/h
B) 2.0×10^{5} mm/min
C) 40 km/h
D) 0.74 km/min
E) 400 m/min
Ans: A Difficulty: Difficult

49. Iron has a density of 7.87 g/cm^3. What mass of iron would be required to cover a football playing surface of 120 yds × 60 yds to a depth of 1.0 mm? (1 inch = 2.54 cm)
A) 76 kg B) 47 Mg C) 7.6×10^{5} g D) 4.7×10^{8} g E) 1.9×10^{7} g
Ans: B Difficulty: Difficult

50. The recommended daily allowance (RDA) of calcium is 1.2 g. Calcium carbonate contains 12.0% calcium by mass. How many grams of calcium carbonate are needed to provide the RDA of calcium?
A) 0.10 g B) 0.14 g C) 1.2 g D) 10 g E) 14 g
Ans: D Difficulty: Difficult

51. One of the common intravenous fluids, called physiological saline, is a homogeneous mixture of NaCl in water. In this mixture, 0.89% of the mass is contributed by the NaCl. What mass of NaCl is found in 450. mL of physiological saline? (Given: density of physiological saline = 1.005 g/cm^3)
A) 2.0 g B) 4.0 g C) 5.1 g D) 508 g E) 400 g
Ans: B Difficulty: Difficult

52. An empty flask's mass is 17.4916 g, its mass is 43.9616 g when filled with water at 20.0°C (d = 0.9982 g/mL). The density of "heavy water" at 20.0°C is 1.1053 g/mL. What is the mass of the flask when filled with heavy water at 20.0°C?
A) 29.2573 g B) 46.8016 g C) 46.7489 g D) 29.3100 g E) 43.9140 g
Ans: B Difficulty: Difficult

53. 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
Ans: B Difficulty: Difficult

54. 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
Ans: A Difficulty: Difficult

55. 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
Ans: C Difficulty: Easy

56. Which of these is an example of a *physical* property?
A) Corrosiveness of sulfuric acid
B) Toxicity of cyanide
C) Flammability of gasoline
D) Neutralization of stomach acid with an antacid
E) Lead becomes a liquid when heated to 601°C
Ans: E Difficulty: Easy

57. Which one of these represents a *physical* change?
A) Water, when heated, forms steam
B) Bleach turns hair yellow
C) Sugar, when heated, becomes brown
D) Milk turns sour
E) Apples, when exposed to air, turn brown
Ans: A Difficulty: Easy

58. Which one of these represents a *chemical* change?
A) Boiling water to form steam
B) Turning hair yellow with bleach
C) Melting butter
D) Mixing powdered charcoal and oxygen at room temperature
E) Cutting a bar of sodium metal into pieces with a knife
Ans: B Difficulty: Easy

59. 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
Ans: E Difficulty: Easy

60. When the value of something does not depend on the amount of the matter then what is this called?
A) Empirical property
B) Intensive property
C) Inclusive property
D) Extensive property
E) Exclusive property
Ans: B Difficulty: Easy

61. Which of the following is an extensive property?
A) Density B) Temperature C) Mass D) Specific Heat E) Pressure
Ans: C Difficulty: Easy

62. The number 1.050×10^9 has how many significant figures?
A) 2 B) 3 C) 4 D) 9 E) 13
Ans: C Difficulty: Medium

63. After carrying out the operations below, how many significant figures are appropriate to show in the result? $(13.7 + 0.027) \div 8.221$
A) 1 B) 2 C) 3 D) 4 E) 5
Ans: C Difficulty: Medium

64. How many significant figures are in 0.006570?
A) 3 B) 4 C) 5 D) 6 E) 7
Ans: B Difficulty: Medium

65. The result of $(3.8621 \times 1.5630) - 5.98$ is properly written as
A) 0.06 B) 0.056 C) 0.0565 D) 0.05646 E) 0.056462
Ans: A Difficulty: Medium

66. 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
Ans: E Difficulty: Medium

67. How many significant figures does the sum 8.5201 + 1.93 contain?
A) 1 B) 2 C) 3 D) 4 E) 5
Ans: D Difficulty: Medium

68. 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
Ans: E Difficulty: Medium

69. Which is correct if 0.01234 is rewritten in scientific notation?
A) 1.234×10^{-3}
B) 12.3×10^{4}
C) 1×10^{-1}
D) 1.234×10^{2}
E) 1.234×10^{-2}
Ans: E Difficulty: Easy

70. You prepare 1000. mL of tea and transfer it to a 1.00 quart pitcher for storage. Which of the following statements is true? (1L = 1.06qt)
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.
Ans: D Difficulty: Medium

71. The speed needed to escape the pull of Earth's gravity is 11.3 km/s. What is this speed in mi/h? (1 mi = 1609 m)
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
Ans: B Difficulty: Medium

72. The ripening of fruit, once picked, is an example of physical change.
Ans: False Difficulty: Easy

73. When applying the scientific method, it is important to avoid any form of hypothesis.
Ans: False Difficulty: Easy

74. When applying the scientific method, a model or theory should be based on experimental data.
Ans: True Difficulty: Easy

75. Matter is anything that has mass and occupies space.
Ans: True Difficulty: Easy

76. The density of a substance is an intensive property.
Ans: True Difficulty: Easy

77. The volume of a substance is an intensive property.
Ans: False Difficulty: Easy

78. Boiling point and melting point are extensive properties.
Ans: False Difficulty: Easy

79. Rusting of a piece of iron under environmental conditions is a physical change.
Ans: False Difficulty: Easy

80. The number 6.0448, rounded to 3 decimal places, becomes 6.045.
Ans: True Difficulty: Easy

81. A dip of vanilla ice cream is a pure substance.
Ans: False Difficulty: Easy

82. A particular temperature in degrees Celsius is larger than the temperature in Kelvin.
Ans: False Difficulty: Easy

83. Zero Kelvin < 0° Fahrenheit < 0° Celsius
Ans: True Difficulty: Medium

84. 77 K is colder than 4 K.
Ans: False Difficulty: Easy

85. The juice from an orange is a mixture.
Ans: True Difficulty: Easy

86. What is something that has a definite composition?
Ans: pure substance
Difficulty: Easy

87. What is a combination of two or more substances in which the substances retain their distinct identities?
Ans: mixture
Difficulty: Easy

88. What is a substance that cannot be separated into simpler substances by chemical means?
Ans: element
Difficulty: Easy

89. What is a substance composed of atoms of two or more elements chemically united in fixed proportions?
Ans: compound
Difficulty: Easy

90. Give examples of three physical properties.
Ans: (Answers will vary.) Melting point, boiling point, density, color
Difficulty: Easy

91. Give an example of an *extensive* property.
Ans: (Answers will vary.) Mass, length, and volume
Difficulty: Easy

92. Give an example of an *intensive* property.
Ans: (Answers will vary.) Temperature, density, melting point, boiling point
Difficulty: Easy

93. Identify this process as a *physical* or *chemical* change: Bacteria converts milk to yogurt.
Ans: Chemical
Difficulty: Easy

94. What is the equation for the conversion of °Celsius to Kelvin?
Ans: °C + 273.15 = Kelvin
Difficulty: Easy

95. If two numbers are added together, one which has 2 digits after the decimal point and the other has 1 digit after the decimal point, explain how to round the answer.
Ans: The answer will have 1 digit after the decimal point because the least number of digits after the decimal point in the two numbers used in the calculation was 1. Use the least number of digits after the decimal point.
Difficulty: Medium

96. If two numbers are multiplied together, one which has 3 significant figures and the other has four significant figures, explain how to round the answer.
Ans: The answer will have 3 significant figures because the least number of significant figures in the two numbers used in the calculation was 3.
Difficulty: Easy

97. What is the equation used to calculate the mass from the density?
Ans: mass = density × volume or $m = dv$
Difficulty: Medium

98. Melting ice is a _____ change.
Ans: physical
Difficulty: Easy

99. Burning wood in a fireplace is a _____ change.
Ans: chemical
Difficulty: Easy

100. _____ is a substance composed of atoms of two or more elements chemically united in fixed proportions.
Ans: compound
Difficulty: Easy

101. _____ is a substance that cannot be separated into simpler substances by chemical means.
Ans: element
Difficulty: Easy

102. _____ is a combination of two or more substances in which the substances retain their distinct identities.
Ans: mixture
Difficulty: Easy

103. _____ is something that has a definite composition.
Ans: pure substance
Difficulty: Easy

104. _____, _____, and _____ are the three states of matter.
Ans: liquid, solid, and gas
Difficulty: Easy

105. _____ _____ has a uniform composition throughout.
Ans: homogeneous mixture
Difficulty: Easy

106. _____ _____ does not have a uniform composition throughout.
Ans: heterogeneous mixture
Difficulty: Easy

107. _____ tells how closely multiple measurements of the same thing are to one another.
Ans: Precision
Difficulty: Medium

108. _____ is the term used to indicate a measurement is accurate. (Hint: Often used when measurement the volume of a liquid.)
Ans: Graduated or Calibrated
Difficulty: Medium

109. _____ tells how close a measurement is to the true value.
Ans: accuracy
Difficulty: Medium

110. Briefly explain the relationship between hypothesis and experiment in the scientific method.
Ans: A hypothesis should be capable of leading to a prediction which is testable by experiment. If the experimental result differs from the prediction, the hypothesis should be modified.
Difficulty: Medium

111. Explain the difference between accuracy and precision.
Ans: Accuracy is how a measurement is to the true value and precision is how close multiple measurements of the same thing are to one another.
Difficulty: Medium

112. Explain the difference between a hypothesis and a theory.
Ans: A hypothesis is a tentative explanation for observations made and a theory is a unifying principle that explains a body of experimental observations and the laws that are based on them.
Difficulty: Medium

113. Explain the difference between quantitative measurements and qualitative measurements.
Ans: A quantitative measurement is expressed with a number and a qualitative measurement does not require an explicit measurement.
Difficulty: Easy

114. Explain the difference between a physical property and a chemical property.
Ans: A physical property can be observed and measured without changing the identity of the substance and a chemical property requires a chemical change from one substance to another substance.
Difficulty: Easy

115. Explain the difference between an extensive property and an intensive property.
Ans: An extensive property depends on the amount of matter and an intensive property does not depend on the amount of matter.
Difficulty: Medium

116. Explain the rule for significant figures for addition and subtraction.
Ans: The answer cannot have more digits to the right of the decimal point than any of the original numbers used in the calculation.
Difficulty: Medium

117. Explain the rule for significant figures for multiplication and division.
Ans: The number of significant figures in the final product or quotient is determined by the original number that has the smallest number of significant figures.
Difficulty: Easy

118. Explain the difference between a heterogeneous mixture and a homogeneous mixture.
Ans: A homogeneous mixture has a uniform composition throughout and a heterogeneous mixture does not have a uniform composition throughout.
Difficulty: Easy

119. Discuss the benefits of using the metric system for measurements.
Ans: All measurements in the metric system are a multiple of 10 therefore it makes it easy to simply move the decimal point.
Difficulty: Easy

120. Discuss the difference between the Celsius and Fahrenheit scales for measuring temperatures.
Ans: 0°C = 32°F and 100°C = 212°F. To convert from °F to °C use the equation °C = (°F -32°F) × 5°C/9°F and to convert from °C to °F use the equation °F = [9°F/5°C](°C) + 32°F
Difficulty: Medium