Name _____   **Honors Chemistry**   ___/___/___

Practice Test - Chapter 1

Part 1. Solve each of the following. Give your answers using the correct number of significant figures.

_____   a. $12.011 + 31.9988$

_____   b. 0.2884×1.2359

_____   c. $[(8.675 – 8.661) \div 8.675] \times 100.$

_____   d. $(2.9979 \times 10^8) \div (6.50 \times 10^{-7})$

_____   e. $11.50 \div 195.08 \times (6.022 \times 10^{23})$

Part 2. Convert each of the following.

_____   a. 3.69 milligrams to centigrams

_____   b. 98.7 megahertz to Hertz

_____   c. 6.50×10^2 nanometers to meters

_____   d. 2.500×10^{-9} kilograms to micrograms

Part 3. Perform the following unit conversions.

_____   a. 2.00 miles to centimeters

_____   b. 20.4 kilograms to pounds

_____   c. 5.00 kilopascals to torr

_____   d. 22.8° C to Kelvin

Part 4. Solve the following using dimensional analysis. Show all of your work below each problem. Box your final answer. Answers should be given using significant digits.
  a. Gold atoms have an atomic radius of 1.46 Å (angstroms). How many gold atoms would have to be laid side by side to give a row of gold atoms 6'5" long?

  b.   At room temperature oxygen gas travels at 393.5 meters per second. Calculate how fast oxygen gas travels in miles per hour.

Part 5. Solve each of the following density problems. Show all work below the problem.
   a. Diamonds have a density of 3.513 g/mL. The mass of diamonds is often measured in carats, 1 carat equaling 0.200 g. If a 2.50 carat diamond is dropped in 8.25 mL of water, what will be the new volume of the water and diamond?

   b. The water level in a graduated cylinder stands at 18.0 mL before and at 36.2 mL after a 56.74 g metal bolt is submerged in the water. (a) What is the volume of the bolt? (b) What is the density of the bolt? (c) What is your % error if the actual density of the metal in the bolt is 3.25 g/mL?

   i. _____   ii. _____   iii. _____

Part 6. Solve each of the following multiple choice questions.

1. _____ Which of the following is an example of a physical change to a pure substance?
         a. an apple reacting with oxygen and turning brown   b. sublimation of iodine
         c. melting 6.0 grams of salt water   d. burning of coal

2. _____ Which of these is the percent of error in evaluating the molecular mass of a compound if the experimental value was 105.2 amu and the known value was 107.5 amu?
         a. 1.0%   b. 2.1%   c. 3.3%   d. 4.2%

3. _____ Which set of equipment would be most useful to determine the density of a liquid?
         a. Balance and periodic table   b. Periodic table and thermometer
         c. Balance and graduated cylinder   d. Graduated cylinder and thermometer

4. _____ One serving of peanut butter is 36 grams. Which of the following is the same value in kilograms?
         a. 3.6×10^{-4} b. 3.6×10^{-3} c. 3.6×10^{-2} d. 3.6×10^{4}

5. _____ Which of the following is NOT an intensive & physical property?
         a. malleablity   b. good conductor of heat
         c. density of 3.4 g/mL   d. mass of 32.0 grams

6. _____ Which of the following is an extensive property?
         a. reacts with water   b. density of 3.0 g/mL
         c. melts at 424 K   d. mass of 10.0 grams

7. _____ Which of the following measurements shows good precision & good accuracy, if the actual scientific value is 3.74 cm?
         a. 2.75 cm, 3.75 cm , 4.05 cm   b. 3.76 cm, 3.76 cm, 3.75 cm
         c. 4.02 cm, 4.02 cm, 4.01 cm   d. 4.52 cm. 4.78 cm, 3.01 cm

8. _____ Which separation technique would be used by someone stranded at sea to make salt water drinkable?
         a. decanting   b. electrolysis   c. distillation   d. chromatography

9. _____ How many total significant figures would the solution to the following calculation have?
321.3 + 0.003 + 680.
           a. 4   b. 3   c. 2   d. 1

10. _____ Two solid objects are of equal volume, but object A has a density = X and object B has a density = (0.5)(X). Which of the following is true concerning objects A & B?
           a. Object B has twice the density of object A.   b. Objects A & B are of equal mass.
           c. Object A has one half the mass of object B.   d. Object A has twice the mass of object B.

11. _____ Some bottles of colorless liquids were being labeled when the technicians accidentally mixed them up and lost track of their contents. A 15.0 mL sample withdrawn from one bottle weighed 22.3 g. Which of the following is the correct identity of the unknown liquid?
           a. acetone, d=0.792 g/mL   b. benzene, 0.899 g/mL
           c. chloroform, d=1.489 g/mL   d. carbon tetrachloride, d=1.595 g/mL

12. _____ The proper scientific notation for 565,000,000,000 is —
           a. 0.565×10^9 b. 5.65×10^{11} c. 56.5×10^{11} d. 565×10^{12}

13. _____ Sublimation is an example of an:
           a. exothermic chemical change   b. endothermic physical change
           c. endothermic chemical change   d. exothermic physical change

14. _____ The graphite in a mechanical pencil has a size of 0.7 millimeters. What is this value in meters?
           a. 7×10^3 b. 7×10^{-3} c. 7×10^{-2} d. 7×10^{-4}

15. _____ Many reactions are taken to completion by heating the reaction mixture in a test tube. Each of the following would be a safe practice *except* –
           a. heating the test tube gently to prevent the solution from boiling over
           b. pointing the test tube away from others so that no one is injured
           c. placing a stopper in a test tube to prevent gas from escaping
           d. holding the test tube with test tube clamps to avoid touching hot objects

16. _____ How many significant figures are there in 0.0090290 m?
           a. 5   b. 3   c. 7   d. 8

17. _____ A student measured the temperature of a boiling solution and found it to be 56.0°C at standard pressure. The theoretical temperature of that boiling solution is 55.0°C. What is the percent of error in the student's measurement?
           a. 18%   b. 1.8%   c. 0.18%   d. 0.018%

18. _____ In order to determine the identity of a substance, a student listed the following properties. Which of the following is a chemical property?
           a. Oxidizes in air   b. Conducts an electric current
           c. Attraction to a magnet   d. Dissolves in water

19. _____ Which of the following would sink in water?
           a. substance a, density 2.0 g/L   b. substance b, density 0.7 g/mL
           c. substance c, density 1.1 g/mL   d. none of the above

Part 7. Identify each of the following as a compound, monoatomic element, or molecular element

1. _____ NO_2 4. _____ Ne

2. _____ N_2 5. _____ NH_3

3. _____ O_3 6. _____ Na