Problem Set – Chapter 1 Name:_____

1.2 Scientific Notation:

Change to decimal form:

1) 4.3×10^{-3}: _____

2) 9.05×10^{7}:_____

Change to scientific notation:

3) 292,000:_____

4) 0.000031:_____

Dimensional Analysis – Metric Prefixes and Temperature (Show your work!!)

1) 60 kg = _____g

2) 62 cm = _____m

3) 5.3 L = _____µL

4) 6.2×10^{4} nm = _____m

5) 8.43 cm = _____mm

6) 53 kg = _____cg

7) 30°C = _____K

8) 500 K =_____°C

9) 22°C = _____°F

10) 600°F = _____K

1.5 Significant Figures:

How many significant figures are in each of the following:

5) _____a) 12

_____b) 1098

_____c) 2001

_____d) 2.001×10^{3}

_____e) 0.0000101

_____f) 1.01×10^{-5}

_____g) 1000.

_____h) 22.04030

Round to 3 significant figures and put in scientific notation:

6) a) 312.54 _____

b) 0.00031254_____

c) 31,424,000_____

d) 0.3164: _____

e) 31.273×10^{-3}_____

Round to the appropriate number of significant figures:

7) 5.3×800 = _____

8) 0.0062 + 4.05 = _____

9) $6.02 \times 10^{23} \times 4$ = _____

10) 5.032 – 4 = _____

11) 171.5 + 72.915 – 8.23 = _____

12) $\frac{(0.102 \times 0.0821 \times 273)}{1.01}$ = _____

13) $4.184 \times 100.62 \times (25.27 - 24.16)$ =_____

14) $\frac{(8.925 - 8.904)}{8.925} \times 100$ =_____ (Note: Assume 100 is an exact number.)

15) $\frac{(9.04 - 8.23 + 21.954 + 81.0)}{3.1416}$ = _____

1.7 Derived Units

1) What is the density of an object that has a mass of 5.4 g and occupies 5.0 cm^3? _____

2) What is the mass of a 5.0 L gas that has a density of 2.3 g/L? _____

3) What is the volume of a 0.030 kg object that has a density of 4.8 g/mL?_____

4) In each of the following pairs, which has the greater mass?

Densities: lead (11.3 g/mL), mercury (13.6 g/mL), water (1.0 g/mL), gold (19.3 g/mL), copper (8.9 g/mL), benzene(0.88 g/mL)

a. 1.0 kg of feathers or 1.0 kg of lead:_____

b. 1.0 mL of mercury of 1.0 mL of water:_____

c. 19.3 mL of water or 1.00 mL of gold:_____

d. 75 mL of copper or 1.0 L of benzene:_____

1.8 Classification and Separation of Matter

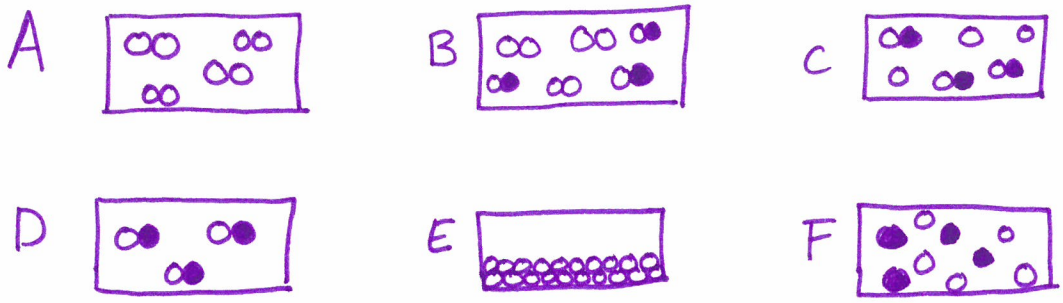
1) Match each description below with the following microscopic pictures. More than one picture may fit each description. A picture may be used more than once or not at all.

a) A gaseous compound:_____

b) A mixture of two gaseous elements:_____

c) A solid element:_____

d) A mixture of a gaseous element and a gaseous compound:_____



2) Classify each of the following as a mixture or a pure substance. Of the pure substances, which are elements and which are compounds?

a. water _____

b. blood _____

c. ocean water _____

d. iron _____

e. brass _____

f. uranium_____

g. sugar _____

h. gasoline_____

i. table salt_____

j. koolaid_____

3) Classify the following as physical or chemical changes.

a. Moth balls gradually vaporize in a closet. _____

b. Hydrofluoric acid attacks glass and is used to etch calibration marks on glass laboratory utensils._____

c. A French chef making a sauce with brandy is able to boil off the alcohol from the brandy, leaving just the brandy flavoring._____

d. Chemistry majors sometimes get holes in the cotton jeans they wear to lab because of acid spills._____

Physical Properties – Extensive or Intensive?

1) hardness:_____

2) length:_____

3) density:_____

4) volatility:_____

5) volume:_____

6) texture:_____