

**Exam I – Chapters 1-4 – 100 points**

$$1\text{ lb} = 454\text{ g}$$

$$1\text{ mile} = 1.61\text{ km}$$

$$1\text{ inch} = 2.54\text{ cm}$$

$$1\text{ qt} = 946\text{ mL}$$

$$T_{\circ\text{F}} - 32 = 1.80 \times T_{\circ\text{C}}$$

Circle the correct answer for each of the following:

- (4 pts) When converting from decimeters into meters you need to divide by  
a. **10**                      b. 100                      c. 1000                      d. 1
- (4 pts) How many significant figures are in the following number: 0.00230 mL?  
a. 1                      b. 2                      **c. 3**                      d. 4
- (4 pts) Circle the correct answer to the following operation:  $(2.340\text{ cm} - 1.50\text{ cm}) \times (13\text{ cm} + 5.6\text{ cm})$   
a.  $15.624\text{ cm}^2$                       b.  $15.6\text{ cm}^2$                       **c.  $16\text{ cm}^2$**                       d.  $20\text{ cm}^2$
- (4 pts) The total number of atoms in caffeine,  $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$ , is  
a. 20                      b. **24**                      c. 4                      d. 8
- (4 pts) Density is a measure of  
a. volume over mass  
b. volume times mass  
**c. mass over volume**  
d. mass times volume
- (4 pts) Some units are listed below. Which one is metric?  
a. in                      b. mi                      c. lb                      **d. cL**
- (4 pts) The element in period 3 that forms a -2 charge when it becomes an ion is:  
a. **S**                      b. Mg                      c. Cl                      d. Ar                      e. Si
- (4 pts) What group of elements are all gases at room temperature?  
a. alkali metals                      b. halogens                      c. semi-metals                      **d. noble gases**
- (4 pts) The noble gas in period 5 is:  
a. Rb                      **b. Xe**                      c. He                      d. I                      e. Sb
- (4 pts) Which element is a liquid at room temperature?  
a. He                      b. K                      c. H                      **d. Hg**                      e. Ca
- (4 pts) The semimetal in group VA is:  
a. N                      b. P                      c. Bi                      d. Xe                      e. **As**

12. (10 pts) Please write the correct name for each element listed (spelling counts!):

a. K     **potassium**

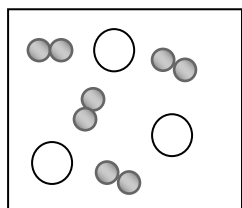
b. Ca    **calcium**

c. Al    **aluminum**

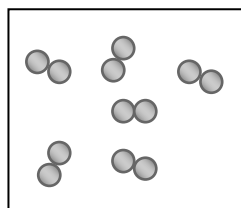
d. S     **sulfur**

e. B     **boron**

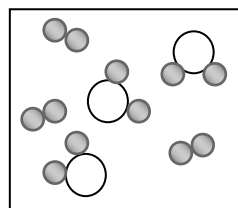
13. (5 pts) Which picture best describes a mixture of two elements? (circle one)



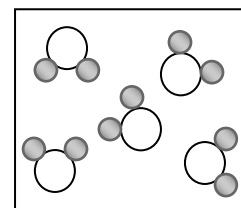
a. **\*\***



b.



c.



d.

14. (5 pts) Circle all of the following that are physical changes:

burning

**melting**

**evaporating**

**grinding**

bubbling

15. (6 pts) Convert 3.46 feet into centimeters.

$$3.46 \text{ ft } (\underline{12 \text{ in}})(\underline{2.54 \text{ cm}}) = 105 \text{ cm}$$
$$(\underline{1 \text{ ft}}) (\underline{1 \text{ in}})$$

16. (6 pts) A 100-mL graduated cylinder contains 54.6 mL of water. A 4.5290 g object is placed in the cylinder. The volume reads 68.0 mL after the object is placed in the cylinder. What is the density of the object?

$$\text{Volume} = 68.0 \text{ mL} - 54.6 \text{ mL} = 13.4 \text{ mL} \quad \text{Density} = \text{mass/volume} = 4.5290 \text{ g} / 13.4 \text{ mL} = 0.338 \text{ g/mL}$$

17. (6 pts) The total mass of a 25.0% salt solution is 45.70 g. How many grams of salt are in the solution?

$$\% = \frac{\text{part}}{\text{whole}} \times 100\% \quad 25.0\% = \frac{x \text{ g salt}}{45.70 \text{ g}} \times 100\% \quad \text{So } x \text{ g salt} = 11.4 \text{ g salt}$$

18. (6 pts) Convert 55°C into °F.

**131 °F**

19. (6 pts) Sodium metal reacts with chlorine gas to make solid sodium chloride. A student wants to make 13.0 g of sodium chloride, NaCl. If the student has 4.68 g of chlorine gas, how much sodium metal does the student need?

Law of Conservation of Mass =  $13.0 \text{ g} - 4.68 \text{ g} = 8.3 \text{ g}$  (2 sig figs due to addition rule!!)

20. (3 pts) Write the correct formula for **three** of the seven diatomic elements.

$\text{N}_2, \text{H}_2, \text{O}_2, \text{F}_2, \text{Cl}_2, \text{I}_2, \text{Br}_2$

21. (3 pts) Please complete the following sentence with the correct word:

A **heterogeneous** mixture contains substances that can be separated by physical means (e.g., filtration).

**Extra credit:**

Write the name of the following compounds (2 pts each and spelling counts!)

- a. MgO      **magnesium oxide**
- b. Na<sub>2</sub>S      **sodium sulfide**
- c. AlCl<sub>3</sub>      **aluminum chloride**