



**Part 1 - Naming/Formulas (40 pts)**

1. (20 pts) Name the following compounds:

- a.  $\text{Ba}_3(\text{PO}_4)_2$  \_\_\_\_\_
- b.  $\text{Na}_2\text{O}$  \_\_\_\_\_
- c.  $\text{SCl}_3$  \_\_\_\_\_
- d.  $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$  \_\_\_\_\_
- e.  $\text{OF}_2$  \_\_\_\_\_
- f.  $\text{ArF}_5$  \_\_\_\_\_
- g.  $\text{KBr}$  \_\_\_\_\_
- h.  $\text{Cr}_2\text{S}_3$  \_\_\_\_\_
- i.  $\text{LiOH}$  \_\_\_\_\_
- j.  $\text{N}_2\text{O}_5$  \_\_\_\_\_

2. (20 pts) Give the chemical formula for each of the following compounds

- a. Zinc(II) chromate
- b. Disulfur dichloride
- c. Nitrogen trioxide
- d. Ammonium fluoride
- e. Magnesium hydroxide
- f. Sodium carbonate
- g. Cobalt(II) chloride
- h. Dichlorine monoxide
- i. Sulfur hexafluoride
- j. Carbon dioxide

**Part 2 – Quantum numbers, electron configurations, periodic trends (20 pts)**

- (5 pts) Write all the possible quantum numbers for  $n = 3$ . ( $n$ ,  $l$ ,  $m_l$ , and  $m_s$ )
- (10 pts) Write the noble gas electron configuration for the following atoms and ions. Identify if they are paramagnetic or diamagnetic by circling the correct choice.

	<b>Noble Gas Configuration</b>	<b>Para or Diamagnetic</b>
a. Cl	_____	P or D
b. Cr	_____	P or D
c. Cs	_____	P or D
d. $\text{Se}^{2-}$	_____	P or D
e. $\text{Mn}^{2+}$	_____	P or D

- (3 pts) Rank the following in order of increasing ionization energy: Si, C, S, F and Ca.
- (2 pts) Rank the following in order of increasing atomic radii: F, S, and N.

**Part 3 – Calculations (30 pts), show ALL work for credit.**

- (10 pts) What is the energy of light that has a frequency of  $5.15 \times 10^{14} \text{ s}^{-1}$ ?
- (5 pts) What is the molecular formula of a compound that has a molar mass of 176.4 g/mol and an empirical formula of  $\text{C}_3\text{H}_8$ .

3. (15 pts) Acetylsalicylic acid,  $C_9H_8O_4$ , is the active ingredient in aspirin.
- Calculate the molar mass of  $C_9H_8O_4$ .
  
  
  
  
  
  
  
  
  
  
  - Calculate the percent of oxygen in  $C_9H_8O_4$ .
  
  
  
  
  
  
  
  
  
  
  - One aspirin tablet can contain 0.250g of  $C_9H_8O_4$ . How many molecules is this?

**Part 4 - Short Answer (10 pts), Give the best answer, please print legibly.**

- In an atom, \_\_\_\_\_ electrons participate in bonding and chemical reactions, but \_\_\_\_\_ electrons shield the nucleus.
  
  
  
  
  
- Metals tend to form \_\_\_\_\_ and nonmetals tend to form \_\_\_\_\_ which attract to form ionic compounds.
  
  
  
  
  
- A compound that holds a specific number of water molecules within its solid structure is called a(n) \_\_\_\_\_.