Sample Problems

- 1. Determine the expected electron configurations for each of the following:
 - a. S
 - b. Ba
 - c. Ni²⁺
 - d. Eu
 - e. Ti⁺
- 2. Which is larger, the hydrogen 1s orbital or the Li 1s orbital? Why? Which is lower in energy, the hydrogen 1s orbital or the Li 1s orbital? Why?
- 3. Which atom would require more energy to remove an electron, Na or Cl? Why?
- 4. Which atom would require more energy to remove an electron, Li or Cs? Why?
- 5. What is the general trend for ionization energy across rows and down columns on the periodic table? (Understand this trend; do not merely memorize it!!)
- 6. Which should be the larger atom, Li or Cs? Why?
- 7. What is the general trend for atomic sizes across rows and down columns on the periodic table? (Understand this trend; do not merely memorize it!!)
- 8. Arrange the elements oxygen, fluorine and sulfur according to increasing
 - a. Ionization energy
 - b. Atomic size
- 9. Explain why the graph of ionization energy verses atomic number (across a row) is not linear. Where are the exceptions? Why are there exceptions?
- 10. Which has the larger second ionization energy, lithium or beryllium? Why?