The Periodic Table Review

1. Identify the following elements as a metal, metalloid or nonmetal, and as a solid, liquid, or gas at room temperature.

Element	Symbol	Metal, metalloid, or nonmetal?	Solid, liquid or gas?
Fluorine			
Germanium			
Zinc			
Phosphorus			
Lithium			

2. Name two elements that have properties similar to those of the element potassium. Why did you pick these two?

3. List at least 2 properties of each: metals, nonmetals and metalloids.

4. Use the periodic table to write the electron configuration for silicon and iodine. (Shorthand or Longhand)

    a. Si:

    b. I:

5. Complete the following table with the appropriate electron configurations, number of valence electrons, and electron dot notation.

Element	Electron Configuration	# of electrons	# of valence electrons	Electron dot structure
Si				
Se				
Nb				
Eu				

6. For the following elements, predict what ion will form and write the electron configuration for the ion.

    a. I

    b. Sr

    c. S

    d. Rb

7. Name the element that matches the following description.

   a. one that has 5 electrons in the third energy level _____

   b. one with an electron configuration that ends in $4s^2 4p^5$ _____

   c. the Group 6A element in period 4 _____

   d. the alkaline earth metal in period 6 _____

   e. The noble gas with the smallest atomic radius _____

   f. The alkali metal with the greatest ionization energy _____

   g. The halogen with the lowest electronegativity _____

8. What is the common characteristic of the electron configurations of the elements Ne and Ar? In which group would you find them?

9. Is a magnesium atom smaller or larger than the atoms of both sodium and calcium? Explain.

10. What is ionization energy? Which of the following has the lowest ionization energy: sodium or potassium?

11. Describe electrogegativity. Is the electronegativity of barium larger or smaller than that of strontium?

12. Tell whether each of the following elements is an *inner transition metal*, a *noble gas*, an *alkali metal*, an *alkaline earth metal*, or a *halogen*. The give its period and group numbers (ex. 18 & 8A.)

Element	Symbol	Type	Period #	Group #'s
Calcium				
Cesium				
Fluorine				
Chromium				
Neon				
Silver				

13. Among the following parts of atoms and ions, identify the larger of the two:

Atom, Ion	Larger Atomic Radius
Li, Li^+	
Cl, Cl^-	
Mg, Mg^{2+}	

14. Given the outermost energy level configurations below, complete the table by providing the period number, group number, group name (if appropriate), and symbol for each element identified.

Element	Period #	Group #	Group Name	Symbol
$[He]2s^2$				
$[Ne]3s^23p^3$				
$[Ne]3s^23p^6$				
$[Ar]4s^1$				
$[Ar]4s^23d^1$				
$[Ar]4s^23d^{10}4p^5$				

15. Among the following pairs of atoms, identify the larger of the two, the one with the greater first ionization energy, and the one with the lower electronegativity.

Element	Larger Atomic Radius	Greater Ionization Energy	Lower Electronegativity
Li, K			
C, F			
Mg, Ca			
O, S			

16. The outermost energy level configurations for the theoretical elements A-E are listed below. Use the symbols A through E to answer each of the questions that follow.

A = $3s^2$ B = $3s^1$ C = $2s^22p^6$ D = $2s^22p^5$ E = $2s^22p^3$

a. Which has the lowest first ionization energy? _____

b. Which is a noble gas? _____

c. Which has the highest electronegativity? _____

d. Which has the highest second ionization energy? _____

e. Which is the largest atom? _____

17. How are the values of both ionization energy and electronegativity related to atomic size?