Homework #3

You must show your entire work on a separate sheet(s) of paper to get full credit.

1. What happens when an electron collapses back to its ground state from an excited state?

2. Draw a diagram similar to the step ladder method in lecture with the electronic configuration of the following elements.
   a. Sodium       b. Magnesium
   c. Aluminum     d. Silicon
   e. Phosphorus   f. Argon

3. How many valence electrons does each element have in Question 2?

4. Classify each of the following elements as a metal, a nonmetal, or a semimetal.
   a. Helium       b. Sodium     c. Iodine     d. Calcium     e. Boron

5. What is the maximum number of electrons that could be contained in each of the following?
   a. a 2s orbital     b. a 2s subshell    c. the first shell    d. a 3d subshell

6. Write an electronic configuration for each of the following elements, using the form 1s², 2s², 2p⁶, and so on. Indicate how many of the electrons are unpaired in each case.
   a. Ca               b. nickel              c. element number 34            d. V

7. Use trends with the periodic table and indicate which member of the following pairs has the larger atomic radius.
   a. Mg or Sr       b. Rb or Ca       c. S or Te       d. I or Sn

8. Write the symbol and name for the elements located in the periodic table as follows:
   a. belongs to group VIA(16) and period 3
   b. the first element (reading down) in group VIB (6)
   c. the fourth element (reading left to right) in period 3
   d. belongs to group 1B and period 5

9. Identify the subshells found in the fourth shell (n=4) and indicate the maximum number of electrons that could occupy each subshell and the total number of electrons that could occupy the shell.