Chapter 5: Electrons Review

1. ***Define*** the following terms:
   a. energy levels b. atomic orbital c. principle quantum number (n)
   d. frequency e. ground state
2. True or False The ***Rutherford model*** could not explain the behavior of ***protons***.
3. True or False The ***Bohr model*** described ***electrons*** moving in set ***orbits***.
4. True or False The ***Quantum Mechanical model*** describes the probability of finding ***electrons*** in ***orbitals***.
5. True or False ***Orbitals*** are regions with a ***high probability*** (90%) of finding ***electrons***.
6. ***Describe*** the three rules for writing ***electron configurations***:
   a. Aufbau Principle b. Pauli Exclusion Principle c. Hund's Rule
7. ***Identify*** each element based its the ***electron configuration***.
   a. $1s^2\ 2s^2\ 2p^6\ 3s^1$
   b. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^{10}\ 5p^6$
   c. [Kr] $5s^2\ 4d^{10}\ 5p^3$
   e. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^5$
   f. [Ne] $3s^2\ 3p^1$
   g. [Xe] $6s^2\ 4f^{10}$
8. For the following elements list the ***electron configuration***.
   a. oxygen b. cesium c. Chlorine d. iron
9. How many ***s orbitals*** can there be in an ***energy level***? p, d and f orbitals?
10. How many ***electrons*** can occupy an ***s orbital***? p, d and f orbitals?
11. What is the ***shape*** of a ***s orbital***? p, d and f orbitals?
12. Which is the ***lowest energy level*** that can have a ***s orbital***? p, d and f orbitals?
13. Distinguish between an atom in its ***ground state*** and an ***excited atom***.

Chapter 6: Periodic Trends Review

1. What is Mendeleev's ***periodic law***?
2. Identify each element as a ***metal, metalloid, or nonmetal***.
   a. fluorine b. germanium c. zinc d. phosphorus e. lithium
3. Give ***two*** examples of elements for each category.
   a. noble gases b. halogens c. alkali metals d. alkaline earth metals
4. What trend in ***atomic radius*** do you see as you go down a ***group/family*** on the periodic table? What causes this trend?
5. What trend in ***atomic radius*** do you see as you go across a ***period/row*** on the periodic table? What causes this trend?
6. Select the atom in each pair that has the largest ***atomic radius***.
   a. Al B b. S O c. Br Cl d. Na Al e. O F f. Mg Ca
7. Define ***ionization energy***.
8. Is it easier to form a ***positive ion*** with an element that has a high ***ionization energy*** or an element that has a low ***ionization energy***? Explain.
9. What trend in ***ionization energy*** do you see as you go down a ***group/family*** on the periodic table? What causes this trend?
10. What trend in ***ionization energy*** do you see as you go across a ***period/row*** on the periodic table? What causes this trend?
11. Circle the atom in each pair that has the greater ***ionization energy***.
   a. Li Be b. Na K c. Cl Si d. Ca Ba e. P Ar f. Li K
12. Define ***electronegativity***.
13. What trend in ***electronegativity*** do you see as you go down a ***group/family*** on the periodic table? What causes this trend?
14. What trend in ***electronegativity*** do you see as you go across a ***period/row*** on the periodic table? What causes this trend?
   a. Ca Ga b. Li O c. Cl S d. Br As e. Ba Sr f. O S