Homework Assignment
Hill-Petrucci
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1. Orbitals that possess electrons with the same quantity of energy are said to be degenerate.
   B & C
2. B & C for Hydrogen
   Only C for all other atoms.
   Since Hydrogen only possesses electrons in levels 1 & 2 in the ground state, all orbitals in the 3rd energy level would be empty and would be considered degenerate until occupied by an electron.
3. Spins must be in the same direction before being paired so the bottom diagram best represents carbon.
4. a. Fluorine   b. Copper   c. Nitrogen   d. Sodium   e. Iron
5. a. s   b. p   c. d   d. f
6. Li, Na, K have one valence electron in their electron configuration
   Be,Mg,Ca have two valence electrons in their electron configuration
7. a. 4,2   b. 8,2   c. 7,2   d. 3,10 e. 2,10
8. In the first period, there is only s
   In the third period, there is S & P so a change of 8 electrons occurs across the row.
   In the fifth period, there is S,P & D so a change of 18 electrons occurs across the row.
   In the seventh period, there is S,P, D & F so a change of 32 electrons occurs across the row.
9. The atomic number for argon is 18 and for potassium 19.
10. 6 electrons
    3-dimensional dumbbell-shaped
    3 orbitals (p_x,p_y,p_z)
11. c-Fe and e-Pt
21. a. One pair has parallel spins
    b. There are 3 electrons in one 2p orbital
    c. The spins of the unpaired electrons in the 2p orbital should all be the same
22. a. The 2s electrons have the same spin
    b. There are 3 electrons in one of the 2p orbitals
    c. The unpaired 3p electrons do not have the same spin.
23. a. The 3s must fill before any electron goes into the 3p.
    b. The 4s fills before the 3d
    c. The 2d does not exist.
25. a. 2s can only have two electrons. 2p is lower in energy than 3s
    b. 2p can only have 6 electrons
    c. There is no 2d
27. a. $1s^22s^22p^63s^2$ e. $1s^22s^22p^63s^23p^3$
    b. $1s^22s^22p^5$ f. $1s^22s^22p^63s^23p^2$
    c. $1s^22s^22p^4$ g. $1s^22s^22p^2$
    d. $1s^22s^2$ h. $1s^22s^22p^63s^23p^64s^1$
                                   i. $1s^22s^22p^63s^23p^64s^23d^1$