Quantum Numbers

1. Determine the total number of $e^-$ that can occupy the following:
   a. One $s$ orbital
   b. Three $p$ orbitals
   c. Five $d$ orbitals
   d. Seven $f$ orbitals

2. Determine how many $e^-$ can have the following quantum numbers:
   a. $n=3, l=0$
   b. $n=3, l=1$
   c. $n=3, l=2, m_l=-1$
   d. $n=5, l=0, m_l=-2, m_s=-1/2$

3. How many $e^-$ can exist in all of the $n=5$ orbitals?

4. How many possible orbitals are there for $n=4$?

5. Figure out the $n$ and $l$ values for the following orbitals:
   a. 2s
   b. 7s
   c. 6p
   d. 5d
   e. 4f

6. State all of the four quantum numbers, their names and explain what they represent.

7. What are the $m_l$ values for a $d$ orbital?

8. What is the lowest value of $n$ for which a $d$ subshell can occur?

9. A single subshell orbital can contain how many $e^-$?

10. Fluorine commonly has an oxidation state of -1. Draw orbital diagrams, with quantum numbers $l$ and $m_l$ labeled, of both the neutral atom and the most common oxidation state.