Problem Set 5: Atomic Structure

1a) Identify the shell and subshell of an orbital with the quantum numbers n = 3 and l =2.

b) How many different orbitals of this type are there?

c) How many electrons could this set of orbitals hold?

2) Give all possible sets of quantum numbers for an electron in a 4p orbital.

Value of n	**Value of l**	**Value of m_l**	**Value of m_s**

3) Provide orbital notation for electrons in orbitals defined with the following quantum numbers:

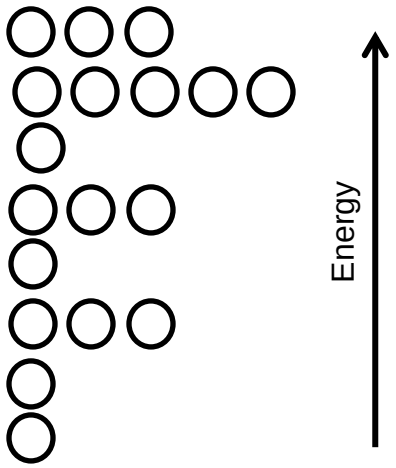
a) n =2, l = 1, ml = 1

b) n = 4, l = 3, ml = -2

c) n =3, l = 2, ml = 0

4) a) Give the ground-state electron configuration of arsenic, Z = 33.

b) Draw an orbital filling diagram, indicating the electrons as up or down arrows.



c) What is the shorthand electronic configuration of this atom?

5) Predict the main group ions that will form from the following atoms and write the shorthand electron configuration for the ion.

a) Mg
b) S
c) Al