Name: _____
Review: Atomic Orbitals

1. Is the set of quantum numbers permissible? If no, why not?

   n = 1, ℓ = 0, m_ℓ = 1, m_s = +½

   n = 2, ℓ = 1, m_ℓ = 1, m_s = +½

   n = 2, ℓ = 2, m_ℓ = 1, m_s = +½

   n = 3, ℓ = 2, m_ℓ = -3, m_s = +½

2. How many electrons can be located in the p subshell?

   How many electrons can be located in a single p orbital?

   How many orbitals are in the d subshell?

   How many electrons can be in the n = 1 energy level?

3. Write the full electron configuration:

   Phosphorus (P)

   Magnesium (Mg)

   Yttrium (Y)

4. Write the abbreviated Noble gas electron configuration:

   Calcium (Ca)

   Copper (Cu)

   Lead (Pb)

   Silver (Ag)

5. What element is represented by the electron configuration?

   [Ar] $4s^1\ 3d^5$

   $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^{10}\ 5p^5$

   [Rn] $7s^2\ 5f^{14}\ 6d^2$

6. Is the electron configuration permissible? If no, why not?

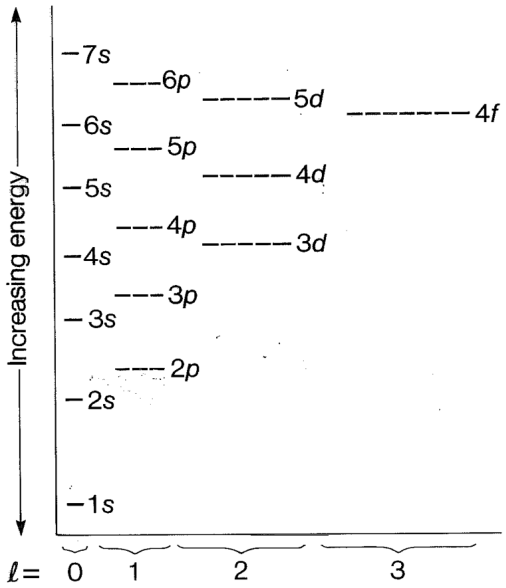
   [Ar] $4s^2\ 3d^9$

   $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4d^{10}\ 4p^6\ 5s^1$

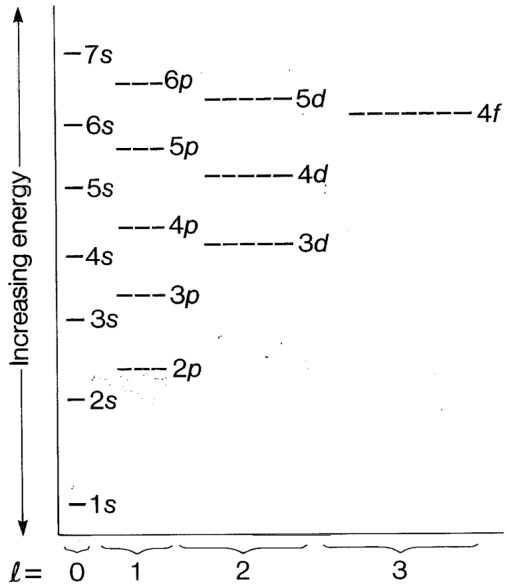
   $1s^2\ 1p^6\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$

7. Fill in the orbital diagram for the following elements.

Vanadium (V)



Carbon (C)



Sulfur (S)