Name _____ date _____

Quantum Numbers and Electron Configuration

1. Indicate which of the following orbital destinations are possible.
   a. 7s b. 1p c. 5d d. 2d e. 4f

2. Explain why there are 10 elements in each **"d"** series.

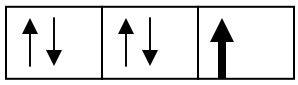
3. Explain why the following ground-state electron configurations are not possible:
   a. $1s^2 2s^3 2p^3$ b. $1s^2 2s^2 2p^3 3s^6$ c. $1s^2 2s^2 2p^7 3s^2 3p^8$ d. $1s^2 2s^2 2p^6 3s^2 3p^1 4s^2 3d^{14}$

4. How many unpaired electrons are there in the ground state of each of the following atoms?
   a. Ge b. Se c. V d. Fe e. Si f. Mo g. Ag

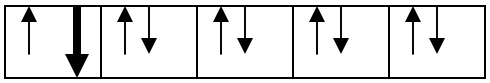
5. Which sets of quantum numbers are unacceptable? Why?
   a. n=3, l= -2, m_l=0, m_s= +½
   b. n=2, l= 2, m_l= -1, m_s= -½
   c. n=6, l= 2, m_l= -2, m_s= +½

6. Write the values for the quantum numbers for the bold electron in the following diagrams:

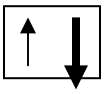
   a. 3p orbitals



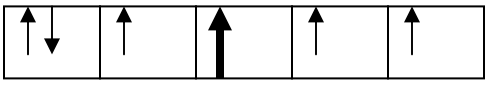
   c. 4d orbitals



   b. 5s



   d. 3d orbitals



7. Determine element whose outermost electron has the following quantum numbers.

Quantum Number "Code"	Element
a. n=1, l = 0, m_l = 0, m_s = - ½	_____
b. n=2, l = 1, m_l = -1, m_s = + ½	_____
c. n=2, l = 1, m_l = 0, m_s = - ½	_____
d. n=3, l = 1, m_l = -1, m_s = - ½	_____
e. n=5, l = 3, m_l = 3, m_s = + ½	_____
f. n=3, l = 1, m_l = 1, m_s = - ½	_____
g. n=4, l = 0, m_l = 0, m_s = + ½	_____
h. n=3, l = 2, m_l = -2, m_s = + ½	_____
i. n=3, l = 2, m_l = 2, m_s = - ½	_____
j. n=4, l = 1, m_l = 0, m_s = + ½	_____