GLY 4200C NAME_____

HOMEWORK 2 - Fall 2019

Periodic Table and Quantum Numbers KEY

1. List the complete electronic configuration of each of the following. You may use [ ] around an inert gas element symbol to indicate the electrons up to and including that element.

A. Ti^{2+} [Ar] $3d^2$

B. Co^{3+} [Ar] $3d^6$

C. Al^{3+} [Ne]

D. Br^{-1} [Ar] $3d^{10}4s^2\ 4p^6$

E. As^{3+} [Ar] $3d^{10}4s^2$

2. List five species (ions or atoms) with the electronic configuration

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

Te^{2-}

I^-

Xe

Cs^{+1}

Ba^{2+}

3. What type of orbitals are being filled across the rare earth elements and the actinides?
f orbitals

4. What type of orbital (s, p, d, or f) are being filled across the first, second, and third transition series? d orbitals

5. Give a general description of the valance electrons for each of the indicated columns of the periodic table. See example. (Be sure to use a modern table - column designations have changed).

Column	Valance configuration
EX. Alkali Metals	ns^1, n = 1 to 7
Column 3 (Sc on down)	$nd^1 (n+1)s^2$ n = 3-6
Column 14 (C on down)	$ns^2 np^2$, n=2-6
Column 16 (O on down)	$ns^2 np^4$, n=2-6

6. List the valence electrons of the following species.

A. Mg $3s^2$

B. Ga $4s^2 4p^1$

C. Sb $5s^2 5p^3$

D. Cl $3s^2 3p^5$

E. Mn $3d^5 4s^2$

7. How many electrons can each of the following subshells hold?

A. 4p 6

B. 1s 2

C. 5f 14

D. 4d 10