Quantum Model of the Atom Practice

1.) What is the maximum number of electrons found in the:

a.) 1st principal energy level b.) 2nd principal energy level

c.) 3rd principal energy level d.) 4th principal energy level

2.) How many electrons are there in:

a.) a (s) subshell b.) a (p) subshell c.) a (d) subshell d.) a (f) subshell

3.) How many electrons are there in:

a.) a (p) orbital b.) a (f) orbital

4.) How many orbitals are there in:

a.) a (s) subshell b.) a (p) subshell c.) a (d) subshell d.) a (f) subshell

5.) For the following pairs of orbitals, indicate which is higher in energy:

a.) 3p or 4p b.) 4s or 4d c.) 2s or 3d d.) 5s or 4f

6.) Select the correct electron configuration for sulphur.

a.) $1s^2 2s^2 2p^6$ b.) $1s^2 2s^2 2p^8 3s^2 3p^4$ c.) $1s^2 2s^2 2p^8 3s^2 3p^2$

d.) $1s^2 2s^2 2p^6 3s^2 3p^4$ e.) $1s^2 2s^2 2p^6 3s^2 3d^4$

7.) Which of the following elements has the largest atomic size?

a.) S b.) Ca c.) Ba d.) Po e.) Rn

8.) Elements with _____ first ionization energies and _____ electron affinities generally form cations.

a.) low, very negative b.) high, positive or slightly negative c.) low, positive or slightly negative

d.) high, very negative e.) none of these is generally correct.

9.) Which of the following elements will form a cation with a $^{+2}$ charge?

a.) Si b.) Sr c.) Ga d.) Cs e.) S

10.) Which element has the following drawn electron configuration?

1s 2s 2p

a.) P b.) S c.) O d.) N e.) F

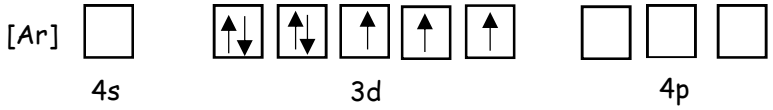
11.) Which $^{+3}$ ion has the ground state electron configuration $[Kr]4d^5$?

a.) Ru b.) Fe c.) Ag d.) Tc e.) Nb

12.) If the ground state electron configuration of an element is [Ar] $4s^2 3d^{10} 4p^3$, what is the typical charge on the monatomic anion of the element?

a.) $^{+2}$ b.) $^{+1}$ c.) $^{-1}$ d.) $^{-2}$ e.) $^{-3}$

13.) What $^{+2}$ ion has the following ground state drawn electron configuration?



a.) Ni^{+2} b.) Co^{+2} c.) Ca^{+2} d.) Cu^{+2} e.) Mn^{+2}

14.) Place the following atoms in order of increasing atomic radii: Ca, Mg, P, and Cl.