1) Write the abbreviated electron configuration of the atom K

2) Write the abbreviated electron configuration of the atom Rb

3) K and Rb are placed in the same group in the periodic table which indicates that they have similar chemical properties but what is the reason they do have the same properties?

4) Consider the electron configuration for iron - draw arrows up or down to indicate how the Fe electrons are placed into these 3d orbitals shown below

______ ______ ______ ______ ______ ______

5) A 6p orbital has what value of primary quantum number n =

and what value of secondary quantum number l =

6) And what are the possible values of m_l if l=2

7) An experiment is done in which a substance is found to conduct electricity when it is a liquid but not when it is a solid. Which of the following is a possibility based on these results

KBr, Br_2, K

8) What is the abbreviated electron configuration of Mo (one of the exceptions you learned)

9) And what is the electron configuration (not abbreviated) of the ion Fe^{2+}

10) And why is iron attracted to a magnet (paramagnetic)?
11) A photon of light has a frequency of \(2.00 \times 10^{14} \text{ s}^{-1}\) therefore the wavelength (m) is

12) If a photon of light has a frequency of \(2.00 \times 10^{14} \text{ s}^{-1}\) then what is the energy (J) of this one photon of light?

13) Which of the following types of electromagnetic radiation has the longest wavelength?
   microwave  x-rays  infrared light  radio waves  visible light

14) Circle the one of the following with the smallest size?
   \(\text{Fe}\)  \(\text{Fe}^{2+}\)  \(\text{Fe}^{3+}\)

15) How many sigma bonds and how many pi bonds in the ethene molecule \(\text{C}_2\text{H}_4\)? - Draw Lewis structure first and then count.

16) The atom with the smallest size is
   \(\text{K}\)  \(\text{Ca}\)  \(\text{Ga}\)  \(\text{As}\)  \(\text{Br}\)

17) The atom with the lowest ionization energy is
   \(\text{K}\)  \(\text{Ca}\)  \(\text{Ga}\)  \(\text{As}\)  \(\text{Br}\)

18) Sharing two electrons is the basis of a(n) _________ bond.
   metallic  covalent  ionic

19) Water molecules are found throughout living cells. Draw a Lewis structure for water and then identify the type of hybridization on the oxygen atom
   \(\text{sp}\)  \(\text{sp}^2\)  \(\text{sp}^3\)  \(\text{sp}^3\text{d}\)  \(\text{sp}^3\text{d}^2\)

20) What is the name for the electron pair geometry around oxygen in water?
21) And what is the name for the molecular geometry when only the atoms are considered?

22) And what is the more electronegative side of the polar water molecule
   oxygen side  hydrogens side

23) Aluminum has only one isotope aluminum-27. In the ion $^{27}$Al$^{3+}$ what are the number of
   protons  neutrons  electrons

24) Write the electron configuration (not abbreviated) for Al$^{3+}$

25) Draw the Lewis structure for alcohol molecule called ethanol C$_2$H$_5$OH

26) Draw the Lewis structure for O$_2$

27) How many different 4f orbitals are there?

28) Indicate which one of the following is an ionic compound by circling
   Na  SiO$_2$  H$_2$O  NaCl

29) Draw the Lewis structure for SF$_6$ and then answer the following
   hybridization on central S atom is  and molecular geometry is

30) Draw a picture of a wave and label the distance on your drawing that is used to define one
    wavelength