Series N°:5

Exercise 1:

Let's consider the following elements $_{17}Cl$, $_{3}Li$, $_{1}H$, and the task is:

1- Assign the appropriate electronegativity value to each element from the following values: 3.00, 2.1, 1.0;
2- based on the given values:

H-Cl	H-Li	
1.28 Å	1.61 Å	The distance between the two atoms
1.00 D	5.90 D	The dipole moment

The required task is to calculate the electric charge carried by the hydrogen atom in each of the previous molecules and then calculate the percentage of ionic character for each bond. What do you conclude?

Exercise 2:

Provide Lewis structures for the following molecules with bond determination:

$$H_2O, NH_3, SF_6, AlCl_3, SCl_2, CH_4, PCl_5$$

1- Which of the previous central atoms do not obey the octet rule?
2- Explain the absence of the molecule $NaCl_5$.

Exercise 3:

The dipole moments for the following two molecules, F_2O and H_2O, in the gas phase are 1.85 D and 0.3 D, respectively. If the bond angles in the same molecules are 104.5° and 103°, and the bond lengths O-H and O-F are 1 Å and 1.42 Å, respectively. The electronegativity values for the three atoms are as follows: $x_O = 3.44, x_H = 2.20, x_F = 3.98$

Calculate the dipole moment and the percentage of ionic character for the O-H and O-F bonds on each atom.