CHE 111 - Homework - Ch 4e

OER 4.4-4.6 **Basic Lewis Structures and VSEPR Theory** Score: _____/60

Name: _____ Date: _____

[15 pt] 1. Complete the following questions about Lewis Structures:

(a) When counting valence electrons in a cation _____an electron for each positive charge

(b) When counting valence electrons in an anion _____ an electron for each negative charge.

(c) Molecules should be drawn as _____ as possible and the least _____ element should be in the center.

(d) Hydrogen makes _____ bonds.

(e) Oxygen generally makes _____ bonds and very rarely (almost never in CHE 111) bonds to _____

(f) Nitrogen generally makes _____ bonds.

(g) Rarely Nitrogen can make _____ bonds if it is a _____

(h) F, Cl, Br, I generally make _____ bond.

(i) After making a trial structure start to complete _____ until you run out of _____

(j) If you can't complete _____ then you will need to form _____ and _____ bonds

(k) If you have completed all octets you are _____

[2 pt] 2. What does VSEPR stand for? What primary force determines the shape of molecules?

[3 pt] 3. Complete the following table:

# bonding e^-pairs	# lone e^-pairs	Molecular Shape	Bond Angle
4	0		
3	1		
		Bent	109.5
		Trigonal Planar	
2	1		
2			180

[40 pt] 4. Draw the Lewis Structure of the indicated molecule. List the number of Valence electrons. Predict the shape(s) and bond angles using VSEPR theory for all relevant atom(s) in the following molecules. Indicate if the molecule is Dipolar or Nonpolar. For ions, show on which atom the formal charges reside.

1. SiH_4	2. $CSBr_2$
3. SeO_3	4. NCl_3
5. CH_3OH	6. Cl_2O
7. HCO_3^-	8. PO_2^{-3}