**CHEM131 – General Chemistry I**

**Unit 6 – Molecular Structure and Covalent Bonding Theories**

**Guided Reading Exercise**

**Instructions: Answer the following questions after reading Chapter 8.**

1. Construct a flow diagram to show the procedure for analyzing the structure and bonding in any compound.

2. (a) Summarize the basic ideas of the valence shell electron pair repulsion (VSEPR) theory.

(b) How are the electron groups around the central atom counted?

(c) According to VSEPR theory, when is the molecule or ion most stable?

3. (a) What leads to the formation of a polar bond?

(b) For a molecule to be polar two conditions must be met. List the two conditions.

(c) Construct a flow diagram which can be used to determine whether a polyatomic ion is polar or non-polar.

4. (a) Copy Tables 8-1, 8-2, 8-3 & 8-4 into your notebook.

(b) Make short notes on each of the following (include experimental facts and Lewis formulas, VSEPR theory and valence bond theory):

(i) Linear Electronic Geometry: AB2 species

(ii) Trigonal Planar Electronic Geometry: AB3 species

(iii) Tetraheral Electronic Geometry: AB4 species

(iv) Tetraheral Electronic Geometry: AB3U species

(v) Tetraheral Electronic Geometry: AB2U2 species

(vi) Tetraheral Electronic Geometry: ABU3 species

(vii) Trigonal Bipyramidial Electronic Geometry: AB5, AB4U, AB3U2, & AB2U3

(viii) Octahedral Electronic Geometry: AB6, AB5U & AB4U2

5. (a) Explain how a double bond is formed.

(b) Explain how a triple bond is formed.