Week 1&2 Worksheet #2

1. Assign formal charges to any charged atoms in the following molecules

   a. 
      ![Image](image)

   b. 
      ![Image](image)

2. Given the condensed structure, CH$_2$CHCN, draw the following

   a. Lewis Structure

   b. 3-D structure

   c. Skeletal Structure

3. (1) Draw the resonance structures for the following molecules, (2) label each resonance as major, minor, very minor, and (3) draw the hybrid structure.

   a. O$_3$

   b. 
      ![Image](image)
4. Label the type of bond and the overlapping atomic orbitals for each of the indicated bonds.

![Cyclohexane and ketone structures]

5. True/False. Give a 1-sentence explanation for each statement.

   a. (T/F) Both bond length and bond strength increase as you descend any column in the periodic table.
      i. Explanation:

   b. (T/F) Bond length and bond strength changes are more dramatic down a column rather than across a row of the periodic table
      i. Explanation:

   c. (T/F) A double bond is twice as strong as a single bond.
      i. Explanation:

   d. (T/F) The more “s” character a hybrid orbital has, the further away and loosely held are its electrons.
      i. Explanation:

   e. (T/F) The greater the s-character in the orbital, the larger the bond angle
      i. Explanation:

6. State whether the following molecules have (1) bond polarity and (2) molecular polarity.

   ![Molecule structures]