1. Put the following in order of:
   a. increasing electronegativity C F Cl
   b. increasing polarity C – N C – C C – O

2. Draw Lewis Structures for the following. Show resonance where applicable.
   a. H₂O
   b. NCl₃
   c. HCN (carbon is central atom)
   d. N₂
   e. CO₂
   f. NO₃⁻
3. Draw two Lewis structures for the following molecules, one that obeys the octet rule and one that minimizes formal charge:

a. BeF₂

b. SO₄²⁻

4. Rank the following in order of relative carbon-oxygen bond length. Also give the bond order.

CH₃OH  CO  CO₂  CO₃²⁻

5. Use the table of bond energies to estimate ΔH for the following reactions:

<table>
<thead>
<tr>
<th>Bond</th>
<th>Bond Energy (kJ/mol)</th>
<th>Bond</th>
<th>Bond Energy (kJ/mol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-H</td>
<td>432</td>
<td>C-H</td>
<td>413</td>
</tr>
<tr>
<td>H-Cl</td>
<td>427</td>
<td>O-H</td>
<td>467</td>
</tr>
<tr>
<td>C-Cl</td>
<td>339</td>
<td>O-O</td>
<td>146</td>
</tr>
<tr>
<td>Cl-Cl</td>
<td>239</td>
<td>O=O</td>
<td>495</td>
</tr>
</tbody>
</table>

a. 2H₂ + O₂ → 2 H₂O

b. CH₄ + Cl₂ → CH₃Cl + HCl