1. Give electron configurations and the number of unpaired electrons for:
   
a. C
   b. Br

2. Pick the best answer:
   
a. most electronegative atom
   P  O  S
b. longest bond
   H – F  H – Cl  H – Br
c. shortest C-O bond
   CO₂  CO₃²⁻  CH₃OH
d. most polar bond
   C – S  C – O  C – F
e. nonpolar molecule
   CH₂Cl₂  H₂O  BF₃
f. smallest bond angle
   NH₂⁻  NH₃  NH₄⁺

3. Fill in the table with the correct structures:

<table>
<thead>
<tr>
<th>Condensed structure</th>
<th>Kekule structure</th>
<th>Line structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CH₃)₃CCH₂CH(CH₂CH₃)CH(CH₃)CH₃</td>
<td>CH₃CH(CH₂CH₃)CH(CH₃)CH₃</td>
<td></td>
</tr>
</tbody>
</table>
4. Draw resonance structures for $\text{N}_2\text{O}$. Indicate which is the most and least stable.

5. Draw the following molecular orbitals:
   a. $\sigma$
   b. $\sigma^*$
   c. $\pi$
   d. $\pi^*$

6. Given the following molecule:

   ![C=C=C=C-CH₃](image)

   a. Label all sp, sp² and sp³ atoms and give bond angles around each atom.
   b. How many sigma and pi bonds are present?