1. (20 POINTS) Is the following structure a correct Lewis structure? (Y/N) ____ If not, give the reason and draw a correct Lewis structure.

\[
\begin{array}{cc}
\text{H} & \text{O} \\
\text{H—C—O—C—H} \\
\text{H} \\
\end{array}
\]

b. Draw a resonance structure (for the correct structure) using electron shift arrows to show electron delocalization. Indicate formal charges as appropriate.

2. (10 POINTS) Which of the following molecules is polar? Circle all that apply.
   a. CHCl₃
   b. CH₂Cl₂
   c. CCl₄

3. [16 pts] Draw the following structures.
   a) An alcohol and an ether, each having the molecular formula C₂H₆O.
   b) An aldehyde and a ketone, each having the molecular formula C₃H₆O

4. (12 POINTS) Consider the following molecule:
   \[
   \begin{array}{c}
   \text{CH₂} \\
   \text{CH} \equiv \text{C — C — CH₃} \\
   \end{array}
   \]
   a. How many carbons are sp² hybridized? _____
   b. How many carbons are sp³ hybridized? _____
   c. How many carbons are sp hybridized? _____
   e. What is the total number of sigma bonds present in this structure? _____
5. (16 POINTS) Draw structural formulae for all constitutional isomers of C₅H₁₁Cl. Also, provide IUPAC names of all these isomers.

6. (14 POINTS) The following name is incorrect. Explain and give the correct name.

1-ethyl-5-methylcyclohexane

7. (12 POINTS) Draw a Newman projection representing the least stable conformation of 1-bromo-2-methylpropane (as viewed along C₁ to C₂)