1. (2) What is an approximate C-C-C bond angle in propyne, CH₃C≡CH (circle correct answer):

109.5°  180°  160°  140°  120°  90°  60°

2. (3) What is hybridization of the carbon and nitrogen atoms of acetonitrile, CH₃CN? Place correct answers in each box (1 pt each):

\[ sp^3 \quad sp \quad sp^2 \quad sp \]

3. (2) Which atomic orbitals overlap to form the carbon-oxygen \( \sigma \) bond and \( \pi \) bond of formaldehyde, H₂C=O (circle correct answer):

\[ \sigma: sp^2 + sp^3 \quad \sigma: sp^2 + sp^2 \quad \sigma: sp^2 + sp^2 \quad \sigma: sp^3 + sp^3 \]
\[ \pi: p + p \quad \pi: sp^2 + sp^2 \quad \pi: p + p \]

4. (2) Circle the structure of the compound that has dipole moment \( \mu = 0 \) D:

CH₃OH    NH₃    H₂O    CHCl₃    CH₂Cl₂    CCl₄

5. (6) Write molecular formulas for each of the following skeletal structures (2 pts each):

\[ \text{C}_3\text{H}_6\text{O} \quad \text{C}_3\text{H}_2\text{O}_2 \quad \text{C}_{10}\text{H}_{11}\text{N} \]

(write correct molecular formula \( \text{C}_x\text{H}_y\text{O}_z \) or \( \text{C}_x\text{H}_y\text{N}_z \) in box under each structure)

6. (10 pts) Place correct formal charges on atoms by writing 0, -, or + in each circle (1 pt each):

\[ \begin{array}{c}
\text{H}^- \quad \text{N}^- \quad \text{N}^- \quad \text{N}^- \\
\text{H} \quad \text{N} \quad \text{N} \quad \text{N} \\
\text{H}_3\text{C} \quad \text{C} \quad \text{N} \quad \text{O} \\
\text{H}_2\text{C} \quad \text{N} \quad \text{O} \quad \text{O} \\
\end{array} \]

1 pt each circle

Overall Score: 25