Academic Honesty Policy. Academic honesty is strictly enforced on quizzes, exams, and other aspects of this course. Academic dishonesty will result in a failing grade in the class and a letter in the student's file. Activities constituting academic dishonesty include:

Cheating
- Copying from others during an examination.
- Communicating exam answers with other students during an examination.
- Offering another person's work as one's own.
- Taking an examination for another student or having someone take an examination for oneself.
- Tampering with an examination after it has been corrected, then returning it for more credit.
- Using unauthorized materials, prepared answers, written notes, or concealed information during an examination.

Dishonest Conduct
- Stealing or attempting to steal an examination or answer key from the instructor.
- Allowing another student to copy off of one's own work during a test.

Collusion
- Any student who knowingly or intentionally helps another student perform any of the above acts is subject to discipline for academic dishonesty.

I understand and will abide by this academic honesty policy: ___________________________ (signature) Seat: ______

1. (5 pts)
a. Draw the Lewis structure of methyl isocyanate (CH₃NCO). Make sure to show all formal charges and lone pairs of electrons.

\[ \begin{array}{c}
\cdot N &=& \cdot C &=& \cdot O \\
\text{C} &\text{H}_3 \\
\end{array} \]

b. What is the hybridization of the carbon atom in the isocyanate (NCO) functional group? $SP^2$

What is the hybridization of the nitrogen atom? $SP^2$

c. What is the approximate C–N–C bond angle? 120°

2. Use the symbols $\delta^+$ and $\delta^-$ to indicate the polarity of the labeled bonds. (Smith 1.73ad, 2 pts)

\[ \begin{array}{c}
\delta^+ & \delta^- \\
\text{Br} & \text{Cl} \\
\end{array} \]

\[ \begin{array}{c}
\delta^+ & \delta^- \\
\text{Li} & \text{C} \\
\end{array} \]

3. Assign formal charges to each carbon atom in the given species. All lone pairs have been drawn in. (Smith 1.37ad, 2 pts)

\[ \begin{array}{c}
\cdot C=\cdot C \\
\text{CH}_2=\text{CH} \\
\end{array} \]

\[ \begin{array}{c}
\cdot C=\cdot C \\
\text{H} & \text{H} \\
\text{H} & \text{H} \\
\end{array} \]

4. Draw a second resonance structure for the following ion (Smith 1.47c, 1 pt)

\[ \begin{array}{c}
\cdot C=\cdot C \\
\text{CH}_2=\text{CH} \\
\end{array} \]

\[ \begin{array}{c}
\cdot C=\cdot C \\
\text{C} & \text{H} \\
\text{H} & \text{H} \\
\end{array} \]