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. (4 pts)
a. Rank the following in order of increasing C–O bond length: \( B < C < A \)
   A. ethanol
   B. acetone
   C. sodium acetate

b. Rank the following in order of increasing acidity: \( B < C < A \)
   A. formic acid
   B. ethanol
   C. acetic acid

2. Rank the following in order of increasing basicity (Smith 19.40c, 2 pts): \( C < B < A \)
   A. \[
   \begin{array}{c}
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \end{array}
   \]
   B. \[
   \begin{array}{c}
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \end{array}
   \]
   C. \[
   \begin{array}{c}
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \text{[structure]} \quad O^- \\
   \end{array}
   \]

3. Explain the following. If acetic acid (CH₃COOH), labeled at its OH oxygen with the uncommon \(^{18}\text{O}\) isotope, were treated with aqueous base, and then the solution was acidified, two products having the \(^{18}\text{O}\) label at different locations would be formed. (Smith 19.47, 4 pts)

   The carboxylic anion that forms upon deprotonation has two equivalent resonance structures, which can protonate on either oxygen.