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)

1. Use curved arrows to indicate the flow of electrons in the following reaction: (2 pts)

\[
\begin{align*}
&\text{CH}_3\text{C}^{\equiv}\text{N}^+ + \text{CN}^- \\ &\text{CH}_3\text{C}^{\equiv}\text{N}^+ \rightleftharpoons \text{CH}_3\text{C}^{\equiv}\text{N}^- + \text{CN}^- \\ &\text{CH}_3\text{C}^{\equiv}\text{N}^- \rightleftharpoons \text{CH}_3\text{C}^{\equiv}\text{N}^+ + \text{CN}^- 
\end{align*}
\]

2. (4 pts)
   a. Write chemical equation for the acid-base equilibrium that occurs when sodium cyanide (NaCN, i.e., Na\(^+\) CN\(^-\)) is mixed with acetic acid (CH\(_3\)COOH).

\[
\begin{align*}
\text{CH}_3\text{COOH}^+ &+ \text{Na}^+ \text{CN}^- \rightleftharpoons \text{CH}_3\text{COO}^- \text{Na}^+ + \text{H}^+ \text{CN}^- \\
\text{pK}_a &= 4.75 \\
\text{pK}_b &= 9.25
\end{align*}
\]

   b. Does the equilibrium lie substantially to the right, to the left, or in the middle? right

   c. Estimate the equilibrium constant. (You must show your work, below, to receive credit.)

\[
K_{eq} = 10^{4.75} = 10^{4.75} (10^4) = 10^{4.75 + 4} = 10^{8.75}
\]

3. (Smith, 2.38e and 2.39c, 4 pts)
   a. Rank the following compounds in order of increasing acidity: c < b < a
      (a) CH\(_3\)OH
      (b) CH\(_2\)NH\(_2\)
      (c) CH\(_3\)CH\(_3\)

   a. Rank the following ions in order of increasing basicity: c < a < b
      (a) CH\(_3\)COO\(^-\)
      (b) CH\(_3\)CH\(_2\)O\(^-\)
      (c) ClCH\(_2\)COO\(^-\)