# UCI Department of Organic Chemistry Peer Tutoring Review Session Feedback Evaluation

<table>
<thead>
<tr>
<th>Quarter: Fall 2017</th>
<th>Date: 10/20/2017</th>
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</thead>
<tbody>
<tr>
<td>Class: Professor Rychnovsky</td>
<td>Midterm Review 1</td>
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<tr>
<td>Tutors’ Names: Thinh Nguyen, Lina Nguyen, Andrew Nguyen</td>
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</tbody>
</table>

**Comments/Suggestions (Very Important!):**

- **Thinh Nguyen:**
- **Lina Nguyen:**
- **Andrew Nguyen:**

**What worked best?**

**What could be improved?**

**What would you like to see next time?**

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>This review was interactive and engaging</strong></td>
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<td><strong>The presentation volume was acceptable.</strong></td>
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<td><strong>The presentation was visually clear and logically organized.</strong></td>
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<td><strong>The review improved/reinforced your understanding of the material.</strong></td>
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<tr>
<td><strong>The quality of the review packet was excellent.</strong></td>
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*Please fill out this evaluation, even if you plan to leave early. Thank you very much.*
This page is intentionally left blank on purpose. You can use this page as scratch work if you want.
Midterm 1 Review Packet

1. Draw the Lewis structure, in the boxes, for the following ions. Then fill in the table with missing information about each ion, with respect to the central atom.

\[
\begin{array}{|c|c|}
\hline
\Theta \text{C(CH}_3\text{)}_3 & \Theta \text{C(CH}_3\text{)}_3 \\
\hline
\text{Orbital Hybridization} & \\
\hline
\text{Molecular geometry} & \\
\hline
\text{Bond angle for C-C-C} & \\
\hline
\text{Does it have a dipole moment?} & \\
\hline
\end{array}
\]

2. Convert the following to skeletal structures.

a. \((\text{CH}_3)_2\text{C(OH)CH}_2\text{CH(CCH}_3\text{)}_2 \\
b. (\text{CH}_3)_3\text{CCHCH}_2 \\

3. Which of the following molecule does not have a net dipole moment?

a. H\textsubscript{2}O  \\
b. NH\textsubscript{3}  \\
c. BF\textsubscript{3}  \\
d. BrF\textsubscript{5}
4. For each pair, draw curved arrow to show how the first resonance structure can be converted into the second and circle the most stable resonance structure.

a. 

b. 

c. 

5. Rank the following bonds in order of increasing bond length.

\[ \begin{align*}
A & :C\cdot O\cdot \\
B & :C\cdot O\cdot H \\
C & :C\cdot O\cdot H
d\end{align*} \]
6a) Complete the following reactions with arrow pushing.
b) Please label Bronsted-Lowry/Lewis acid/bases, or if its amphoteric.
c) Circle the arrow that points in the direction of the favored equilibrium.

\[
\text{Benzoic acid} \quad \text{Pyridine} \\
\begin{array}{c}
\text{O} \\
\text{\includegraphics[width=1cm]{benzoic-acid}}
\end{array} + \quad \begin{array}{c}
\text{\includegraphics[width=1cm]{pyridine}}
\end{array} \\
\text{Arrows point in direction of favored equilibrium.}
\]

\[
\text{Acetic acid} \quad \text{Water} \\
\begin{array}{c}
\text{O} \\
\text{\includegraphics[width=1cm]{acetic-acid}}
\end{array} + \quad \begin{array}{c}
\text{\includegraphics[width=1cm]{water}}
\end{array} \\
\text{Arrows point in direction of favored equilibrium.}
\]

7. Complete the following sentence with Bronsted-Lowry or Lewis:

All ________ acids and bases are also ________ acids and bases, but not all ________ acids and bases are also ________ acids and bases.
8. Rank the following compounds in order of increasing acidity:

\[
\begin{align*}
\text{BrCH}_2\text{CO}_2\text{H} & & \text{CH}_3\text{CH}_2\text{CH}_2\text{OH} & & \text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{H} \\
\end{align*}
\]

9) *Penicillin G* is an antibiotic used to treat a number of bacterial infections, including pneumonia, syphilis, cellulitis, tetanus, etc.

\[
\text{\includegraphics[width=4cm]{penicillin.png}}
\]

a) Circle all the functional groups and name them.

b) Label the most acidic proton present.

c) Identify the intermolecular forces present between two molecules of *Penicillin G*.

d) Put an asterisk/star next to electrophilic carbons.
10) Rank the following molecules in order of increasing boiling point with 1 = lowest and 6 = highest. Then, list each intermolecular forces present in each molecule.

11) Rank the following molecules in order of increasing melting point with 1 = lowest and 6 = highest.
12) For the following molecules, would you expect greater solubility in water or in hexane? Then, name each intermolecular forces present between the solute and your identified solvent for each molecule.

\[ \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C(CH}_3)_2\text{OH} \]

\[ \text{HO} \cdot \text{CH}_2 \cdot \text{OH} \]

\[ \text{N} - \text{C} - \text{O} \]

\[ \text{CH}_3 \cdot \text{OH} \]