### UCI DEPARTMENT OF ORGANIC CHEMISTRY PEER TUTORING
#### REVIEW SESSION FEEDBACK EVALUATION

<table>
<thead>
<tr>
<th>Quarter: Winter 2019</th>
<th>Date: Friday, 03/15/19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class: Chem 51B, Professor Blum</td>
<td>Final Review</td>
</tr>
<tr>
<td>Tutors’ Names: Anh Tran, Jessica Mo, Joshua Torosyan</td>
<td></td>
</tr>
</tbody>
</table>

**COMMENTS/ SUGGESTIONS**

<table>
<thead>
<tr>
<th>Name: Anh Tran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: Jessica Mo</td>
</tr>
<tr>
<td>Name: Joshua Torosyan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What worked best?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What could be improved?</td>
</tr>
<tr>
<td>What would you like to see next time?</td>
</tr>
</tbody>
</table>

<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>This review was interactive and engaging.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The presentation volume was acceptable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The presentation was visually clear and logically organized.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The review improved/reinforced your understanding of the material.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The quality of the review packet was excellent.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.
Final Review

1. Provide a curved arrow mechanism for the following reaction. Show all steps. Do not combine multiple steps into one step.

   *Note: Show the two major resonance structures of the intermediate as part of your mechanism.*
2. Provide a curved arrow mechanism for the following reaction. Show all steps. Do not combine multiple steps into one step.

![Image of a reaction with mCPBA and another molecule with an E-label](attachment:image.png)

3. Provide a curved arrow mechanism for the syn dihydroxylation with the reagent KMnO₄. Do not provide the mechanism for hydrolysis, but do show the final product.

![Image of a reaction with KMnO₄ and another molecule with a H₂O label](attachment:image.png)
4. Draw a stepwise mechanism for the following reaction.

\[
\text{NBS} \quad \text{hv} \quad \text{Br}
\]

\[
\text{ + Br} \quad \text{ + H-Br}
\]
5. **Inspire you to Ponder:** Taxol is a chemotherapy drug used to treat a number of cancers - most notably breast, ovarian, and lung cancers. The first steps of synthesis produce a transition state that illustrates an important concept of stereochemistry in Diels-Alder reactions.

a) Provide the 3D structure as the result of the first step.
b) What aspect of starting material makes it a particularly “good” diene? Write your answer in the box at the bottom of the page.
6. Draw the following Diels Alder products. Include stereochemistry and indicate if enantiomers or diastereomers form.

a) 

\[
\text{\includegraphics{diagram1.png}}
\]

b) 

\[
\text{\includegraphics{diagram2.png}}
\]

c) 

\[
\text{\includegraphics{diagram3.png}}
\]

d) 

\[
\text{\includegraphics{diagram4.png}}
\]
7. Fill in the box with the missing reagent(s) or the major organic product of the given reaction sequence. If reagents are added in separate steps, provide a numbered list. If a chiral center is formed, draw the chiral center with a wedge and/or dashed notation. If both enantiomers are formed, draw one of them and state “+ en” in the box. If only one enantiomer is formed, draw the correct one.
8. For the following set, write in each box a single compound number which correctly completes the statement.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(a) The compound that yields the same alcohol when treated with \( \text{H}_2\text{SO}_4/\text{H}_2\text{O} \) as it yields when treated with 9-BBN followed by \( \text{H}_2\text{O}_2/\text{H}_2\text{O} \)?

(b) The compound that forms a tertiary carbocation when treated with \( \text{H}_2\text{SO}_4/\text{H}_2\text{O} \) followed by a hydride shift?

(c) Which compound contains an aldehyde?

(d) The compound that forms tetrachlorides with excess \( \text{Cl}_2 \)?

(e) The compound that forms an acetylide when treated with \( \text{NaNH}_2 \)?

(f) The compounds that are chiral?

(g) The alkene for which attack from the top face is not symmetrical to attack from the bottom face?

(h) The compound that contains a monosubstituted alkene?

(i) Which compound contains exactly 7 units of unsaturation?

(j) The compound that forms an enolate when treated with a base?

(k) The compound that contains no \( \text{sp}^3 \) hybridized carbon?

(l) The compound that forms an aldehyde upon treatment with \( \text{BH}_3 \) followed by \( \text{H}_2\text{O}_2/\text{NaOH} \)?

(m) The compound that yields diastereomers when treated with \( \text{Cl}_2 \)?

(n) Which compound does not form a diiodide when treated with excess \( \text{I}_2 \)?
9. For the following reactions, propose a numbered synthetic sequence that would allow the given starting materials to be transformed into the product(s) shown.

a.  

b.  

c.  

d. \[
\begin{align*}
\text{Hexane} & \to \text{Methanol} + \text{Methanol} \\
\end{align*}
\]

e. \[
\begin{align*}
\text{Cyclopentane} & \to \text{Butanoic acid} \\
\end{align*}
\]

f. \[
\begin{align*}
\text{Propene} & \to \text{Acetic acid} + \text{Carbon dioxide} \\
\end{align*}
\]