## Final Exam Review Packet

### UCI Department of Organic Chemistry

#### Peer Tutoring Review Session Feedback Evaluation

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter 2018</td>
<td>3/12/18, 6:00-7:50 PM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor King</td>
<td>Chem 51B</td>
</tr>
</tbody>
</table>

| Tutors’ Names | Joseph Han, Amanda Pinski, and Chris Tang |

### Comments

**Joseph:**

**Amanda:**

**Chris:**

**What helped you the most? What was most effective?**

**What could be improved?**

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

<table>
<thead>
<tr>
<th>This review was interactive and engaging.</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| The presentation volume was acceptable. | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                |                   |          |         |       |                |

| The presentation was visually clear and logically oriented | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                                |                   |          |         |       |                |

| This review improved/reinforced your understanding of the material. | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                                        |                   |          |         |       |                |

| The quality of the review packet was excellent. | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                         |                   |          |         |       |                |

| Would recommend attending review sessions. | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                    |                   |          |         |       |                |

| Do you use our weekly worksheets available at http://sites.uci.edu/ochemtutors/ | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| Comments:                                    |                   |          |         |       |                |
Final Exam Review

Ranking and Conceptual Questions

1. Observe the following molecules.

   ![Molecules](image)

   a. Which molecule(s) will react fastest with ROOR and light?

   b. Which molecule(s) will react slowest with ROOR and light?

   c. Draw the most stable radical formed when molecule A reacts with ROOR.

2. Label the following as antiaromatic, nonaromatic or aromatic. Indicate your reasoning.

   ![Molecules](image)
3. Rank the three molecules below in order of increasing rate of reaction in an SN1 reaction with water.

![Molecules A, B, and C](image)

4. Observe the following dienophiles.

![Dienophiles A, B, C, D, and E](image)

a. Which dienophile will react fastest in a Diels Adler reaction?

b. Which dienophile will react slowest in a Diels Adler reaction?

Open-Ended Synthesis

5. Provide a step-by-step synthesis for the following product given the starting material. You may use organic reagents of no more than three carbons and any inorganic starting material. Clearly indicate all steps and do not combine two steps in one. Indicate stereochemistry where appropriate.

![Synthesis](image)
6. Provide a step-by-step synthesis for the following product given the starting material. You may use organic reagents of no more than three carbons and any inorganic starting material. Clearly indicate all steps and do not combine two steps in one. Indicate stereochemistry where appropriate.
Mechanism

7. Provide the mechanism for the following reaction. Clearly show all lone pairs, charges and curvy arrows. Do not combine two steps in one.

8. Provide the mechanism and products for the following reaction that occurs at high temperature. Clearly show all lone pairs, charges and curvy arrows. Do not combine two steps in one. Label the 1,4 product and 1,2 product, and indicate which is the thermodynamic product and which is the kinetic product.
**Synthesis**

9. Provide the starting material, reagents, and/or products for the following reactions. Clearly indicate all steps and do not combine two steps in one. Indicate stereochemistry where appropriate.

a.  

\[
\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3 \quad \rightarrow \quad \text{CH}_3\text{CH}(...\text{CN})\text{CH}_3
\]

b.  

\[
\text{C}_2\text{H}_4\text{C}_2\text{H}_4\text{C}_2\text{H}_4 \quad \xrightarrow{1. \text{H}_2, \text{Lindlar's catalyst}} \quad \xrightarrow{2. \text{O}_3} \quad \xrightarrow{3. \text{CH}_3\text{SCH}_3} \quad \rightarrow
\]

c.  

\[
\text{CH}_3\text{CH}(...\text{OH})\text{CH}_2\text{CH}_3 \quad \rightarrow \quad \text{C}_6\text{H}_{12}
\]

\[\text{C}_6\text{H}_{12} \quad \xrightarrow{\Delta} \quad \text{C}_6\text{H}_{12} \quad \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, \text{NaOH}} \quad \rightarrow\]
d.

\[ \text{Cyclopentadiene} \rightarrow \text{Cyclopentadiene} \]

*Two perspectives of the product are shown*

e.

\[ \text{Phenylmethane} \rightarrow \text{Phenylethanol} \]

f. 

\[ \text{Cyclopentane} \rightarrow \text{Cyclopentene} \]

and

\[ \text{Cyclopentylpropanoic acid} \]