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

<table>
<thead>
<tr>
<th>Quarter: Spring</th>
<th>Date: 06/03/2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class: Professor Weiss</td>
<td>Circle One Midterm Review Final Review</td>
</tr>
<tr>
<td>Tutors' Names</td>
<td>Tiffany Pham, May Nguyen, DanQuynh Bui</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMMENTS/ SUGGESTIONS (VERY IMPORTANT)</th>
<th>Tiffany Pham</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>May Nguyen</td>
</tr>
<tr>
<td></td>
<td>DanQuynh Bui</td>
</tr>
</tbody>
</table>

**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>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! Thanks!**
Final Review Session

1) Carbohydrates: Fischer Projection, Haworth Projection, and Chair Conformation
   a) Draw D-glucose and then draw D-mannose, the C-2 epimer of D-glucose. Draw the Fischer projection of D-mannose.

   b) Draw D-mannose in a Haworth projection when hydronium is added.

   c) Convert the Haworth projections into chair conformations.
2) Reactions of Carbohydrates
Provide a synthesis for these problems.

a)

b)

b)

c)

d)
3) Disaccharides
A glycosidic bond is when we use the anomeric carbon of a sugar to form a disaccharide with another type of sugar. There are 3 types of glycosidic bonding arrangements:
- 1,1' linkage: anomeric carbon of the first sugar is bonded through the O atom to the anomeric carbon of the second sugar (the prime symbol indicates the carbon of the second sugar).
- 1,4' linkage: anomeric carbon bonded to the O atom on C4 of the second sugar
- 1,6' linkage: anomeric carbon bonded to the O atom on C6 of the second sugar

A glucosidic linkage is where we use the anomeric carbon of glucose to bond with another glucose sugar. A galactosidic linkage is where we are using the anomeric carbon of galactose to form disaccharides with the second sugar.

a) Draw sucrose, a 1,1' glycosidic linkage between glucose and fructose. Fructose has a very similar structure to glucose except the only differences are that it is a ketose and it forms a 5-membered ring.

b) Draw lactose, a β-1,4' galactosidic linkage between glucose and galactose. Galactose is the C4 epimer of glucose.

c) For (a), is the disaccharide formed reducing or non-reducing? Why?
Bonus Questions:

a) What is the name of the reaction between amino acids and reducing sugars that give the browning effect seen in spray tans, caramel, and cooked meat?

b) Which type of sugar gives high sweetness with lower calories?

c) Why does glycosylation help in making protein-based pharmaceuticals?

4) What are the four factors that contribute to basicity of amines?

5) Circle the most basic amine, then explain your reasoning using resonance structures, brief explanations, etc.

\[
\text{\begin{array}{c}
\text{NH}_2 \\
\text{Cyclic} \\
\text{O} \\
\text{Pyrrole} \\
\text{Pyridine}
\end{array}}
\]

\[
\text{\begin{array}{c}
\text{H} \\
\text{Pyrazole} \\
\text{NH}_2
\end{array}}
\]
6) Use each of the indicated methods to synthesize the desired amine.

Reductive Amination

Gabriel Synthesis
7) What is the name for the amine which is a powerful poison (which is so potent that even after the poison sac is removed, those who eat it still feel a strong numbing sensation) released by the pufferfish?

8) Synthesize a diazonium salt from benzene.

\[
\text{ benzene } \quad \rightarrow \quad \text{ benzene diazonium chloride}
\]

9) Use your diazonium salt in a coupling reaction to the following azo compound.

\[
\text{ benzene diazonium chloride } \quad \rightarrow \quad \text{ azo compound}
\]

10) Why were azo compounds so revolutionary to the world we live in?

Bonus: Synthesize the following drug from the given starting material. (Hint: There are actually two possible methods. Can you find both?)

\[
\text{ starting material } \quad \rightarrow \quad \text{ drug}
\]
11) In the stop light reaction, what happened when we shook the flask?

12) What was one of the reducing sugars name? What functional group did it contain?

13) What are the 2 modes of polymer synthesis?

14) Match the following material with their polymer.

- **Cotton**: cellulose + glucose
- **Silk**: clothing +backpacks
- **Rubber**: bullet proof glass
- **Polyethylene**: water bottles
- **Nylon 6,6**: linked amino acids arranged in B-sheets
- **Lexan**: isoprene units

15) Place brackets around the repeating unit that creates nylon 6,6.
16) Draw the mechanism for the chain growth polymerization (radical).

1.) Initiation:

\[ \text{O-O-O} \rightarrow \text{O-O} \]

2.) Propagation:

3.) Termination
17) What's the difference between cationic and anionic polymerization growth?

18) Draw the mechanism of action for cationic polymerization:

1.) Initiation:
\[
\text{F}_3\text{B} : \text{O}^\ominus \text{H} \quad \overset{\rightarrow}{\longrightarrow} \quad \text{F}^\ominus \text{B}^{-} \text{O}^\oplus \text{H}
\]

2.) Propagation:

3.) Termination:

19) Draw the mechanism of action for anionic polymerization.

1.) Initiation
\[
\text{Li} \quad \overset{\rightarrow}{\longrightarrow} \quad - \text{CN}
\]

2.) Propagation:

3.) Termination: