<table>
<thead>
<tr>
<th>Tutors' Names: Thinh Nguyen, Lina Nguyen, Lester Gopar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter: Winter 2018</td>
</tr>
<tr>
<td>Date: 2/23/2018</td>
</tr>
<tr>
<td>Class: Professor Guan</td>
</tr>
<tr>
<td>Midterm 2. Review</td>
</tr>
</tbody>
</table>

**COMMENTS/SUGGESTIONS**

<table>
<thead>
<tr>
<th>Thinh Nguyen:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(VERY IMPORTANT!)</td>
</tr>
<tr>
<td>Lina Nguyen:</td>
</tr>
<tr>
<td>Lester Gopar:</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>
</tbody>
</table>

**Comments**

<table>
<thead>
<tr>
<th>The presentation volume was acceptable.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Comments**

<table>
<thead>
<tr>
<th>The presentation was visually clear and logically organized.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Comments**

<table>
<thead>
<tr>
<th>The review improved/reinforced your understanding of the material.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Comments**

<table>
<thead>
<tr>
<th>The quality of the review packet was excellent.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Comments**

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 2 Review

1. Fill in the missing reactants, products, or intermediates for each reaction in the boxes provided below.

\[
\text{\textbf{Reaction 1:}} \\
\text{NaH} \quad \xrightarrow{\text{O}} \quad \text{HBr} \\
\text{\textbf{Reaction 2:}} \\
\text{\textbf{Reaction 3:}} \\
\text{\textbf{Reaction 4:}}
\]
1. Provide a curved arrow mechanism for the following reaction. Show all steps. Do not combine multiple steps into one step. Only answers that in and fit fully with the provided box will be graded.

2. Provide a curved arrow mechanism for the following reaction. Show all steps. Do not combine multiple steps into one step. Only answers that in and fit fully with the provided box will be graded.
3. Rationale the following observations:

4. This question intend to summarize 5 types of alkene addition reactions.

a) Orientation stereo

b) + enantiomer
c) \[ \text{Br}_2 \rightarrow \text{CH}_3\text{Br} \]

+ enantiomer

d) \[ \text{Br}_2, \text{H}_2\text{O} \rightarrow \text{OH} \]

+ enantiomer

e) \[ 1. \text{BH}_3 \]

2. \[ \text{H}_2\text{O}_2, \text{NaOH} \]

+ enantiomer
5. Please complete the following synthesis problems.

a) 
\[ \text{CH}_3\text{CHCl} \rightarrow \text{OH} \rightarrow \square \rightarrow \text{CH}_2=\text{CH}_2 \rightarrow \text{OH} \rightarrow \square \rightarrow \text{CH}_3\text{CH}_2\text{OH} \]

b) 
\[ \text{CH}_3\text{CHCH}_2\text{OH} \rightarrow \square \rightarrow \text{CH}_2=\text{CHCH}_2\text{CH}_3 \rightarrow \square \rightarrow \text{CH}_3\text{CHCH}_2\text{CH}_2\text{Br} \]
6. Fill in the missing reagent

a.

b. Give the reagents and solving the product. Name this reaction.

7. Fill in the major organic production this reaction forms

8. Draw out the mechanism
9. Fill in the missing reagent

\[ (\text{CH}_3\text{CH}_2)_3\text{C} - \text{C} = \text{CH} \quad \text{reagent} \quad (\text{CH}_3\text{CH}_2)_3\text{C} - \text{C} - \text{CH}_3 \]

b. Name this reaction

10. Draw an arrow that matches the correct tautomers and name if the isomer is a keto or enol tautomer

- [ ] \[ \text{CH}_3\text{COCH}_3 \]
- [ ] \[ \text{CH}_2 = \text{CHCH}_2\text{OH} \]
- [ ] \[ \text{CH}_2 = \text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3 \]
- [ ] \[ \text{CH}_2\text{C} = \text{O} \]
- [ ] \[ \text{CH} = \text{CCH}_3\text{CH}_3 \]
11. Draw the tautomer of the enol

12. Fill in the missing reagent

13. Draw the product and the mechanism