<table>
<thead>
<tr>
<th>COMMENTS/ SUGGESTIONS</th>
<th>Mitchel:</th>
<th>Arash:</th>
<th>Elsie:</th>
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<tr>
<td>(VERY IMPORTANT!)</td>
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**What worked best?**

**What could be improved?**

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

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<tr>
<th>This review was interactive and engaging.</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree or Disagree</th>
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<th>The presentation volume was acceptable.</th>
<th>Strongly Disagree</th>
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<th>The presentation was visually clear and logically organized.</th>
<th>Strongly Disagree</th>
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<th>The review improved/reinforced your understanding of the material.</th>
<th>Strongly Disagree</th>
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<th>The quality of the review packet was excellent.</th>
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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

1. Give the IUPAC name for the following compound.

```
4-bromo-2-chloro-4-ethylheptane
```

2. Rank the following alkyl halides in order of expected reactivity under SN2 and SN1 conditions. Put NR for alkyl halides that are not expected to react.

```
SN2: F > A > B > C  
    D, E = NR

SN1: E > D > A > B > C  
    F = NR
```
3. Draw the product of the following reaction with stereochemistry. Draw the mechanism that leads to the product.

![Reaction Mechanism](attachment:reaction_mechanism.png)

a. Is the rate equation of this reaction bimolecular or unimolecular?
   - Bimolecular
   - rate $\propto$ [alkyl halide] [MeO$^-$]

b. If Mitchel doubled the concentration of the alky halide then he should see the rate of the reaction __________. If Arash doubled the concentration of MeO$^-$ then he should see the rate of the reaction __________. Let’s say that Elsie doubled the concentration of both the alkyl halide and nucleophile then she should see the rate of the reaction __________. Double(2x), Double(2x), Quadruple(4x).

4. What is the product of the following reaction? Draw the mechanism that leads to that product.

![Reaction Mechanism](attachment:reaction_mechanism_2.png)
a. How would you write the rate equation for this reaction? Is this reaction bimolecular or unimolecular?

Rate $\propto$ [alkyl halide], unimolecular

b. If Jiana doubled the concentration of the alkyl halide then she should expect the rate of the reaction to __________. If Cassandra doubled the concentration of the methanol then she should expect the rate of the reaction to __________.

Double, stay the same.
Mechanism:
5. What are the products of the following reactions? Write NR for reactions that would not work.
6. Draw out the mechanism and product for the following E2 reactions.

a. [Diagram of mechanism and product for E2 reaction with a primary halide, labeled as strong base, primary halide so it is E2.]

b. [Diagram of mechanism and product for E2 reaction with a secondary halide, labeled as strong base, secondary halide so it is E2.]
H1 and H3 are antiperiplanar whereas H2 and H4 are syn periplanar so base will attack H1 or H3. This is disubstituted and is less stable compared to the above molecule which is trisubstituted which is why H1 is attacked and not H3. Higher substitution means more stable and more likely to form. zaitsev rule

7. Draw the SN1 and E1 products as well as the mechanisms for the following reactions.

a. tertiary halide and weak base so it is E1. E1 gives SN1 and E1 produs

E1 is not concerted. Pink arrow indicates first step forming carbocation and rest of the mechanism is done through red arrows. Blue mechanism is SN1 product/reaction

E1. remember trisubstituted better than disubstituted. other beta carbon would give you disubstituted

SN1
8. Predict the product for the following reactions.

a. 
\[ \text{E2} \]

b. 
\[ \text{DBU} \rightarrow 0^\circ C \]

c. 
\[ \text{Bulky KOBu}^+ \rightarrow \text{E2} \]

d. 
\[ \text{Strong (2) NaNH}_2 \rightarrow \text{Double Elimination} \]
9. How do the following adjustments affect a reaction?

a. A weaker Nucleophile in an SN1 reaction?  
No Effect

b. Doubling the amount of Nucleophile in SN2  
Double the speed of the reaction
10. Draw the proper chair conformation suitable for an E2 reaction