Fall Semester Organic Chemistry II
Mid-Term Exam 2

Name (print): Key

Name (Sign) :

Instructions

1. Keep the exam closed until you are instructed to begin.

2. The exam consists of 6 questions. The first thing you should do is make sure that no pages are missing. If a page is missing, notify a proctor immediately.

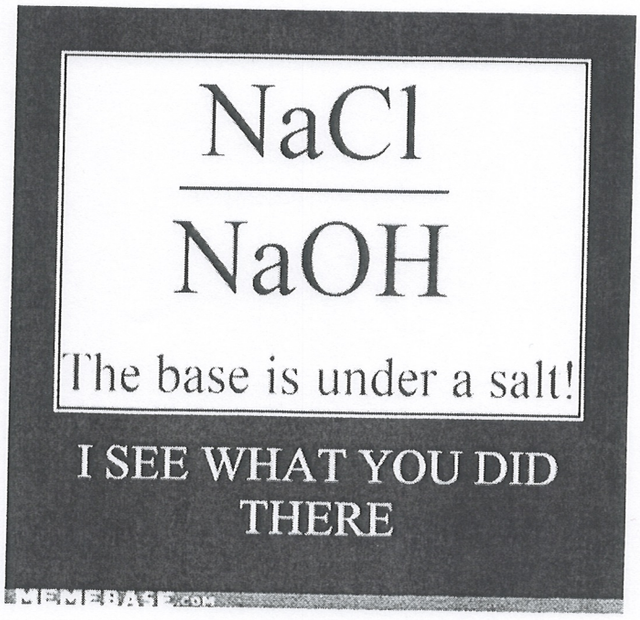
3. You will have 1 hr and 15 minutes to complete the exam, at which time pencils must be put down. Budget your time wisely.

4. Make sure to show all of your work, and make it clear what your thought process was. Answers should fit in the space provided. If you need to use the back of the sheet of paper, you must make note of it in the space allotted for credit.

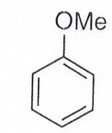
Breakdown

1. ___ / 20
2. ___ /30
3. ___ / 20
4. ___ / 10
5. ___ / 10
6. ___ / 10

total ___ / 100

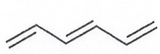


1) **Aromaticity.** Where noted, write down whether the following molecules are aromatic, antiaromatic, or non-aromatic. (20 points, 4 points each)

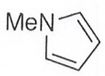


Aromatic

non



non

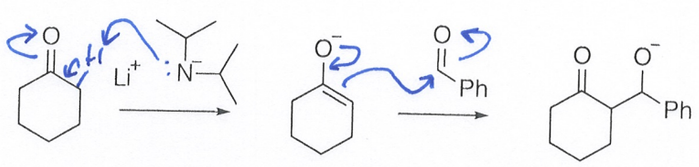


Aromatic

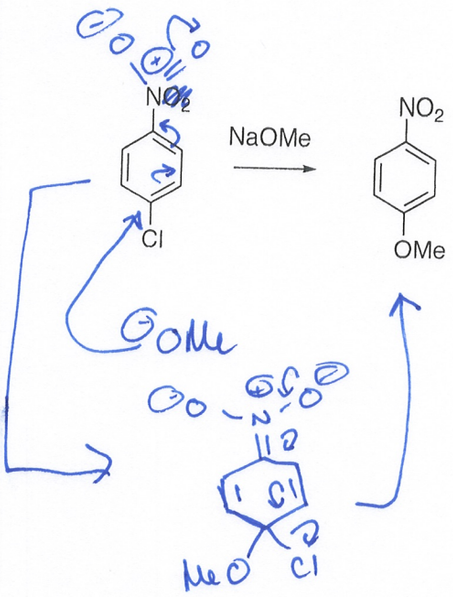
Anti

2) **Mechanisms.** Show mechanisms for the following reactions (30 points, 10 points each)

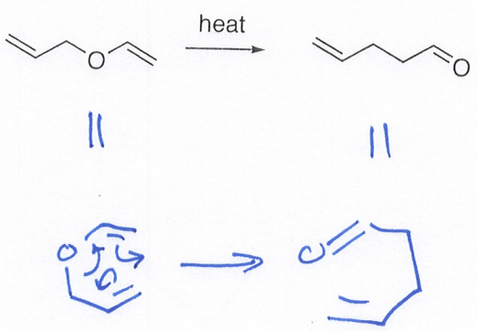
2a.



2b.

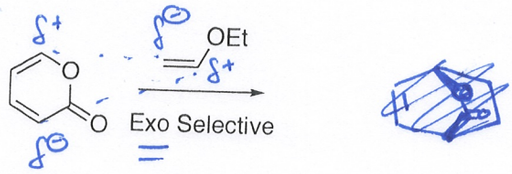


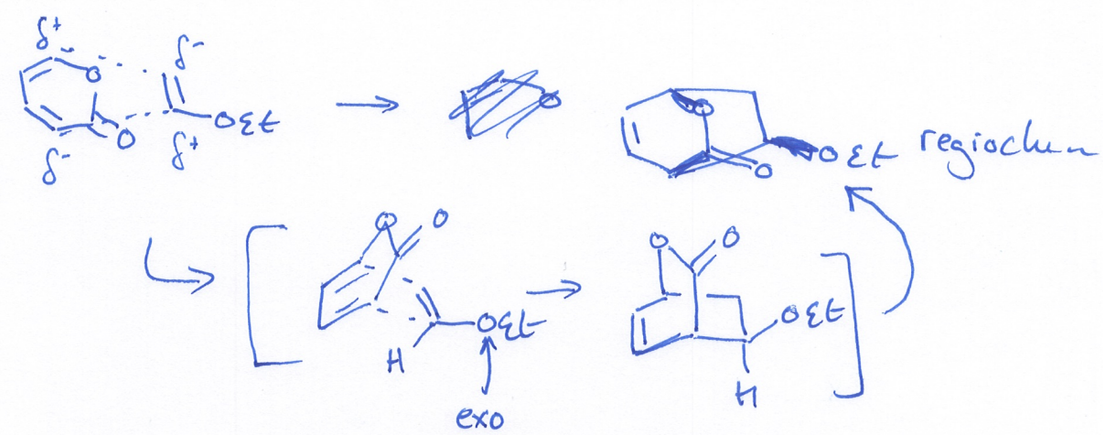
2c.



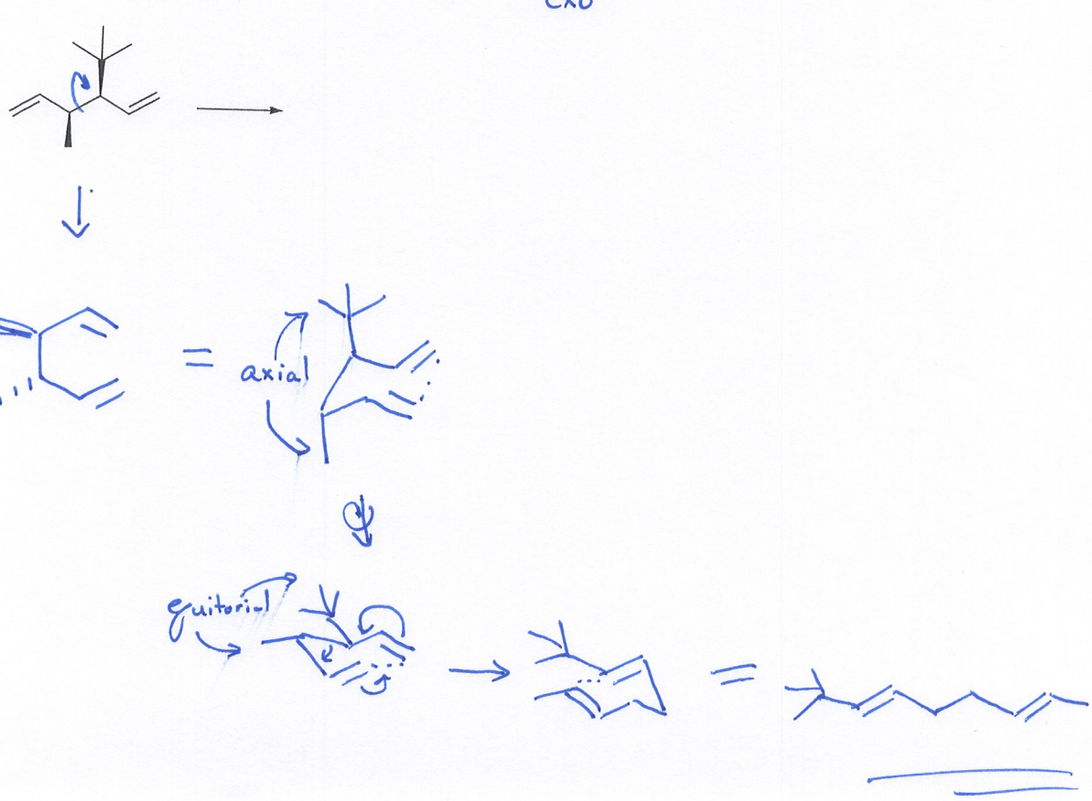
3) **Complex Stereochemistry Determination.** Show the products of the following reactions, making sure to address any relevant stereo and regiochemistry (20 points, 10 points each)

3a.

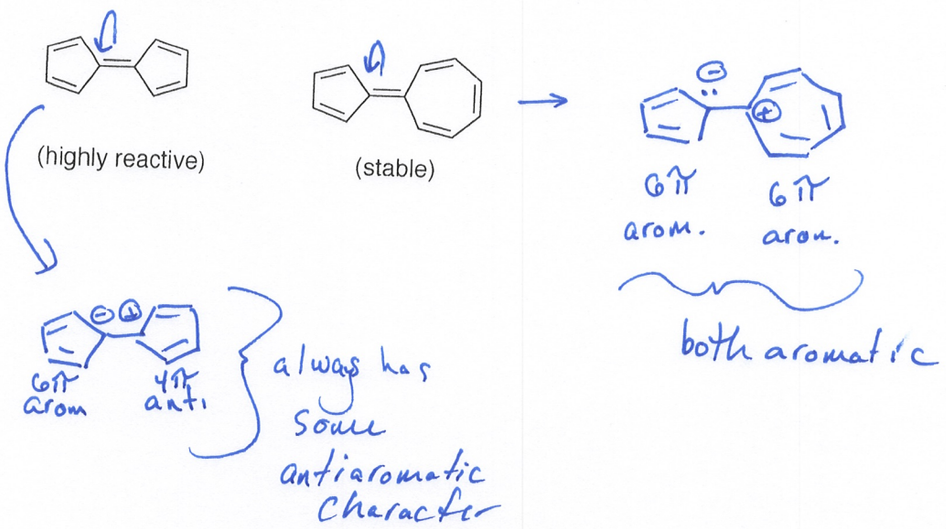




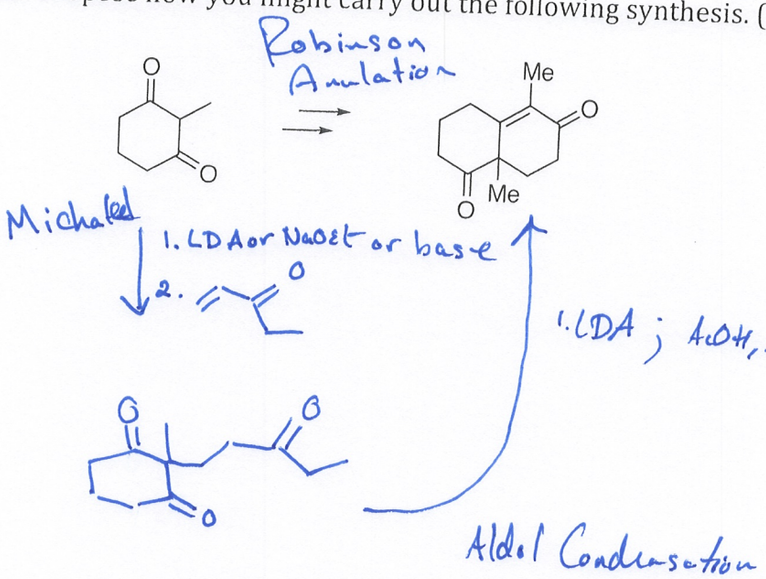
3b.



4. **Concept Question.** Explain the relative reactivity of the following two molecules. (10 points)



5. **Synthesis.** Propose how you might carry out the following synthesis. (10 points)



6. **Mechanism Challenge. Mechanism.** The following reaction is called a 'hexahydro Diels-Alder' and draws elements from the Diels-Alder reaction (first step), and Nucleophilic Aromatic Substitution (2nd step). Show a mechanism for this transformation, and show what the intermediate is prior to the reaction with *t*-BuOH.(10 points)