

**Fall Semester Organic Chemistry I
Practice Exam 1b**

Name (print):

Name (Sign) :

Instructions

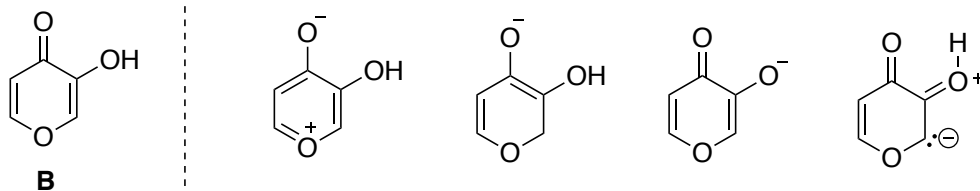
1. Keep the exam closed until you are instructed to begin.
2. The exam consists of 4 questions. The first thing you should do is make sure that no pages are missing. If a page is missing, notify a proctor immediately.
3. You will have 30 minutes to complete the exam.
4. When we are done, you will give yourself a grade breakdown below, at which time I will be collecting this front sheet.

Breakdown

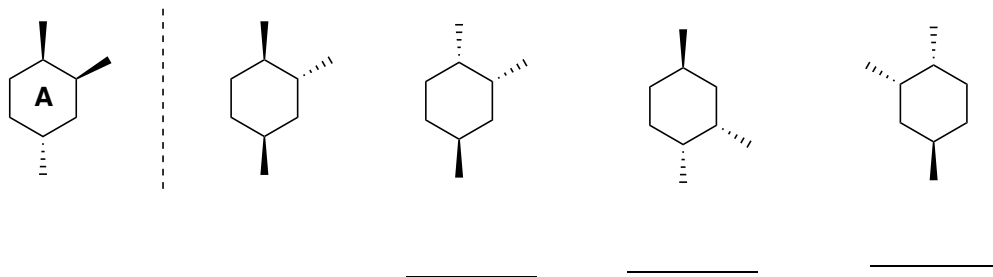
1. ___ / 10
2. ___ / 10
3. ___ / 20
4. ___ / 10
total ___ / 50



1) **Resonance.** Which of the following 4 molecules are resonance forms of compound **B**. (10 points)

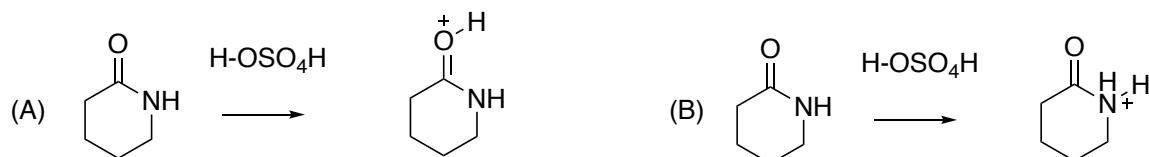


2) **Stereochemistry.** Describe the relationship between the following molecules with compound **A**. Enantiomers, Diastereomers, or Identical (5 points each)



3) **Acid/Base.** Refer to the following two reactions illustrating how an amide could in theory be protonated for this two-part question

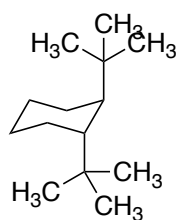
3a. Show mechanism arrows for each of these transformations. (10 points)



3b. Reaction B ends up with a proton on a less electronegative atom. However, reaction B is in fact favored. Why? (10 points)

4) **Concept Question.** Molecules are not ALWAYS favored in the axial conformation.

Explain the following difference between the conformational preference between *trans*-diterbutyl and *trans*-dimethyl cyclohexane. Use Newman projections to help explain your answer. (10 points)



vs.



favored for *trans* 1,2-ditertbutylcyclohexane

favored for *trans* 1,2-dimethylcyclohexane