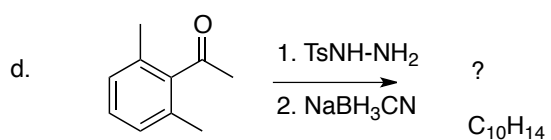
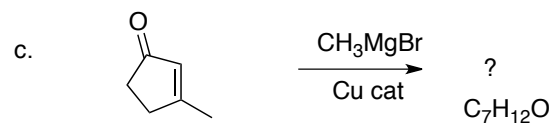
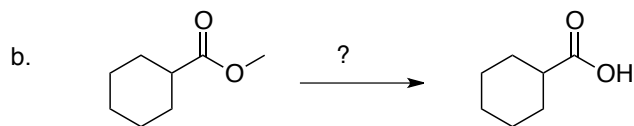
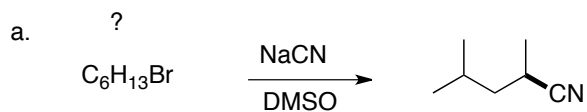


Chem 332
Spring 2012
Exam #4
May 21, 2012

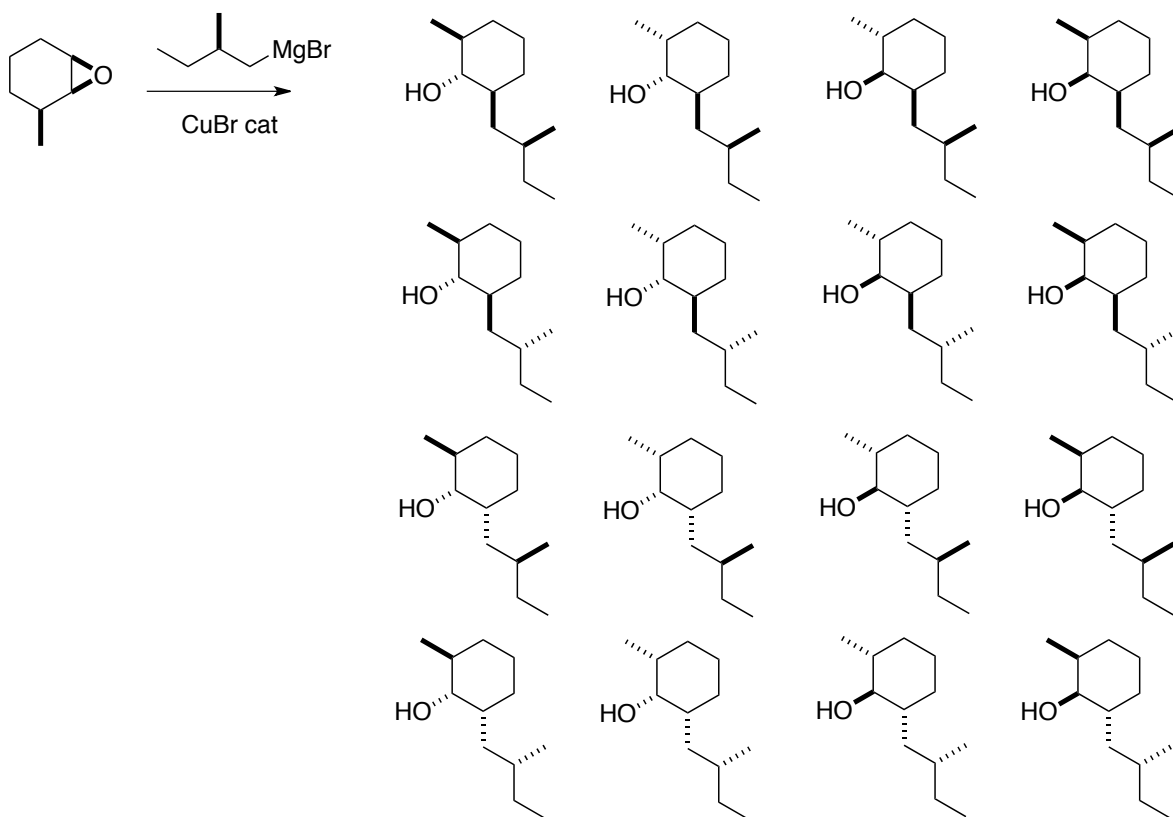
Name _____

This is an open-book, open notes exam. No electronic devices are allowed.

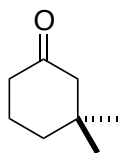
1. (5 points each) Fill in the missing starting material, reagent or product. Stereochemistry is important!



2. (20 points) Circle the correct product, and explain why.

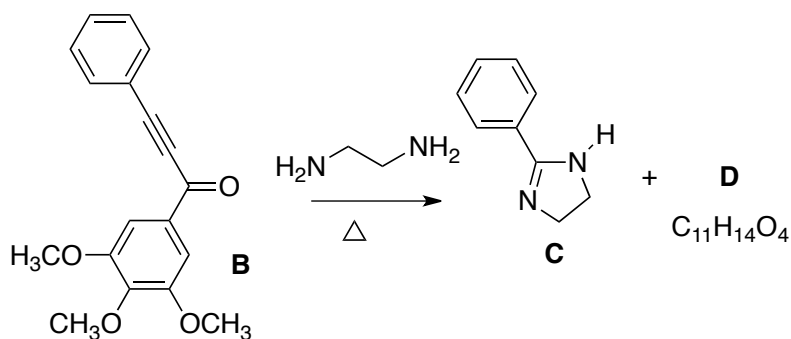


3. (20 points) Outline a synthetic route to **A**. You may use any starting materials that contribute three or fewer carbons to the final product, and/or any monosubstituted benzene derivative that contributes seven or fewer carbons to the final product. Stereochemistry is not important.



A

4. (20 points) Deduce the structure of **D**, and outline an arrow-pushing mechanism for its formation.



IR: 1680 cm^{-1}

| ^{13}C NMR | ^1H NMR |
|---------------------|------------------|
| 196.8, s | 7.17, s, 2H |
| 153.0, s (2) | 3.88, s, 3H |
| 142.5, s | 3.86, s, 6H |
| 132.4, s | 2.54, s, 3H |
| 105.7, d (2) | |
| 60.9, q | |
| 56.2, q (2) | |
| 26.4, q | |

5. (10 points each) Draw arrow-pushing mechanisms for each of the following:

