

**Exam 2**  
**Organic Chemistry C3444—Section 2**  
**Prof. Nuckolls**  
**March 11, 2002**

- Write your name on every page.
  - You should have 6 pages including this one.
    - Turn off your cellular phones.
    - Do your own work.
    - Good Luck!

**Name:** \_\_\_\_\_

**Columbia I.D. #:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

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**Grading:**

**Section A** \_\_\_\_\_ **/48 points**

**Section B** \_\_\_\_\_ **/30 points**

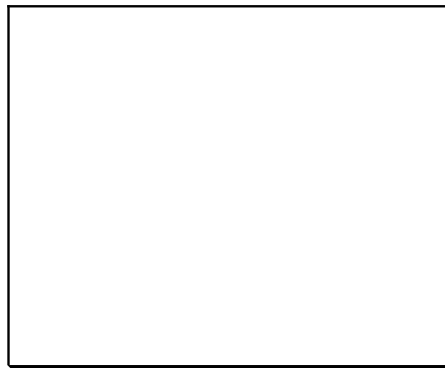
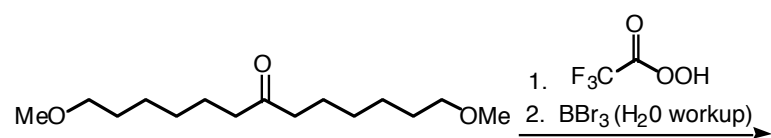
**Section C** \_\_\_\_\_ **/22 points**

**Total** \_\_\_\_\_ **/100 points**

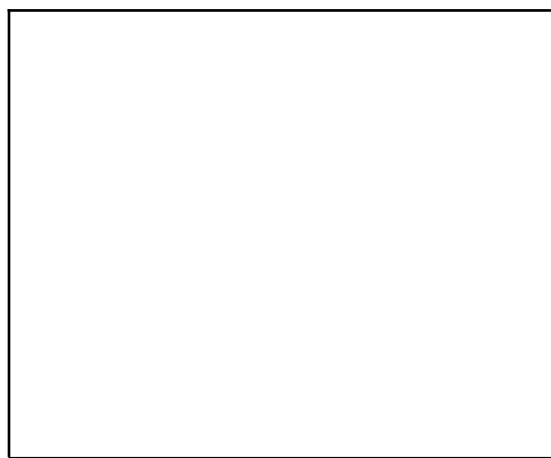
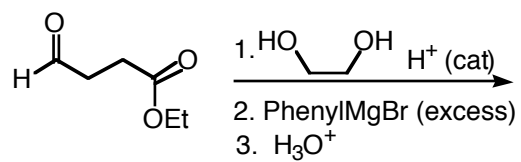
**Section A.** *Answer only 4 out of 5 of the following question. Clearly mark with an "X" the one that is not to be graded. If you answer all of them, only the first four will be graded.*

**Write the answers to the questions below in the box provided. The syntheses may require multiple steps. To achieve partial credit for an *incorrect* answer you must show your work in the space below the equation. Mechanistic details are not necessary. (12 points each)**

1.



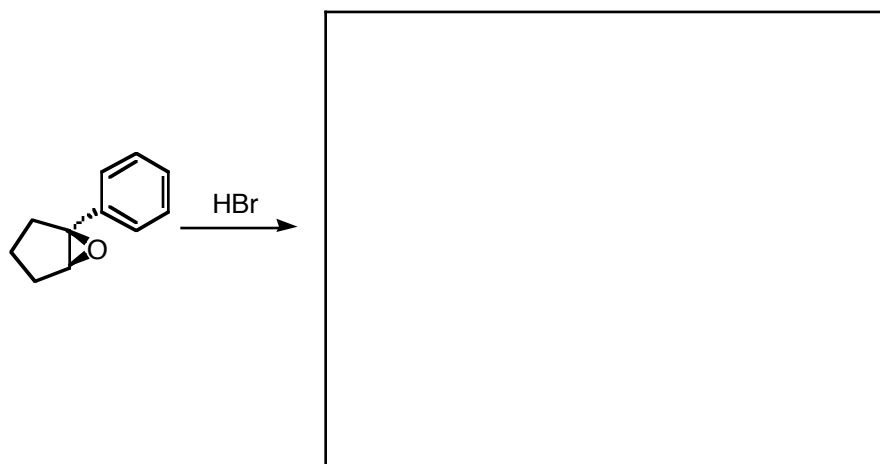
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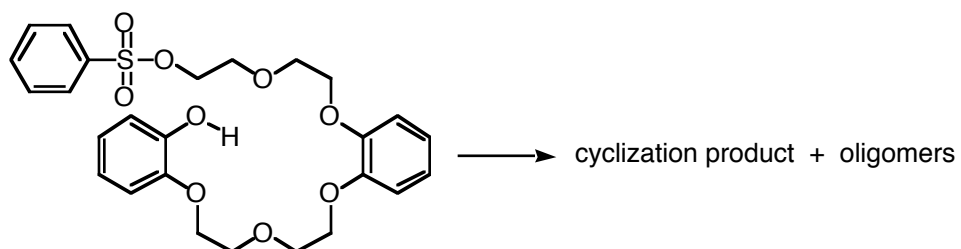
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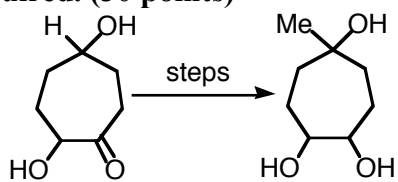
4.



5. Consider the reaction below. When potassium hydroxide (KOH) or sodium hydroxide (NaOH) are used the reaction yield predominately the cyclized product. However, when LiOH is used the oligomers predominate. Explain how the counter ion for the base can have such a profound effect.



**Section B. Show the step-by-step detail of how to achieve the following transformation. Mechanistic details are not required. (30 points)**



**Section C. Consider the reaction below. “A” is an isomer of the starting material containing a five-membered ring. Write a detailed mechanism showing the electron flow and circle the final position of the  $^{18}\text{O}$  label. (22 points)**

