

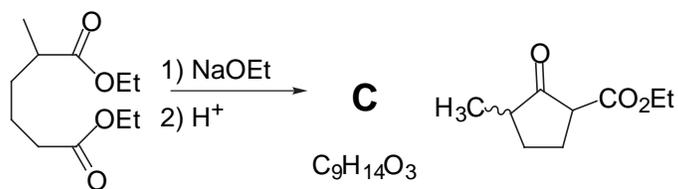
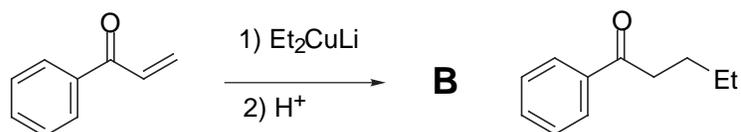
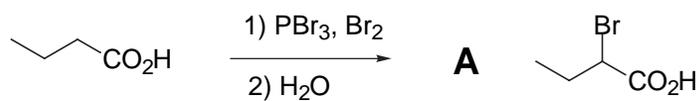
Chem 332  
Exam 2  
April 9, 2003  
Prof. Fox  
50 minutes  
250 points

The exam is open book,  
Open notes. Models are permitted  
Show your work in detail

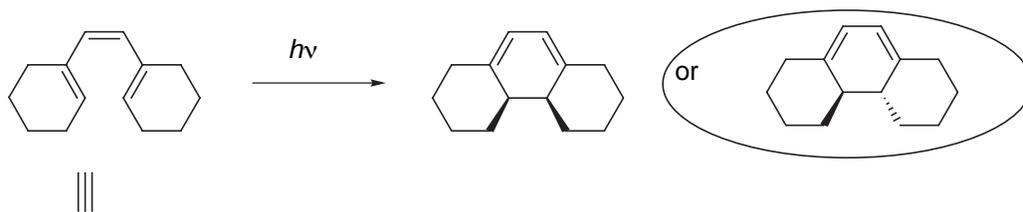
**WRITE YOUR NAME ON EVERY PAGE**

NAME \_\_\_\_\_

1. Provide structures of **A**, **B**, and **C**. 10 points for each correct answer (total 30 pts)

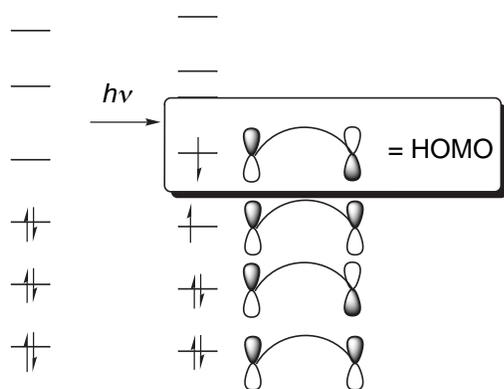


2 (50 points)



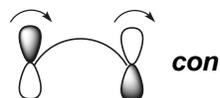
6 pi electrons; 6 MO's

step 1. Draw the MO energy levels and fill in the electrons

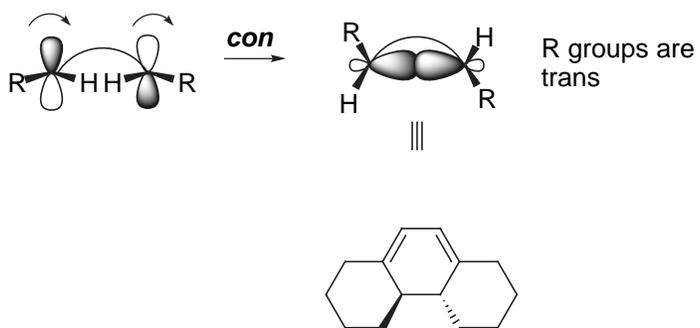


step 2. Determine the symmetry of the Highest Occupied Molecular Orbital (HOMO)

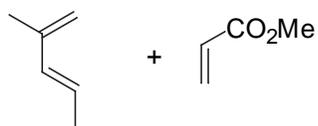
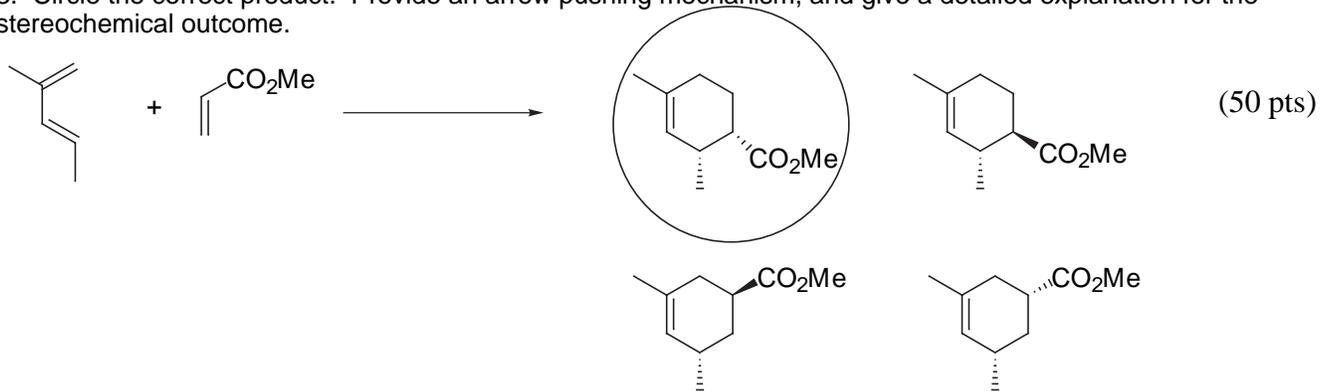
step 3. Decide if the reaction must be conrotatory or disrotatory



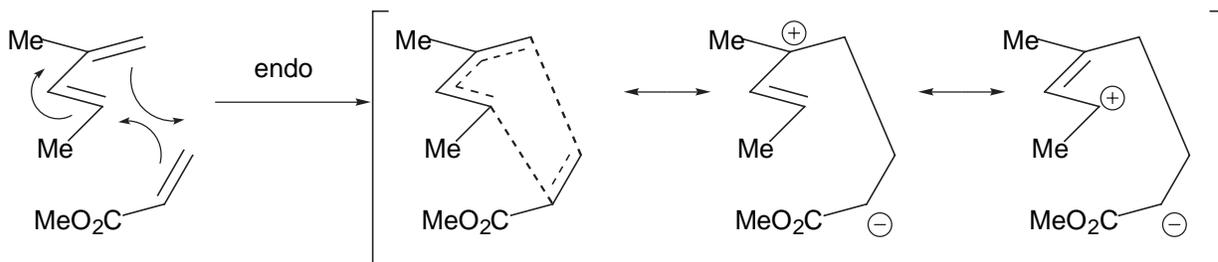
step 4. follow the stereochemistry



3. Circle the correct product. Provide an arrow pushing mechanism, and give a detailed explanation for the stereochemical outcome.



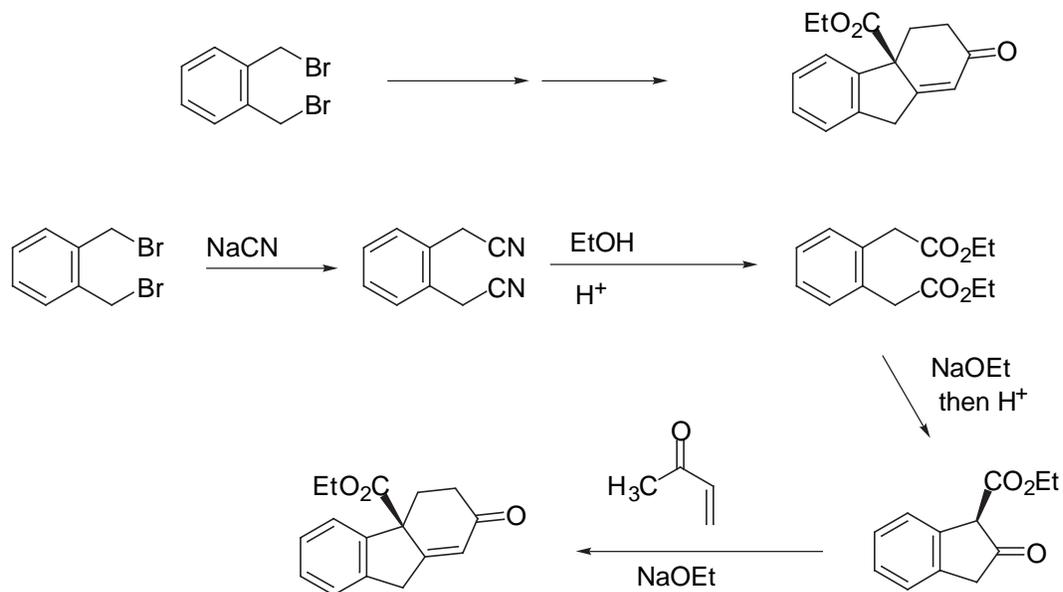
favoured



concerted but not synchronous addition gives the endo product. the favored regioisomer results from the transition state that has the character of  $3^\circ$  and  $2^\circ$  carbocations, with the negative charge stabilized by the ester.

4. Provide a multistep synthesis using **E** and any other starting materials

(60 pts)



5. Provide a detailed arrow pushing mechanism (60 points)

