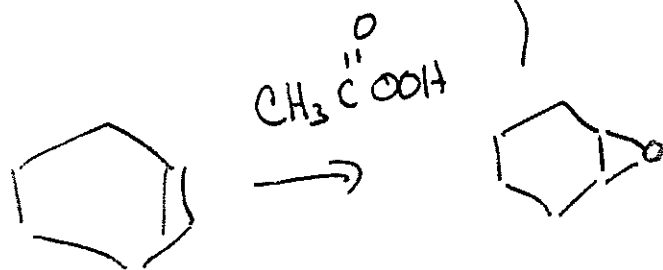
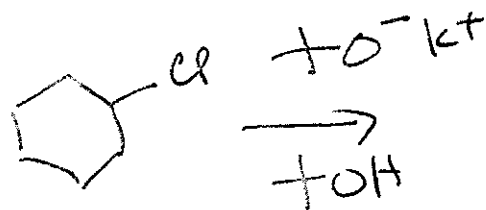
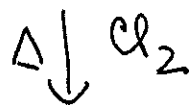
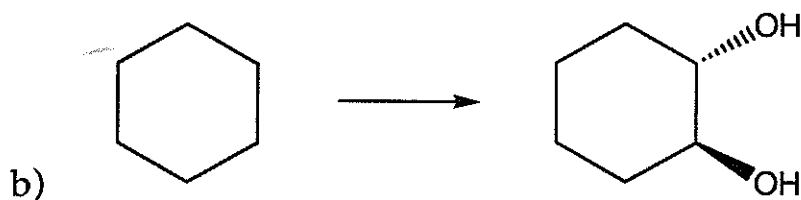
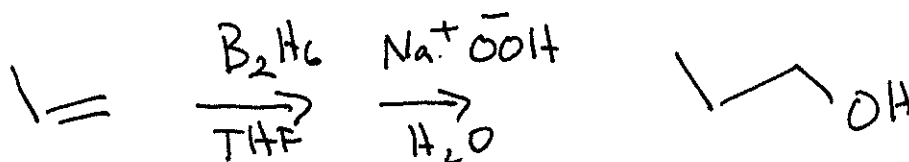
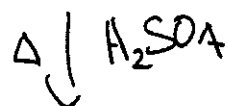
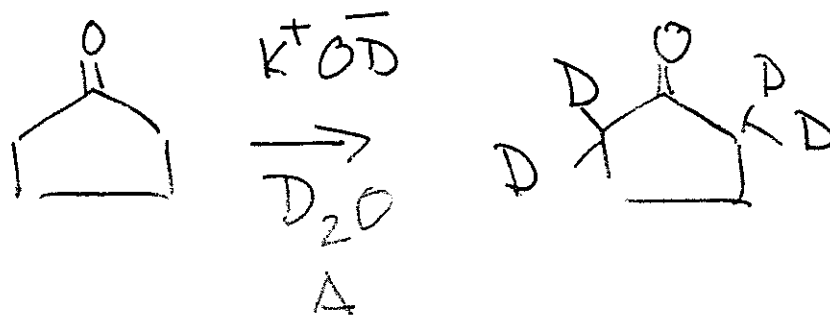
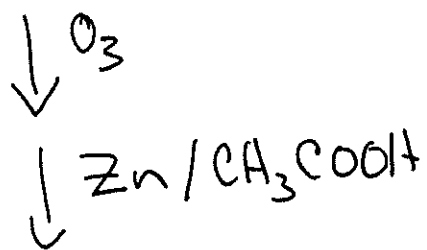
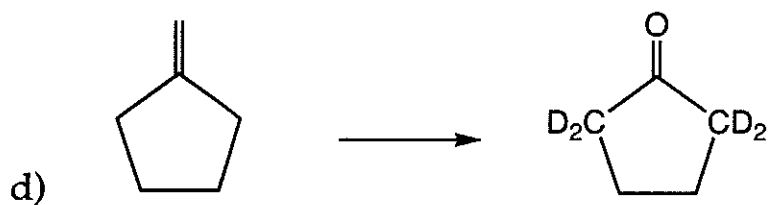
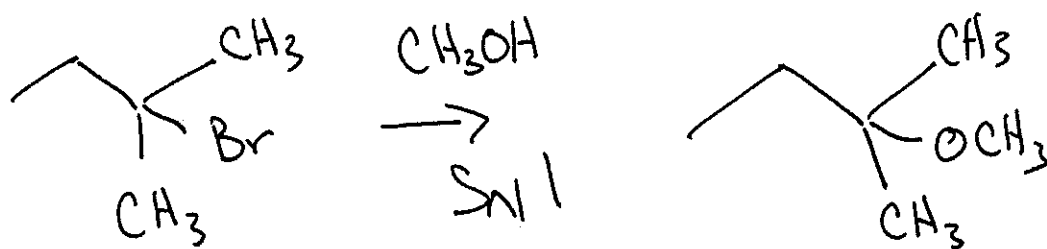
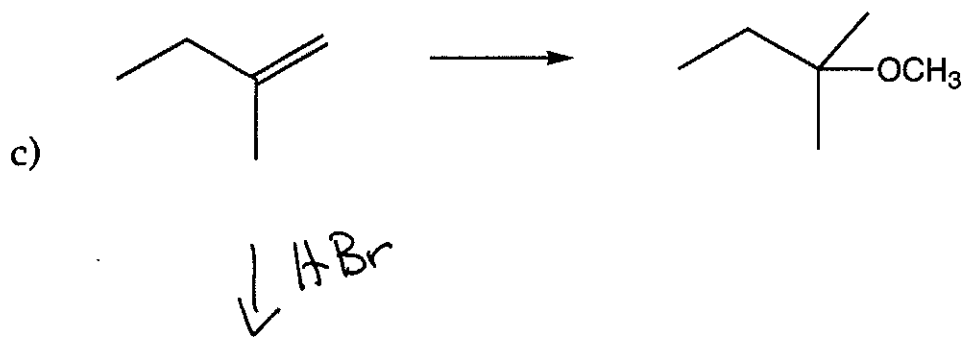


Chemistry 3351-100
 Organic Chemistry / Dr. Barney Ellison
 Saturday: Dec. 13th @ 1:30 pm → 4:00 pm / Final Exam / Chemistry 140

Name: Key (please print)

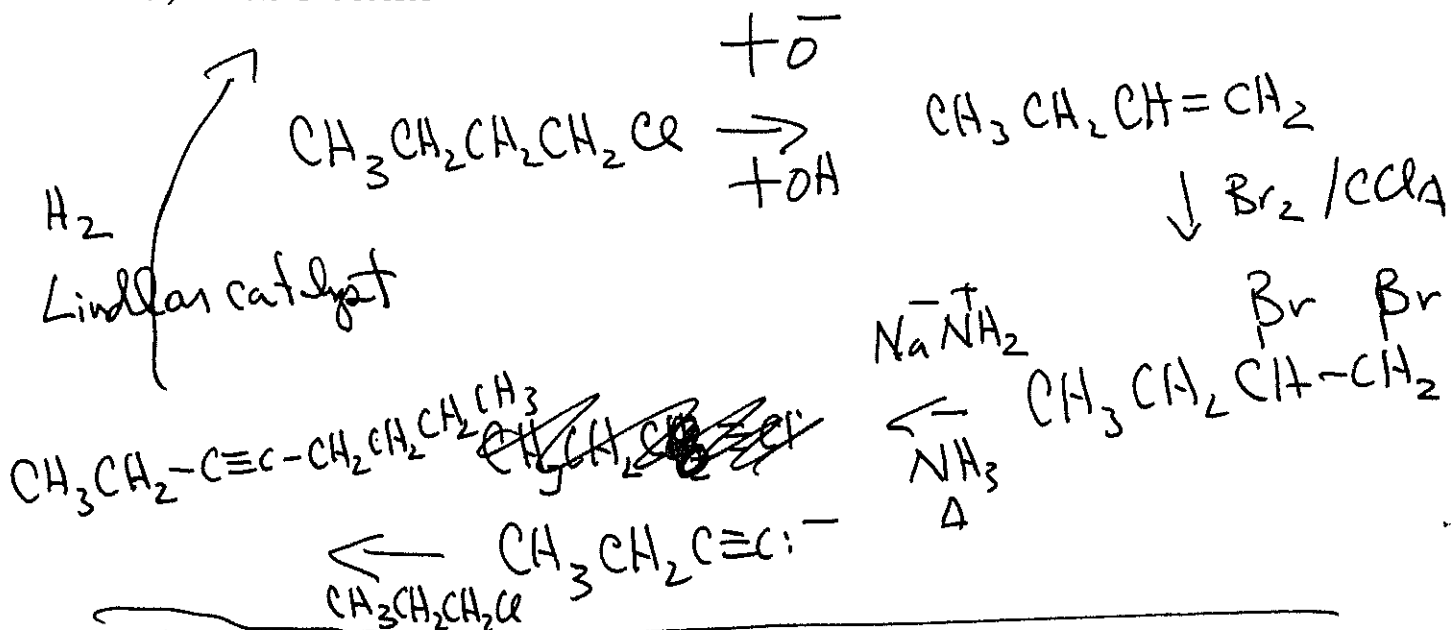
1. (20 pts) Show how to accomplish the following transformations.



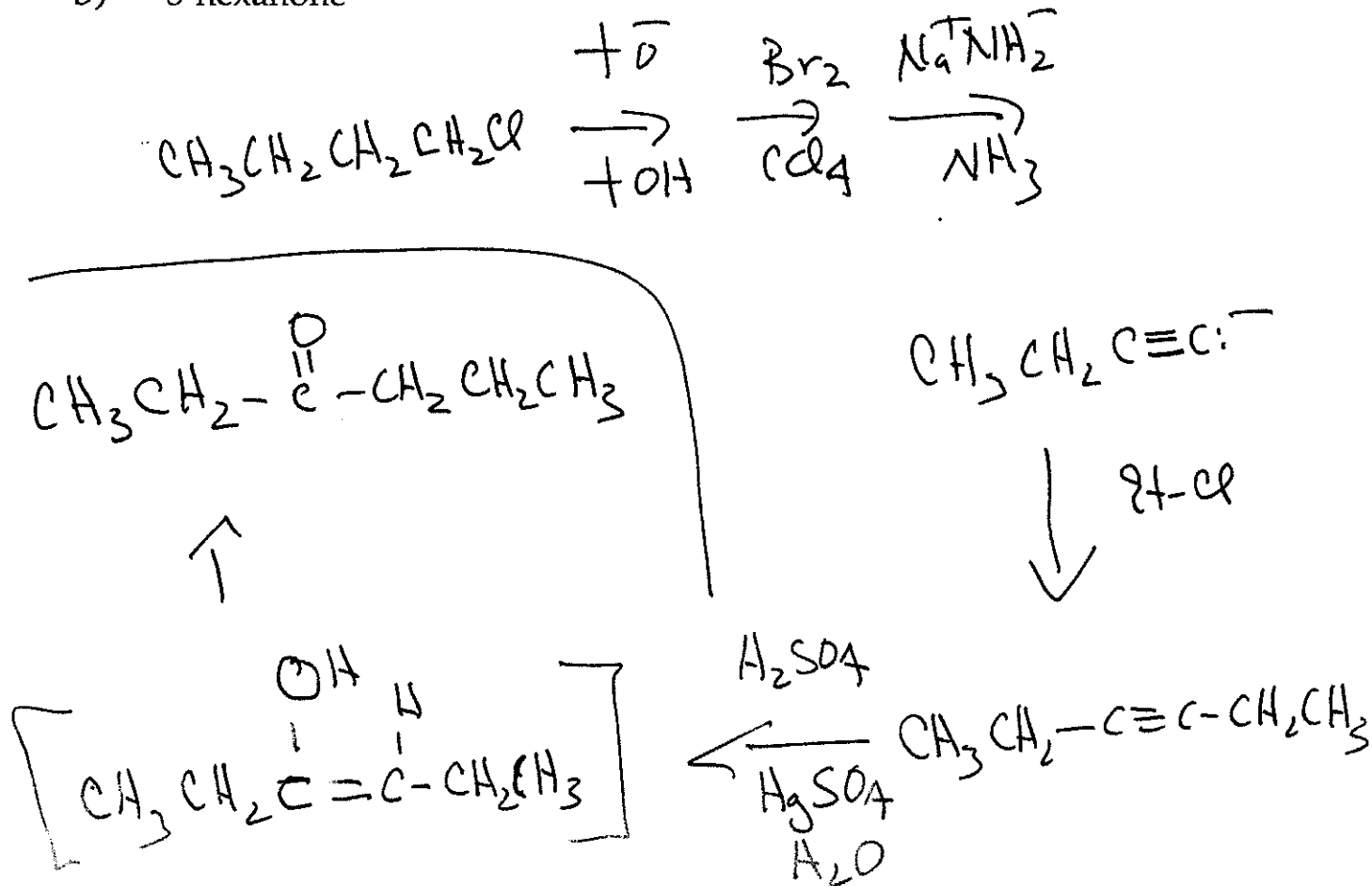


2. (10 pts) Using 1-chlorobutane, show how to prepare the following:

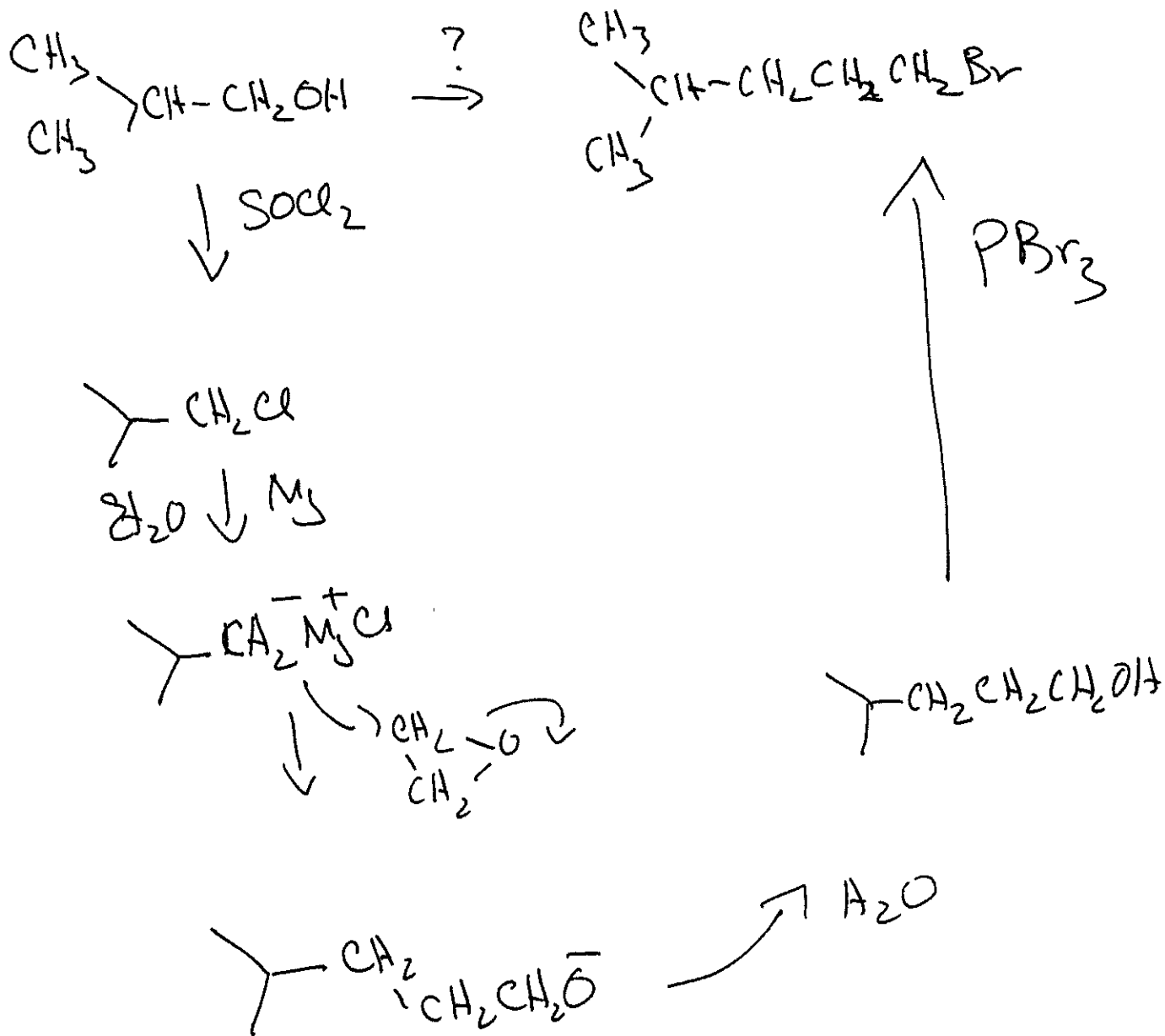
a) *cis*-3-octene



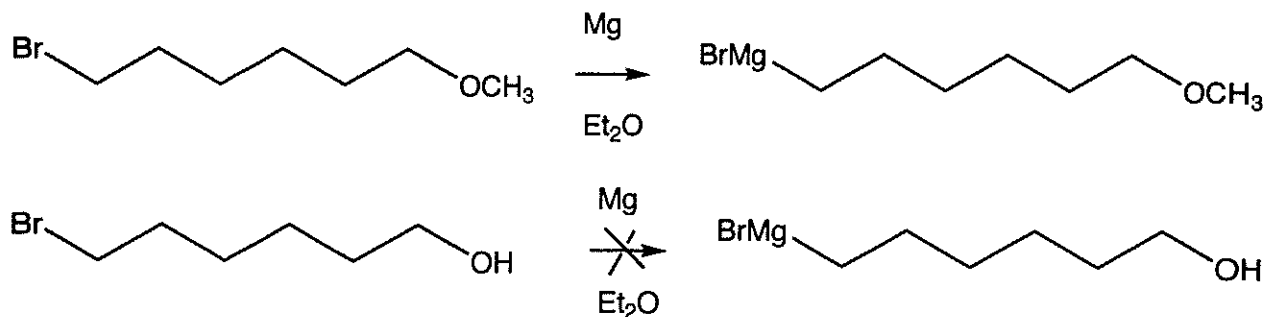
b) 3-hexanone



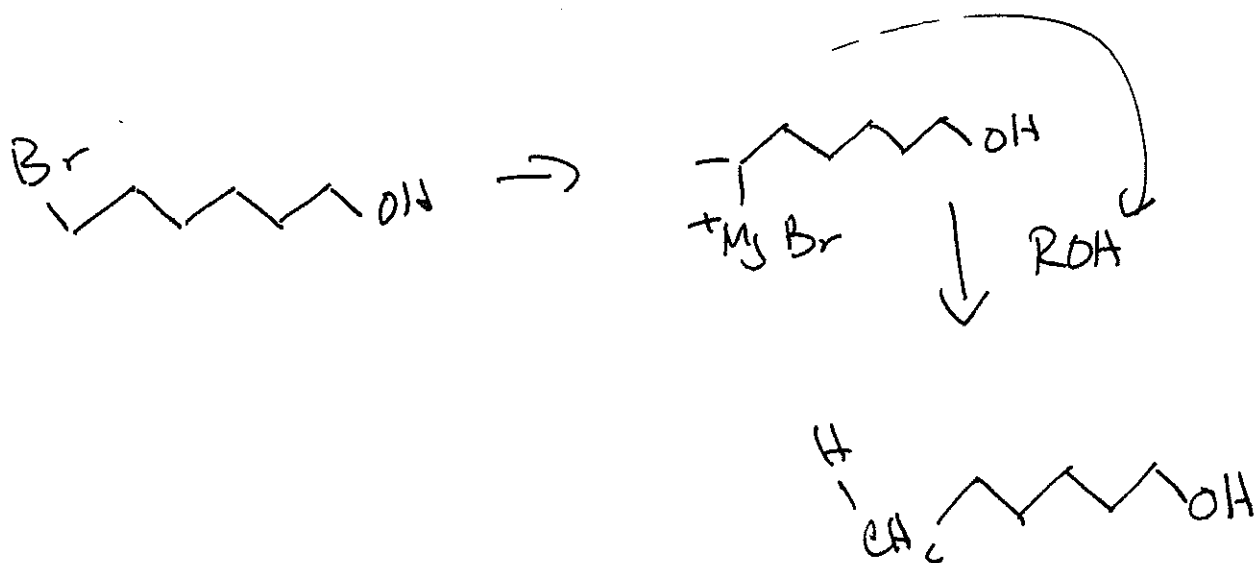
3. (10 pts) Devise a route to convert $(\text{CH}_3)_2\text{CHCH}_2\text{OH}$ to 1-bromo-4-methylpentane.



4. (10 pts) 1-Bromo-methoxyhexane can be converted to a Grignard reagent but the corresponding alcohol cannot. Explain.

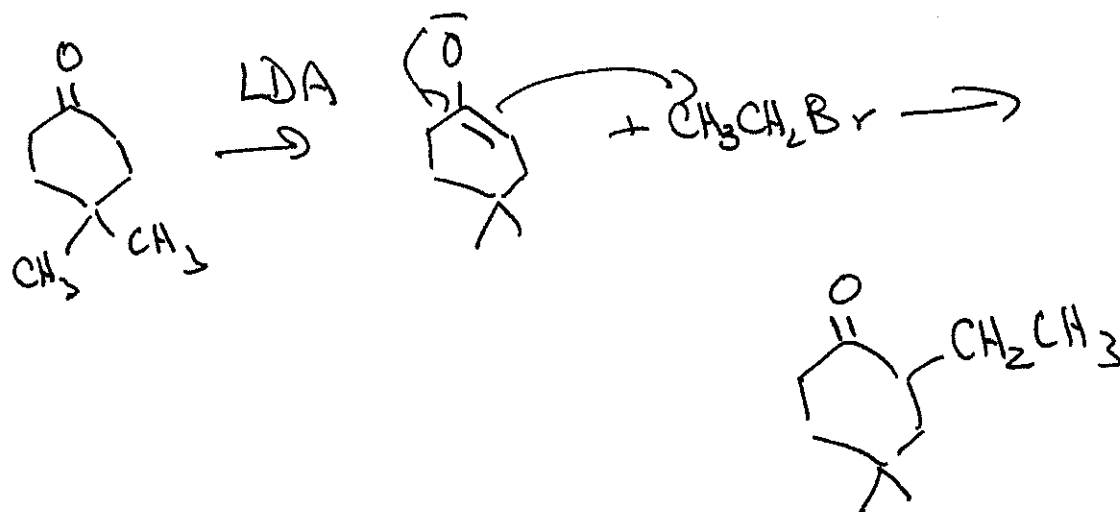


As the Mg forms the Grignard from the alcohol, it will be destroyed by the acidic -OH group.

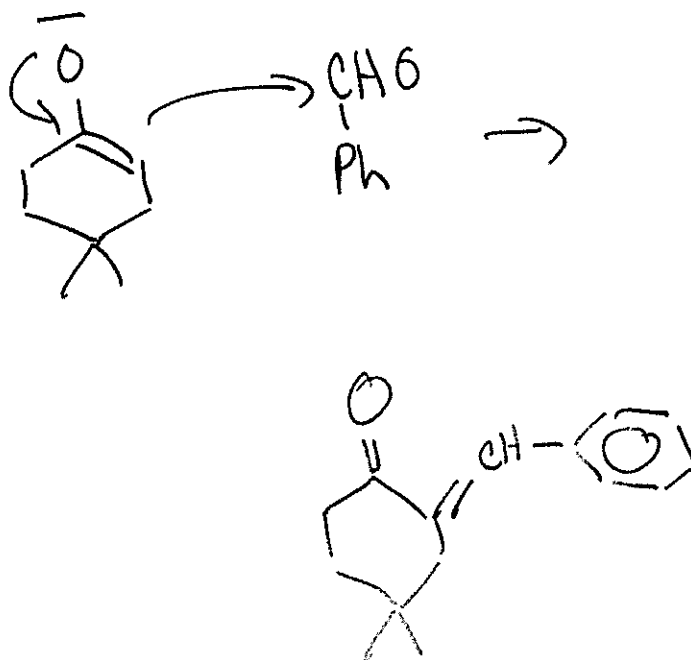


5. (10 pts) What are the products of the reaction of 4,4-dimethylcyclohexanone with each of the following:

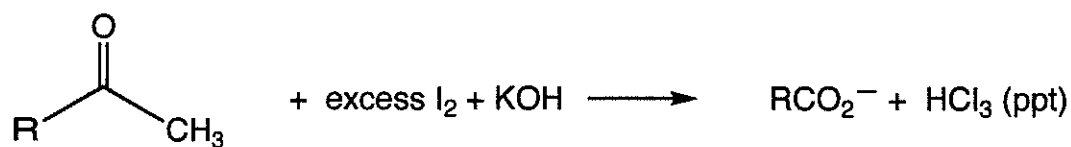
a) (i) 1 equivalent of LDA in THF followed by (ii) $\text{CH}_3\text{CH}_2\text{Br}$



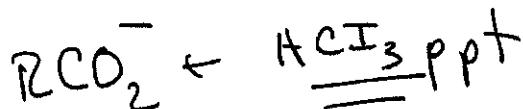
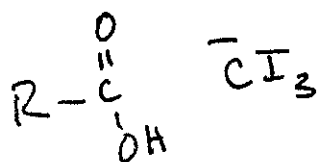
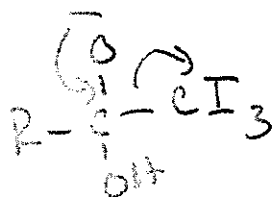
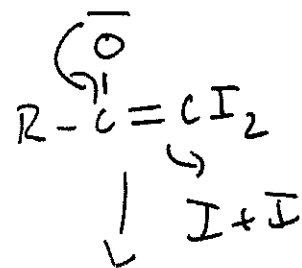
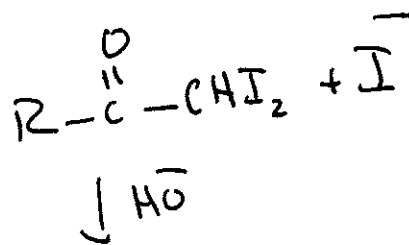
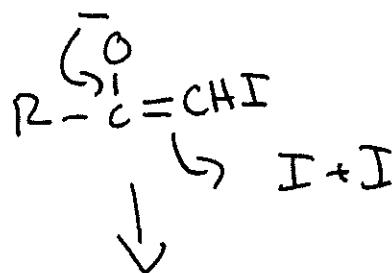
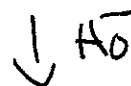
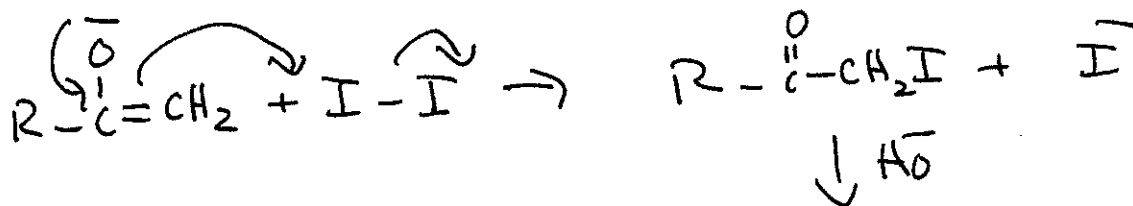
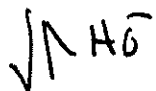
b) $\text{C}_6\text{H}_5\text{CHO} + \text{NaOH}/\text{H}_2\text{O}$



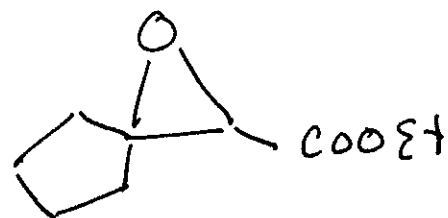
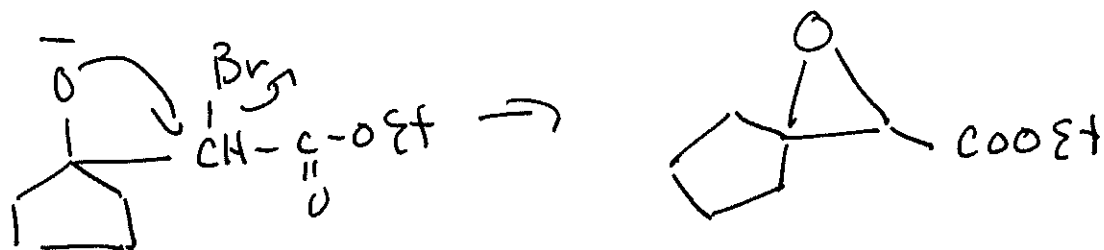
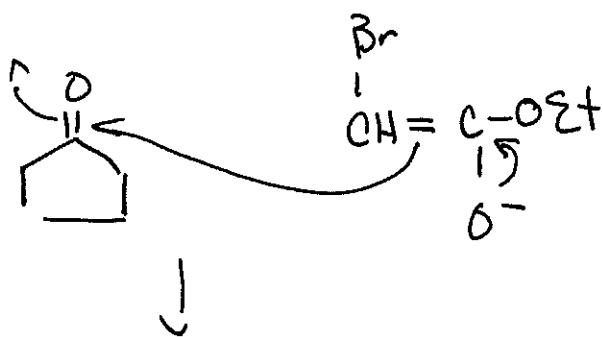
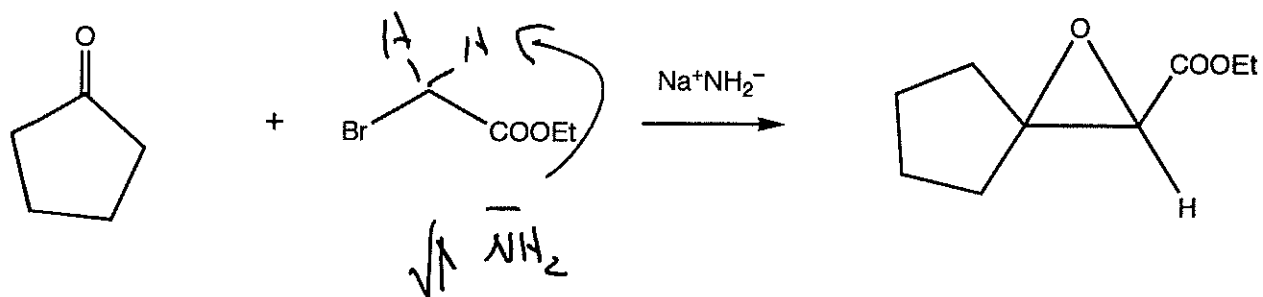
6. (10 pts) A reaction that can identify methyl ketones is the iodoform test:



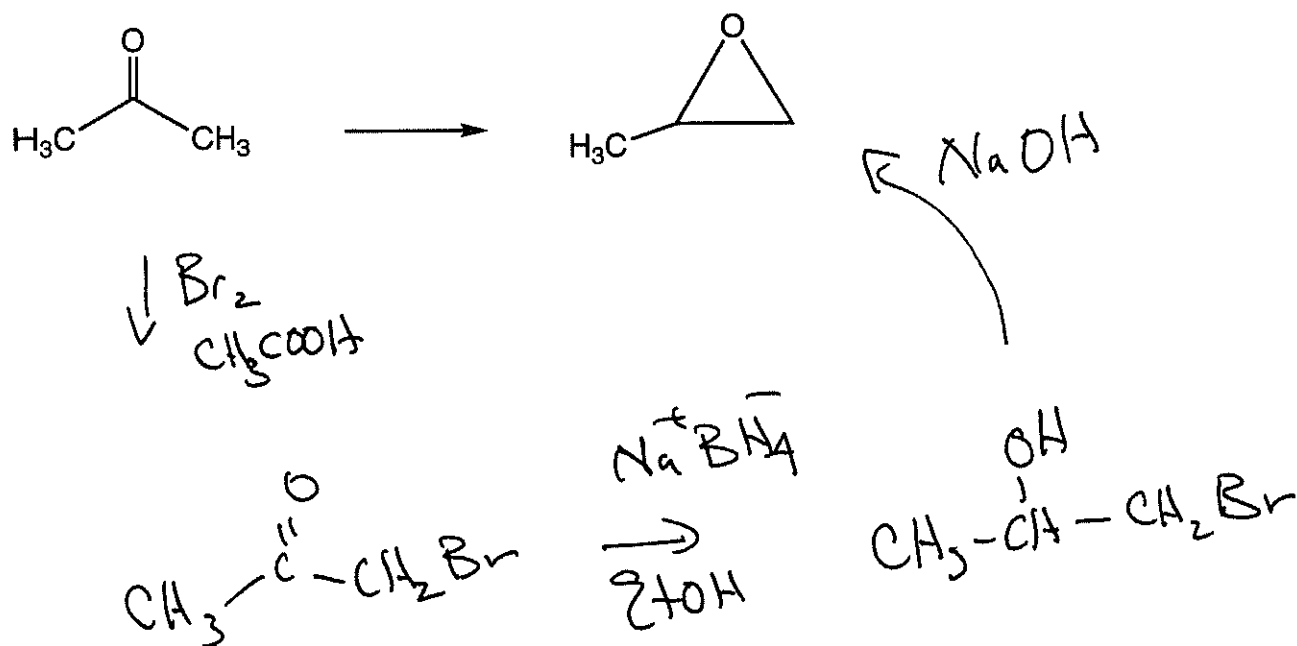
Write a mechanism for this reaction.



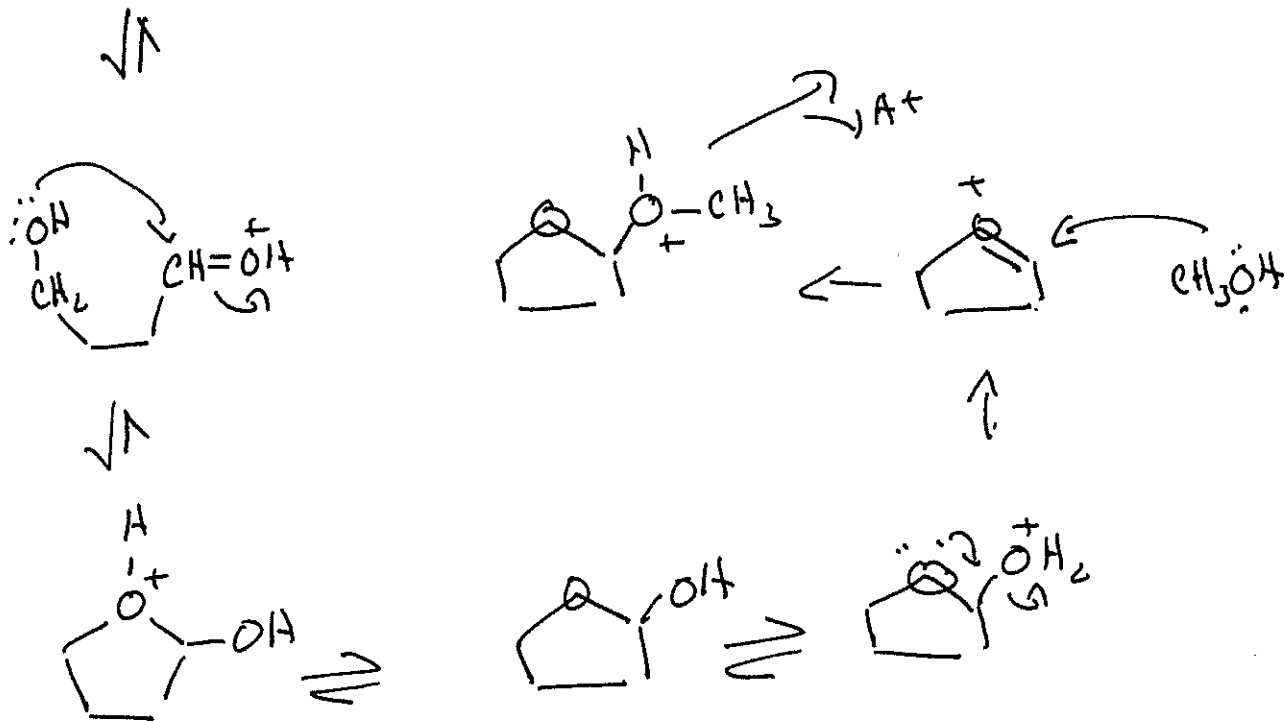
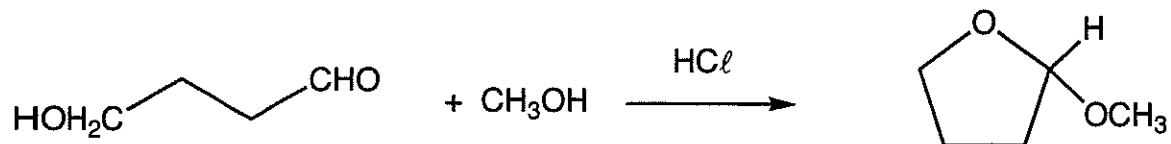
7. (10 pts) Propose a mechanism for the following reaction:



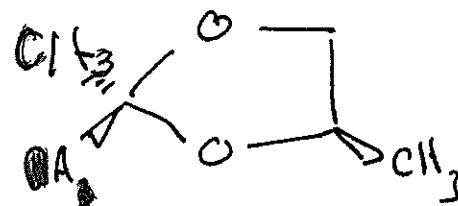
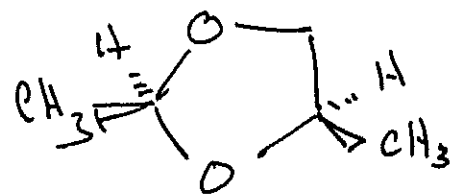
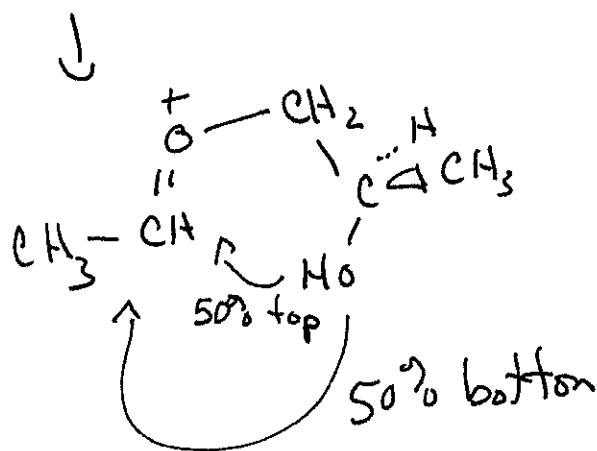
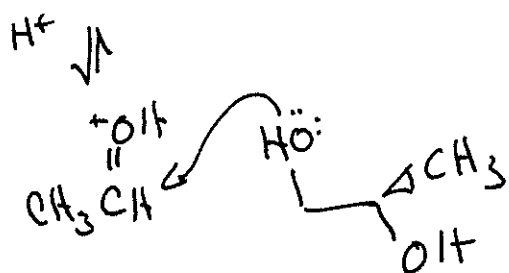
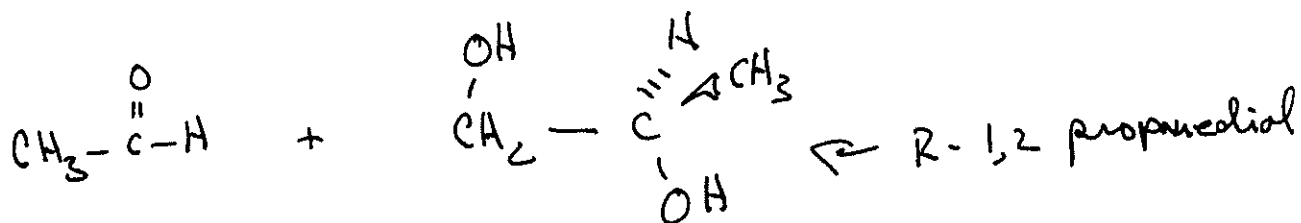
8. (10 pts) Propose a route for the following transformation.



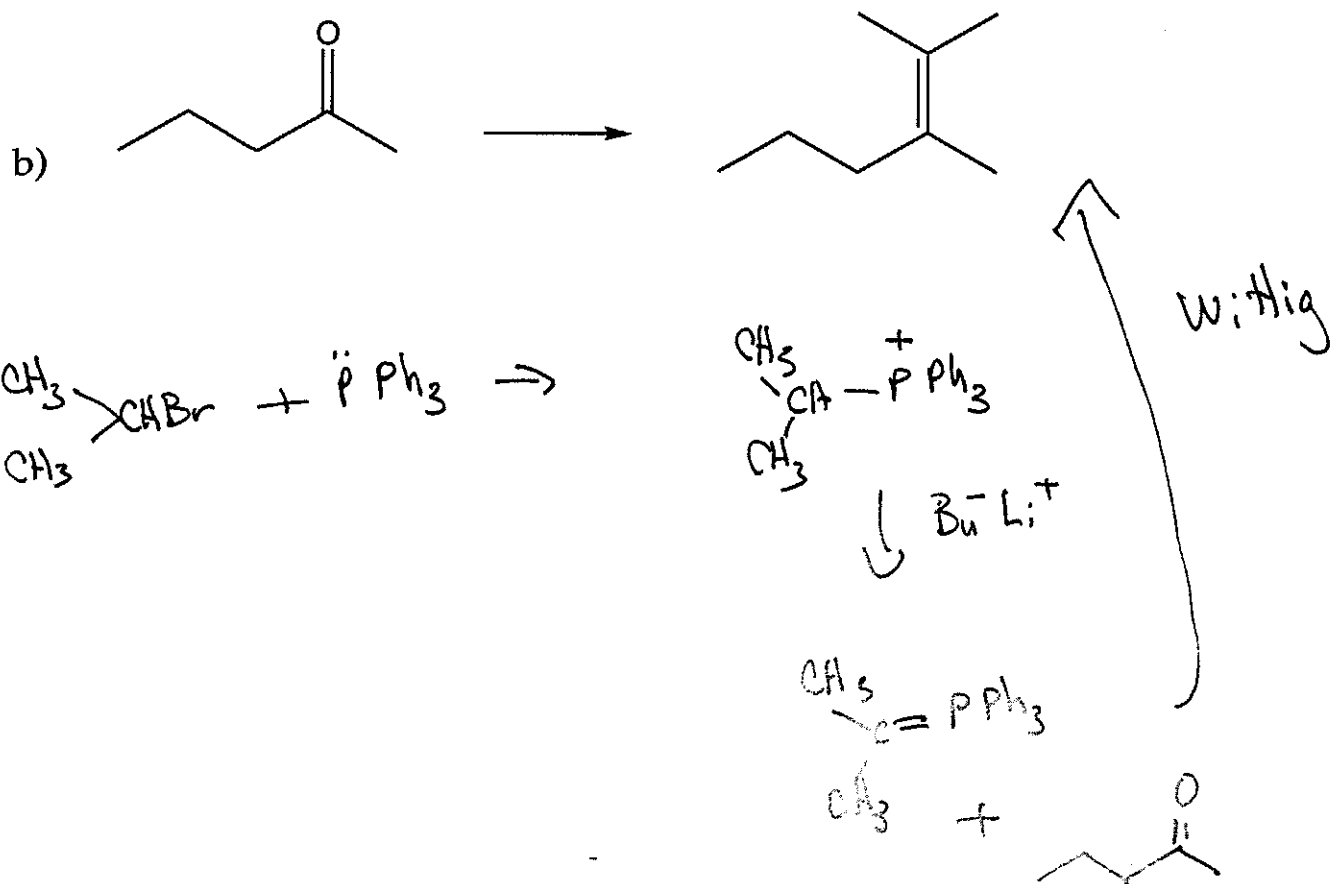
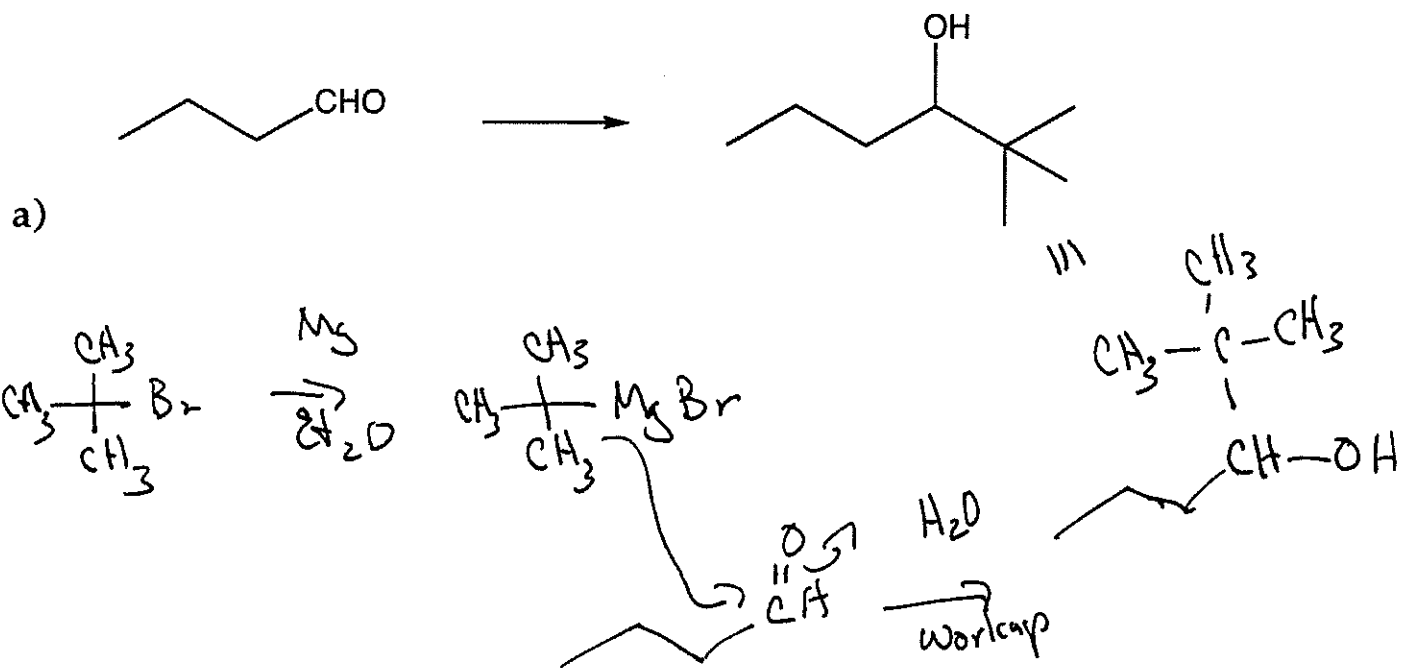
9. (10 pts) When 4-hydroxybutanal is dissolved in methanol containing HCl, the following reaction occurs. What is the mechanism?

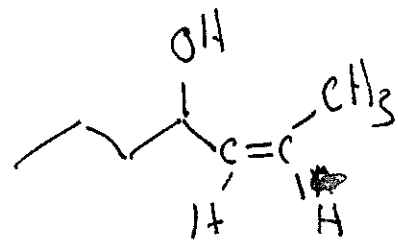
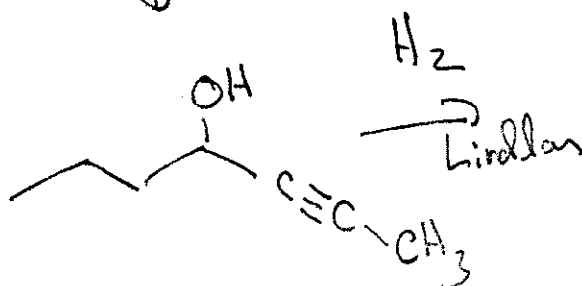
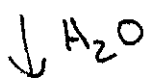
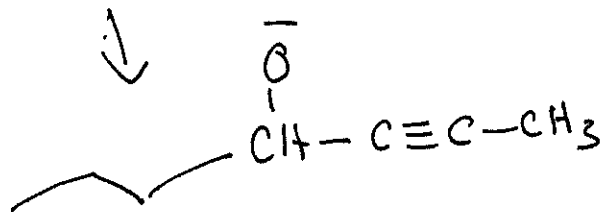
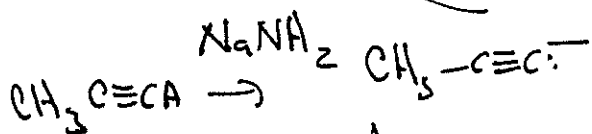
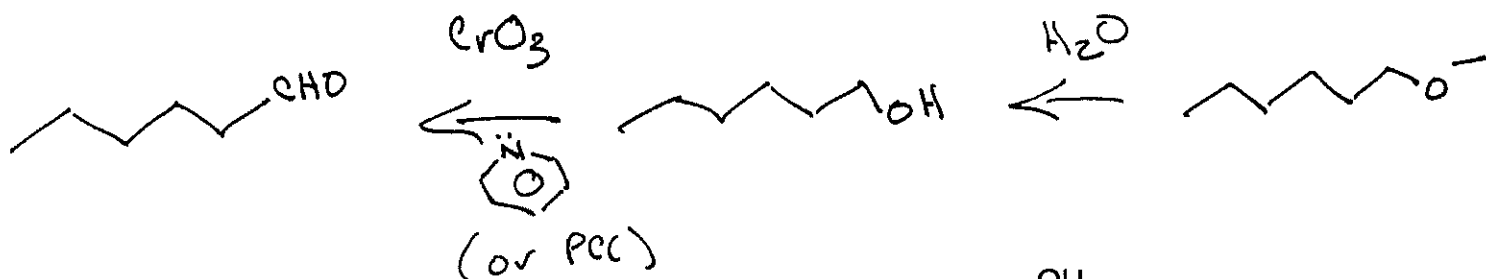
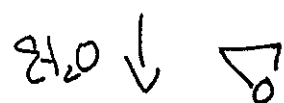
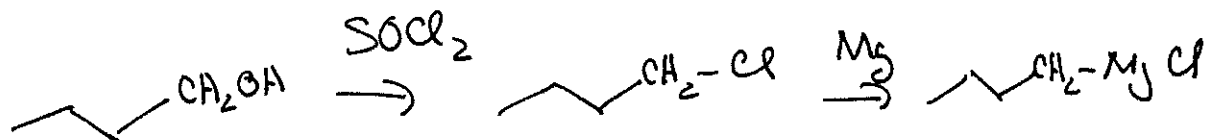
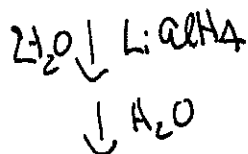


10. (10 pts) Acetaldehyde reacts with (R)-1,2-propanediol to give two isomeric acetals. What are the structures of these two compounds?

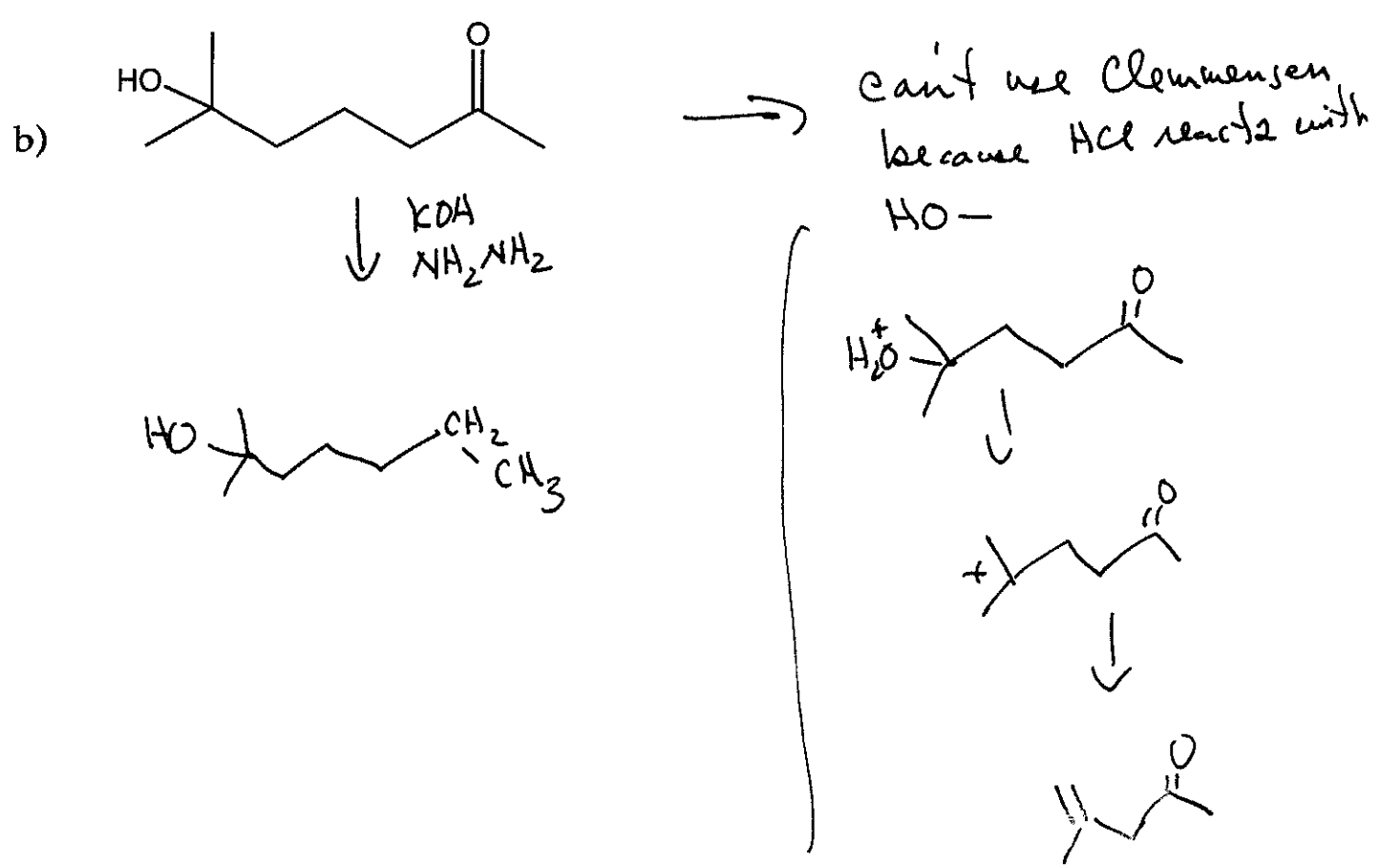
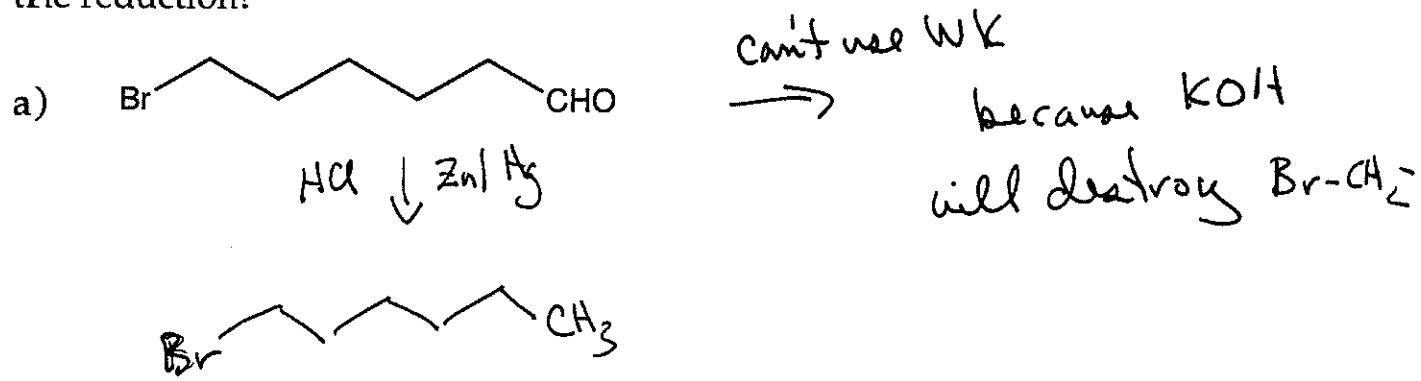


11. (20 pts) Show how to carry out the following transformations.

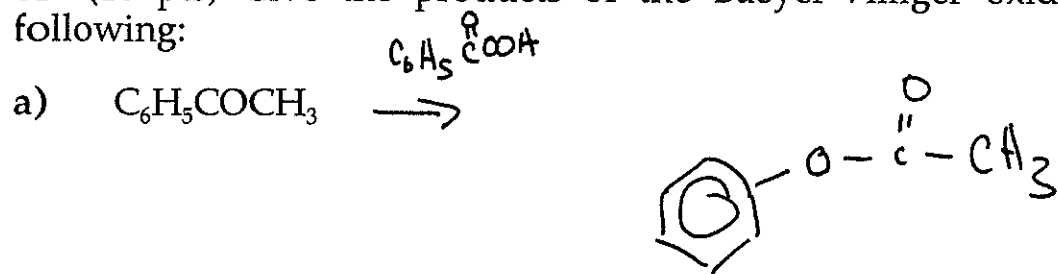




12. (10 pts) Which method (Wolff-Kishner or Clemmensen) is preferable for deoxygenation of each of the following aldehydes? What is the product of the reduction?



13. (10 pts) Give the products of the Baeyer-Villiger oxidation of the following:



b) ethyl cyclohexyl ketone

