

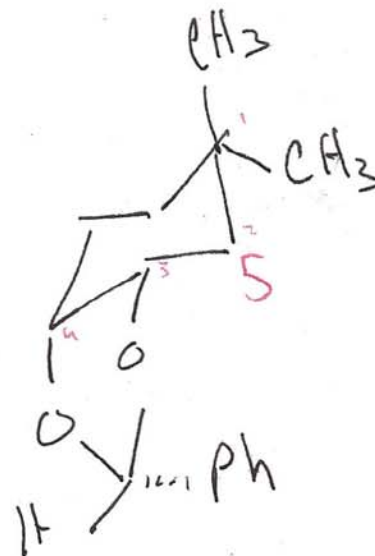
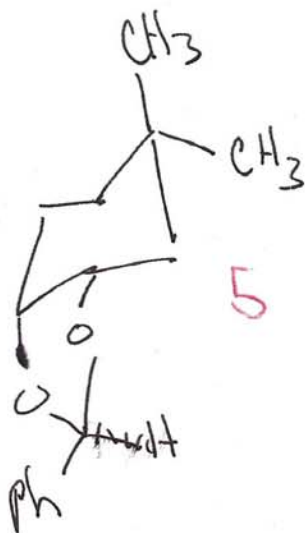
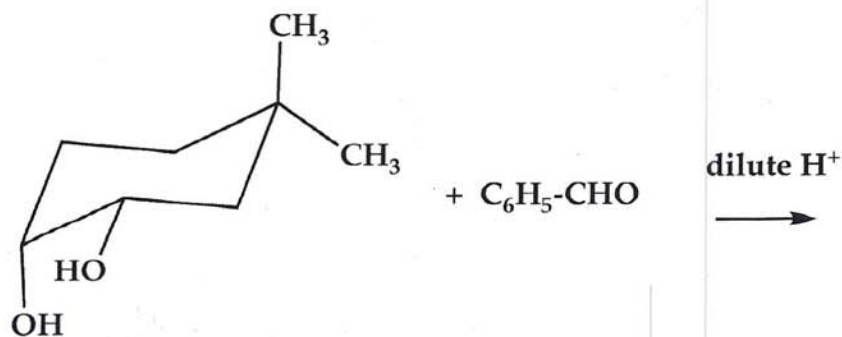
Chemistry 3331-100

Organic Chemistry / Dr. Barney Ellison

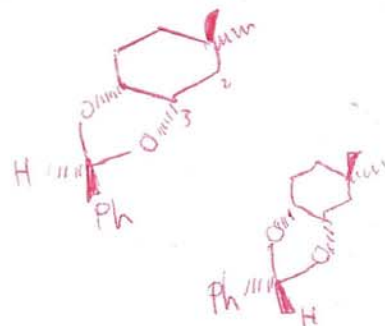
Thursday: October 20st @ 7:00pm → 9:00 / 2nd Exam / Hale Science 270

Name: Keyy (please print)

1. (10 pts) What are the structures of the two separable isomers formed in the reaction:

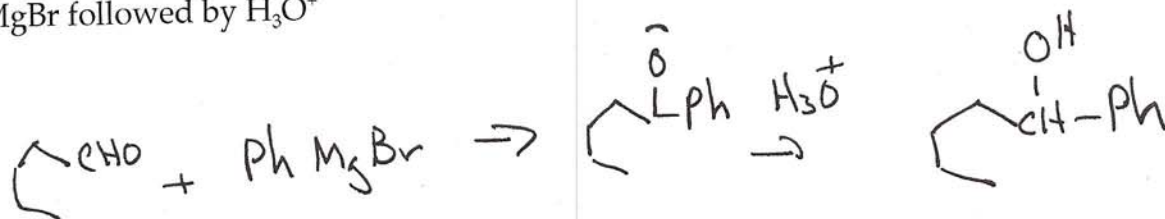


- HALF ACETAL -2
- ESTER -5
- ETHER -7
- OTHER -9 OR -10
- STEREOCHEM. -1
- MISSING GROUP -1
- CONFORMERS -3

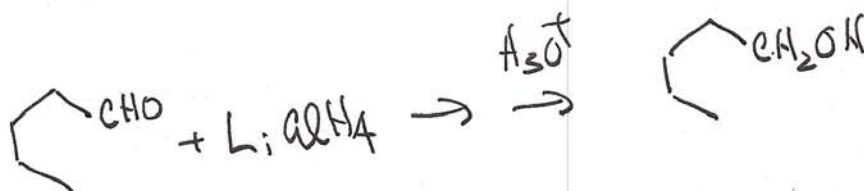


2. (15 pts) ~~Give~~ Give the expected products when pentanal ($\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CHO}$) reacts with the following:

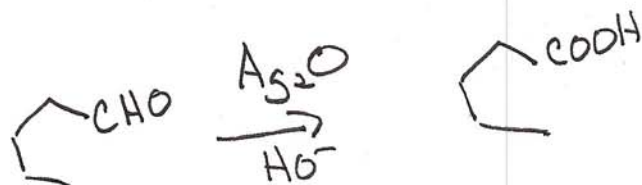
a) PhMgBr followed by H_3O^+



b) LiAlH_4 followed by H_3O^+

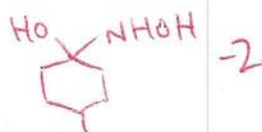
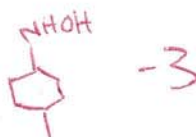
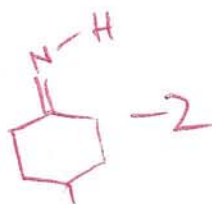
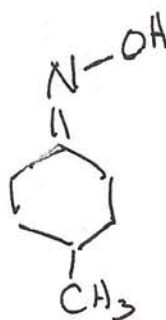
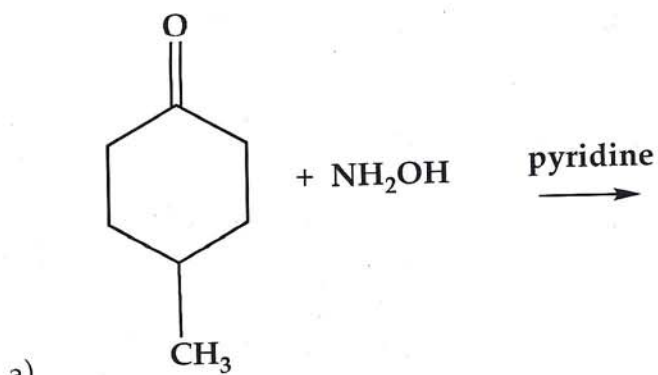


c) $\text{Ag}_2\text{O} / \text{NaOH} / \text{H}_2\text{O}$

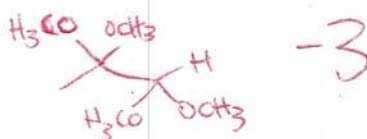
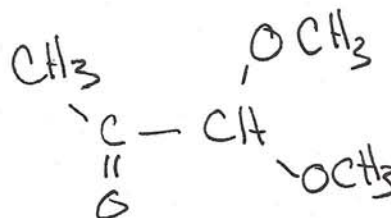
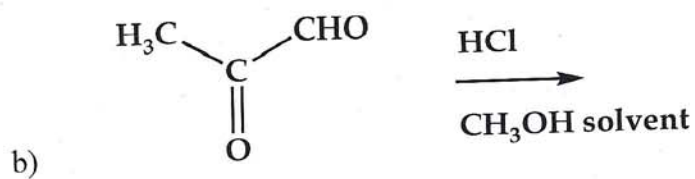


MISSING ONE ATOM -1
WRONG PRODUCT -5

3. (15 pts) Complete the reactions by giving the organic products

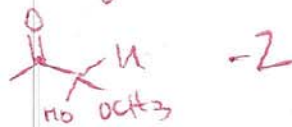
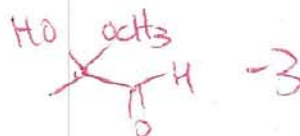
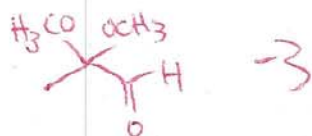


OTHER -5

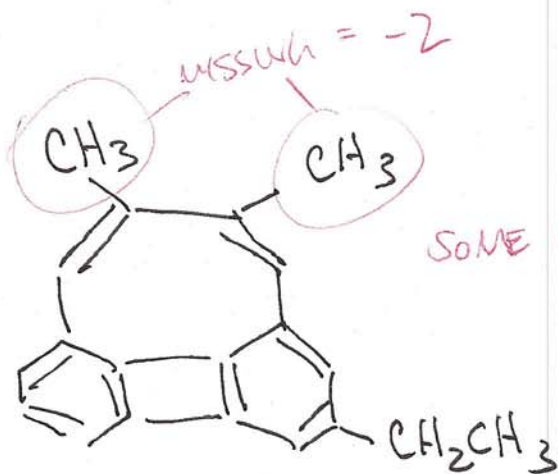
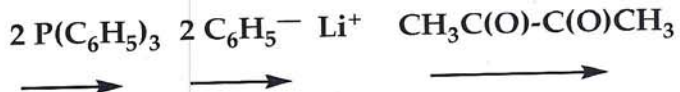
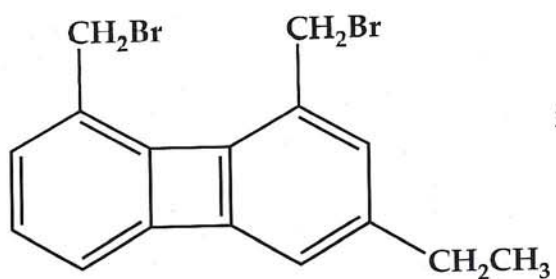


OTHER

-5



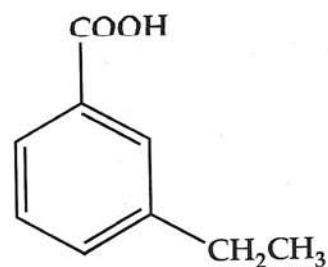
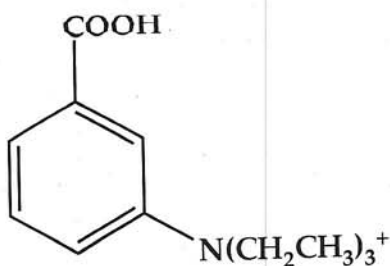
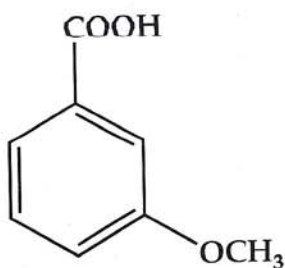
c)



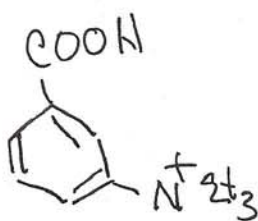
SOME CLOSE VARIATION WITH 8-MEMBER RING = -4

OTHER = 5

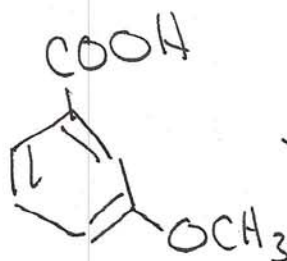
4. (10 pts) Rank the acidity of the following compounds in order of increasing acidity.



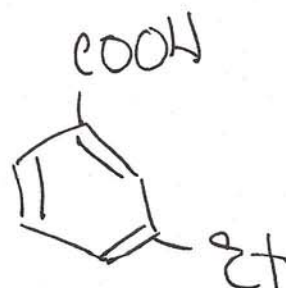
Strong acid



↑
because of + charge
stabilizes the RCO_2^- anion

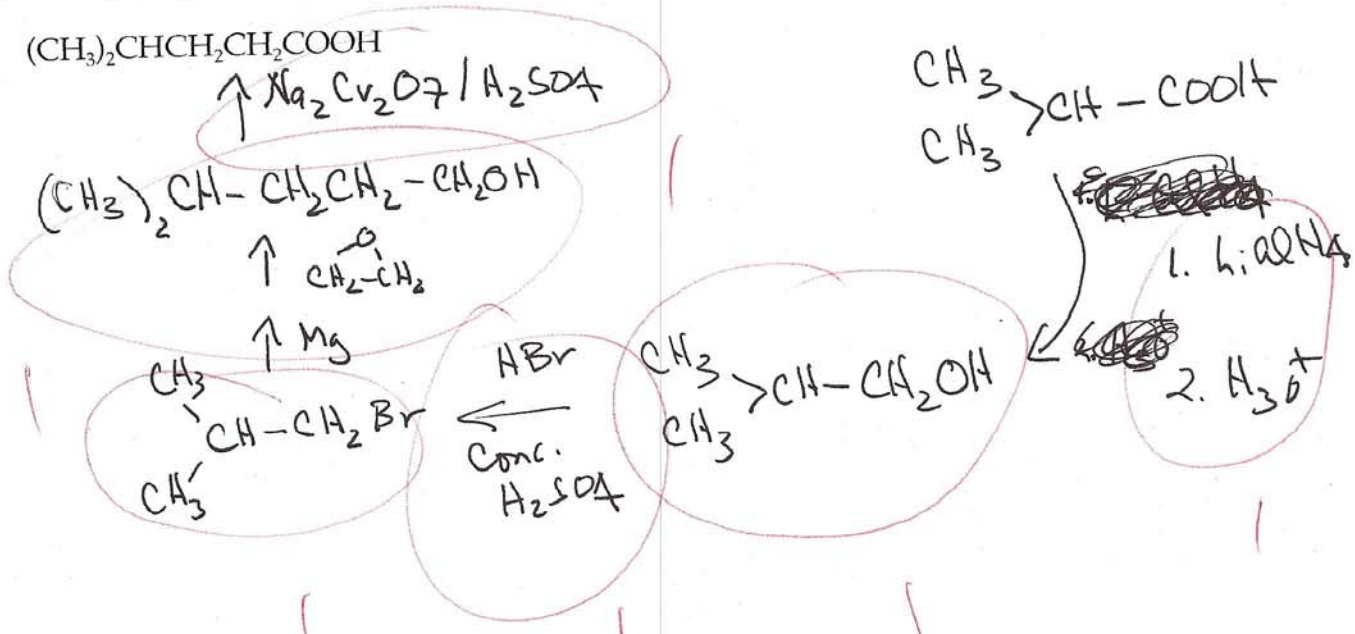


↑
c → OCH₃
polar effect

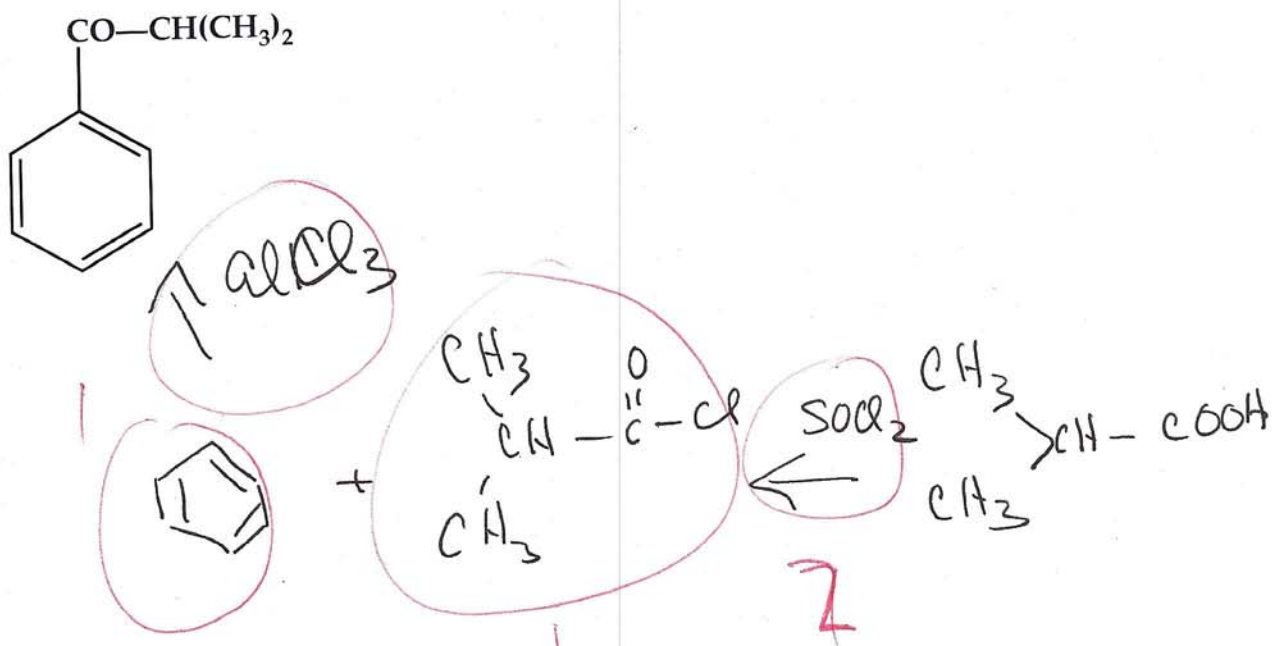


IF ANY IN WRONG ORDER = $(-3) \times 3 = -9$

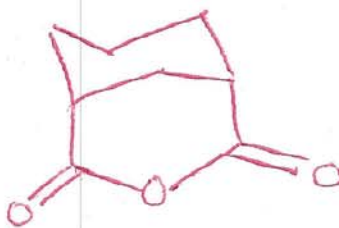
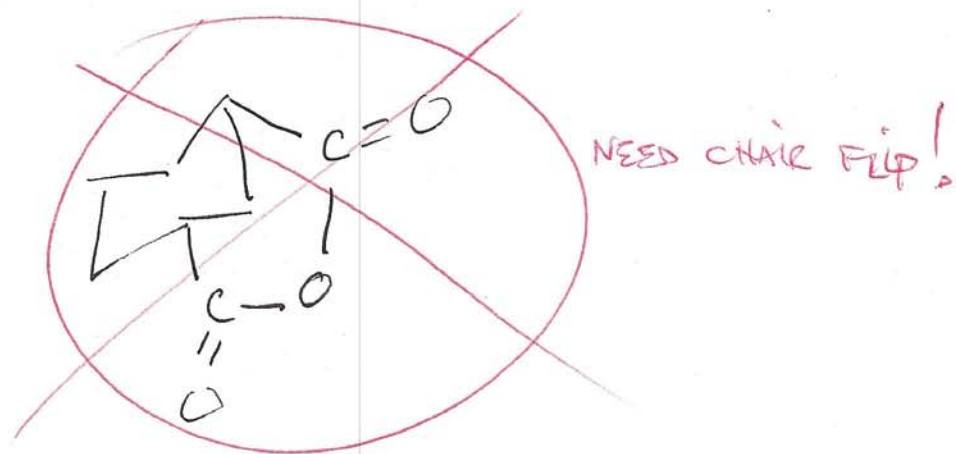
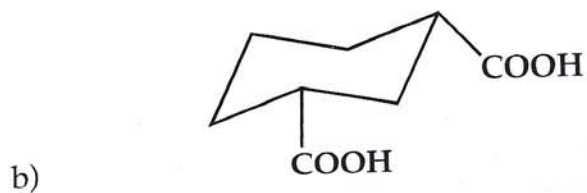
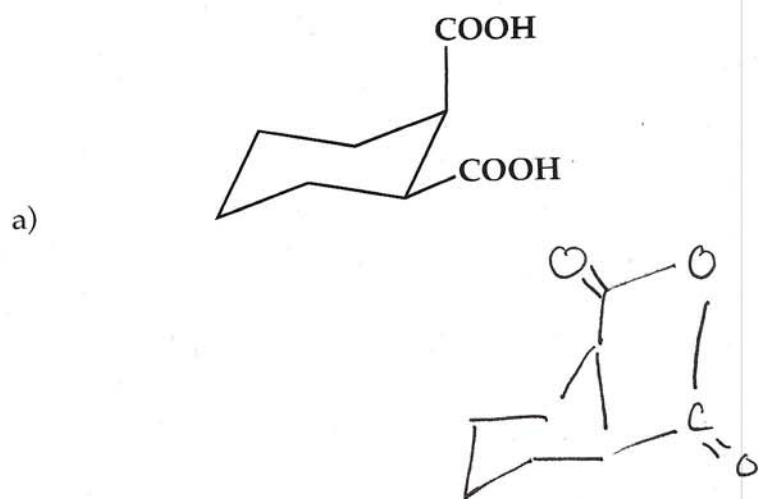
5. (10 pts) Outline a synthesis of each of the following compounds from isobutyric acid (2-methylpropanoic acid)



b)

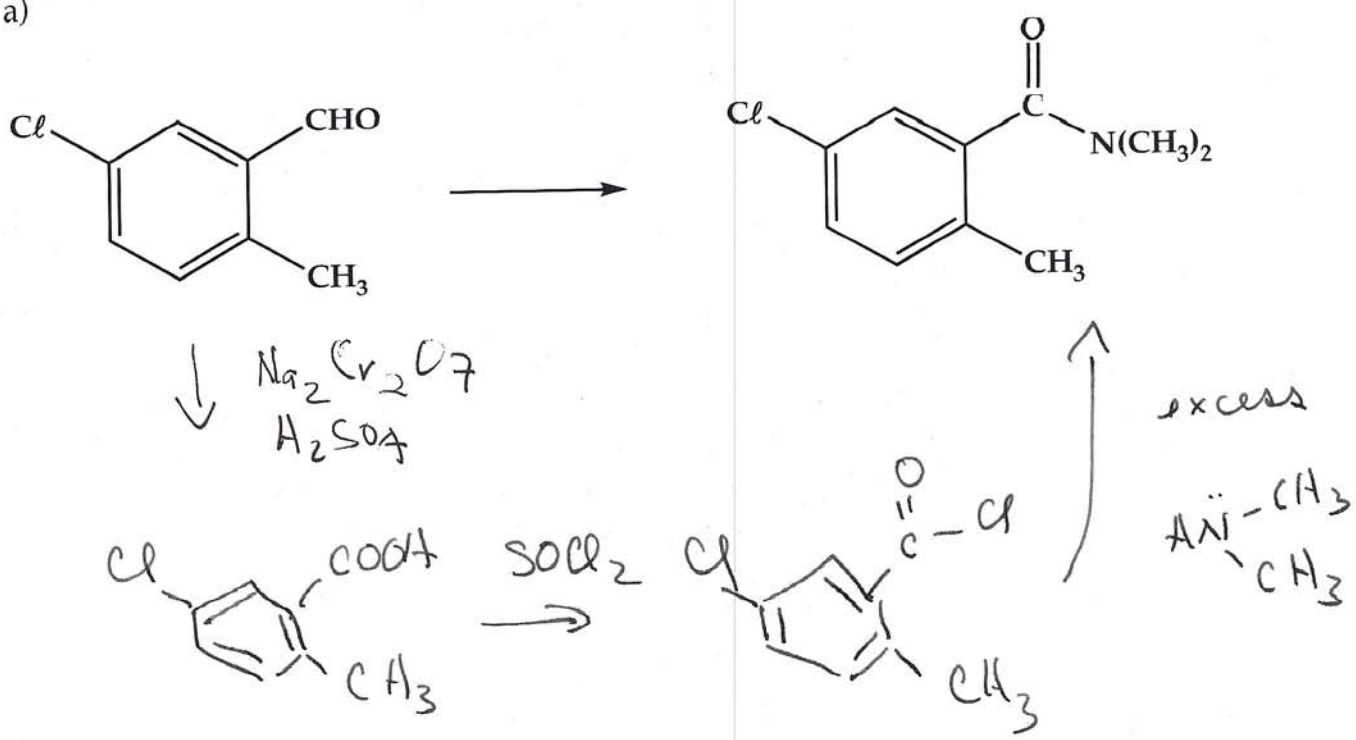


6. (10 pts) Draw the structure of the cyclic anhydride that forms when each is heated.

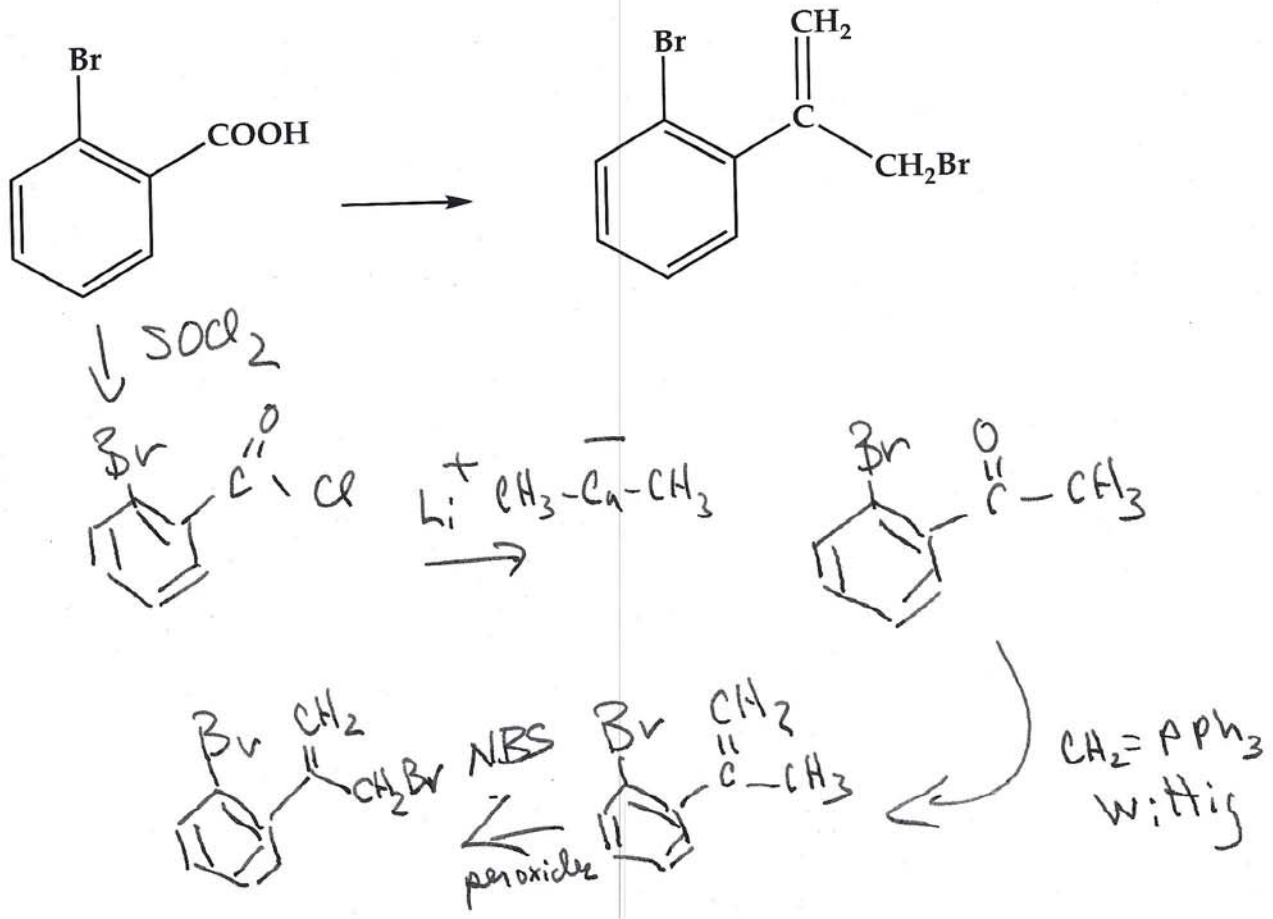


7. (10 pts) Outline a synthesis of each of the following compounds

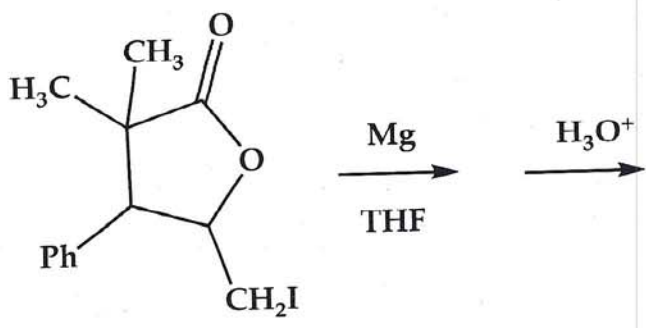
a)



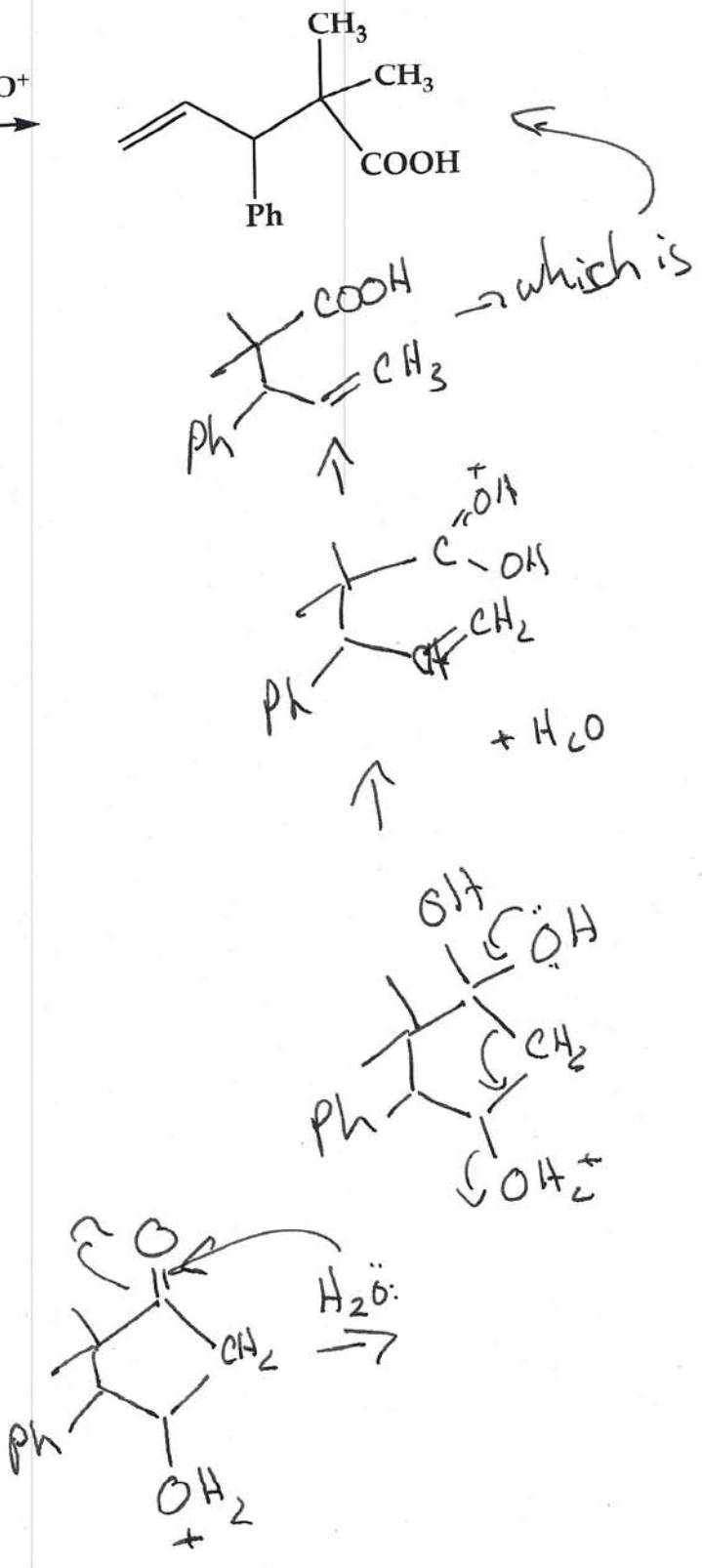
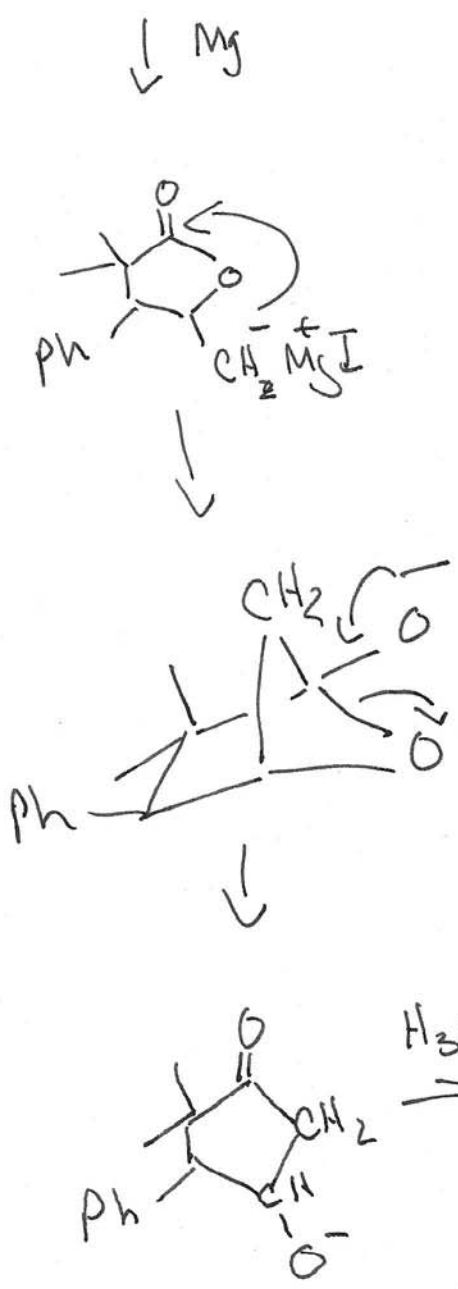
b)

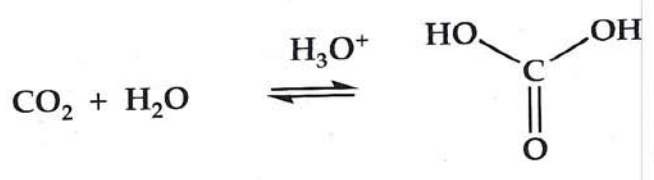


8. (10 pts) Rationalize each of the reactions with a mechanism.

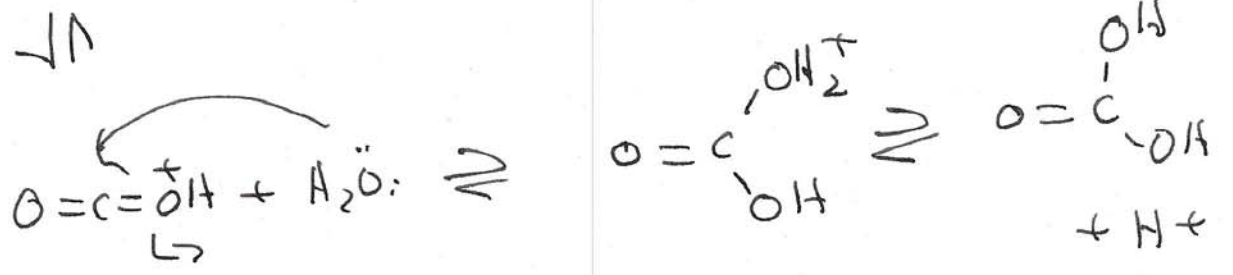


a)





b)



9. (10 pts) ~~_____~~ This a Beckmann rearrangement. What is compound A? What is the mechanism of this reaction?

