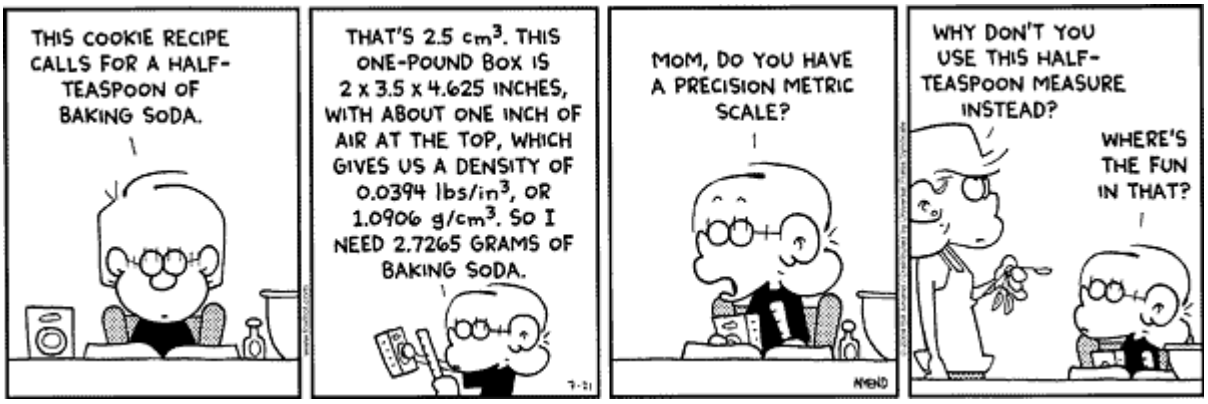
CHEMISTRY 302
EXAM 2
11:15 AM / SECTION 3
27 MARCH 2009

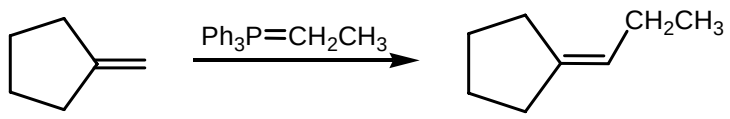
Name: _____

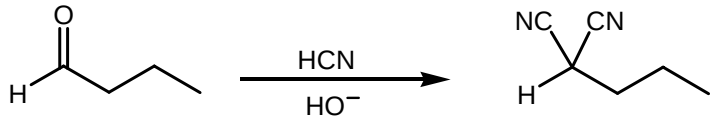
Note: Your exam should consist of 5 pages including the cover page and grade tabulation sheet. Skim the entire exam, and solve the easiest problems first. Exams not returned when time is called will not be graded.

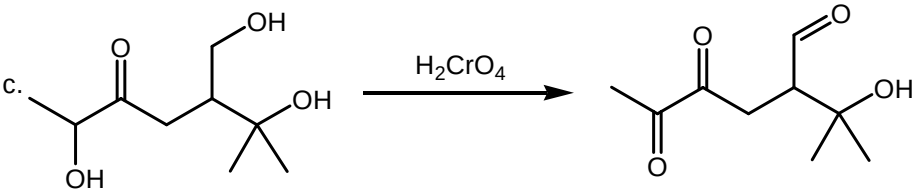


PLEASE DO NOT OPEN THIS EXAM UNTIL YOU ARE INSTRUCTED TO DO SO.

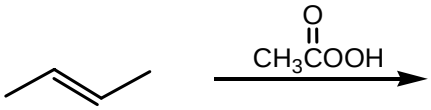
1. (6 pts each) Each of the following reaction schemes contains some sort of error. In each case, clearly identify all the error(s) and correct it/them. The errors may be in any element of the transformation (starting materials, reagents, products).

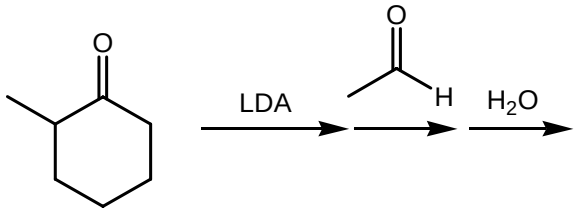
a. 

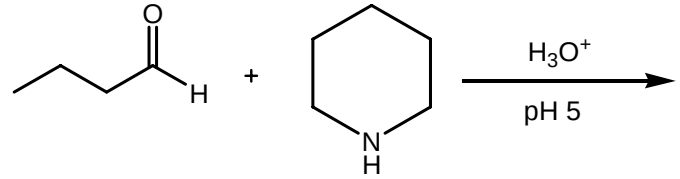
b. 

c. 

2. (6 pts each) Predict the major product of the following reactions. Mechanisms and explanations are not necessary.

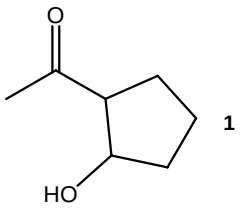
a. 

b. 

c. 

3. (12 pts) Outline two methods for preparing isopropyl methyl ether. Which method is likely to give a better yield of the ether? Explain.

4. (14 pts) Only one of the products to the right can be formed by an aldol reaction. Show the necessary reactant(s) and write a complete mechanism for the reaction you propose.



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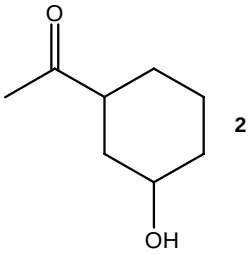
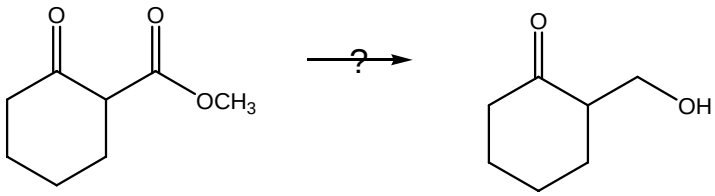


2

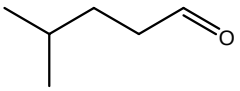
5. (10 pts) What reaction or series of reactions would you use to carry out the following transformation. Mechanisms are not necessary.



6. (12 pts) Many of the reactions that were covered in chapters 16 and 17 (reactions of aldehydes and ketones) could be catalyzed by both acid and base. Give an example of one reaction that could only be catalyzed by either acid or base (not both). Clearly indicate which catalyst works, and explain why the other catalyst does not work. A full mechanism is not necessary, but your answer must include relevant structures in addition to your explanation.

7. (16 pts) Show how you would synthesize the following compounds starting with <u>saturated alcohols containing four or fewer carbons</u>, oxirane, plus any inorganic reagents needed. You may also use organic compounds (eg TsCl, PPh_3, etc) as long as their carbons are not incorporated into the target. A molecule made in one synthesis can be used in another synthesis without "resynthesizing" it.

a.



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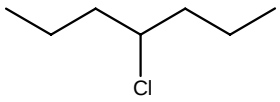

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Page	Points	Score
2	36	
3	36	
4	28	
Total	100