Hour Exam #2
Chemistry 345
Professor Gellman
30 March 2009

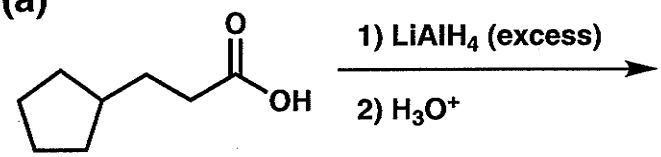
Last Name _____

First Name _____

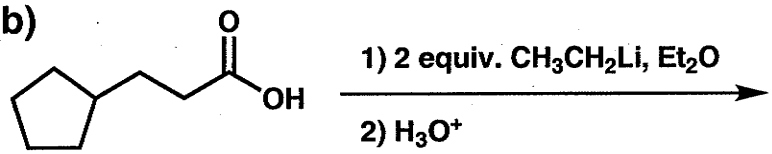
[Use scratch paper at back of exam to work out answers; final answers must be recorded at the proper place on the exam itself for credit.]

1. (18 points) Show the major product or products expected from each reaction.

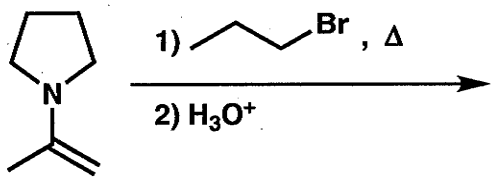
(a)



(b)



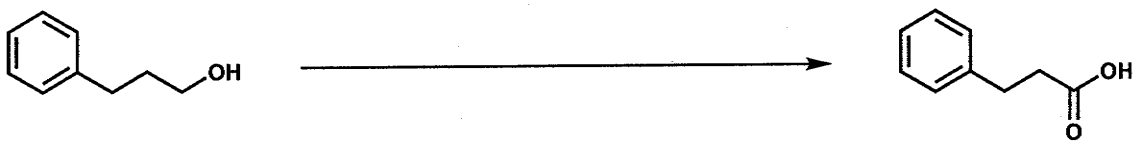
(c)



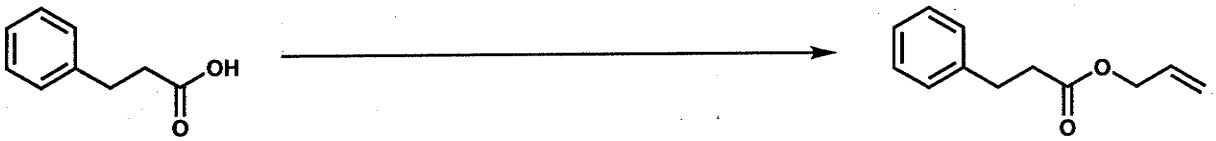
Name _____

2. (18 points) Show the reagents and other organic molecules required to convert the starting material to the indicated product. Be sure to differentiate clearly between distinct steps, by using "1)," "2)," etc. over the arrow.

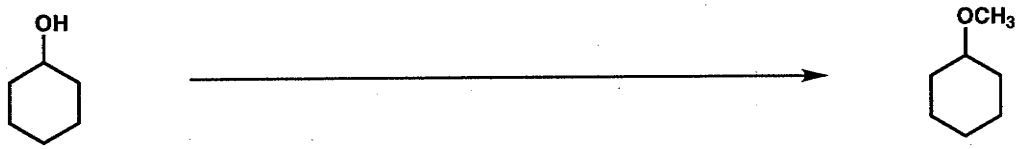
(a)



(b)



(c)

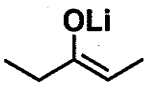


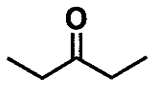
Name _____

3. (9 points) For each of the equilibria shown below, CIRCLE the side that you expect to be favored.

(a) $CH_3CH_2Li + CH_3NH_2 \rightleftharpoons CH_3CH_3 + CH_3NHLi$

(b) $CF_3CH_2ONa + CH_3CH_2OH \rightleftharpoons CF_3CH_2OH + CH_3CH_2ONa$

(c) 

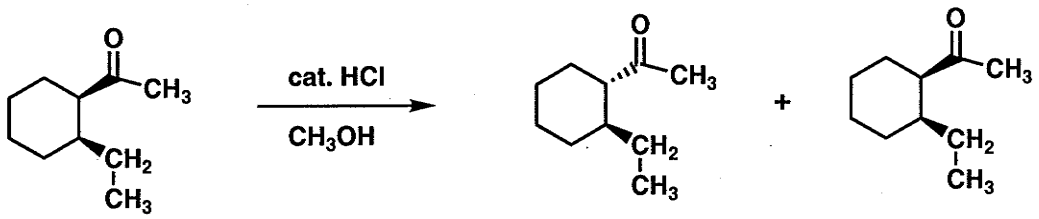
+ CH_3NH_2 $\rightleftharpoons$ 

+ CH_3NHLi

Name _____

4. (25 points) Draw a complete mechanism (curved arrows) for each of the reactions shown below; be sure to show all important resonance forms.

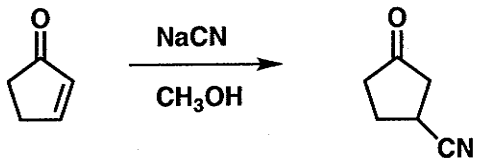
(a)



-- cont. on next page --

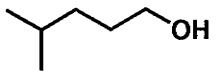
Name _____

4. (cont.)

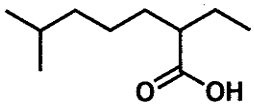
(b) 

Name _____

5. (30 points) Below you are asked to develop two synthetic routes beginning with the "starting material" to generate the "target". In each case, there are additional constraints on your choice of starting materials.



Starting Material



Target

(a) Propose a synthesis of the target from the starting material that uses additional organic molecules containing no more than FOUR carbons (and any other reagents necessary).

-- cont. on next page --

Name _____

5. (cont.)

(b) Propose a synthesis of the target from the starting material that uses additional organic molecules containing no more than THREE carbons (and any other reagents necessary).

Name _____

Problem #	Score
1	/ 18
2	/ 18
3	/ 9
4	/ 25
5	/ 30

_____

Total: / 100