Chemistry 172Q
March 29, 2007

Exam 3

1 _____/50

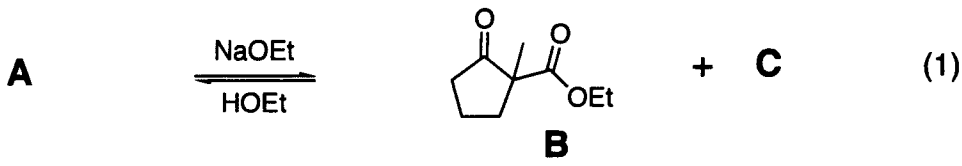
2 _____/25

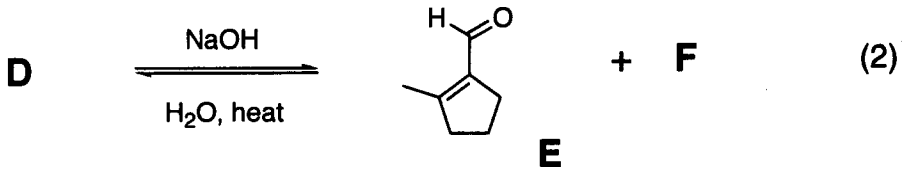
3 _____/50

Total _____/125

NAME Answer Key

1. Consider the reactions shown in equations 1 and 2.





Note: (A and D are acyclic; B and C are isomers, and E and F are isomers).

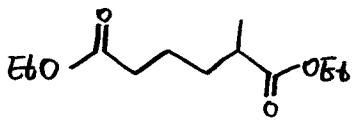
a. Give the structures of **A** and **C**. Draw a mechanism for the formation of A from either **B** or **C**.

b. What kind of ratio of **B** to **C** do you expect? Explain your answer.

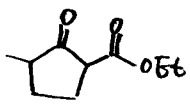
c. If you took a mixture of **B** and **C** and subjected it to H_3O^+ and heat, what products would you get? Give a mechanism for the transformation (one example is enough).

d. Give the structures of **D** and **F**.

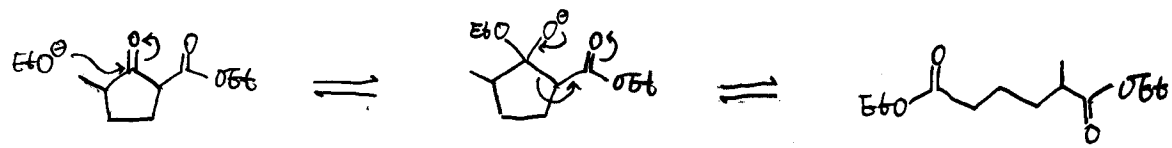
a). A:



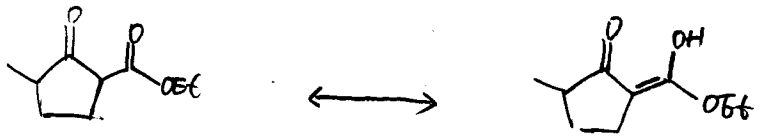
C:



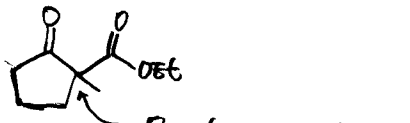
C → A:



b) We would expect C to be the major product, because C has the enolate resonace form that B doesn't have due to the lack of α-Hydrogen



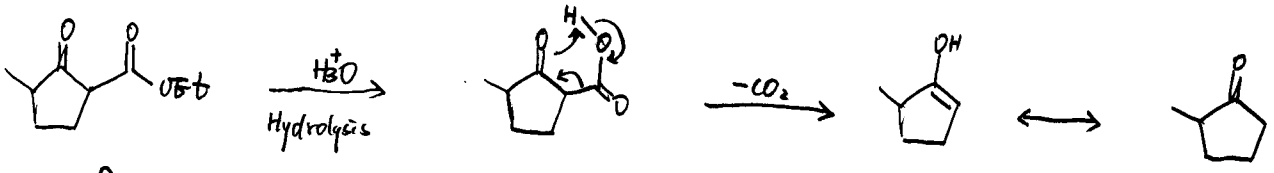
C



B

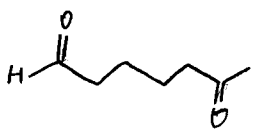
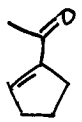
Since C is the more stable product, we would also expect B to react back to A, and to form more C.

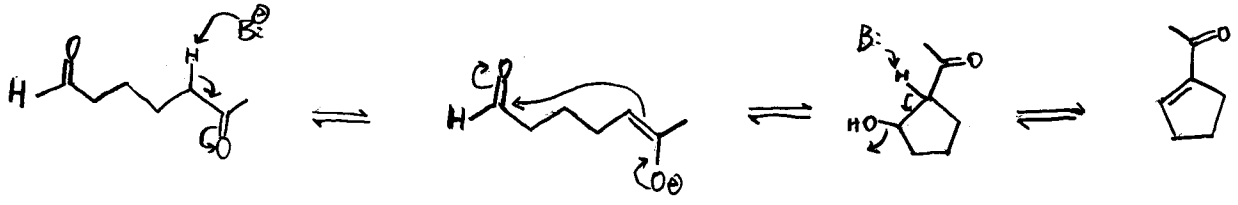
c) Decarboxylation reaction will take place under such condition.



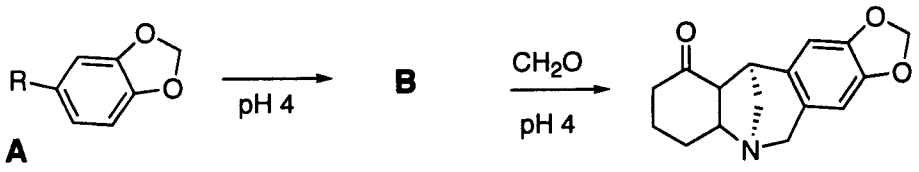
C

B will give the same product

d) D:  F: 

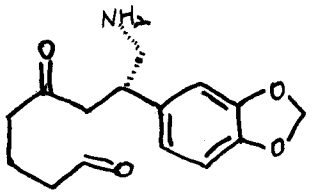


2. Give the structures of **A** and **B**. *Note:* The R substituent is acyclic.

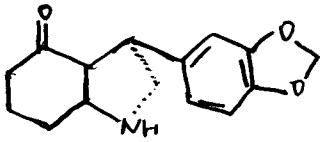


A

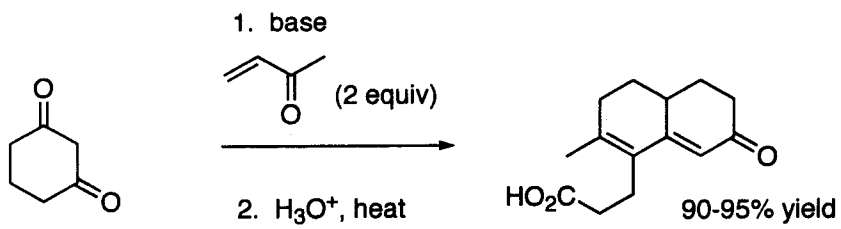
A:



B:

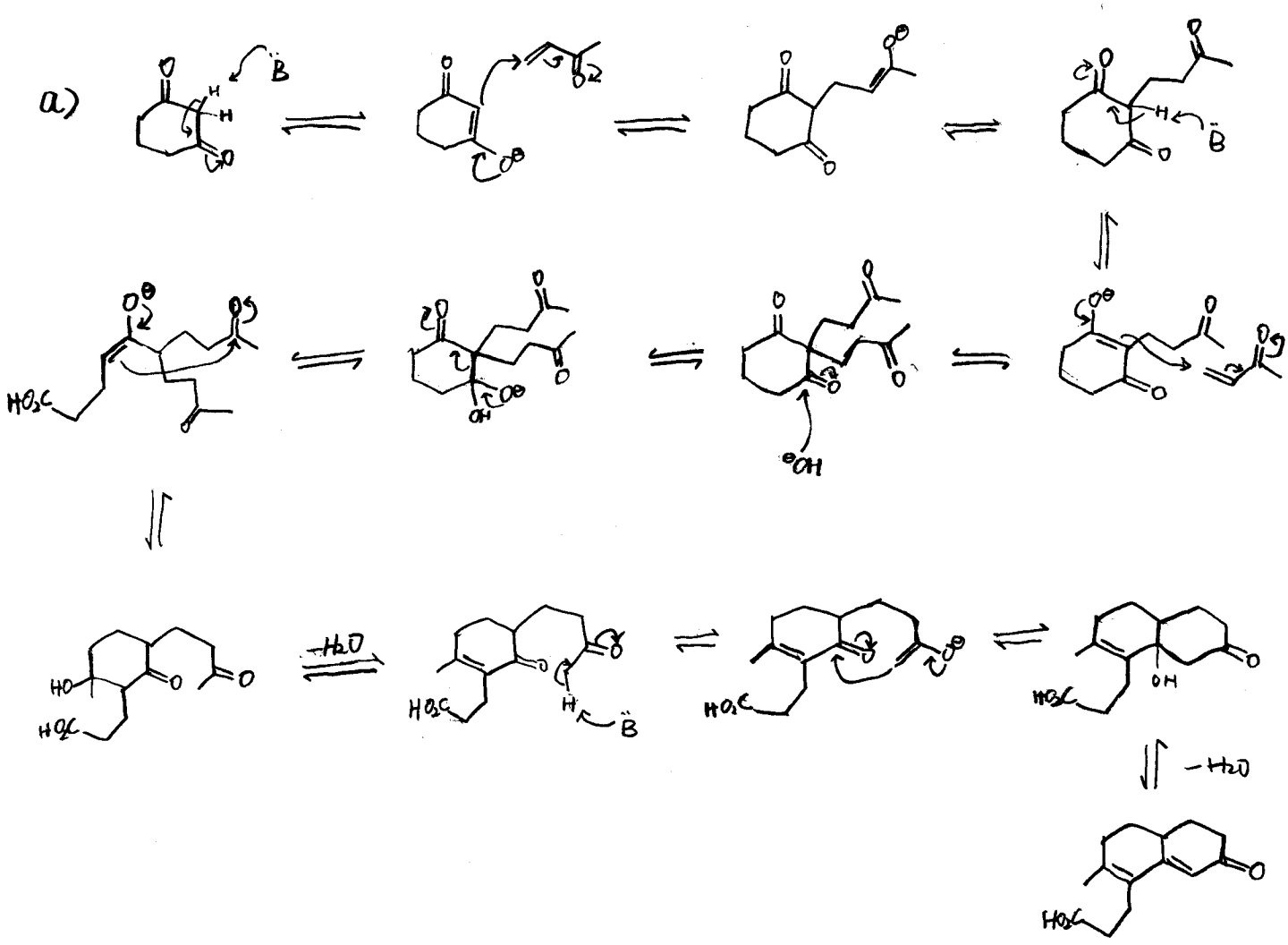


3. a. Draw a mechanism for the following reaction:

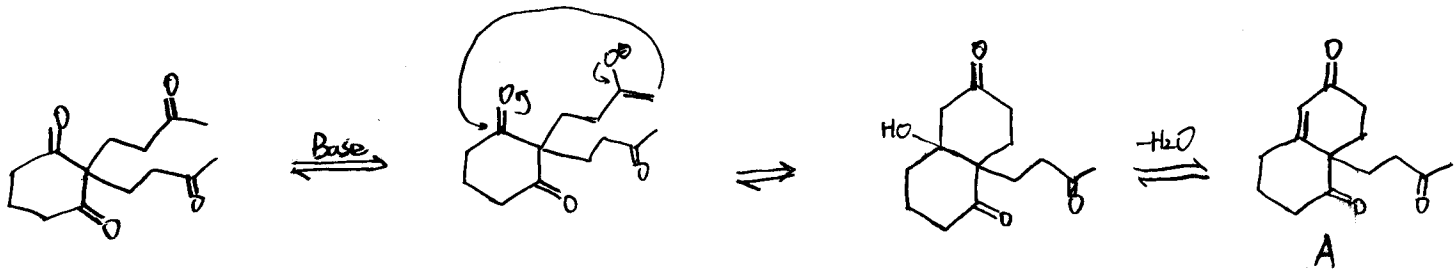


b. Obviously, this is not the product the researchers were expecting. Draw another product that one might expect to form under these reaction conditions.

a)



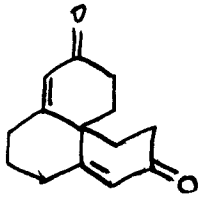
b)



A

Robinson Annulation

A would further undergo another robinson annulation to give B



B