

Exam 3
Organic Chemistry C3444
Prof. Nuckolls
April 16, 2002

- **Write your name on every page.**
 - **You should have 6 pages including this one.**
 - **Turn off your cellular phones.**
 - **Do your own work.**
 - **Good Luck!**

Name: _____

Columbia I.D. #: _____

Signature: _____

Grading:

1. _____ /10 points
2. _____ /10 points
3. _____ /10 points
4. _____ /10 points
5. _____ /10 points
6. _____ /10 points

Section A _____ **/60 points**

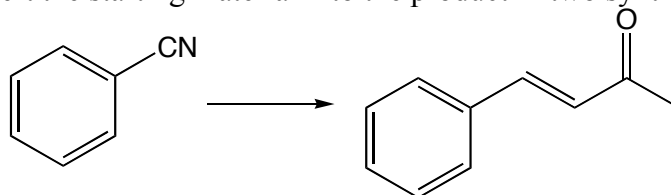
Section B _____ **/20 points**

Section C _____ **/20 points**

Total _____ **/100 points**

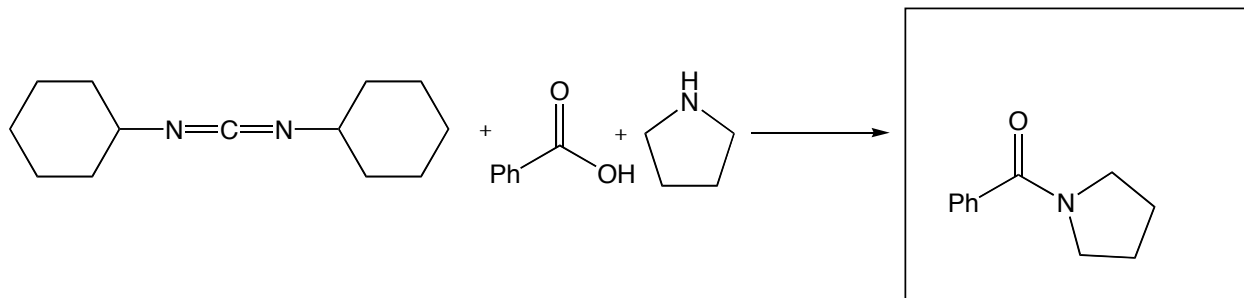
Short Answer. (10 points each)

1. Show how to convert the starting material into the product in two synthetic steps.



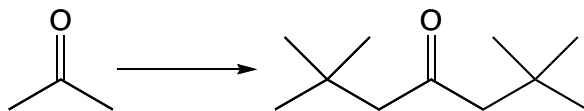
1. DIBAL then water, 2. Acetone, base (aldol)

2. Write the product of the following transformation in the box. Write a mechanism for its formation.



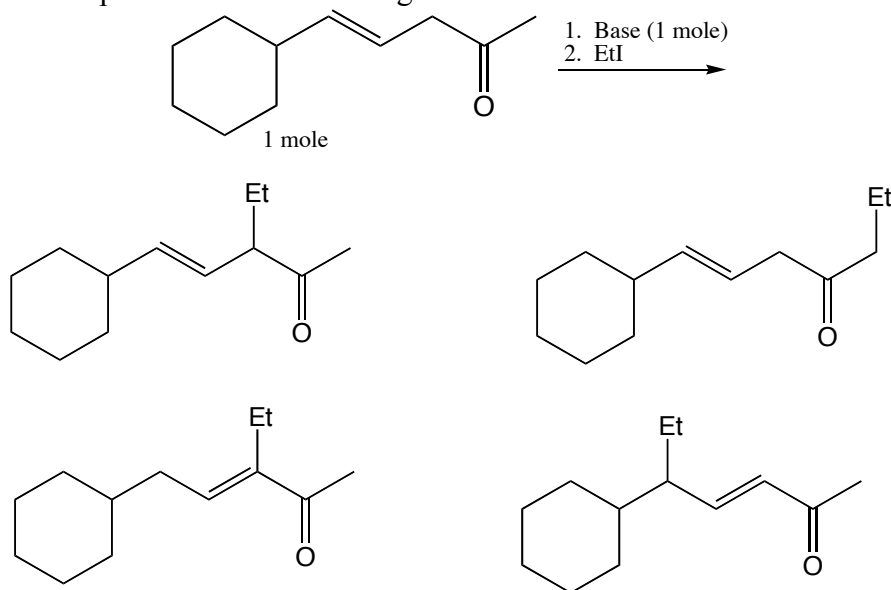
See the notes or book for the mechanism

3. Show the reagents necessary to complete the following transformation in two synthetic steps or less.

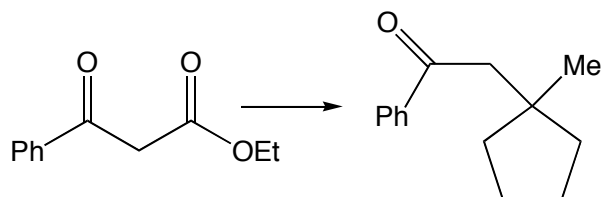


1. Base (double aldol), 2. 2 equivalents of methyl cuprate

4. Draw *all possible* products from following reaction.

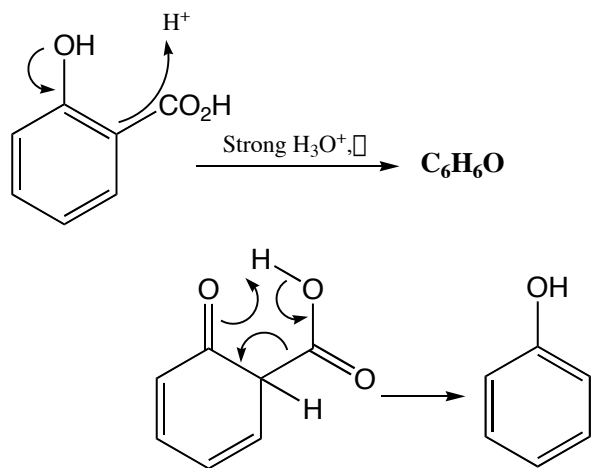


5. Show the reagents necessary to complete the following transformation. Use no more than 4 steps.

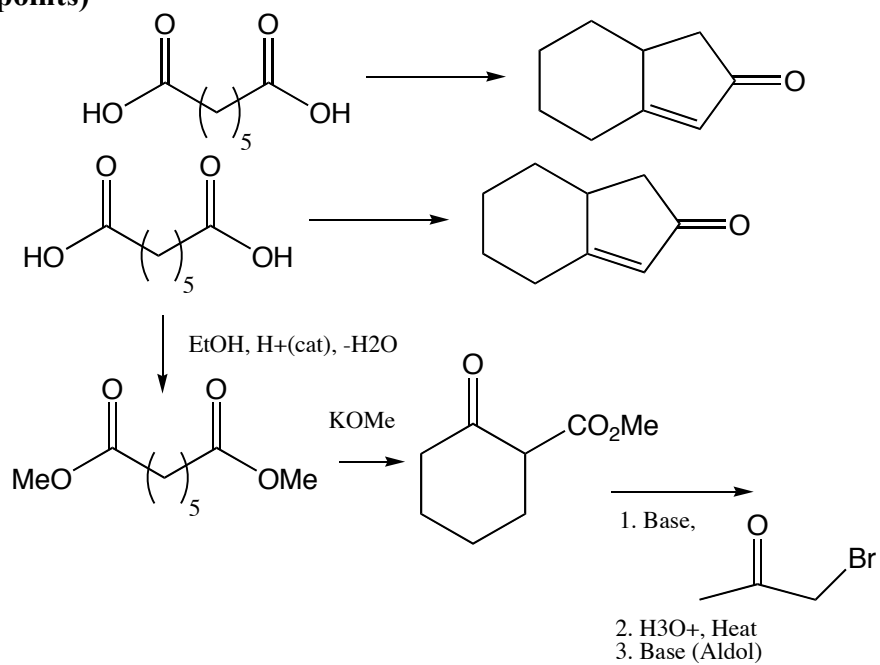


1. KOEt, cyclopentanone, mild acid workup, 2. strong acid, heat, 3. methyl cuprate.

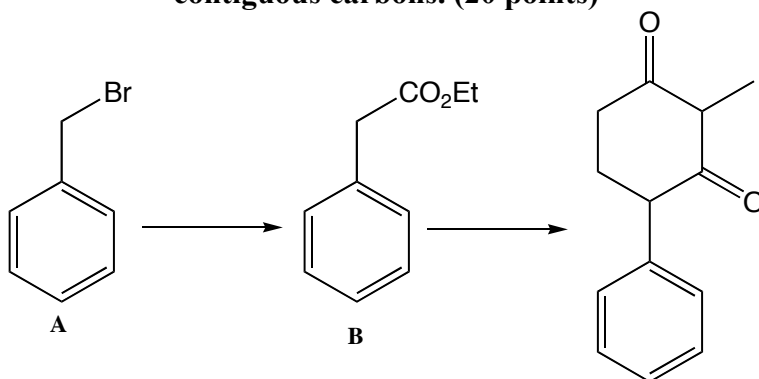
6. Draw the structure of the product from the following reaction and a mechanism for its formation.



Section B. Show the steps necessary to complete the following transformation. Use no more than 7 synthetic steps. You may use any reagent with no more than 3 contiguous carbons. (20 points)



Section C. Show the steps necessary to convert A to B and then B to the final product. Use no more than 8 total synthetic steps. You may use any reagent with no more than 4 contiguous carbons. (20 points)



1. Mg(0), CO₂
2. H⁺, EtOH, -H₂O

1. Base, methyl vinylketone
2. Base (Dieckmann)
3. Base (Methyliodide)