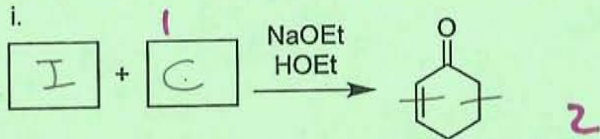
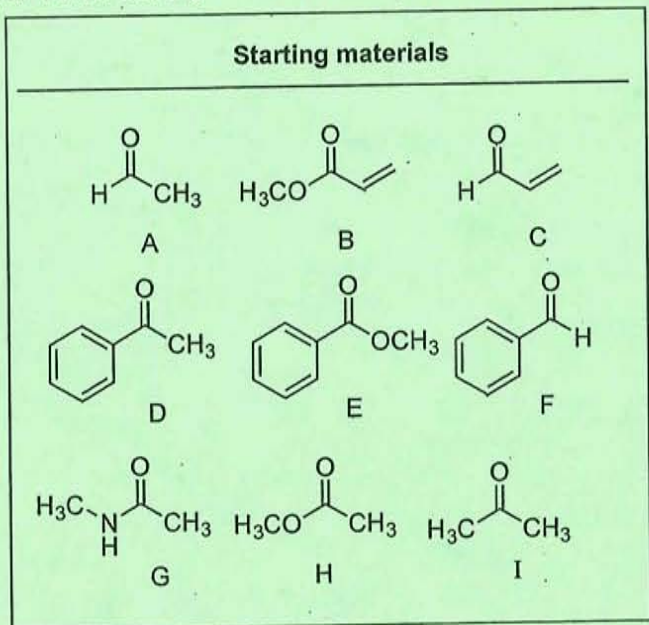
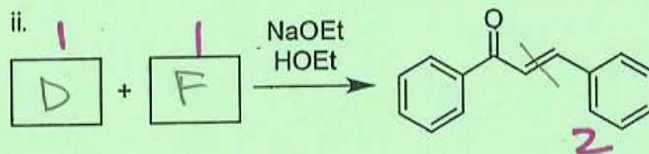


1 (23 points)

a. Which starting materials would you combine in the presence of NaOEt and HOEt to complete the syntheses?



Name of reaction: Robinson annulation

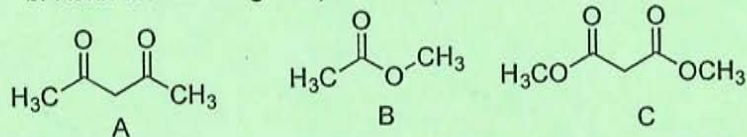


Name of reaction: aldol condensation



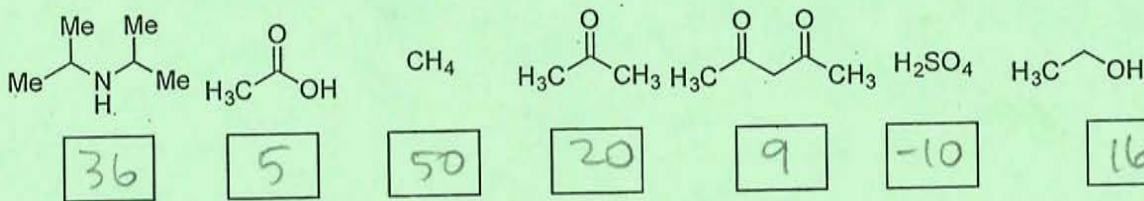
Name of reaction: Claisen

b. Rank the following compounds from **most to least** acidic.

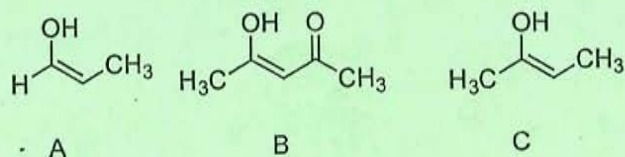


2 $\boxed{A} > \boxed{C} > \boxed{B}$ 2

c. Provide pKa's for **any 6** of the following compounds (if you do them all, we will count your best 6).



d. Rank the following enols from **most to least** stable:



2 $\boxed{B} > \boxed{C} > \boxed{A}$ 2

No Dibal-H on COOH

B

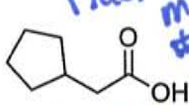
2. Fill in the boxes with the appropriate starting material, reagent or major product (27 points). Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

Initials: _____

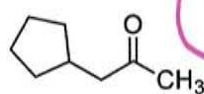
midterm
1
WS 6
#5d

Practice
m2
#2e
M1 #5B

a.



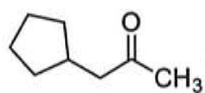
1. SOCl₂ 1
2. Me₂CuLi 2



1. LiAlH₄ 1
2. PCC
3. Me₂CuBr 1 or MeLi
4. PCC 1

WS 6
#3c
Practice
m2
#2b

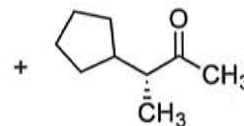
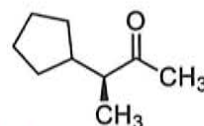
b.



thermodynamic
enolate

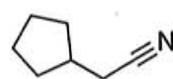
1. NaOEt 2
HOEt
2. H₃C-I 1

CH₃-Br 1

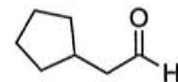


WS 5
#1bii

c.

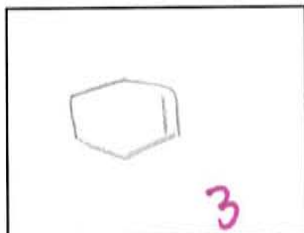


1. Dibal-H 2
2. H₂O 1



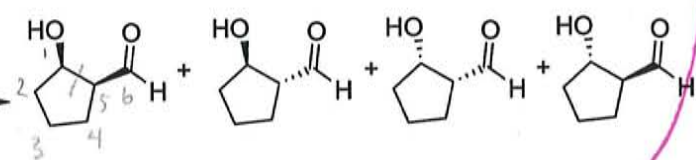
Practice
m2
2d

d.



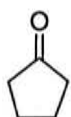
3

1. O₃
2. Me₂S
3. NaOEt, HOEt

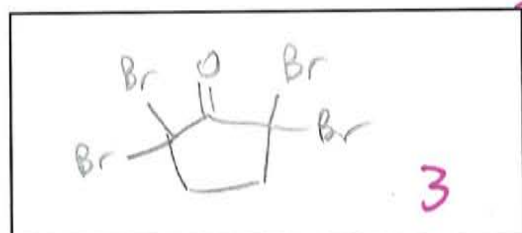


WS 6
2b

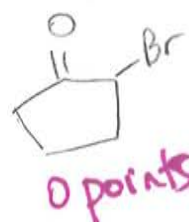
e.



Br₂, NaOH



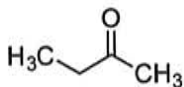
3



0 points

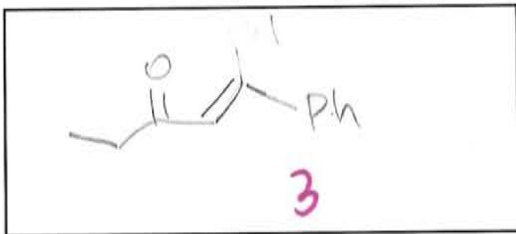
WS 5
#

f.

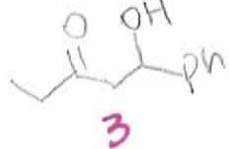
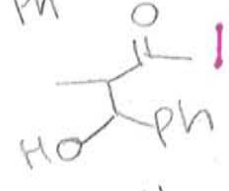
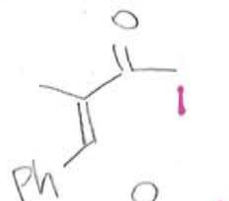


kinetic
enolate

1. LDA, THF, -78 °C
2. O=Cc1ccccc1
3. H₂O

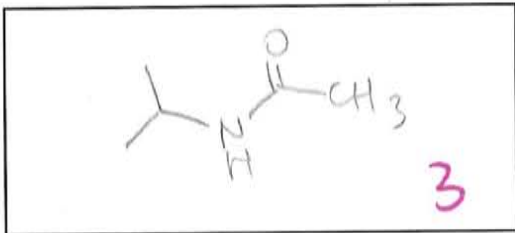


3



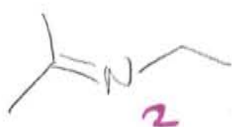
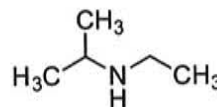
3

g.



3

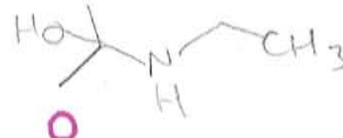
1. LiAlH₄
2. H₂O



2



2



0

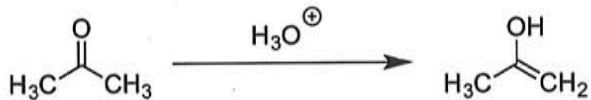
15

B

3. (16.5 points) Provide an arrow-pushing mechanism.

Initials: _____

a.

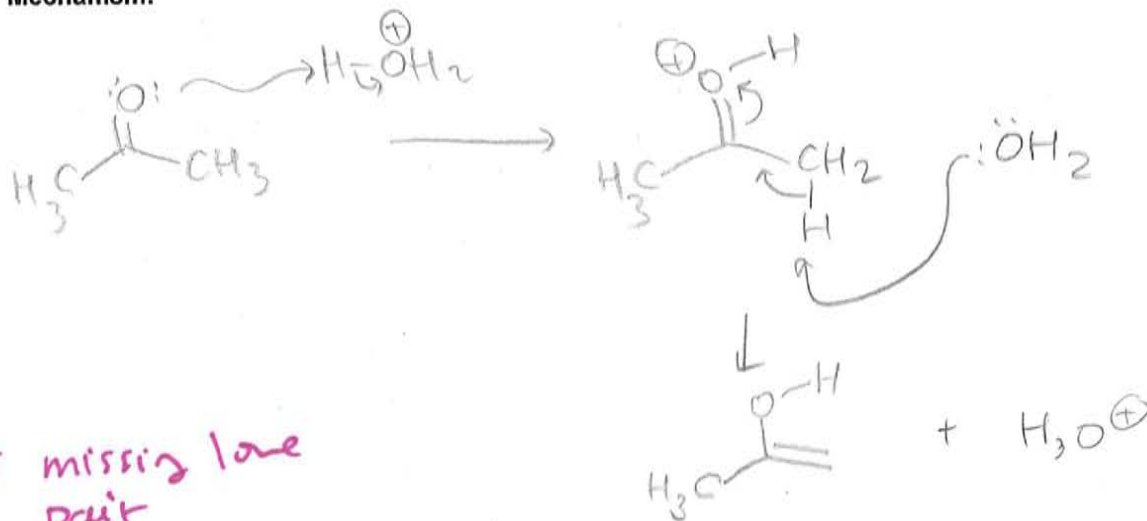


What is the relationship between the starting material and product?

tautomers 2

2

Mechanism:



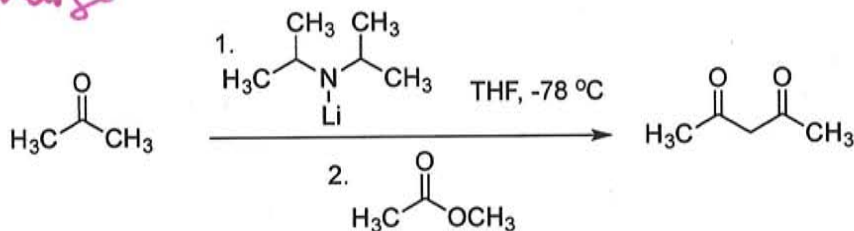
5

5

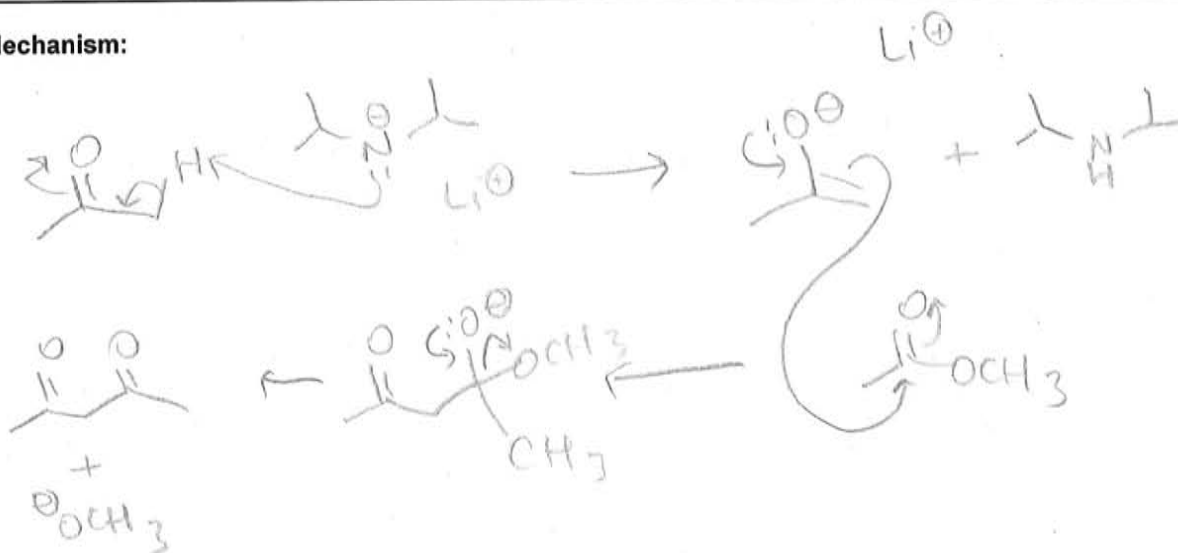
-0.5 missing lone pair

charge

b.

ws 6
#3c

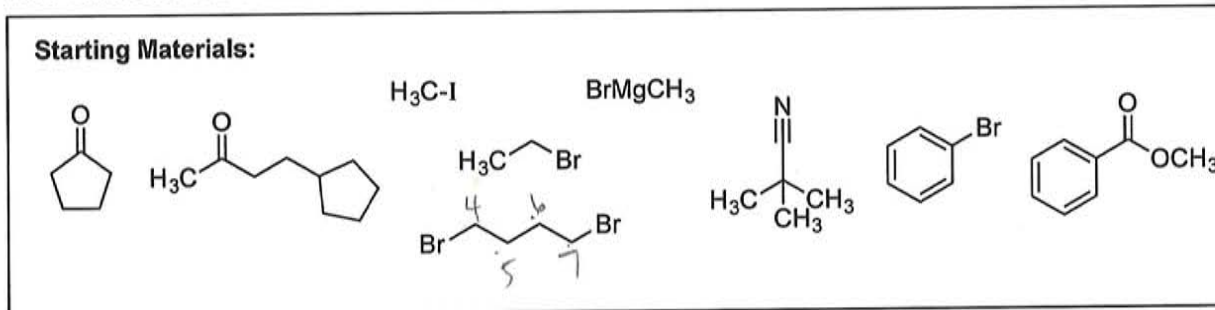
Mechanism:



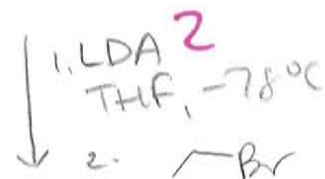
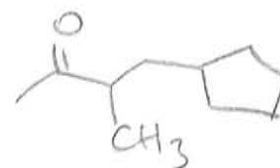
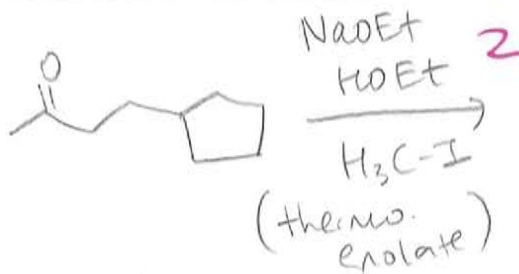
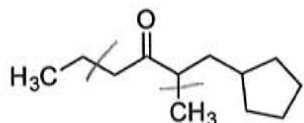
8

Initials: B

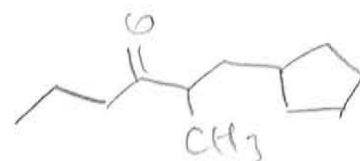
4. (14 points) Propose syntheses of the targets below.
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.



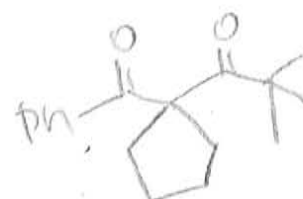
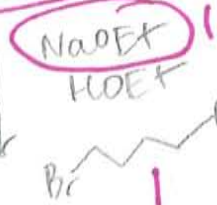
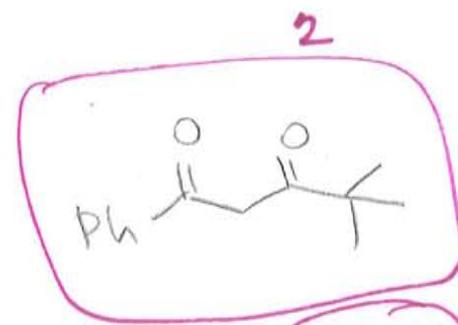
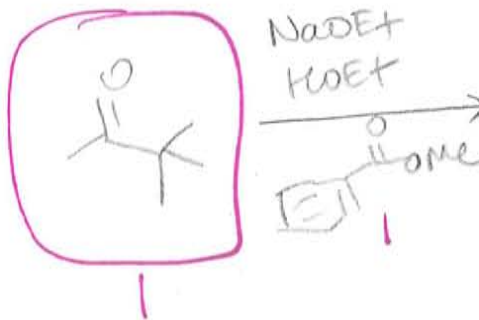
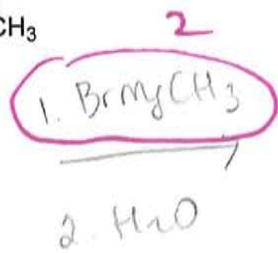
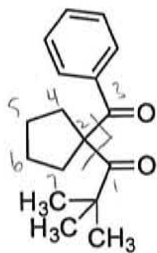
Target A.



2 strategy



Target B.



WS 6
#115g

6

8

Practice M2
#4B, 5A

WS 6

#5c

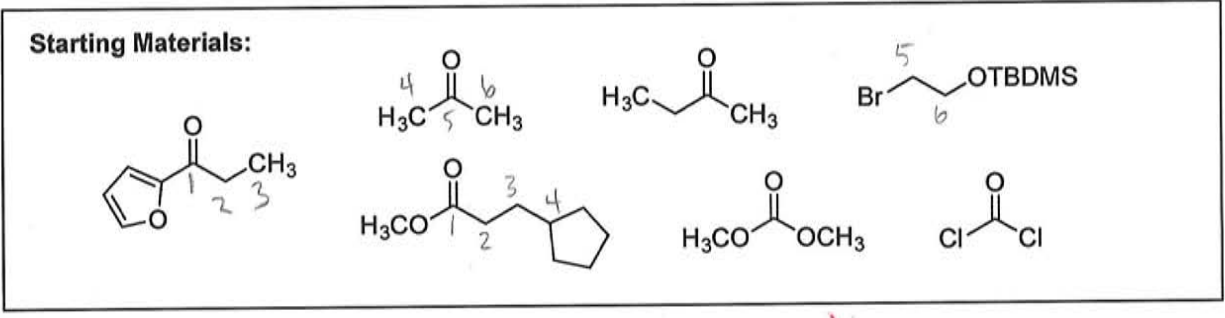
WS 5

#1b iii

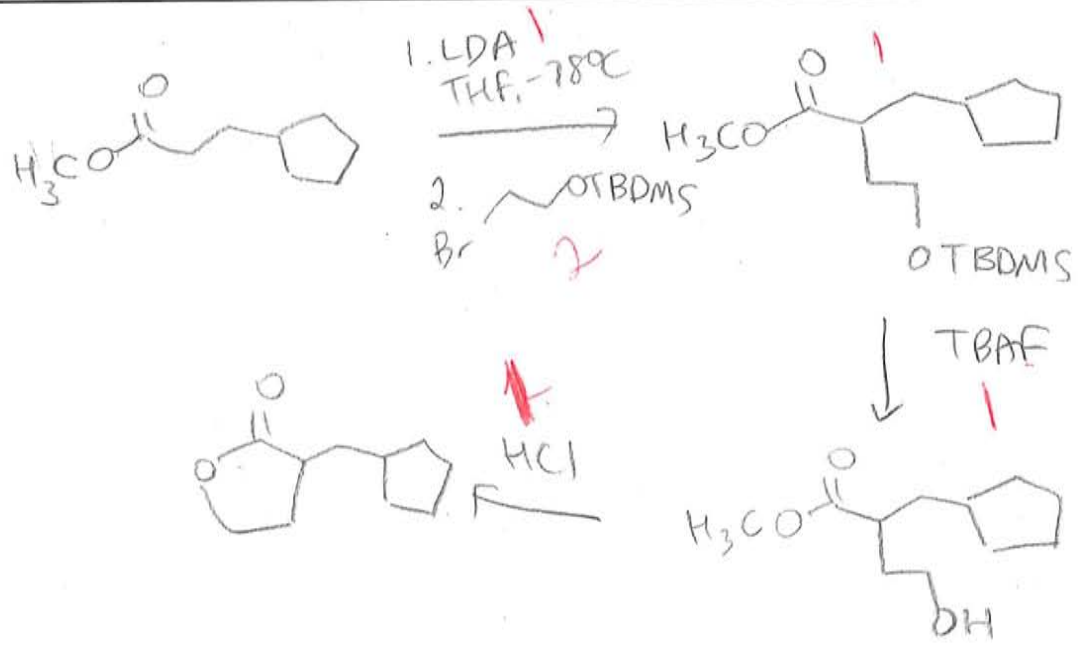
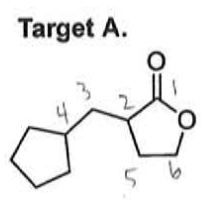
14

Initials: B

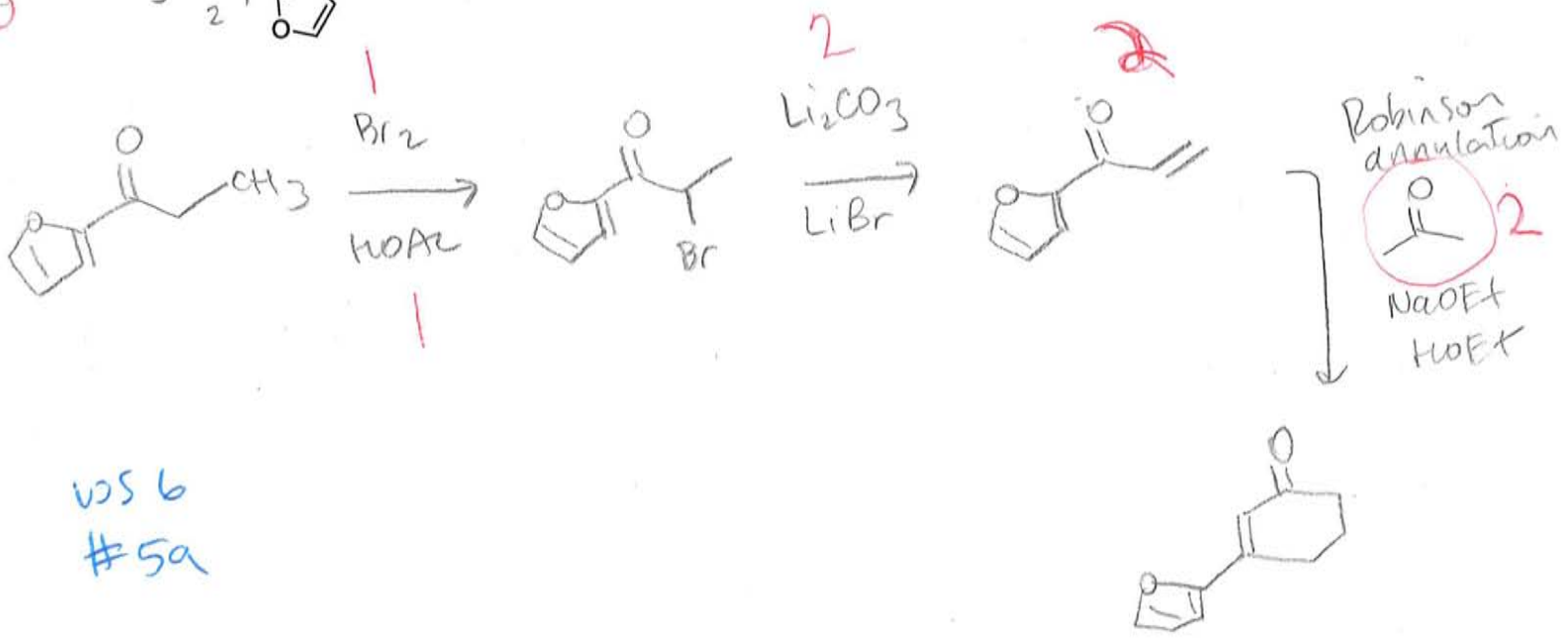
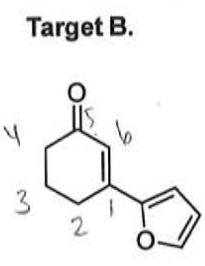
5. (12 points) Propose syntheses of the targets below (10 points).
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.



6
W55
2C



8



W56
5a