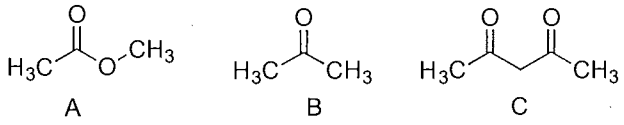
Midterm 2, Chem 51C, Jarvo, Spring 14

Initials: A

1 (~~XX~~ points).

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

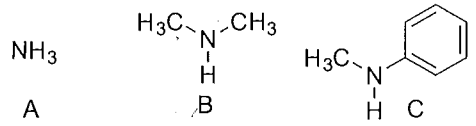


A B C

2 C > B > A 2

B > A > C

b. Rank the following compounds from **strongest to weakest** base.

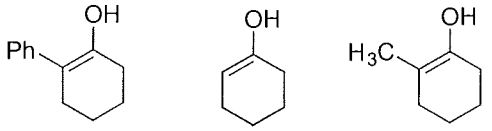


A B C

2 B > A > C 2

A > C > B

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



A B C

2 A > C > B 2

C > B > A

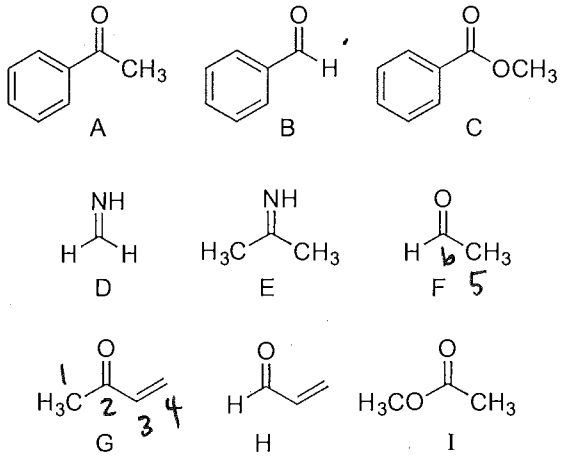
C I Claisen

F G Robso

A D mannich

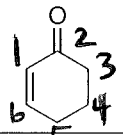
d. Which starting materials would you combine in the presence of NaOEt and HOEt to complete the syntheses?

Starting materials



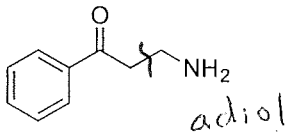
A B C D E F G H I

i. F + G (1 1) NaOEt HOEt →



Name of reaction: Robinson annulation 2

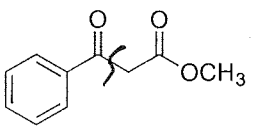
ii. A + D (1 1) NaOEt HOEt →



adiol

Name of reaction: Mannich reaction 2

ii. C + I (1 1) NaOEt HOEt →



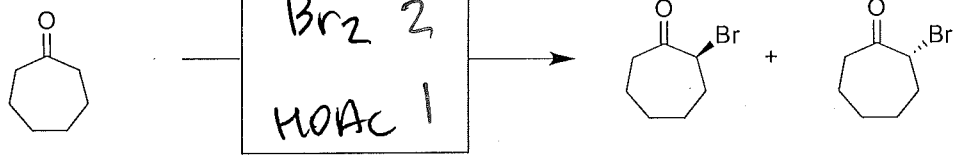
Name of reaction: Claisen 2

24

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

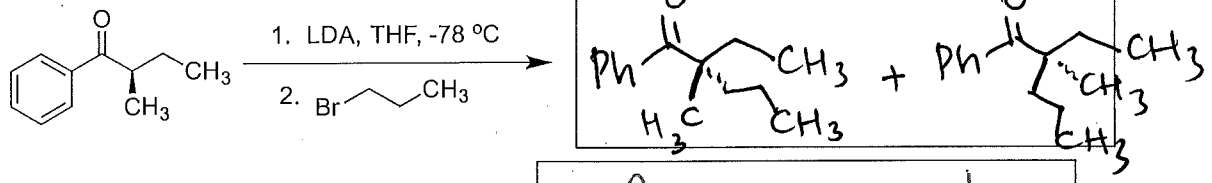
Initials: A

a.

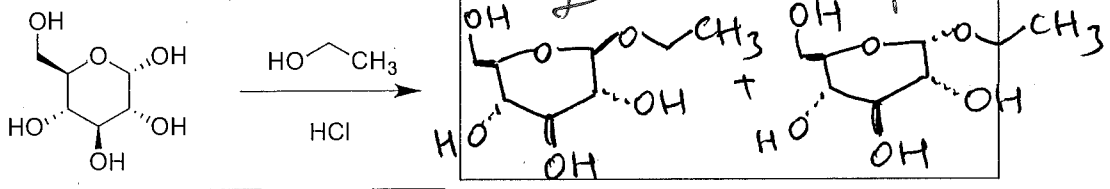


allylate 2
Stereoden 1

b.

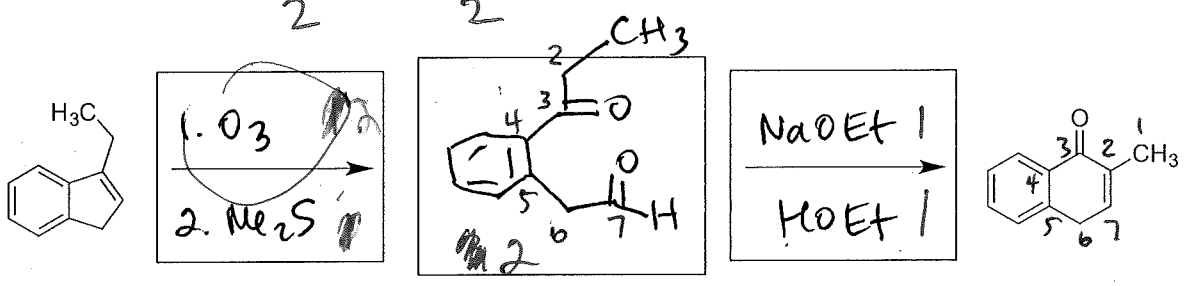


c.

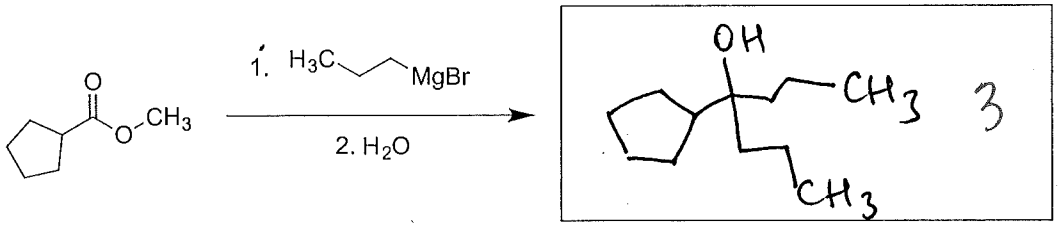


Is this carbohydrate: D or L: D 2 α or β: α 2

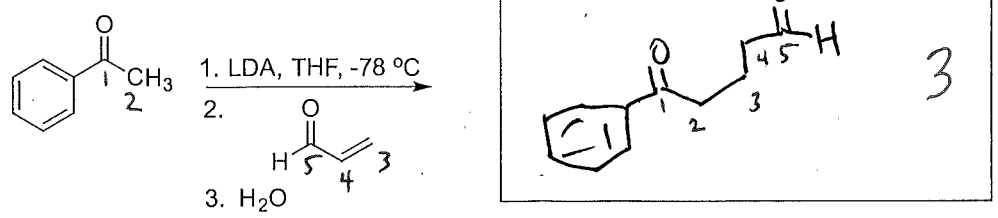
d.



e.



f.



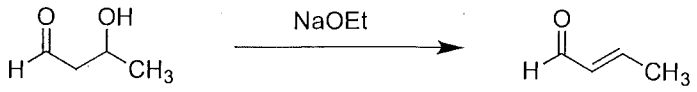
What is the name of this reaction? Michael 2

27

3. Provide an arrow-pushing mechanism.

Initials: A

a.

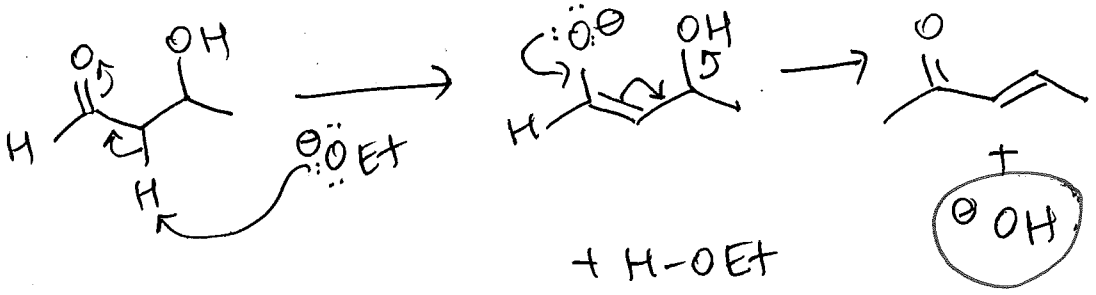


What is the name of this mechanism?

E1cb

2

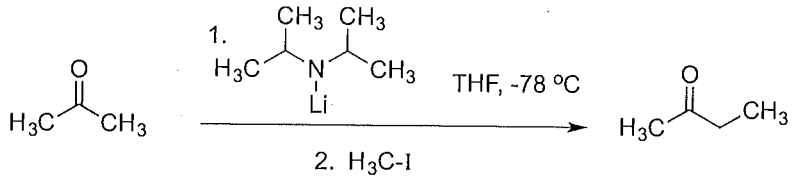
Mechanism:



6.5

1 point each arrow
0.5 for byproduct

b.



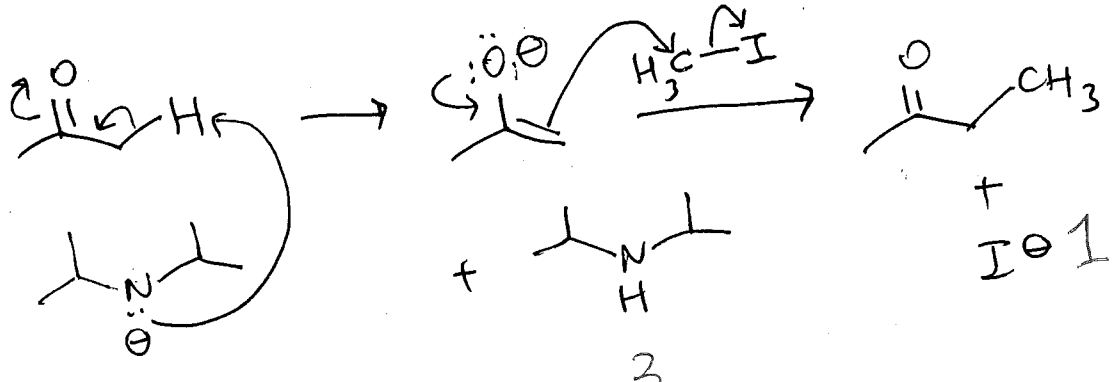
What is the pK_a of acetone (the starting material)?

20

2

ok range 18-22

Mechanism:



2

3

6

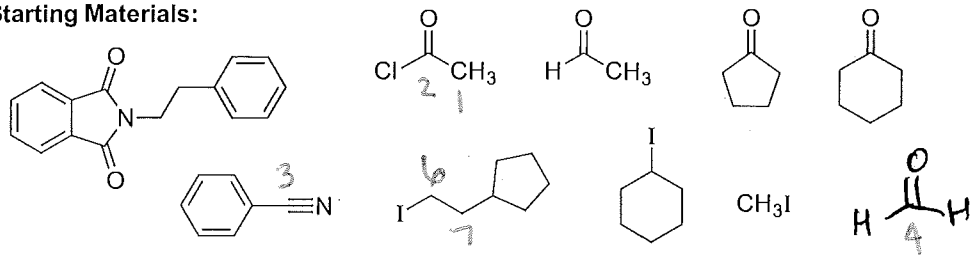
16.5

14

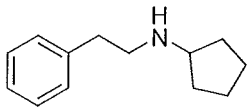
Initials: A

4. 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.

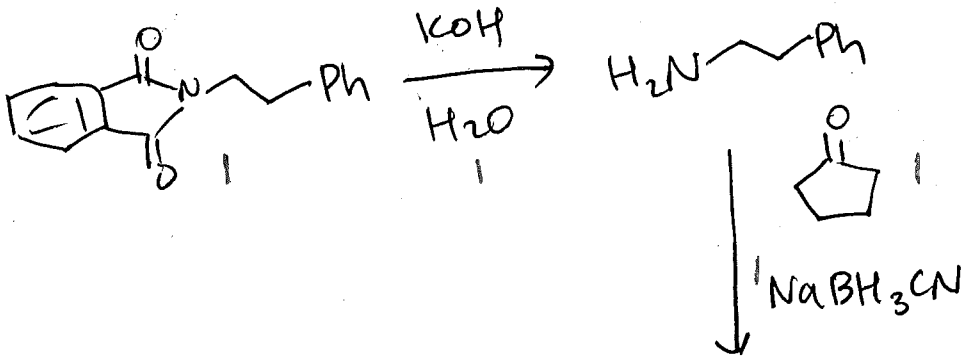
Starting Materials:



Target A.

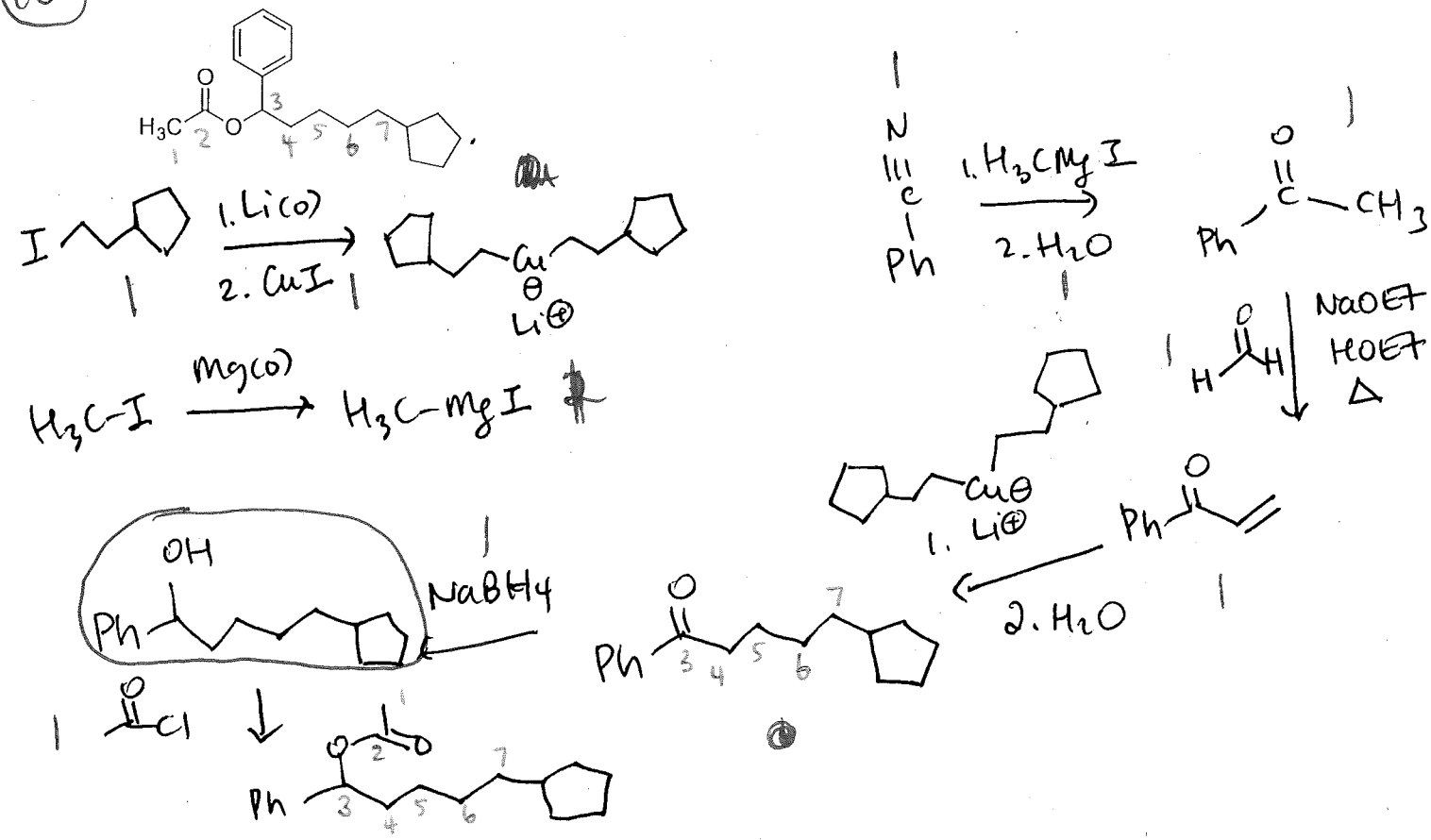


4



Target B.

10

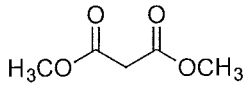
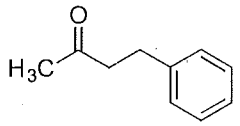
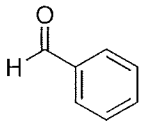
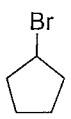
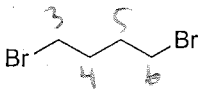
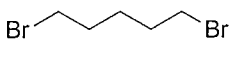


12/

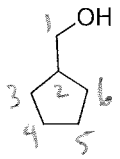
Initials: A

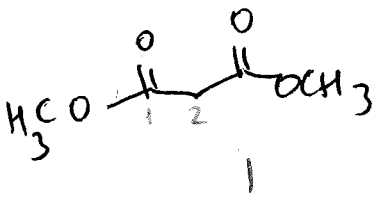
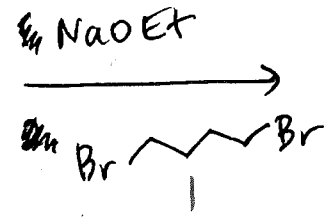
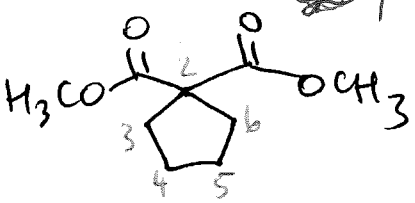
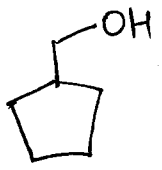
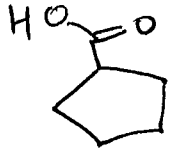
5. Propose syntheses of the targets below (10 points).
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

Starting Materials:

Target A.



Target B.