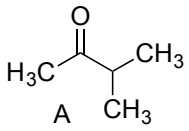
Final Exam, Chem 51C, Jarvo, Spring 14

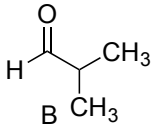
Initials: _____

1 (20 points).

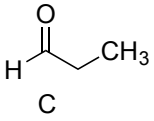
a. Rank the following compounds from fasted to slowest reaction with an enolate:



A

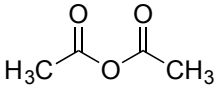


B

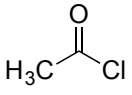


C

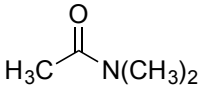
b. Rank fastest to slowest reaction with $LiAlH_4$.



A

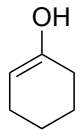


B

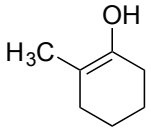


C

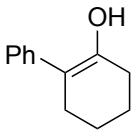
c. Rank the following enols from **most to least** stable:



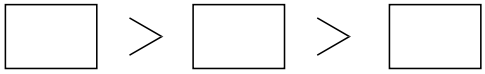
A



B

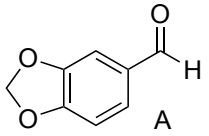


C

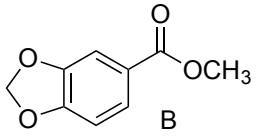


d. Fill in the starting materials to complete the syntheses

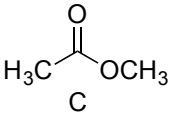
Starting materials



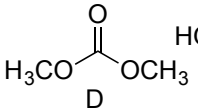
A



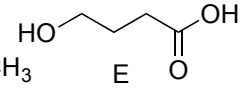
B



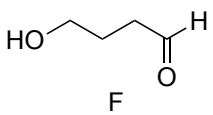
C



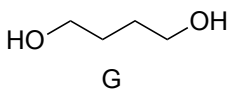
D



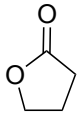
E



F

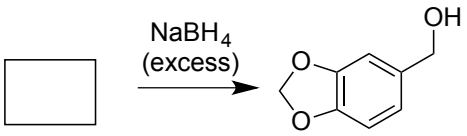


G

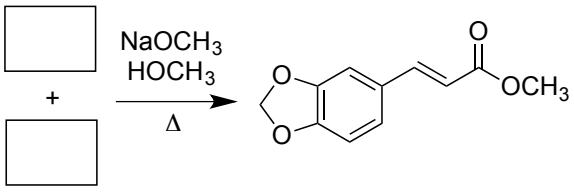


H

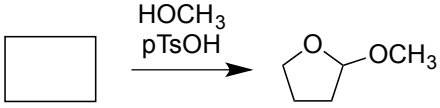
i.



ii.



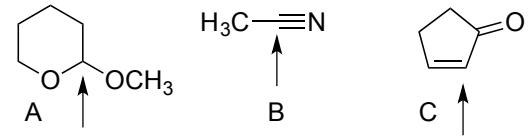
iii.



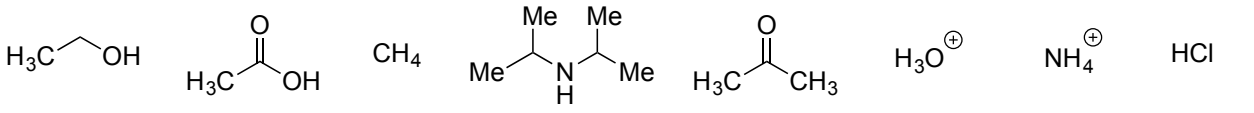
Initials: _____

2 (20 points)

a. Rank from highest to lowest oxidation state:

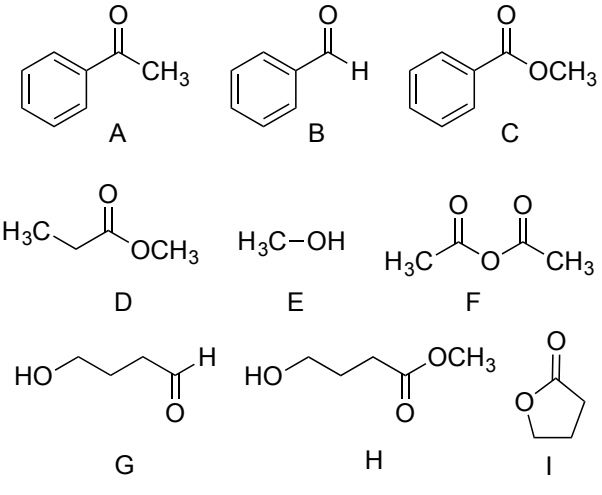


b. Provide pKa's for **any 6** of the following compounds (if you do them all, we will count your best 6).

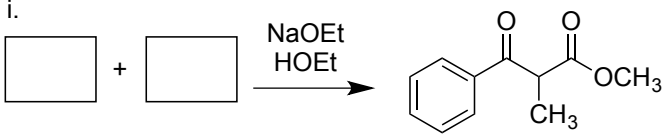


c. Fill in the starting materials to complete the syntheses

Starting materials



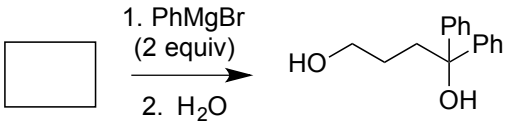
i.



Name of reaction: _____

ii.

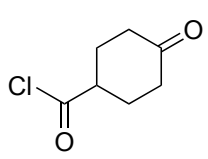
iii.



3. Fill in the boxes with the appropriate starting material, reagent or major product (25 points).
Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

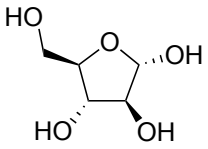
Initials: _____

a.



Me_2CuLi
(excess)

b.

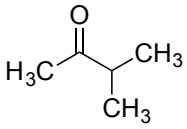


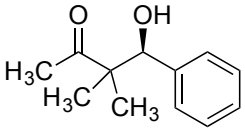
H_3CI

Ag_2O

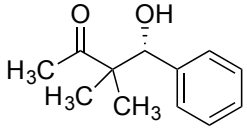
Is this carbohydrate α or β:

c.

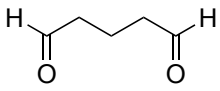


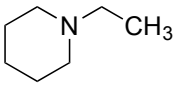


+

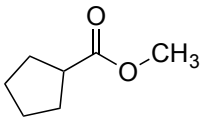


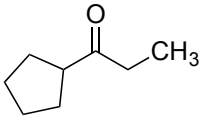
d.



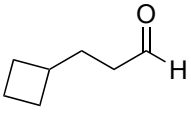


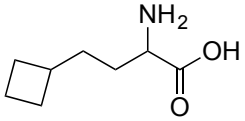
e.





f.



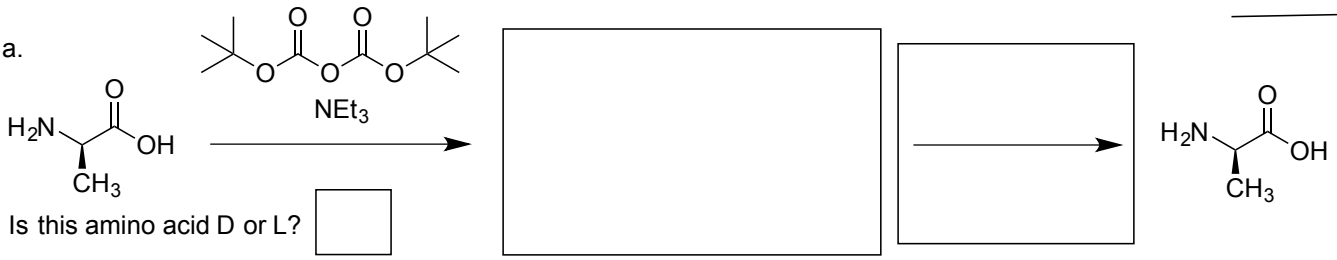


What is the name of this synthesis?

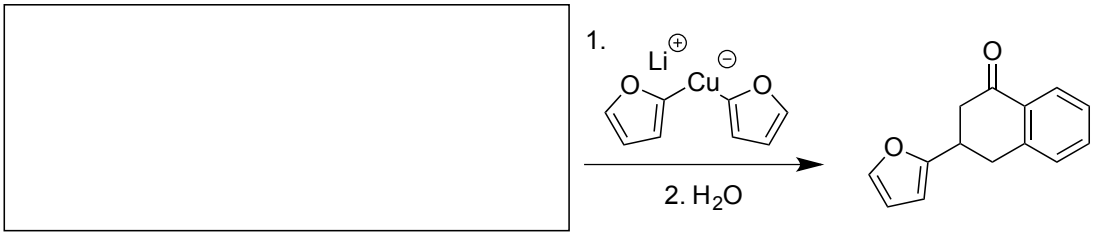
4. Fill in the boxes with the appropriate starting material, reagent or major product (30 points).
Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

Initials: _____

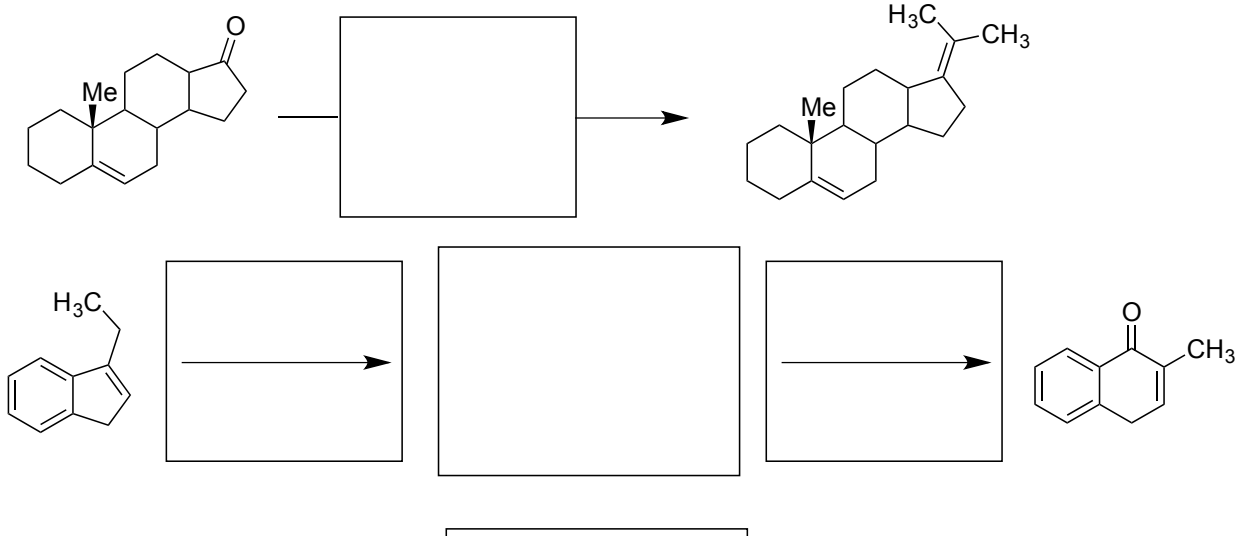
a.



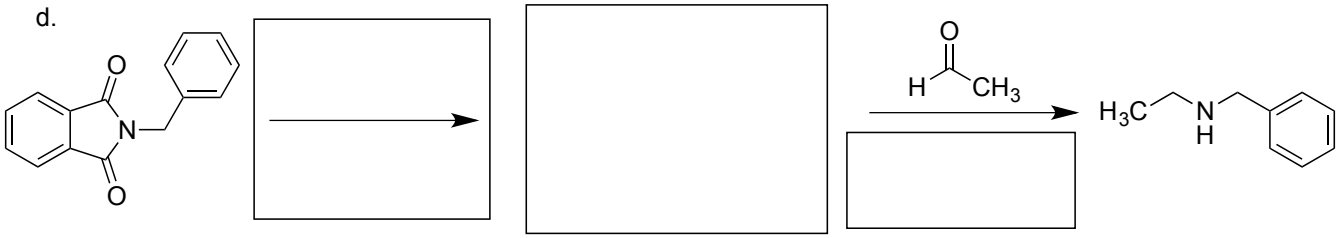
b.



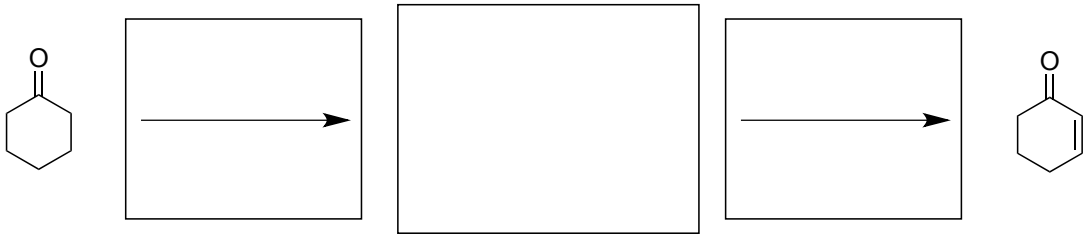
c.



d.



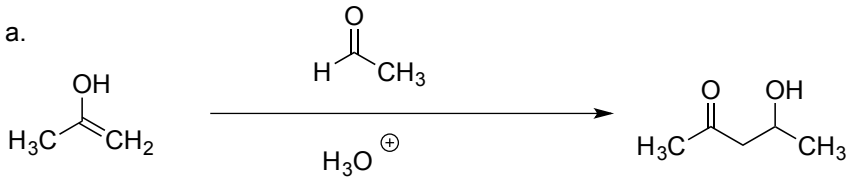
e.



5. (13 points) Provide an arrow-pushing mechanism.

Initials: _____

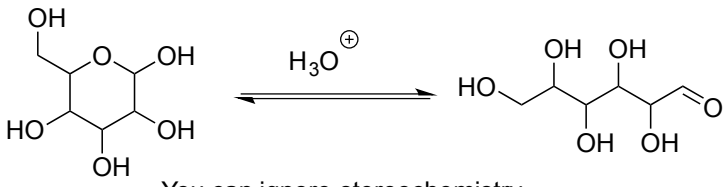
a.



What is the name of this reaction?

Mechanism:

b.



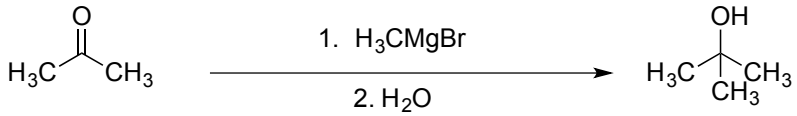
You can ignore stereochemistry.

Mechanism:

6. (13 points)

Initials: _____

a. Provide an arrow-pushing mechanism.

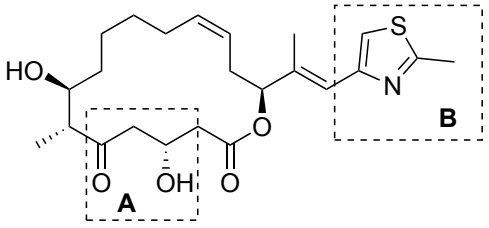


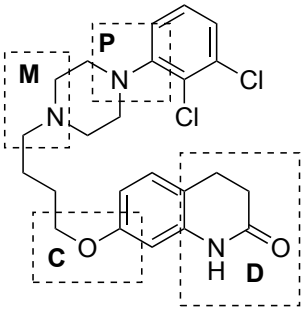
What named type of reagent is H_3CMgBr?

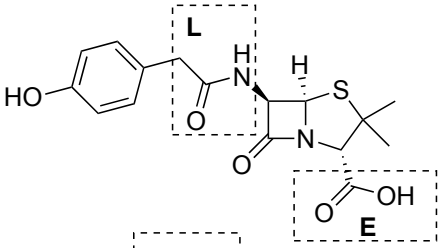
Mechanism:

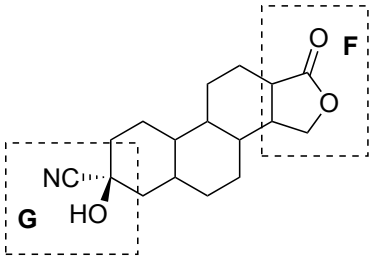
b. Match the names of the functional groups with labeled examples from the natural products and medicines.

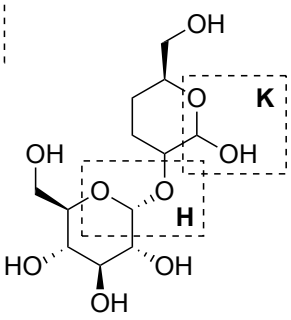
lactam	
ether	
hemiacetal	
cyanohydrin	
aniline	
β-hydroxy ketone	







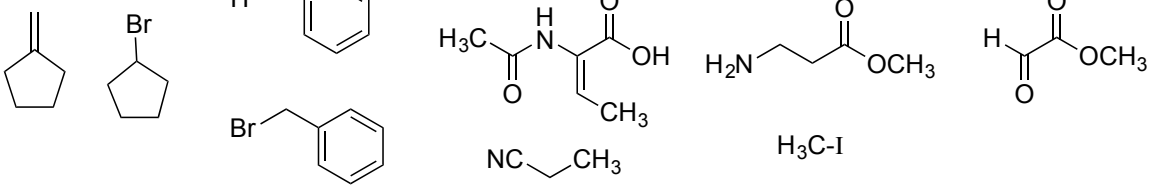




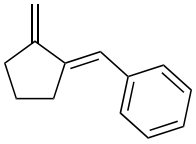
Initials: _____

7. (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.

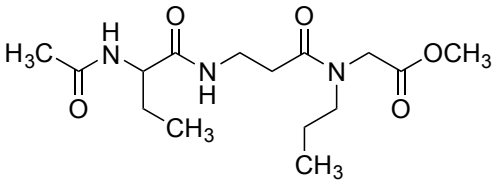
Starting Materials:



Target A.



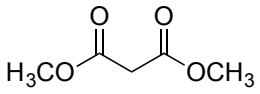
Target B.

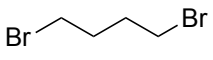


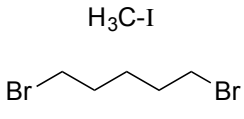
Initials: _____

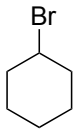
8. (12 points) Propose syntheses of the targets below.
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

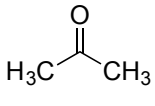
Starting Materials:

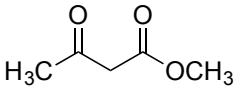


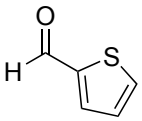


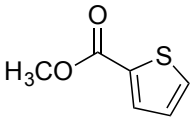


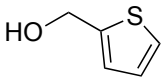


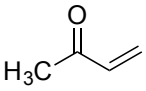




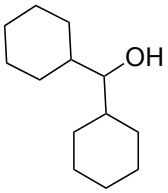




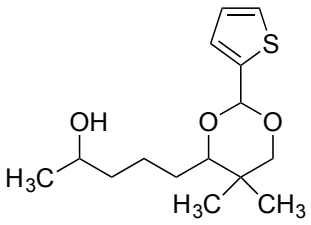




Target A.



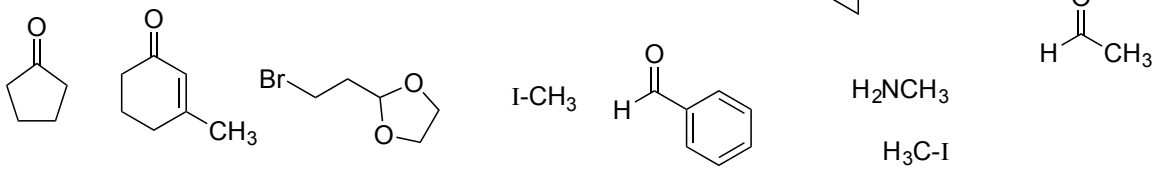
Target B.



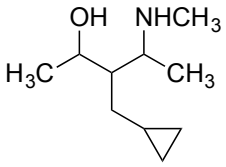
Initials: _____

9. (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.

Starting Materials:



Target A.



Target B.