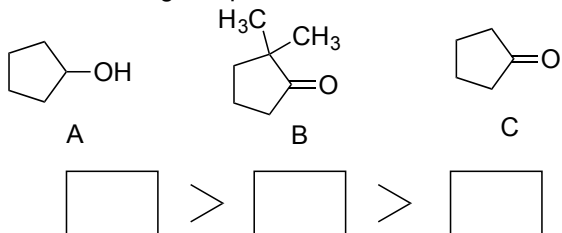
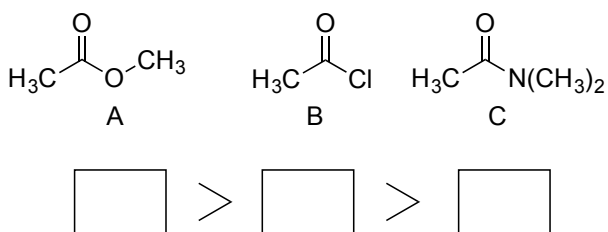


1 (16 points).

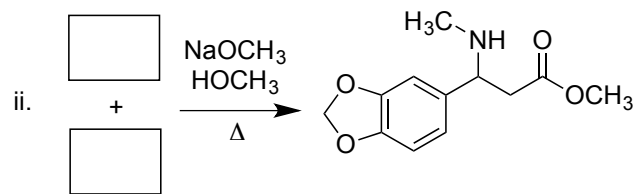
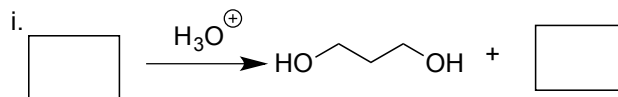
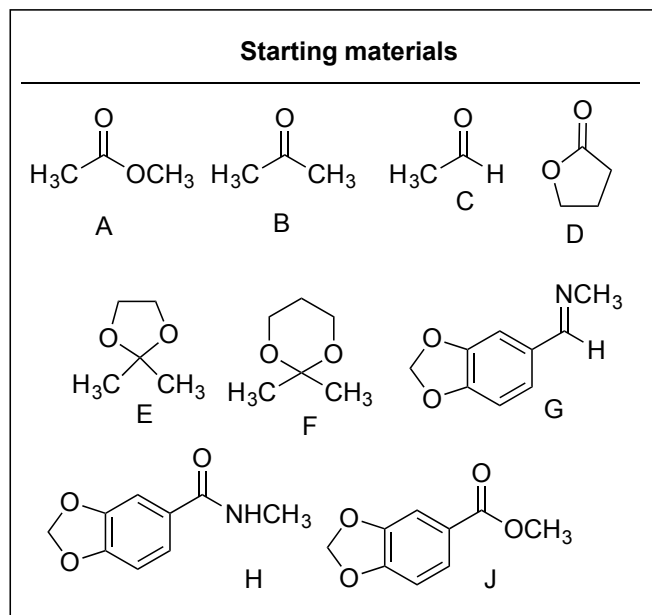
a. Rank the following compounds from fastest to slowest reaction with PhLi:



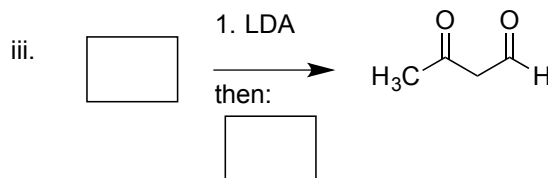
b. Rank fastest to slowest reaction with PhMgBr.



c. Fill in the starting materials to complete the syntheses



Name of reaction:

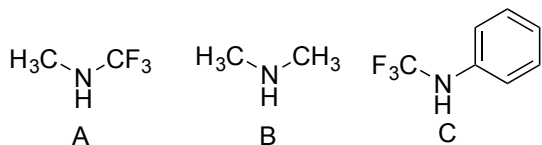


Name of reaction:

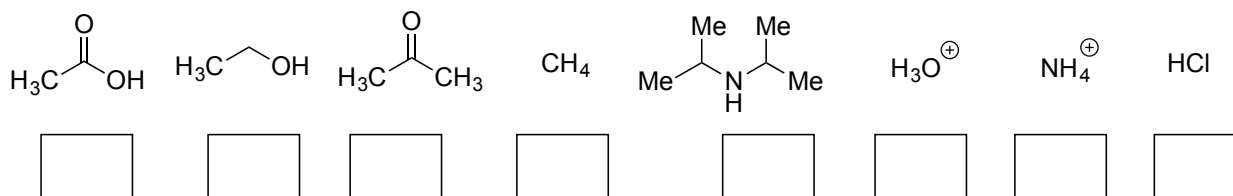
Initials: _____

2 (22 points)

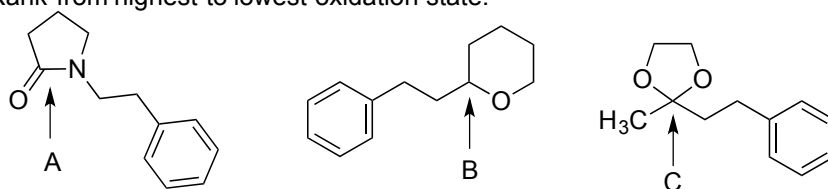
a. Rank from most to least basic:



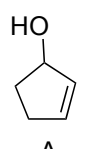
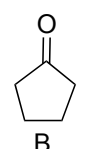
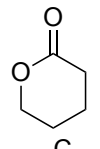
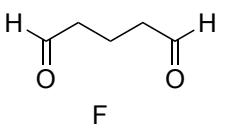
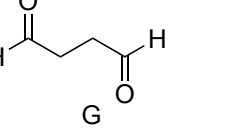
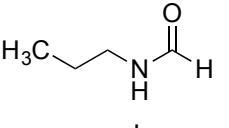
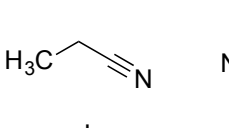
b. Provide pKa's for **any 6** of the following compounds (if you do them all, we will count your best 6).

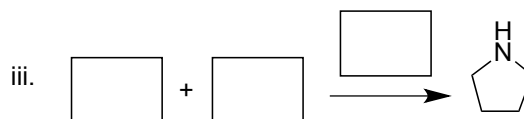
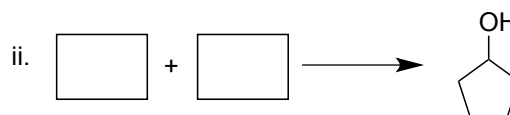


c. Rank from highest to lowest oxidation state:



d. Fill in the starting materials to complete the syntheses

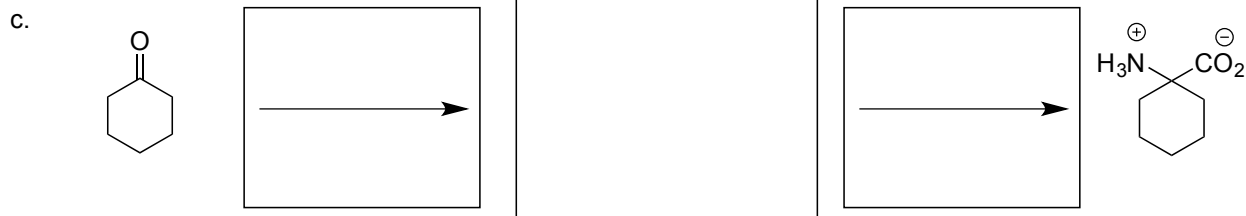
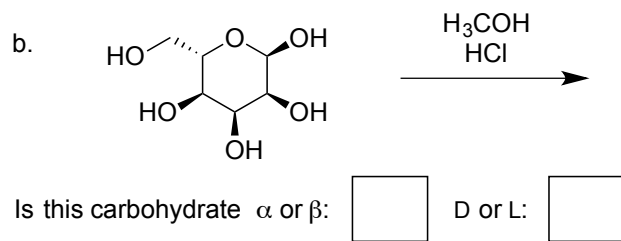
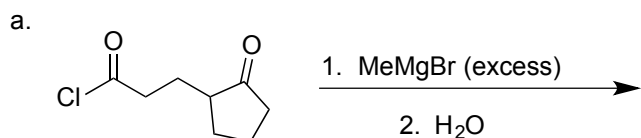
Starting materials					
			NaBH_4	NaBH_3CN	
A	B	C	D	E	
			LiAlH_4		
F	G		H		
			NH_3		
I	J		K		



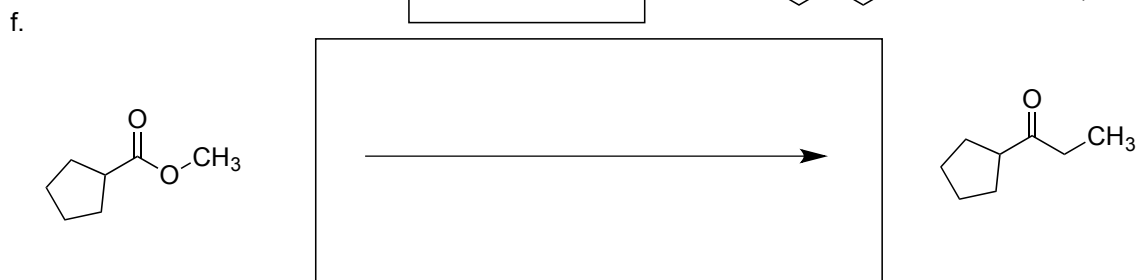
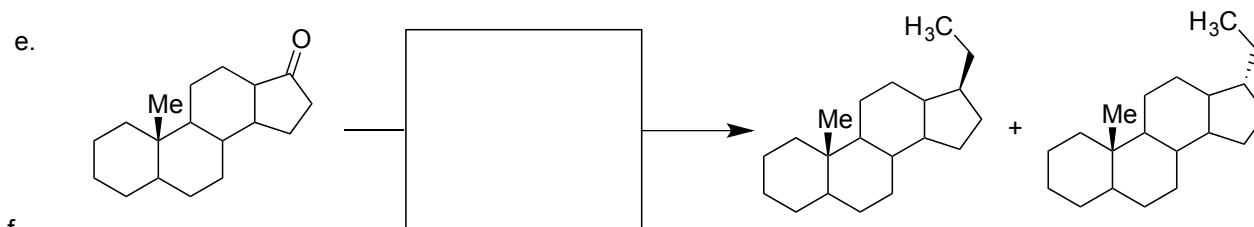
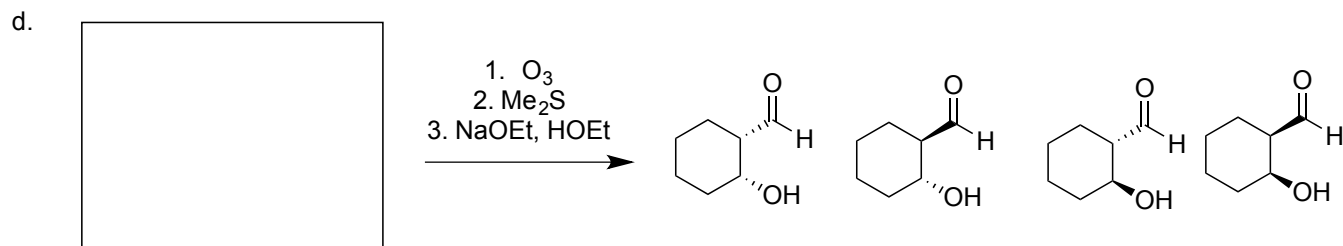
Name of reaction:

3. Fill in the boxes with the appropriate starting material, reagent or major product (26 points).
 Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

Initials: _____

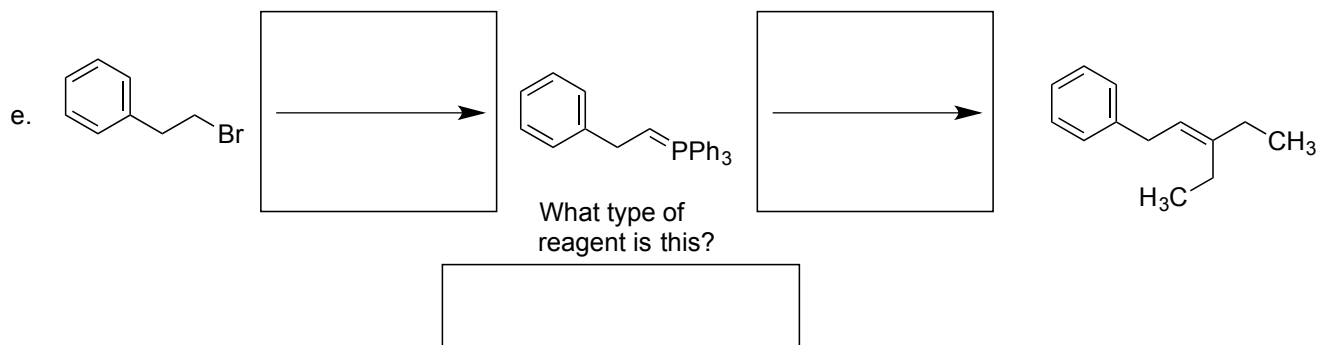
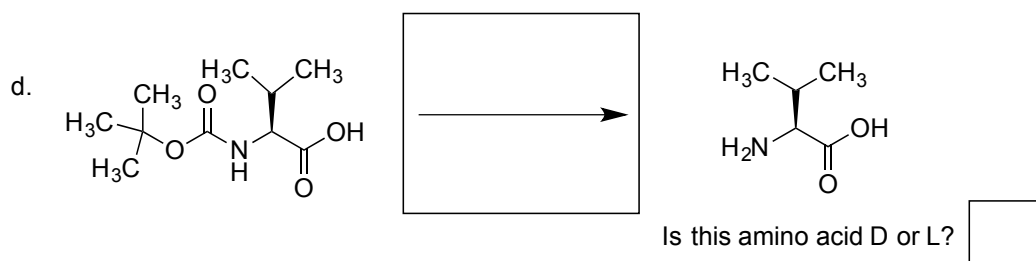
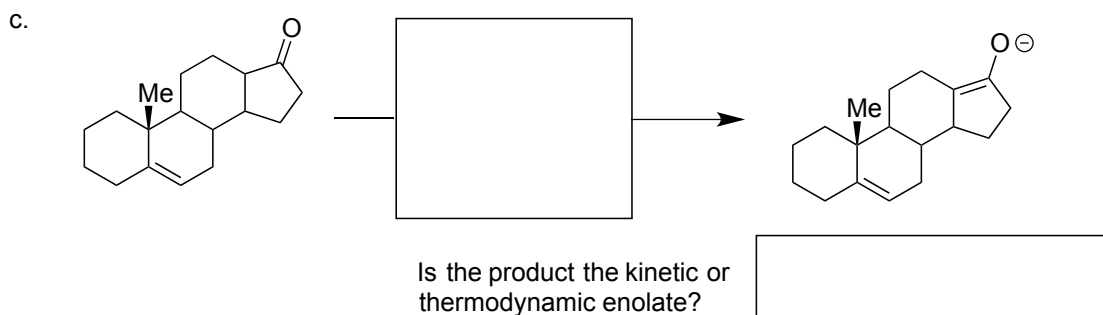
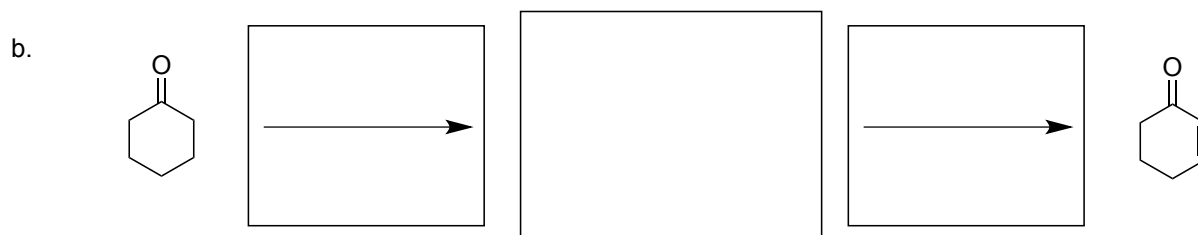
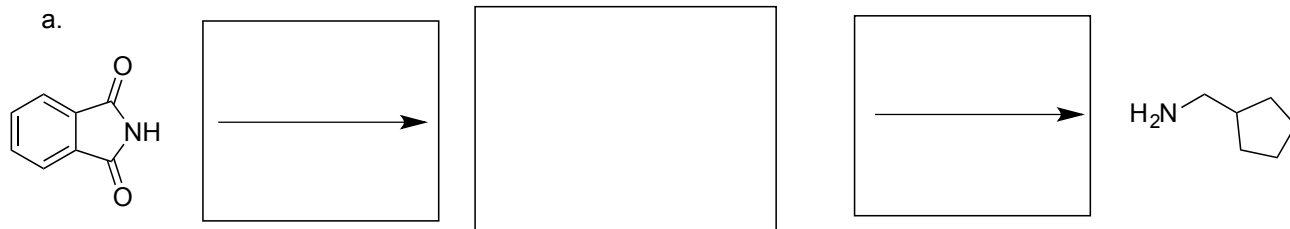


What is the name of this synthesis?



4. Fill in the boxes with the appropriate starting material, reagent or major product (31 points).
 Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

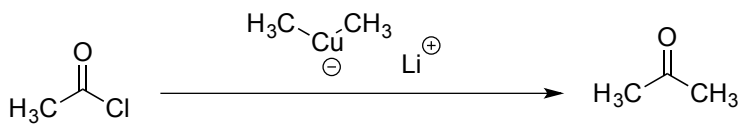
Initials: _____



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

Initials: _____

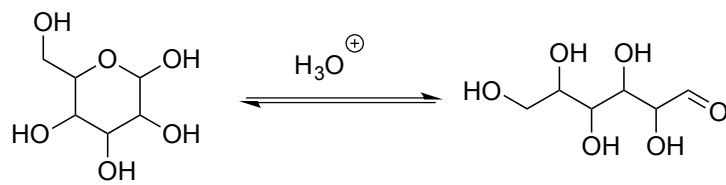
a.



What named type of reagent is $(\text{H}_3\text{C})_2\text{CuLi}$?

Mechanism:

b.



Is this reaction an oxidation, reduction, or neither?

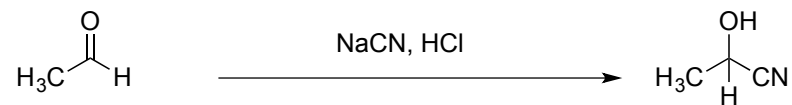
You can ignore stereochemistry.

Mechanism:

6. (12 points)

Initials: _____

a. Provide an arrow-pushing mechanism.



Mechanism:

b. Match the names of the functional groups with labeled examples from the compounds.

acetal

aniline

β -ketoester

imine

lactone

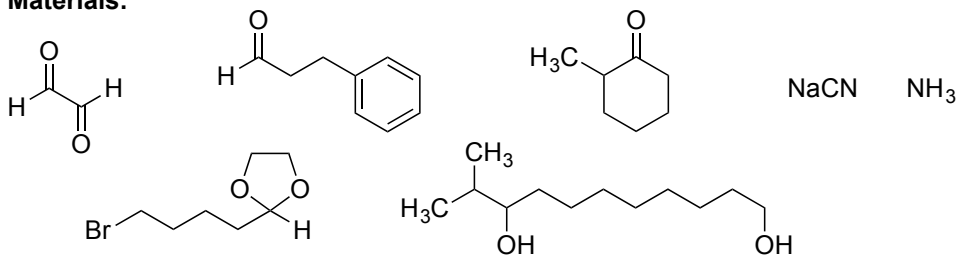
phenol

7. (16 points) Propose syntheses of the targets below.

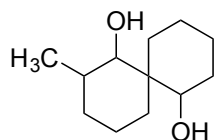
Initials: _____

All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

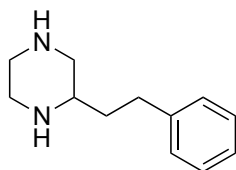
Starting Materials:



Target A.



Target B.

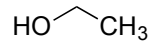
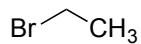
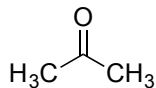
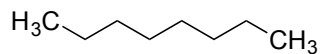
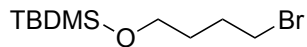
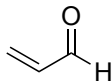
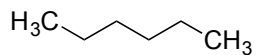


8. (16 points) Propose syntheses of the targets below.

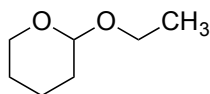
Initials: _____

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.

