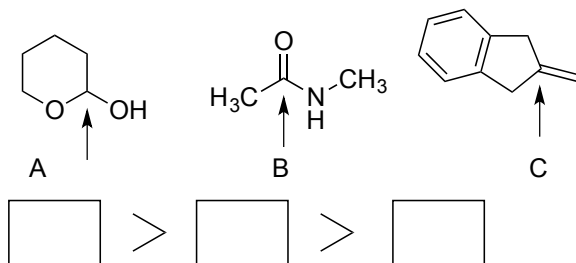
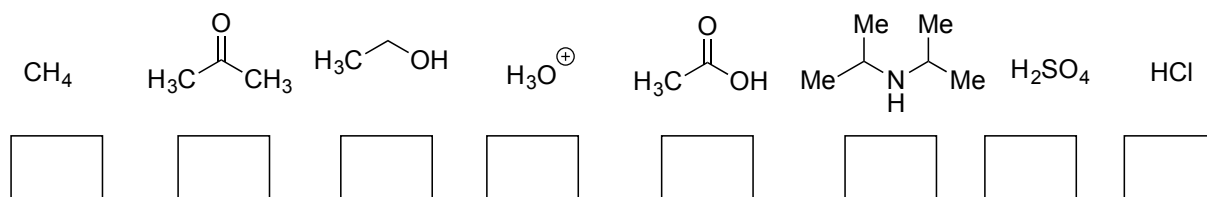
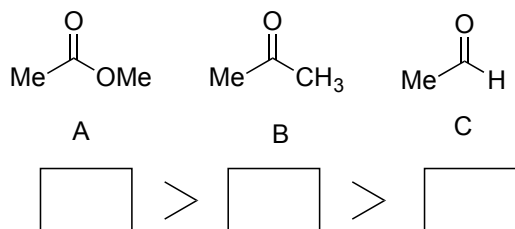


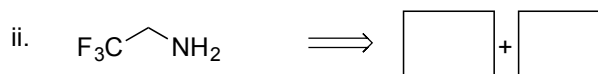
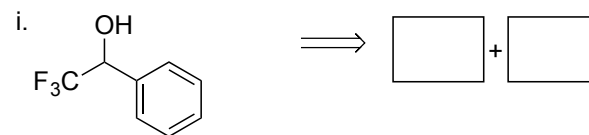
1. (18 points)

a. Rank highest to lowest oxidation state

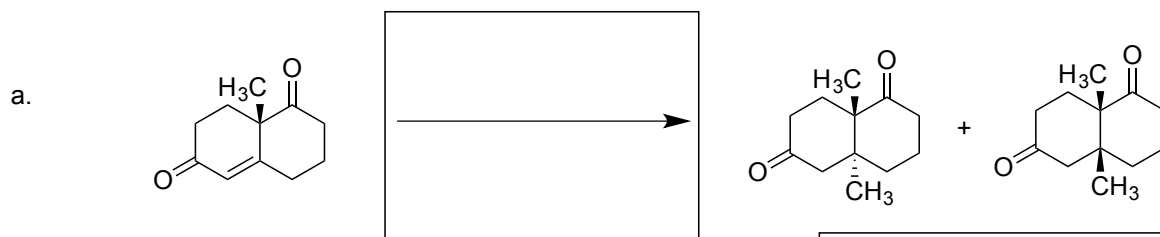
b. Provide pKa's for **any 6** of the following compounds (if you do them all, we will count your best 6).c. Rank fastest to slowest reaction with LiAlH_4 

d. Fill in the correct nucleophile and electrophile from the table to complete the retrosyntheses.

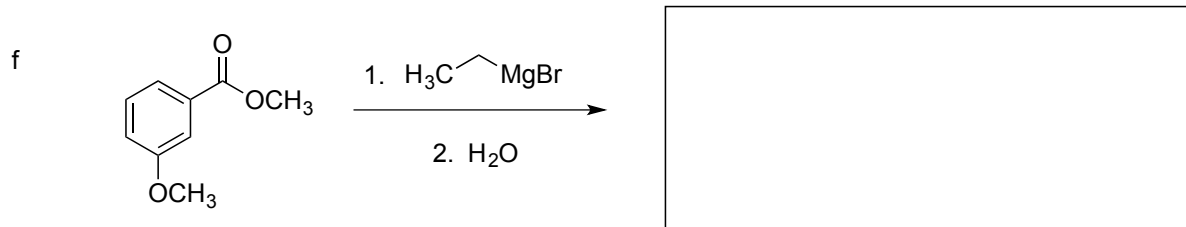
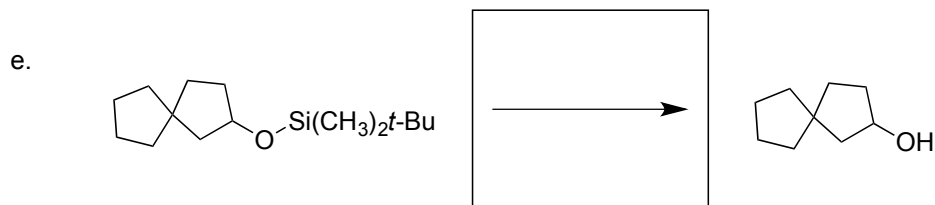
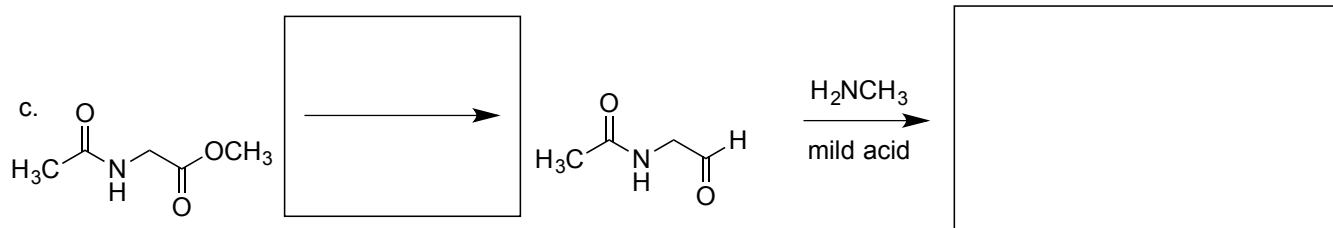
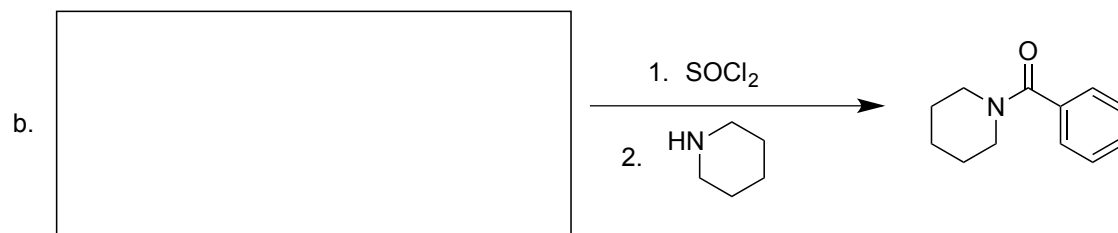
Nucleophiles		Electrophiles	
A	PhLi	E	$\text{F}_3\text{C}-\overset{\text{O}}{\parallel}-\text{OCH}_3$
B	Ph_2CuLi	F	$\text{F}_3\text{C}-\overset{\text{O}}{\parallel}-\text{H}$
C	NaBH_4	G	$\text{F}_3\text{C}-\overset{\text{O}}{\parallel}-\text{OH}$
D	LiAlH_4	H	$\text{F}_3\text{C}-\overset{\text{O}}{\parallel}-\text{NH}_2$

Products

2. (25 points) Fill in the boxes with the appropriate starting material, reagent or major product. Initials: _____
 Show stereochemistry where appropriate.



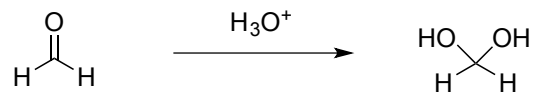
What is the relationship between the products?



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

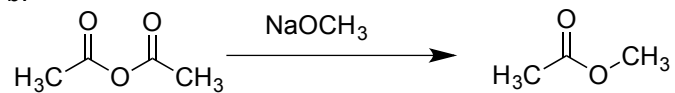
Initials: _____

a.



Mechanism:

b.



Is this reaction an oxidation, reduction, or neither?

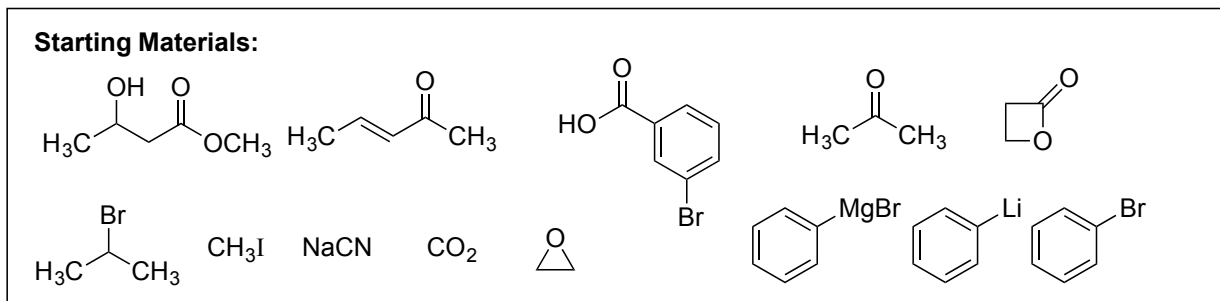
Mechanism:

Initials: _____

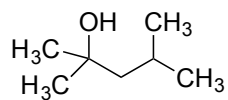
5. Propose syntheses of the targets below (16 points).

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

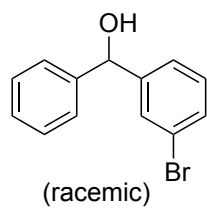
YOU CAN IGNORE STEREOCHEMISTRY.



Target A.



Target B.



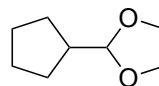
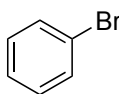
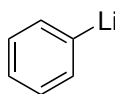
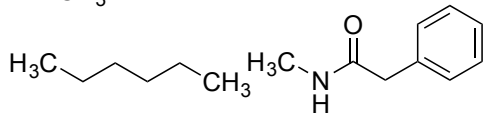
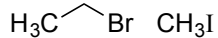
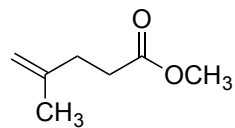
Initials: _____

4. Propose syntheses of the targets below (12 points).

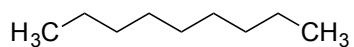
All carbons must come from the starting materials provided, you can use any reagent you wish.

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Starting Materials:



Target A.



Target B.

