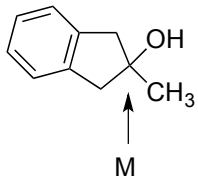
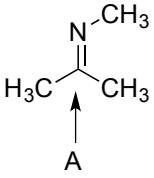
Midterm 1, Chem 51C, Jarvo, Spring 18

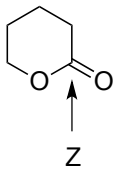
Initials: _____

1. (18 points)

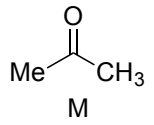
a. Rank highest to lowest oxidation state

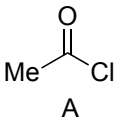


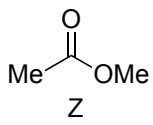




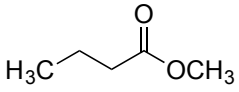
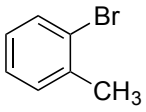
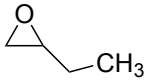
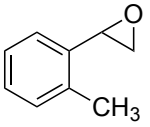
b. Rank fastest to slowest reaction with H_3CMgBr

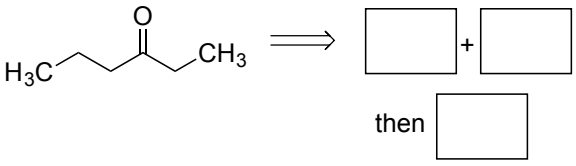


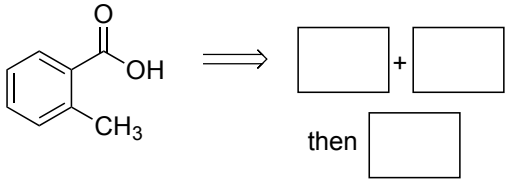




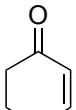
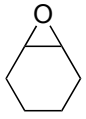
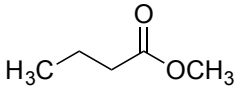
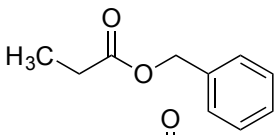
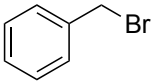
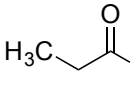
c. Fill in the correct compounds from the table to complete the retrosyntheses. You can use the same compound more than once.

Compounds			
D	PCC	**C**	Mg^0
E	CO_2	**F**	NaCN
L		**G**	$LiCu(CH_2CH_3)_2$
H		**K**	
		M	

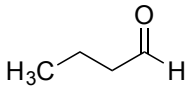


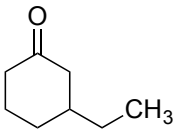


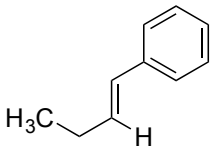
d. Fill in the correct compounds from the table to complete the retrosyntheses. You can use the same compound more than once.

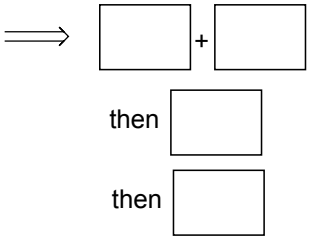
Compounds			
C	$LiAlH_4$	**K**	
D	Dibal-H		
E	$BrMgCH_2CH_3$	**L**	
F	$LiCu(CH_2CH_3)_2$	**M**	
G	Mg^0		
H	*n*-BuLi		
J	PPh_3	**N**	
P		**O**	

Products

i. 

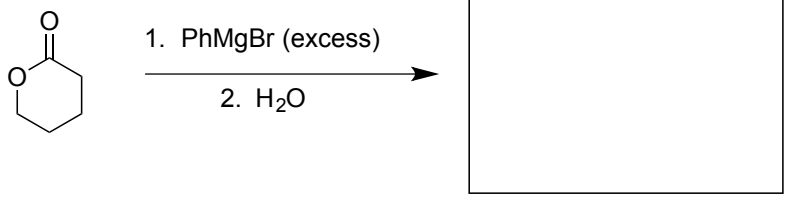
ii. 

iii. 



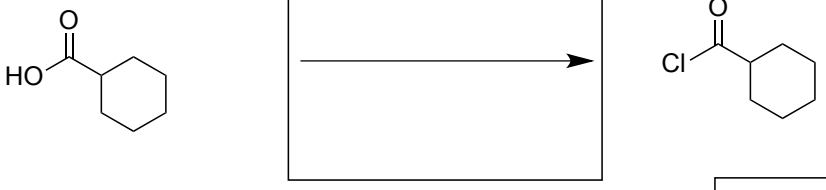
3. (20 points) Fill in the boxes with the appropriate starting material, reagent or major product. Show stereochemistry where appropriate. Initials: _____

a.



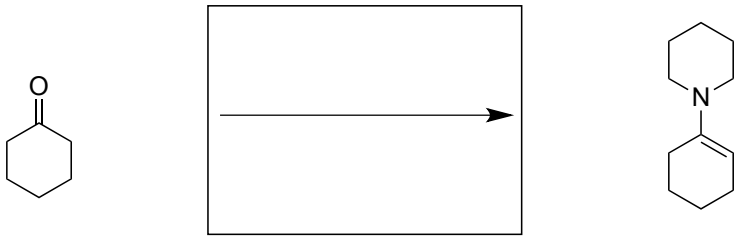
What is the name for this type of reagent? [ ]

b.

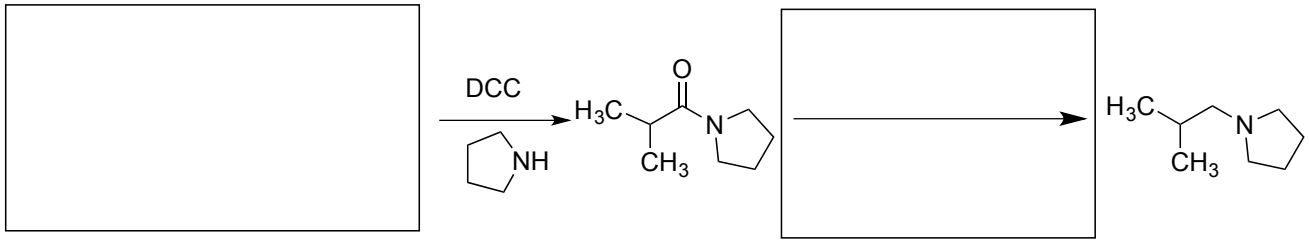


Is this reaction an oxidation, a reduction, or neither? [ ]

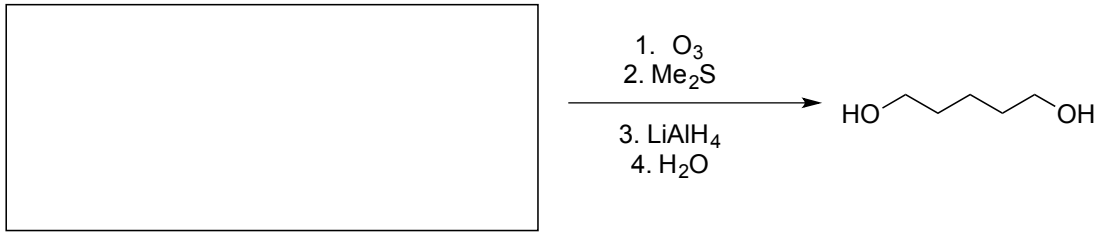
c.



d.



e.



2. (15 points)

Initials: _____

a. Match the names of the functional groups with labeled examples (5 points).

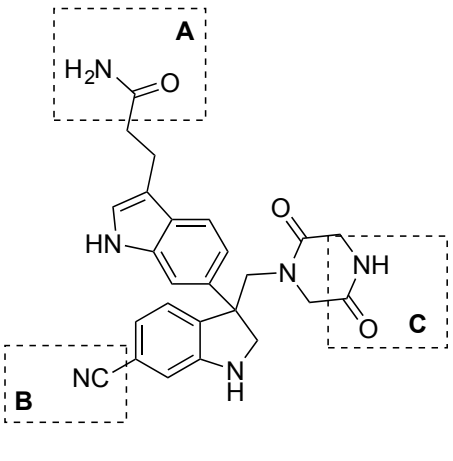
acetal ☐

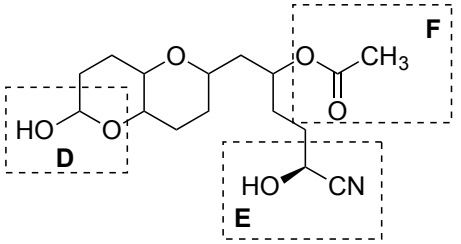
1° amide ☐

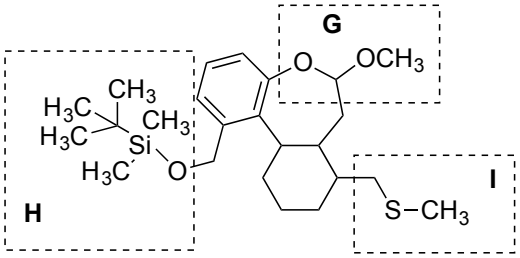
ester ☐

cyanohydrin ☐

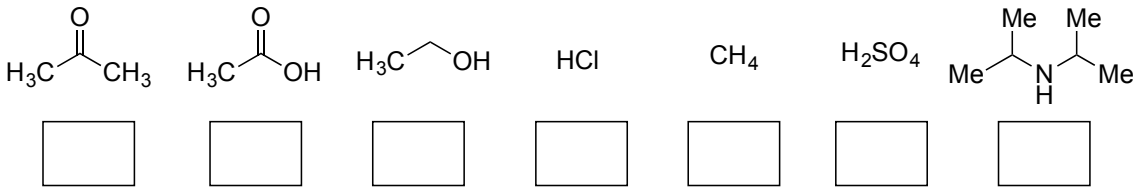
silyl ether ☐





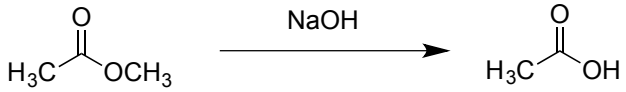


b. Provide pKa's for **any 5** of the following compounds (if you do them all, we will count your best 5).



☐ ☐ ☐ ☐ ☐ ☐ ☐

c. Provide an arrow-pushing mechanism (7 points).

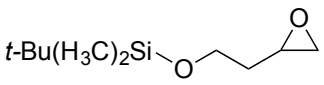


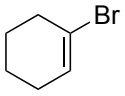
Mechanism:

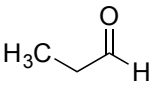
Initials: _____

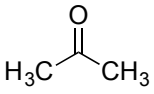
5. Propose syntheses of the target below (14 points).
All carbons in the product must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

Starting Materials:



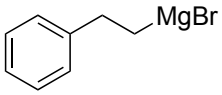


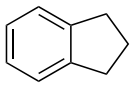




NaCN

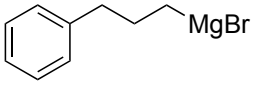
CH_3I



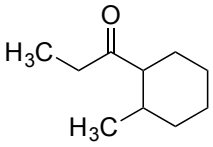


CO_2

Target A.



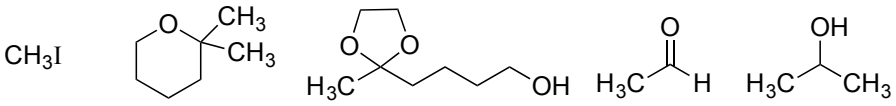
Target B.



Initials: _____

4. Propose a synthesis of the target below (8 points).
All carbons in the product must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

Starting Materials:



Target.