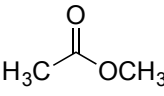
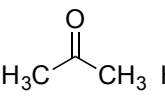
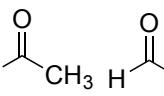
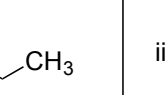
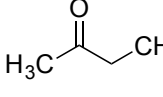
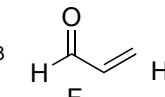
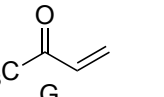
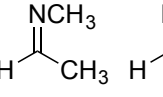
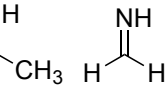
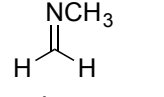
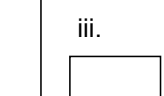
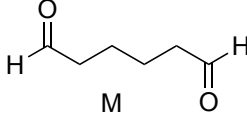
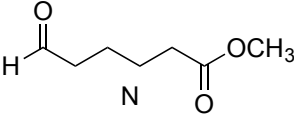
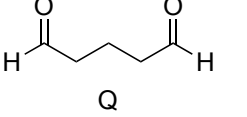
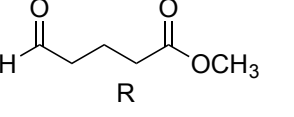
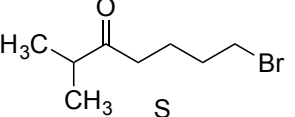
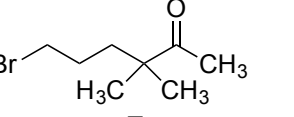
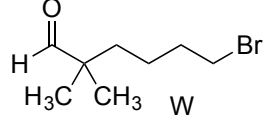
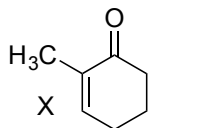


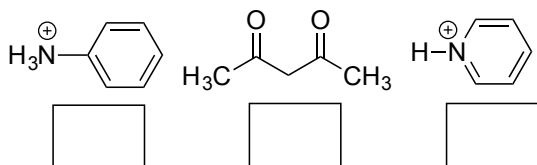
1 (19 points)

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

**Starting materials**

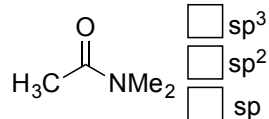
 A	 B	 C	 D
 E	 F	 G	
 H	 J	 K	 L
 M	 N		
 Q	 R		
 S	 T		
 W	 X		

b. Provide pKa's for **any 2** of the following compounds (if you do them all, we will count your best 2).

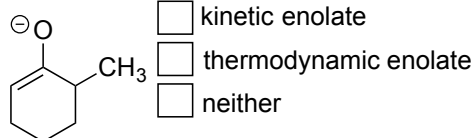


c. Check the appropriate box or boxes.

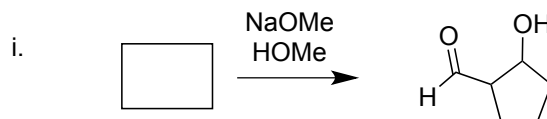
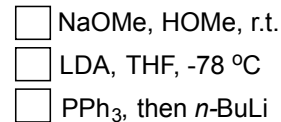
i. Hybridization of the nitrogen:



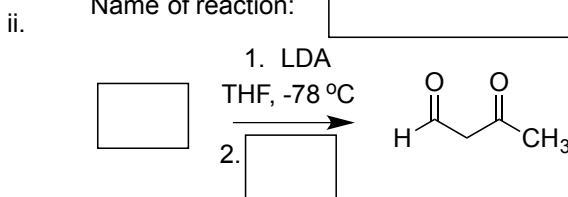
ii. Is this the:



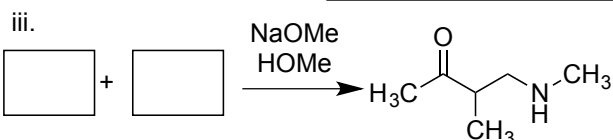
iii. A kinetic enolate is formed with:



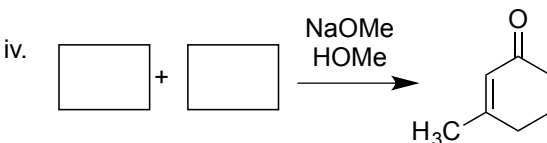
Name of reaction:



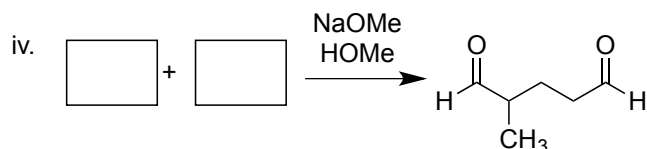
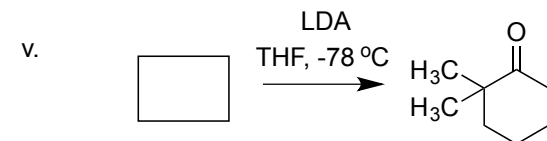
Name of reaction:



Name of reaction:

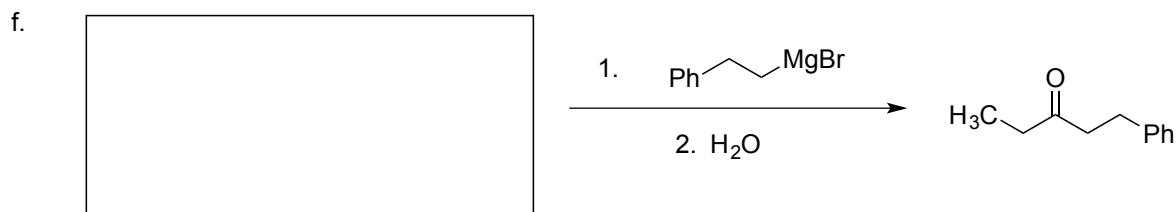
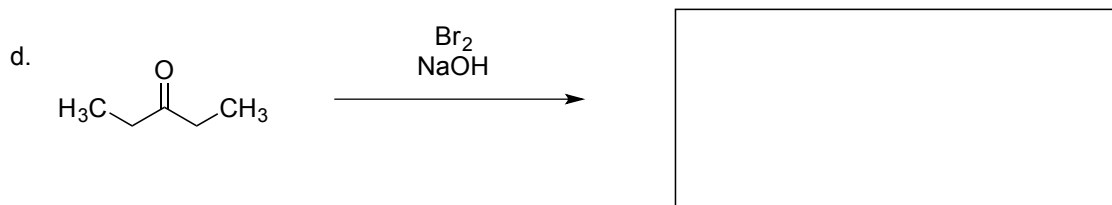
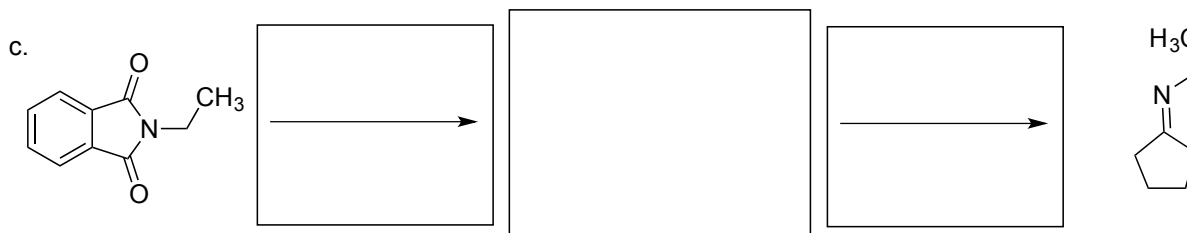
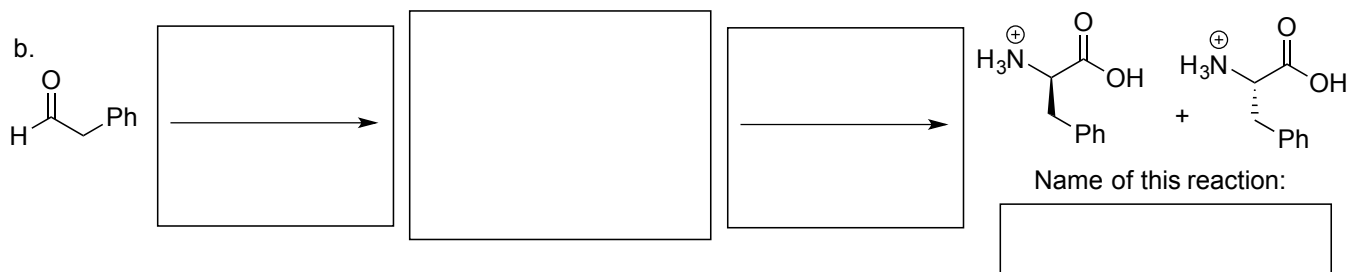


Name of reaction:



Name of reaction:

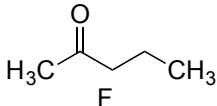
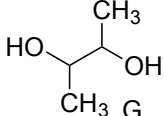
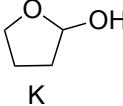
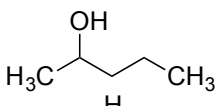
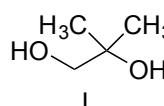
3. Fill in the boxes with the appropriate starting material, reagent or major product (33 points). Show stereochemistry where appropriate (you must DRAW the enantiomers/diastereomers)

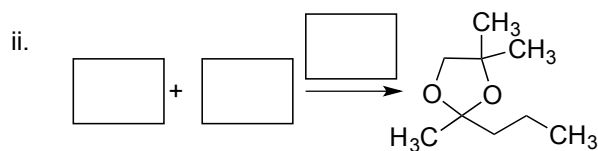
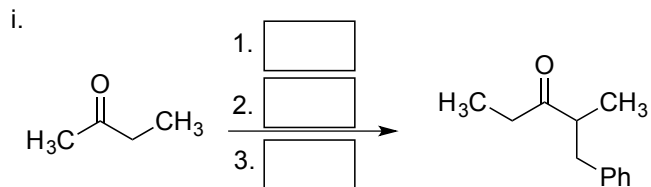


2. (17 points)]

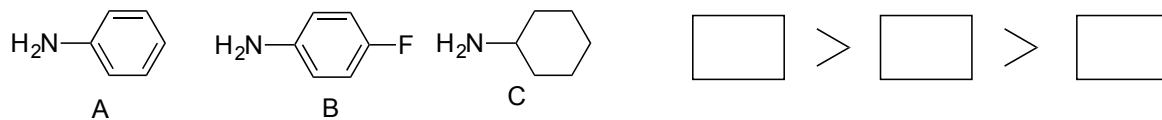
Initials: \_\_\_\_\_

a. Fill in the compounds from the table to complete the synthesis. You can use the same compound more than once.

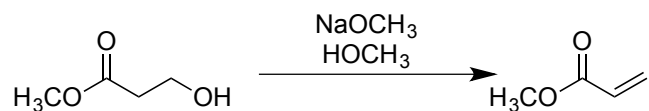
LDA, THF, -78 °C A	NaOMe, HOMe, H <sub>3</sub> C-I B
NaOMe, HOMe, Ph-CH <sub>2</sub> -I C	H <sub>3</sub> C-I D
	Ph-CH <sub>2</sub> -I E
	
	
	pTsOH M
	H <sub>2</sub> O N



b. Rank the following compounds from **most to least basic**.



c. Provide an arrow-pushing mechanism



What is the name of this mechanism?

**Mechanism:**

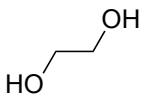
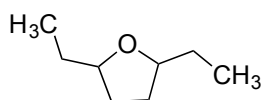
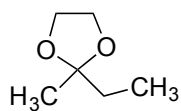
4. (7 points) Propose a synthesis of the target below.

Initials: \_\_\_\_\_

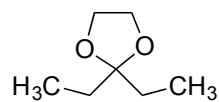
**All carbons** must come from the starting materials provided, you can use any reagent you wish.

**YOU CAN IGNORE STEREOCHEMISTRY.**

**Starting Materials:**



**Target A.**

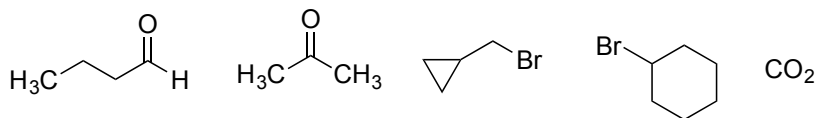


6. (9 points) Propose a synthesis of the target below.

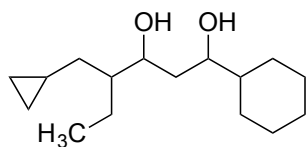
Initials: \_\_\_\_\_

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

**Starting Materials:**



**Target A.**

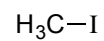
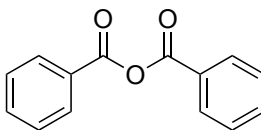
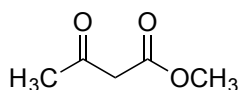
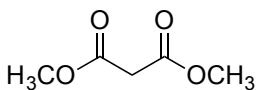


5. (8 points) Propose a synthesis of the target below.

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.**

