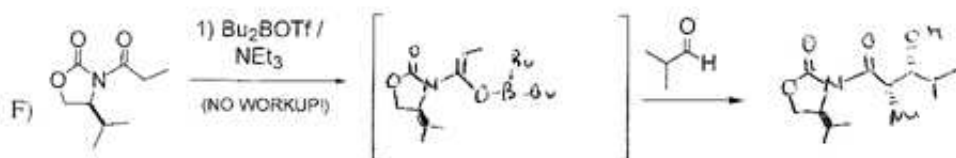
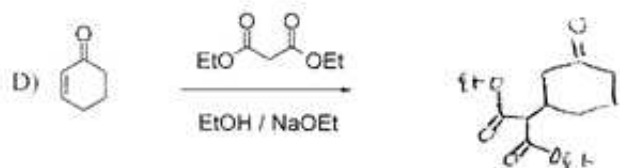
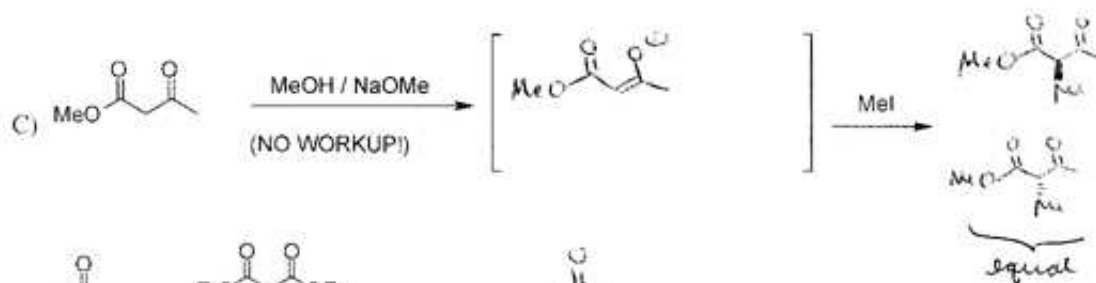
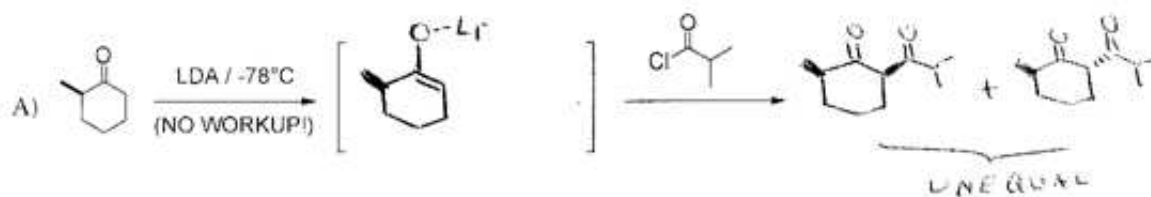
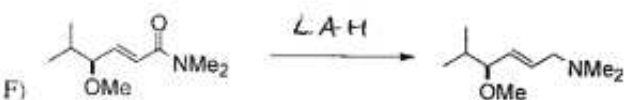
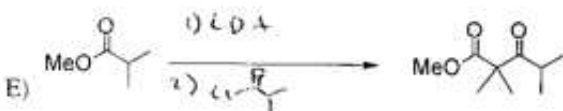
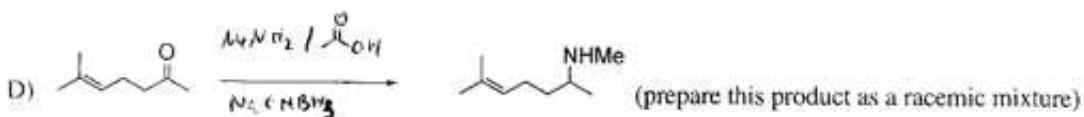
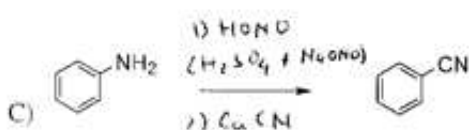
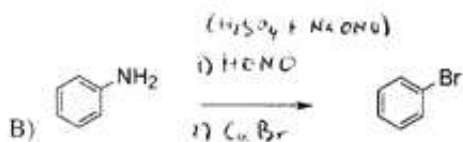
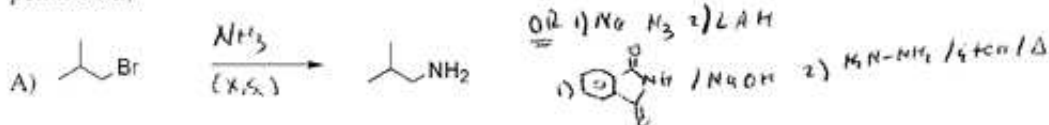


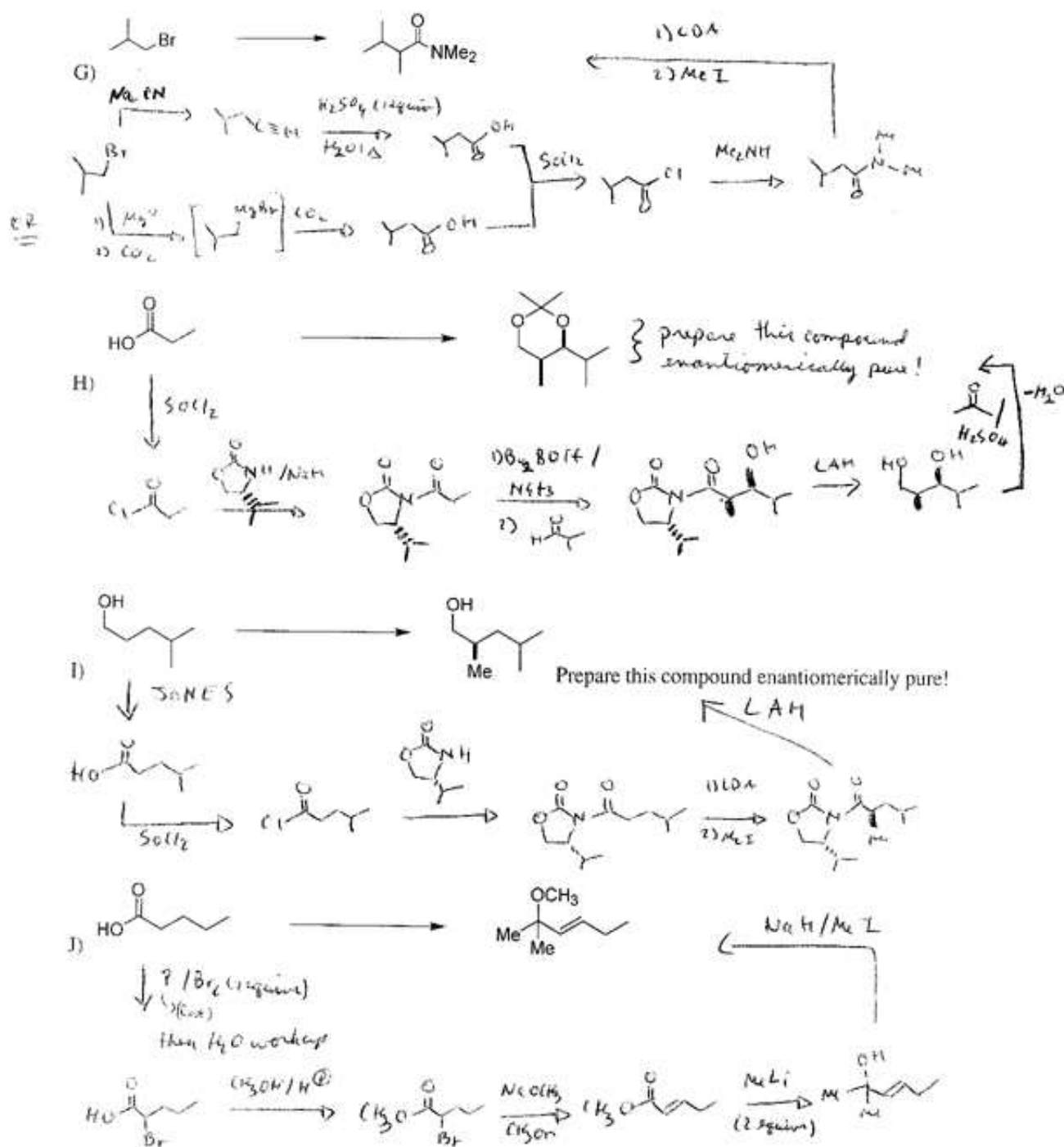
1) Provide the products of the following reactions. If no reaction would occur, then write NR. Draw all possible stereoisomers (i.e., draw dashed and bold lines as needed) and indicate if they would be produced in equal or unequal amounts. There is an appropriate aqueous work up for each reaction **UNLESS OTHERWISE NOTED** (3 points each).



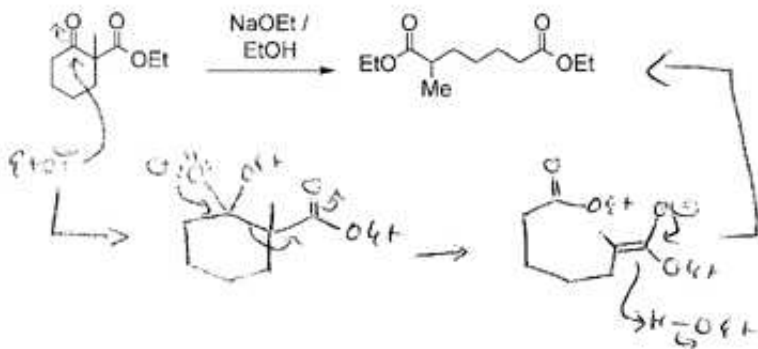
2) Complete the short syntheses shown below in one or two steps using organic reagents of 7 carbons or less and any inorganic reagents you wish. If your synthesis requires more than one step, you must write the product of each step. You do not have to include aqueous work up conditions in your syntheses (4 points each)



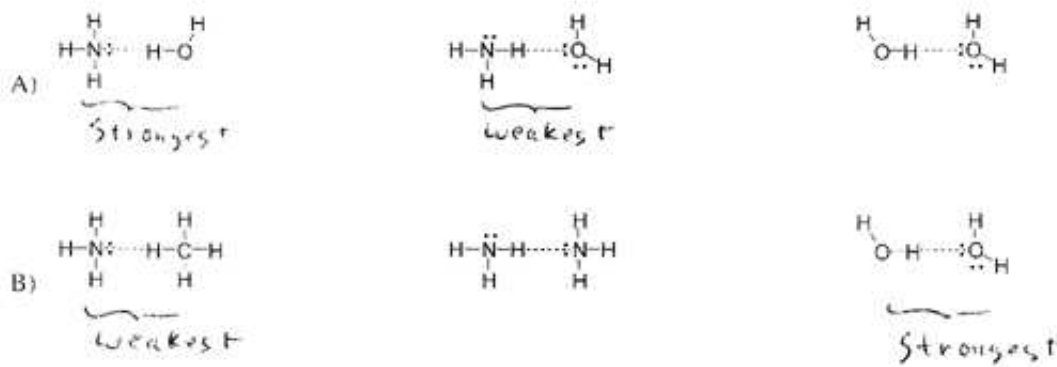
You only have to do THREE of the multi step synthesis problems on this page (30 points). Cross out the problem you do not want us to grade!



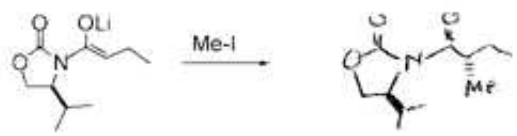
3) Provide a mechanism for the reaction shown below. Be sure to show all intermediates, arrows, and charges, etc (9 points).



4) Indicate the strongest and weakest hydrogen bond for each of the groups of three shown below (2 pts each):



5) Provide the product of the reaction shown below paying careful attention to stereochemistry (3pts).



B) This molecule (the lithium enolate) adopts a certain conformation when it reacts. Draw this conformation and show the interactions that force the molecule to exist in this conformation. Using your drawing, briefly explain the observed stereochemistry (3 pts).

