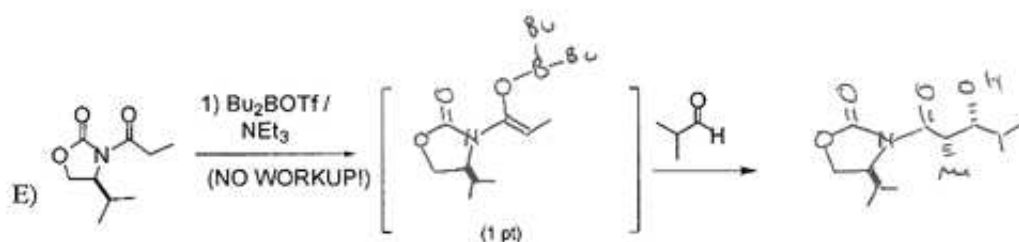
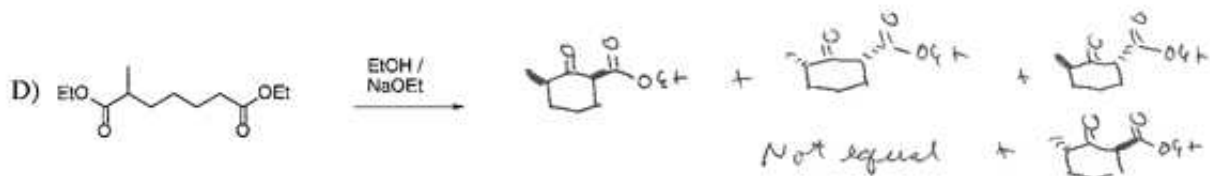
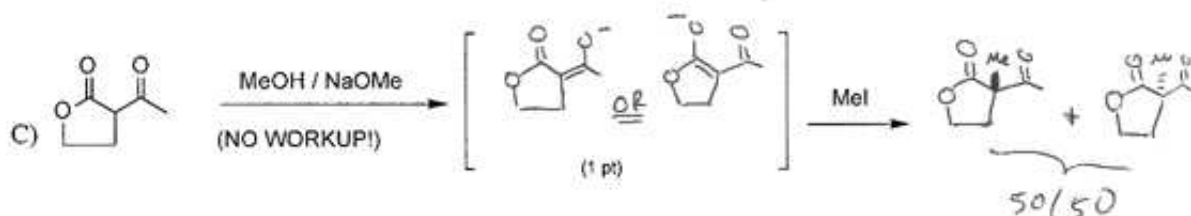
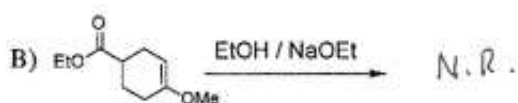
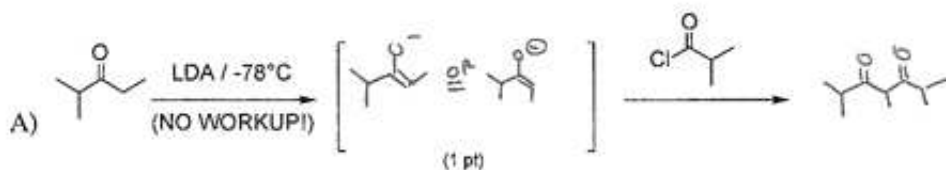
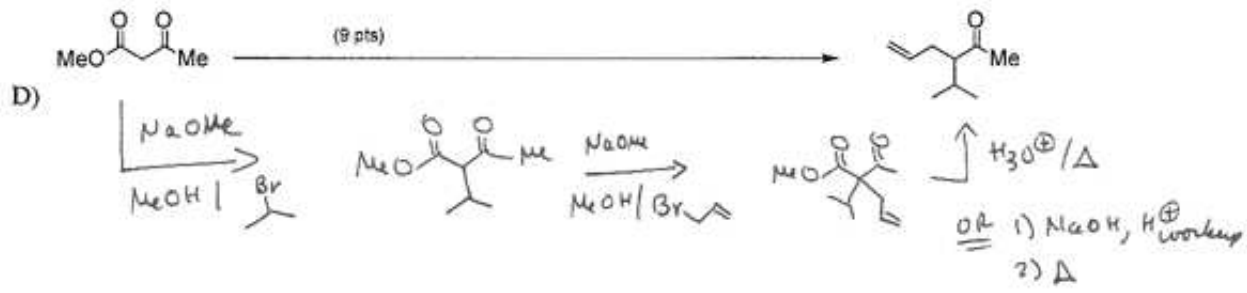
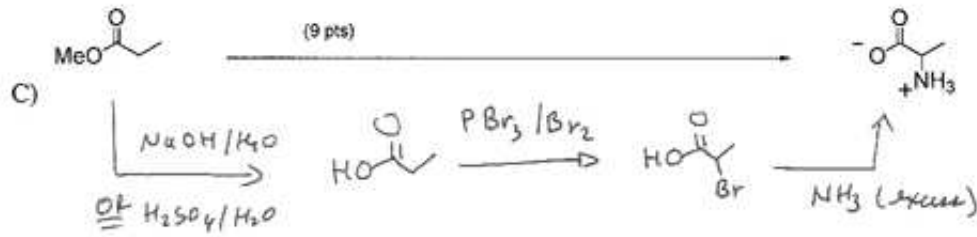
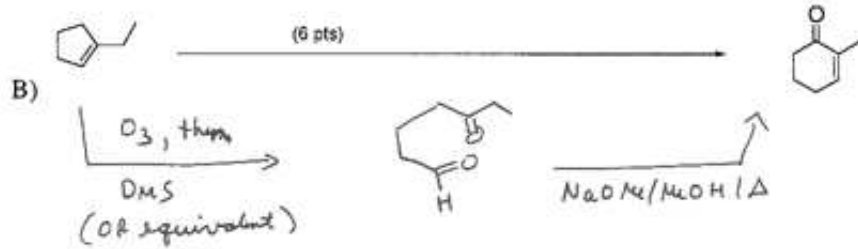
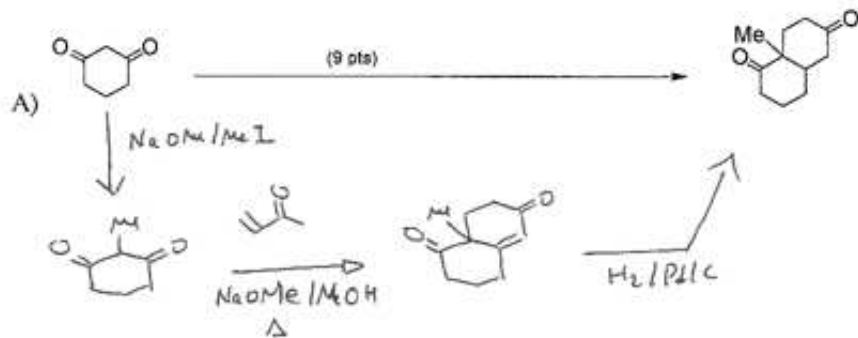


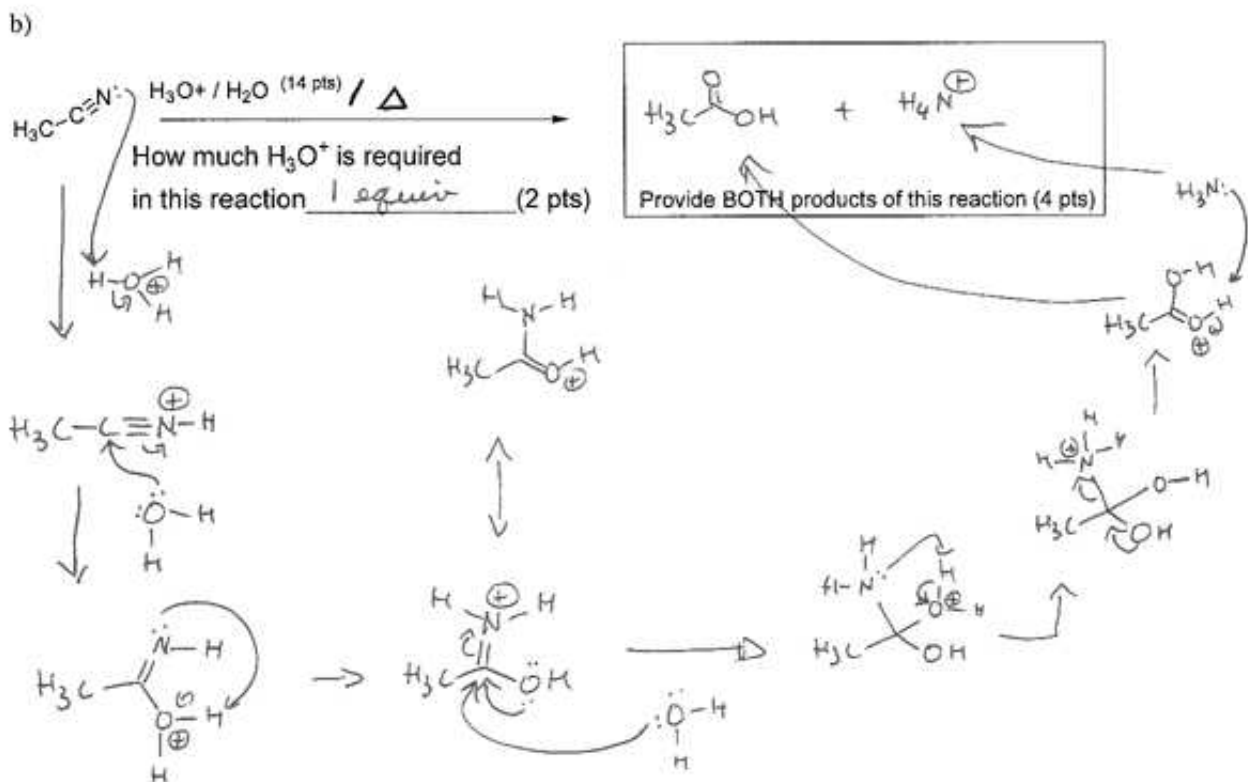
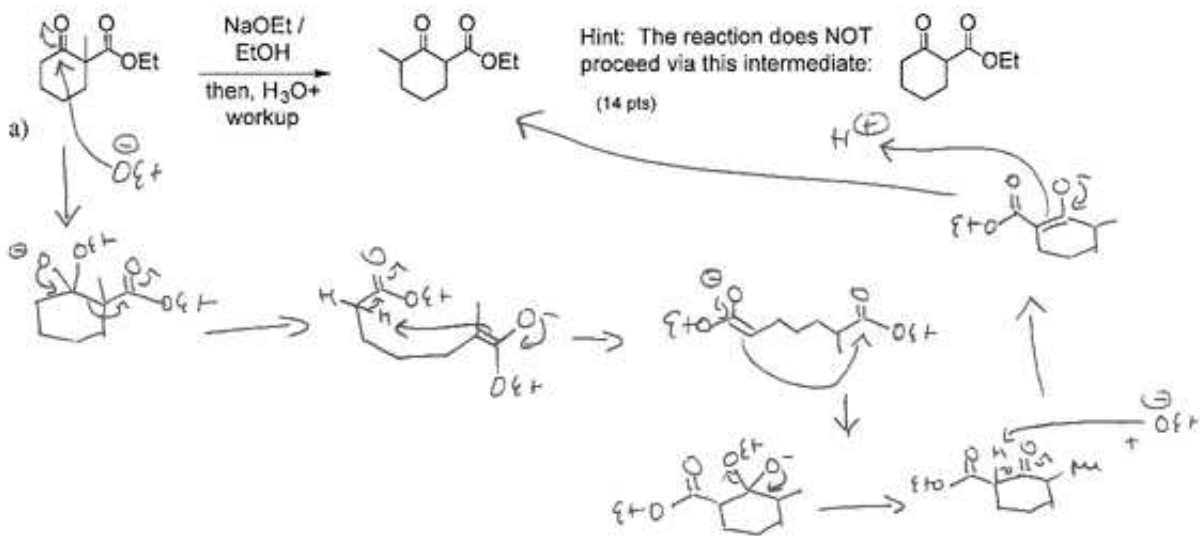
1) Provide the products of the following reactions. If no reaction would occur, then write NR. Draw all possible stereoisomers (i.e., draw dashed and bold lines as needed) and indicate if they would be produced in equal or unequal amounts. There is an appropriate aqueous work up for each reaction **UNLESS OTHERWISE NOTED** (2 points each answer except where indicated).

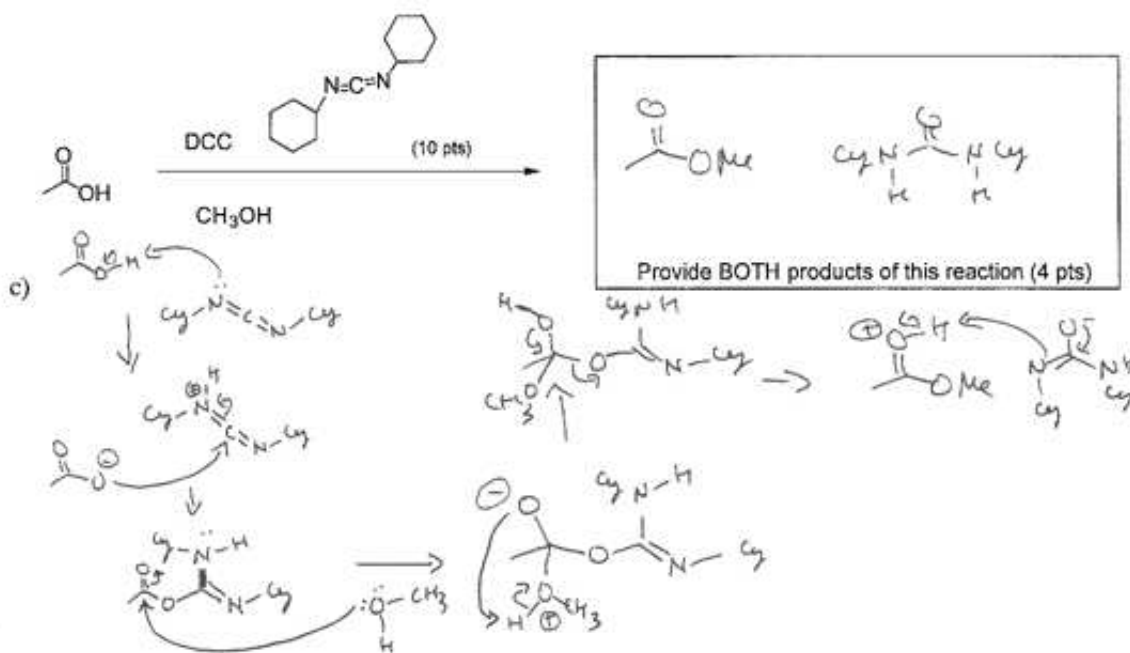


2) Complete the syntheses shown below using organic reagents of 7 carbons or less and any inorganic reagents you wish. If your synthesis requires more than one step, you must write the product of each step. You do not have to include aqueous work up conditions in your syntheses.



3) Provide mechanisms for the reactions shown below. Be sure to show all steps, including work up and all intermediates, arrows, and charges.





4) Rank the following compounds in order of their reactivity as electrophiles (2 pts each, no partial credit).

