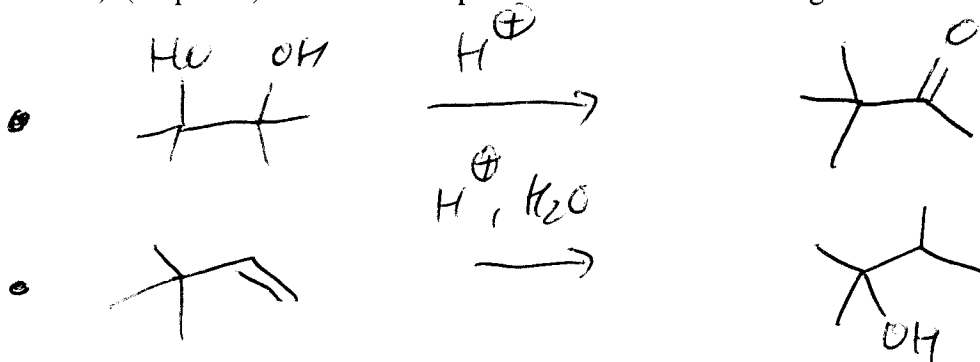
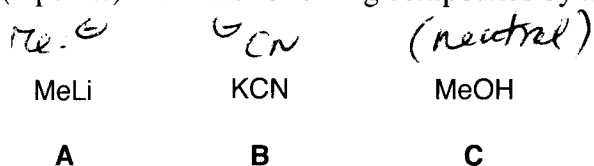


I. CONCEPTS / NOMENCLATURE

1. a) (10 points) Give an example of a carbocation rearrangement seen this quarter:



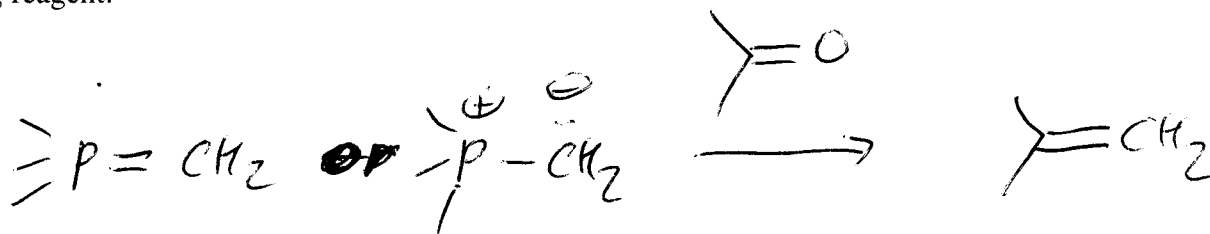
b) (6 points) Rank the following compounds by *increasing reactivity with a carbonyl group*:



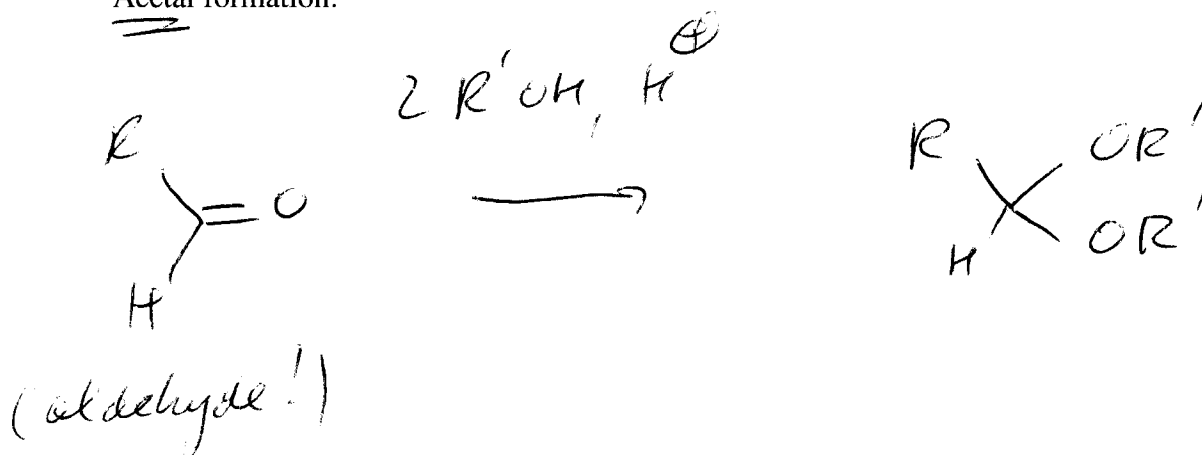
Trend: C < B < A

c) (9 points) Illustrate by an example the following terms seen in material covered this quarter:

Wittig reagent:



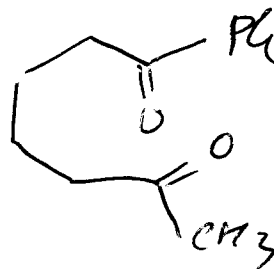
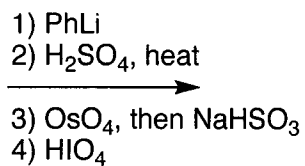
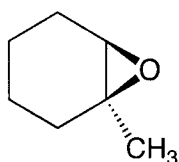
Acetal formation:



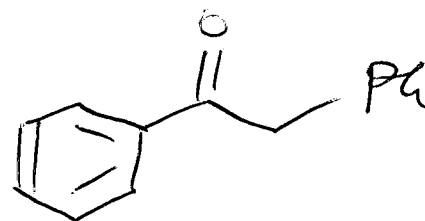
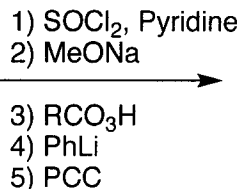
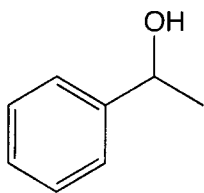
II. REACTIONS

2. (25 points) Draw the **major product** for the following reactions (if there are enantiomers or diastereomers formed, show only one, but pay attention to stereochemistry where needed!) Aqueous workup (e.g. H_3O^+) is implied after each step where needed:

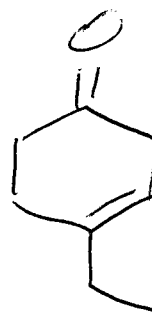
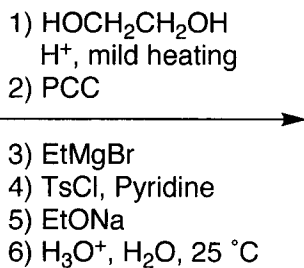
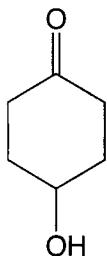
a)



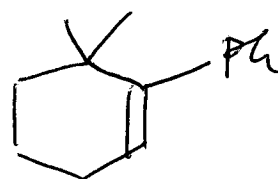
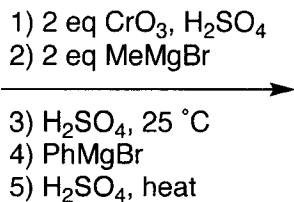
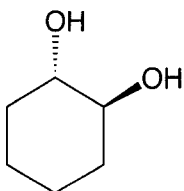
b)



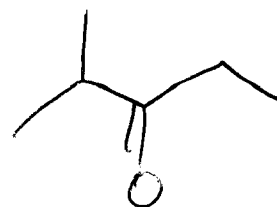
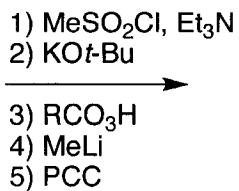
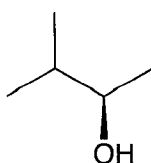
c)



d)



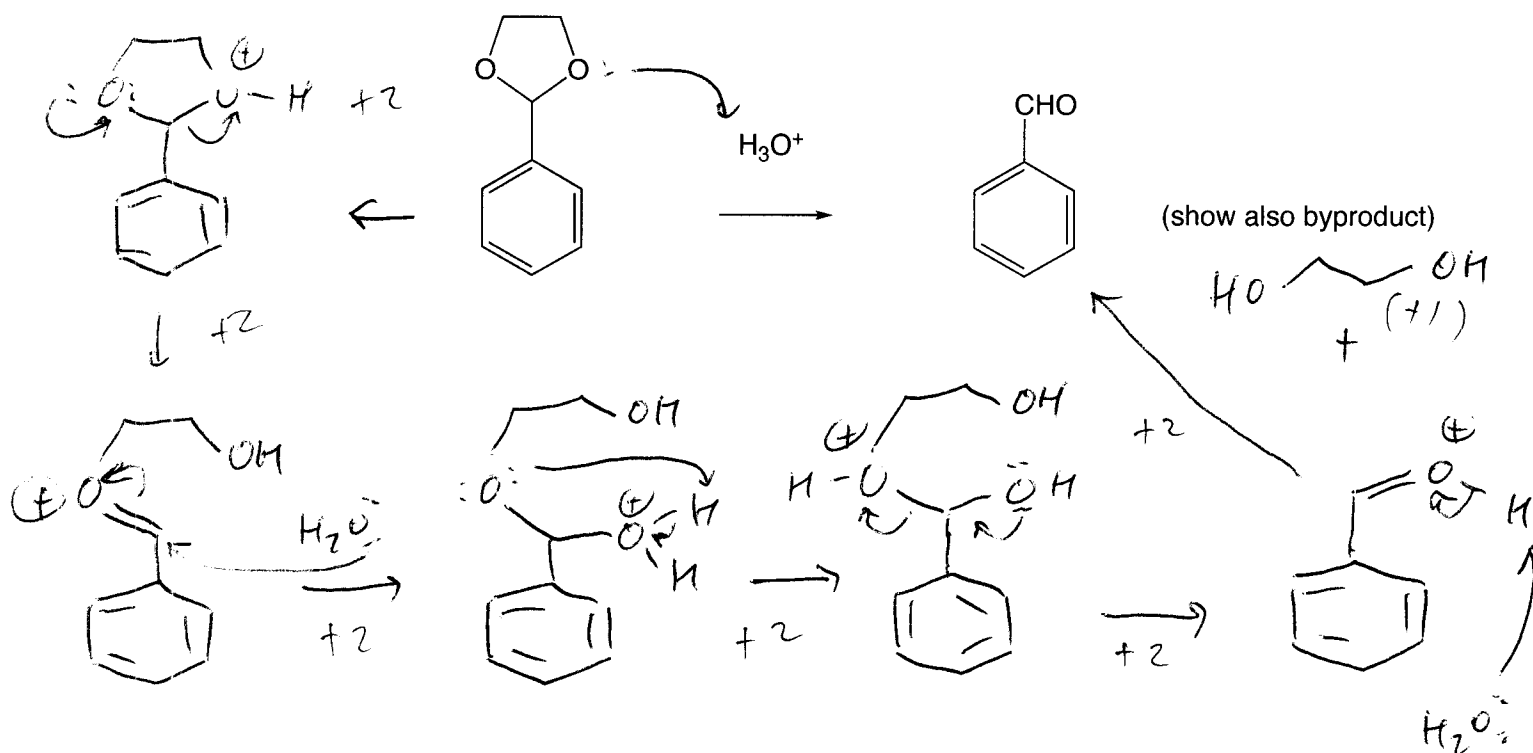
e)



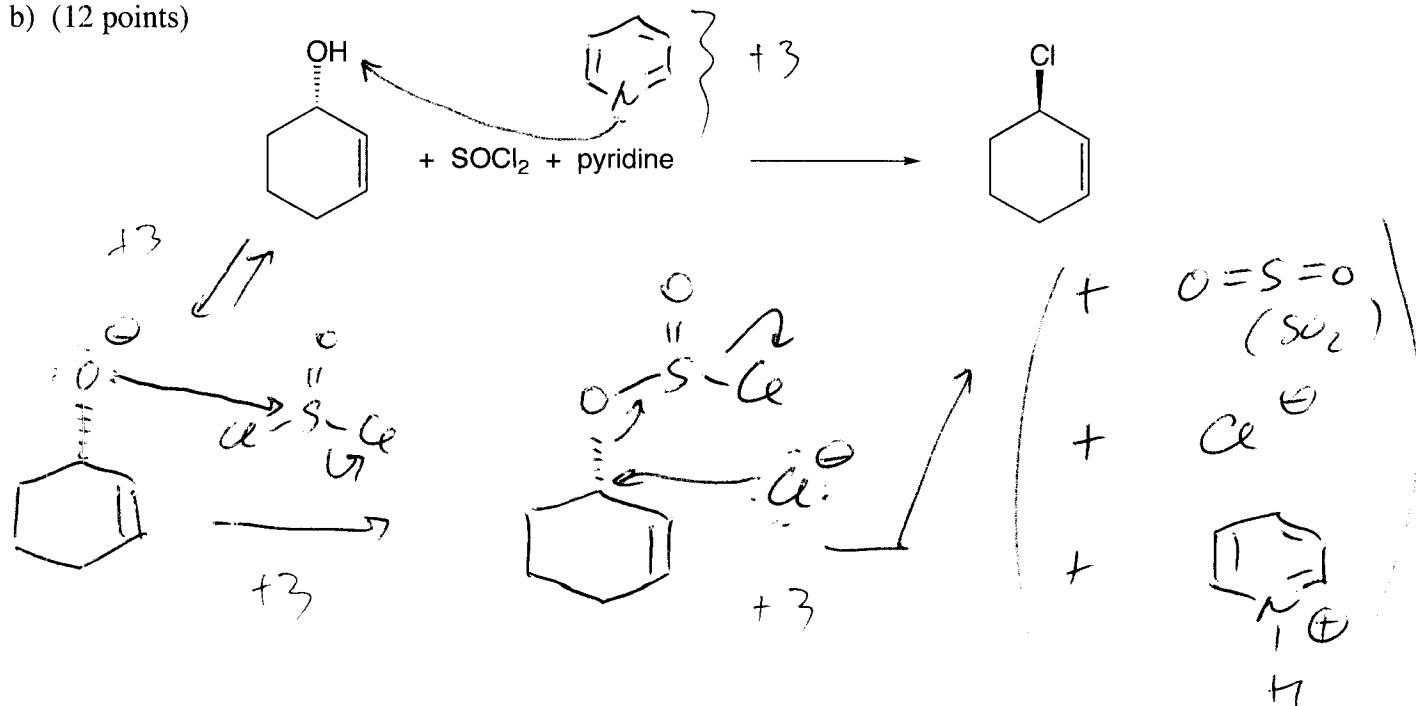
III. MECHANISMS

3. (25 points) Provide a complete, detailed mechanism with curved arrow formalism for the following reactions. **Each step must be explicitly written down**, i.e. every attack of reagent, bond breaking and bond forming steps must be shown!

a) (13 points)



b) (12 points)

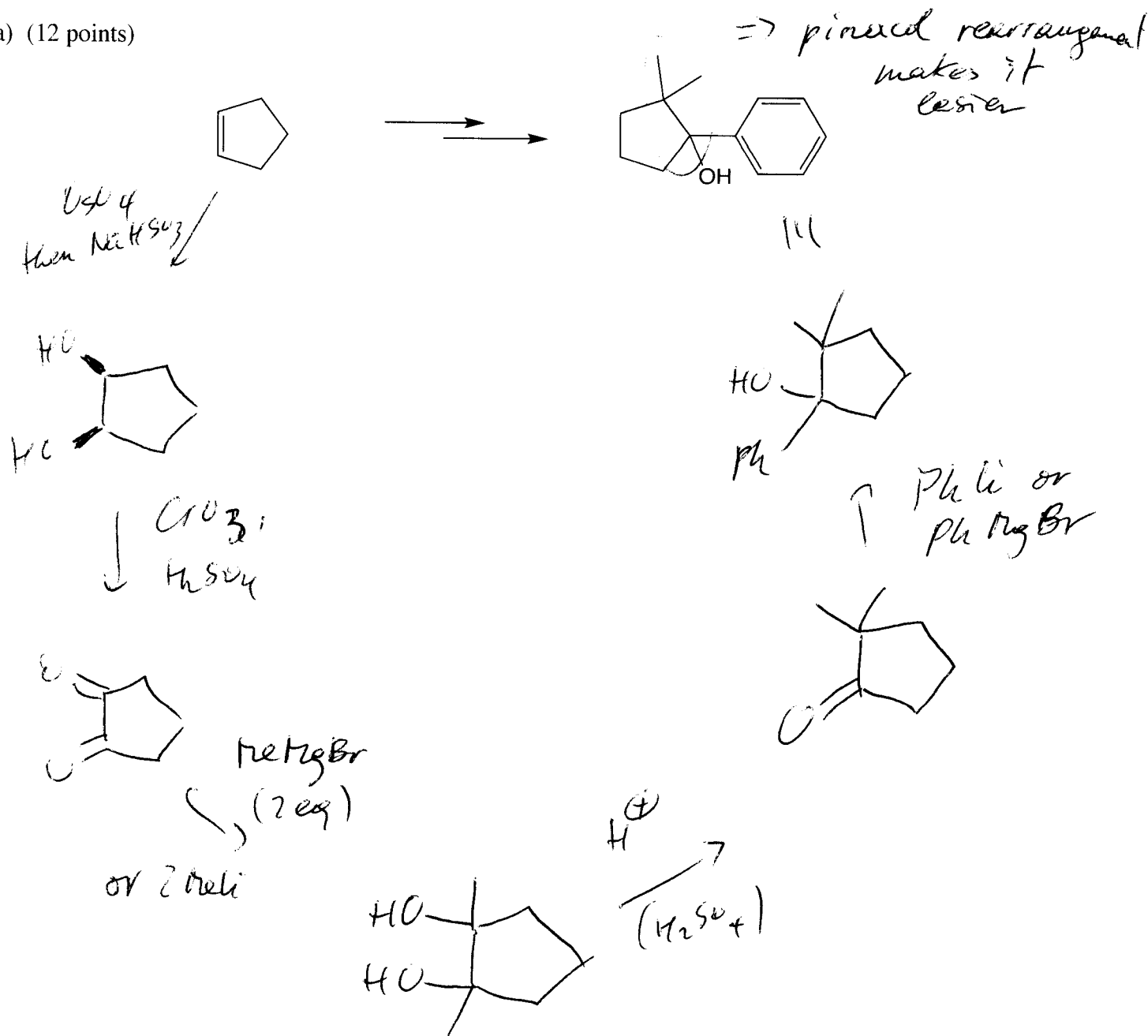


IV. TRANSFORM

4. (25 points) Devise a reasonable synthesis for the following compound from reagents you are familiar with and the starting materials provided:

Note: do no "invent" new reagents or reactions. Use only those specifically taught in class or previous quarter's reactions. There should not be more than 10 steps necessary in these syntheses, although longer ones may also be correct.

a) (12 points)



b) (13 points)

