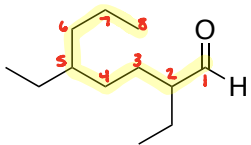


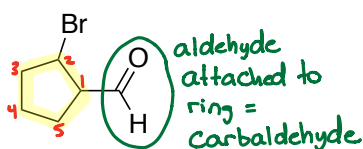
Answer Key
Chemistry 234
Chapter 19 - Problem Set

Nomenclature

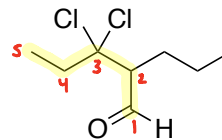
1) Give the IUPAC name for each aldehyde below.



2,5-diethyloctanal

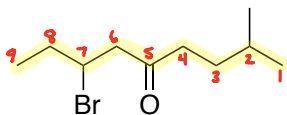


2-bromocyclopentane carbaldehyde

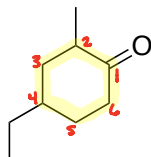


3,3-dichloro-2-propylpentanal

2) Give the IUPAC name or structure for each ketone below.



7-bromo-2-methyl-5-nonanone

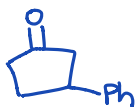


4-ethyl-2-methylcyclohexanone

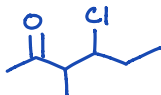


IUPAC: 2,2,4-trimethyl-3-pentanone
 Common: tert-butyl isopropyl ketone

3-phenylcyclopentanone



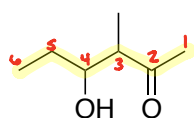
4-chloro-3-methyl-2-hexanone



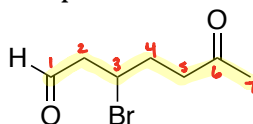
methyl propyl ketone



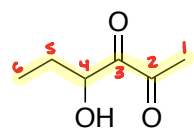
3) Give the IUPAC name for each polyfunctional compound below.



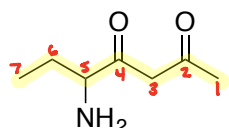
4-hydroxy-3-methyl-2-hexanone



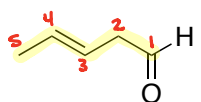
3-bromo-6-oxoheptanal



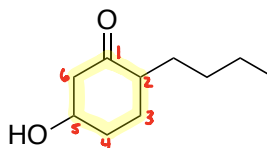
4-hydroxy-2,3-hexanedione



(NH₂ is an amino substituent)
 5-amino-2,4-heptanedione
 keep e ending when using
 di, tri, etc.
 2 ketones



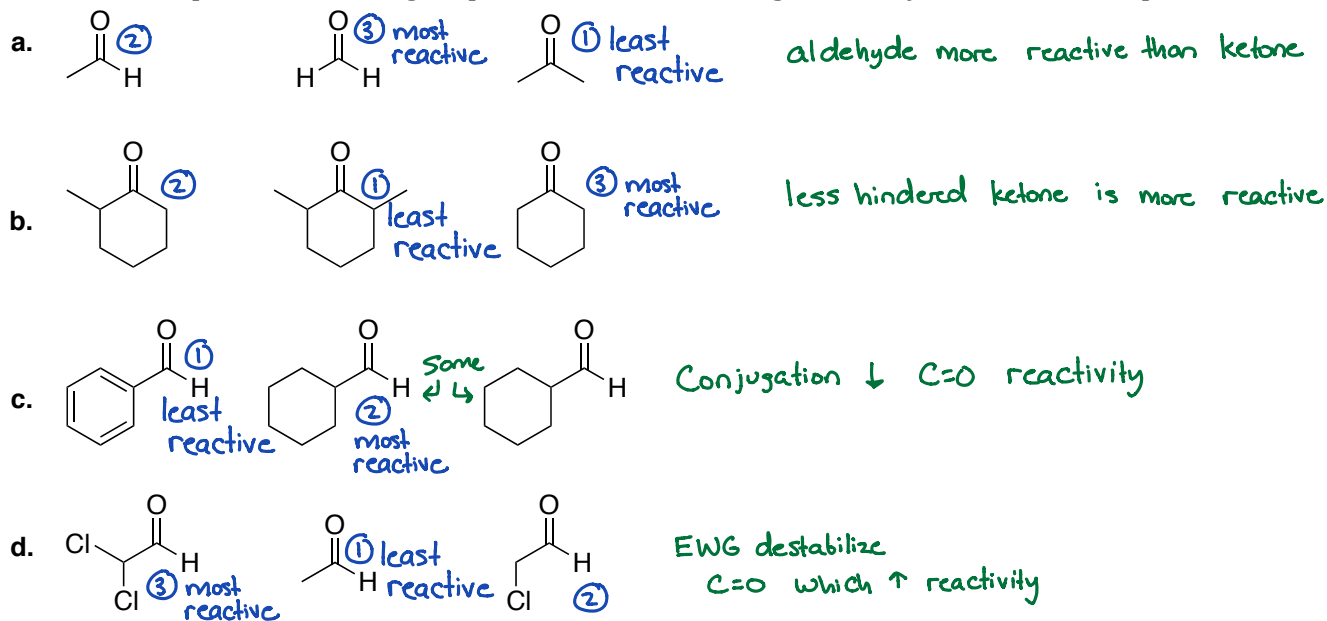
(E)-3-pentenal



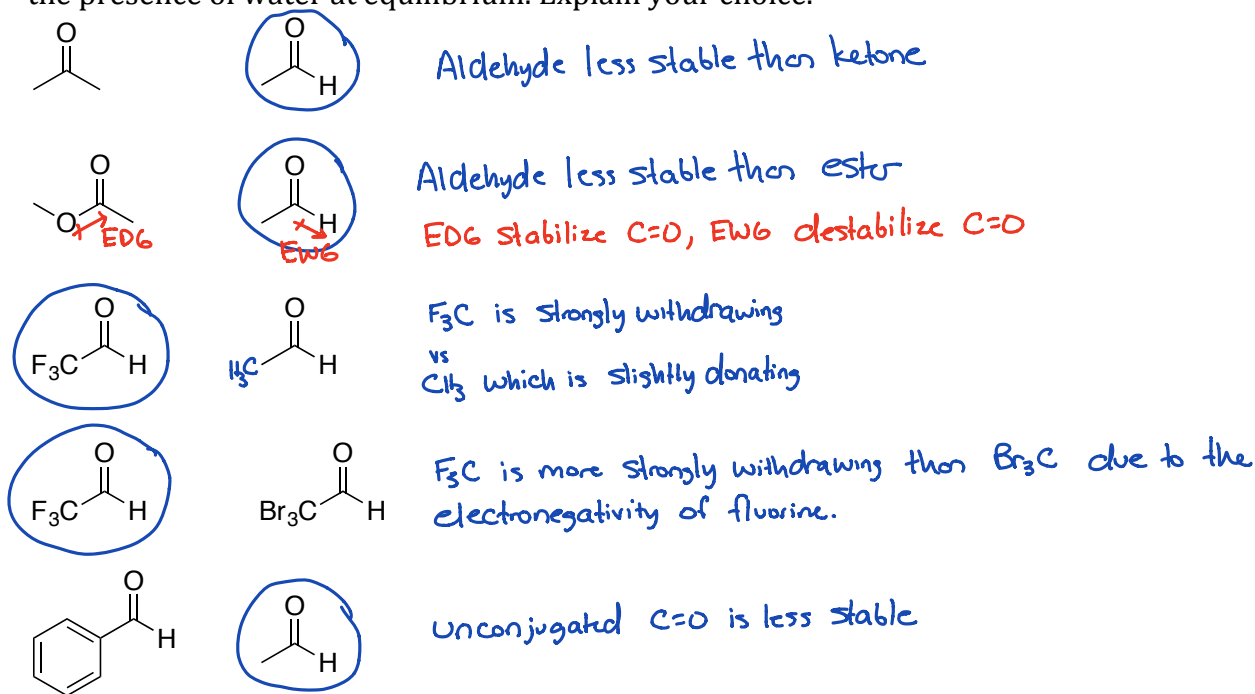
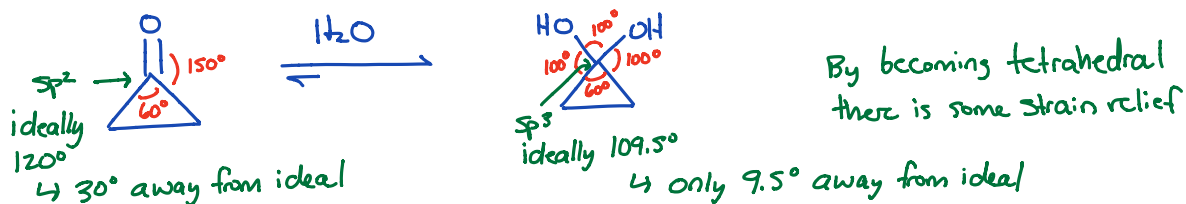
2-butyl-5-hydroxycyclohexanone

Properties and Reactivity of Aldehydes and Ketones

4) Rank the compounds in each group in order of increasing reactivity towards nucleophilic attack.

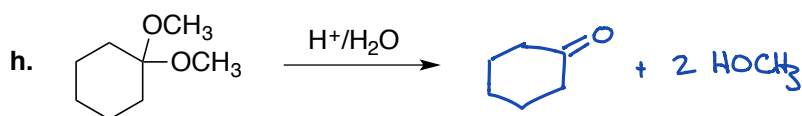
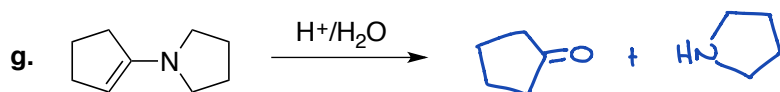
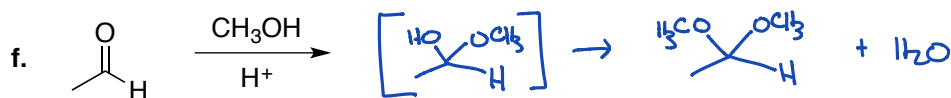
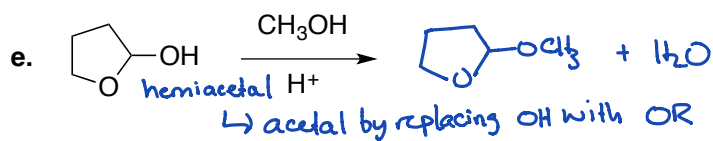
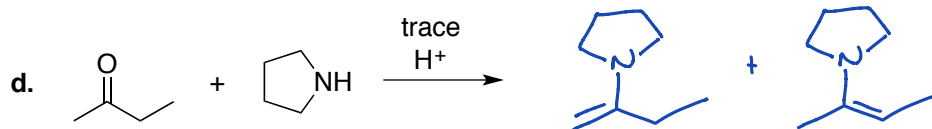
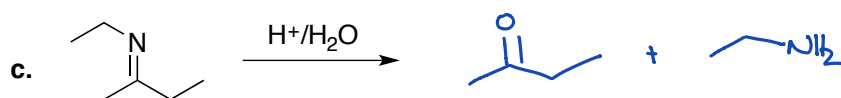
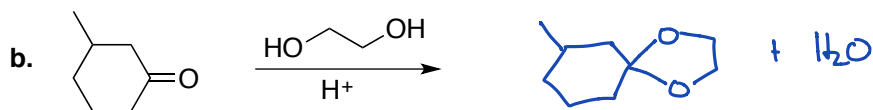
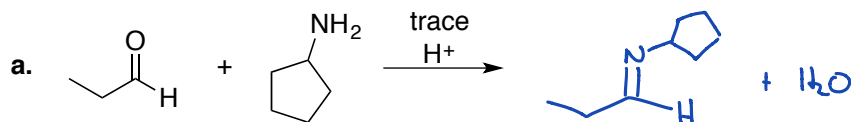
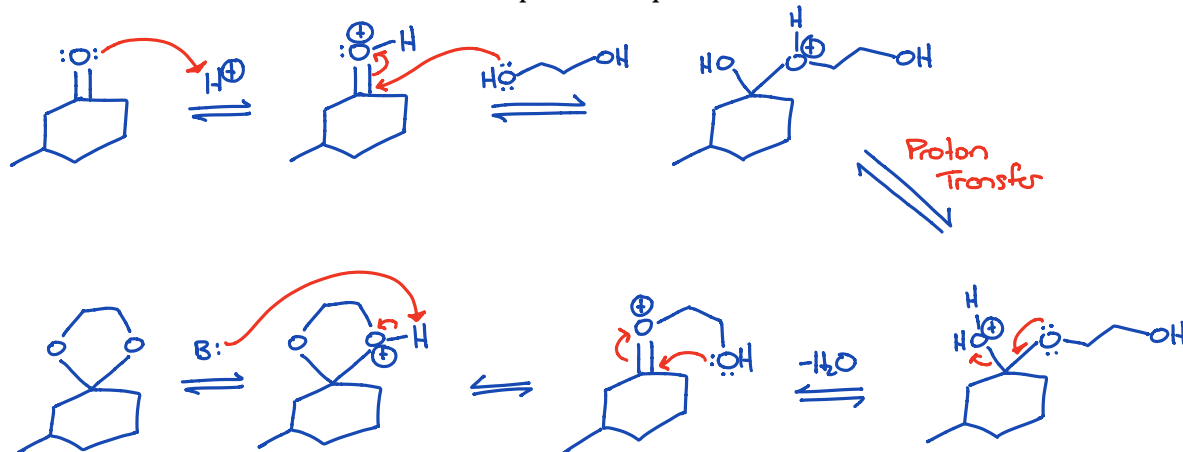


5) In each pair below, determine which compound would exist as the higher percentage of hydrate in the presence of water at equilibrium. Explain your choice.

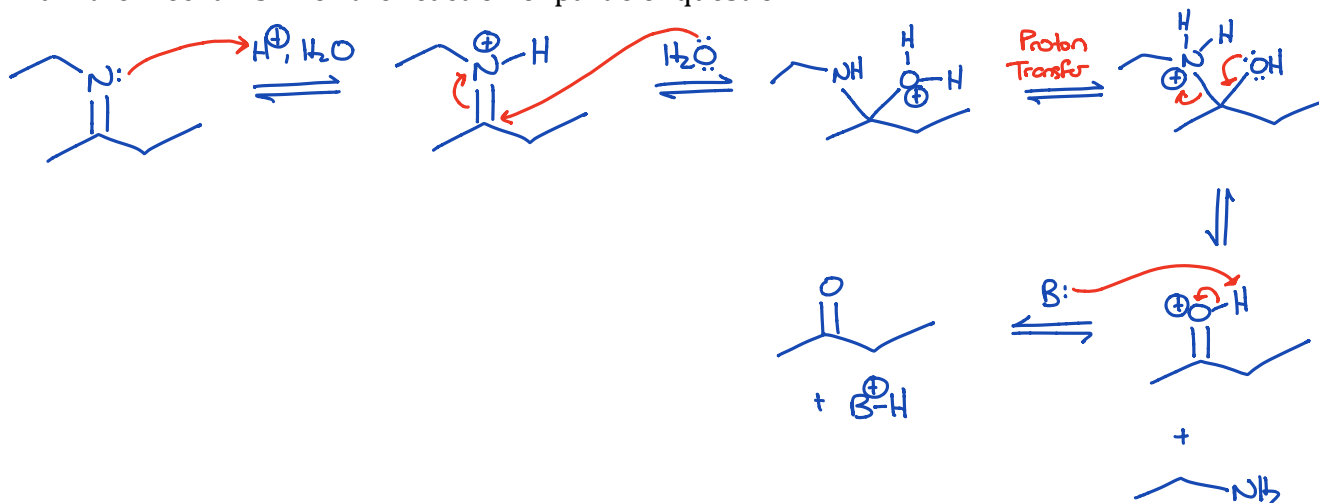
6) **Challenge Problem:** Explain why the hydrate (gem-diol) is the major species present at equilibrium when cyclopropanone is dissolved in water.

Reactions and Mechanisms

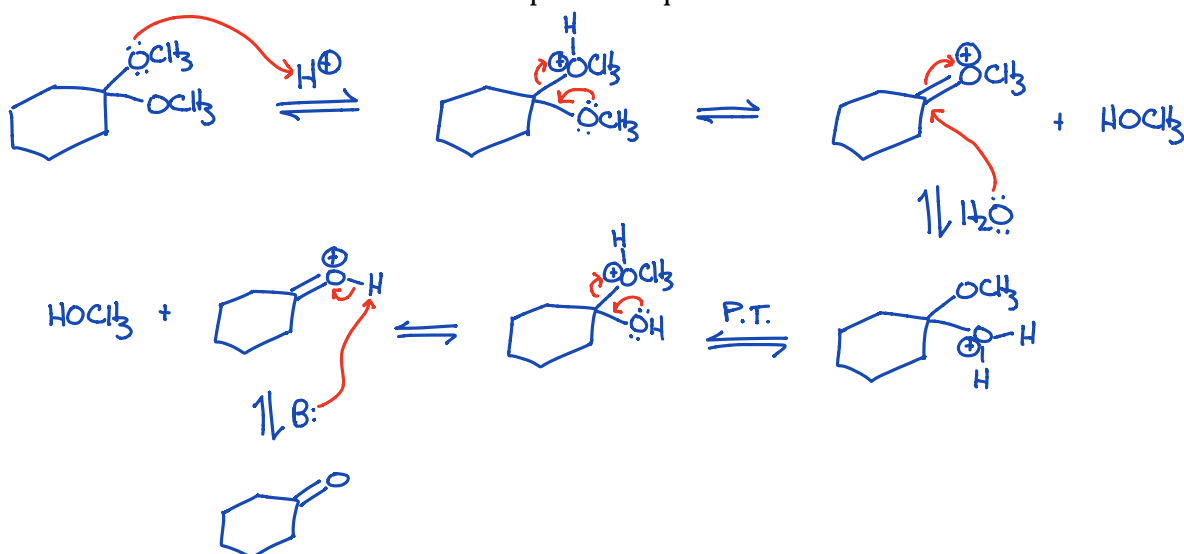
7) Draw the product(s) for each reaction below.

8) Draw the mechanism for the reaction in part **b** of question 7.

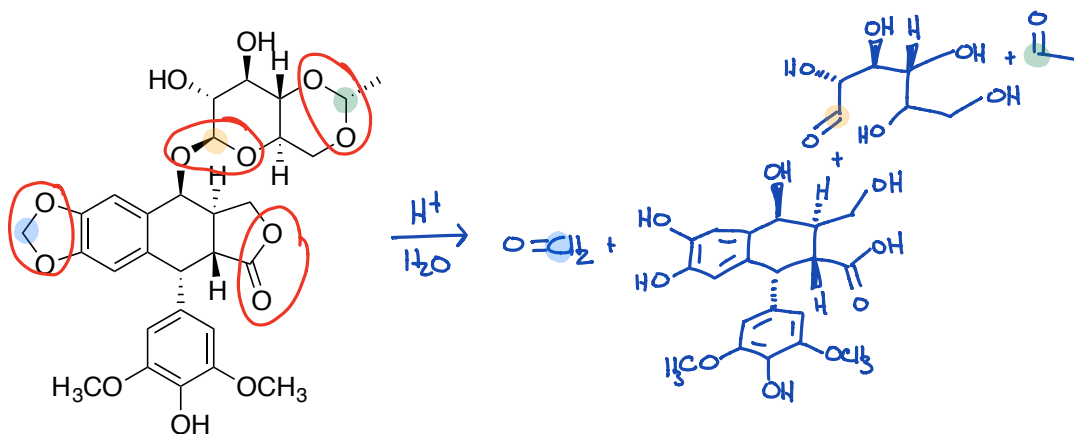
9) Draw the mechanism for the reaction of part c of question 7.



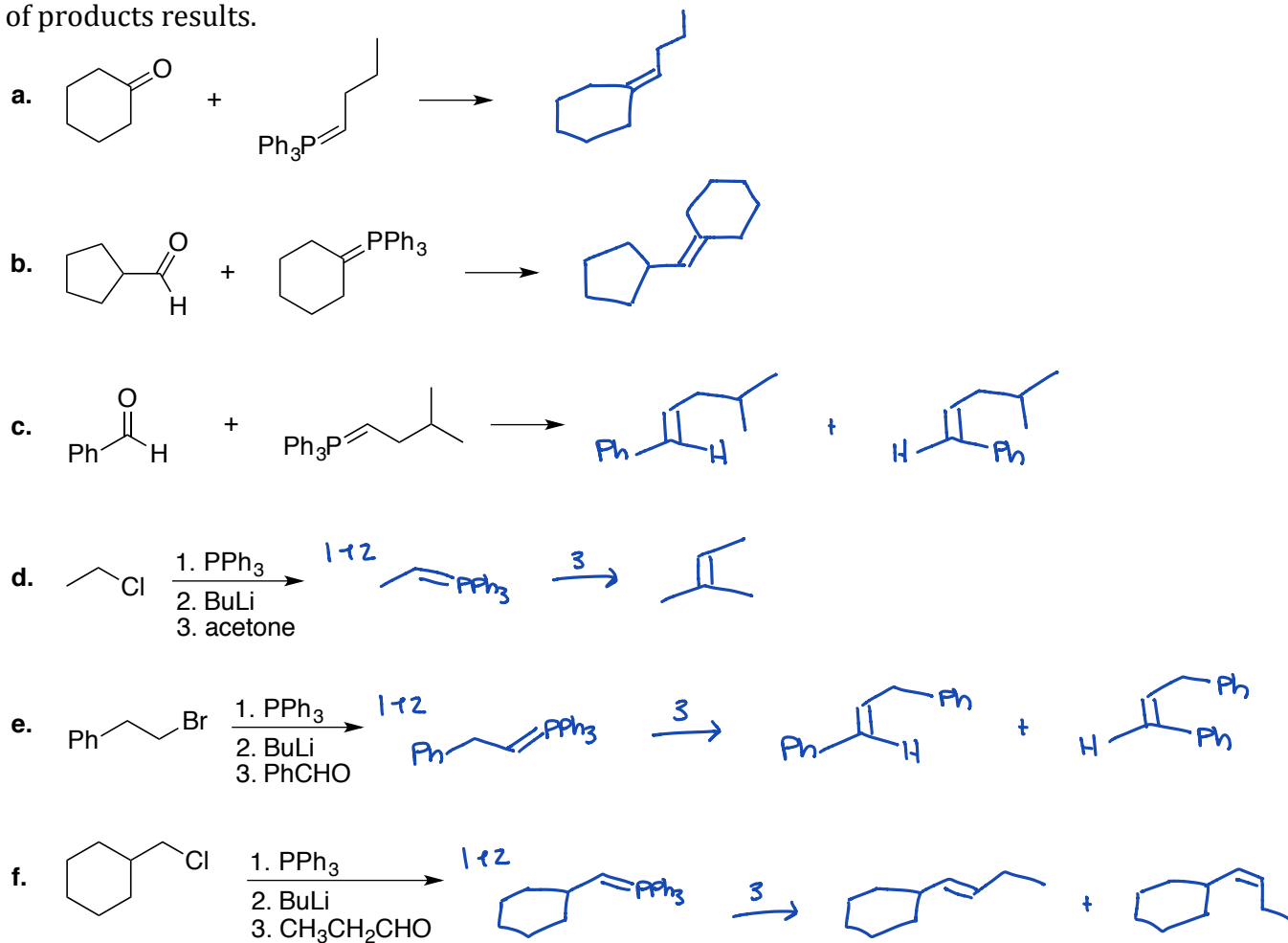
10) Draw the mechanism for the reaction of part h of question 7.



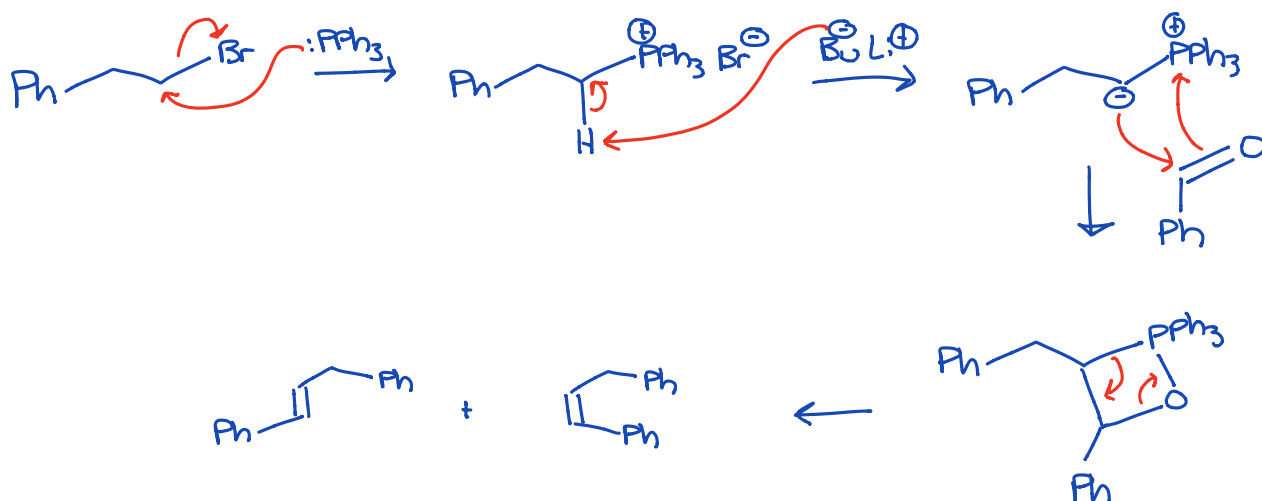
11) Etoposide is used for the treatment of lung cancer, testicular cancer, and lymphoma. Circle every acetal in etoposide. What products would be formed if etoposide were hydrolyzed with H^+/H_2O ?



12) Draw the products formed in each Wittig reaction. Draw all stereoisomers formed when a mixture of products results.

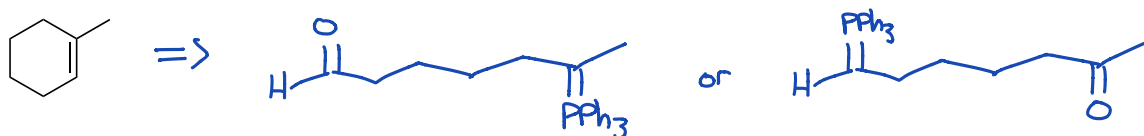
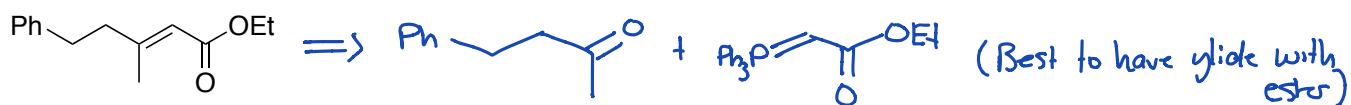
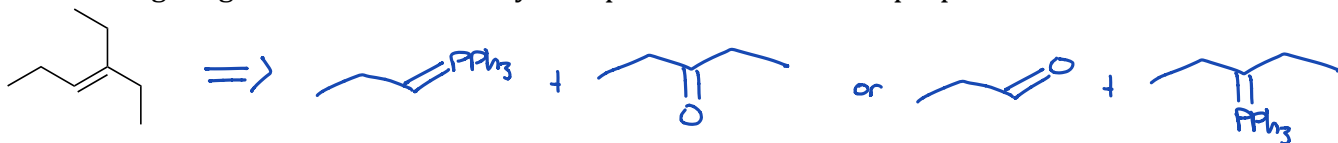


13) Draw the mechanism for the reaction in part e of question 12.

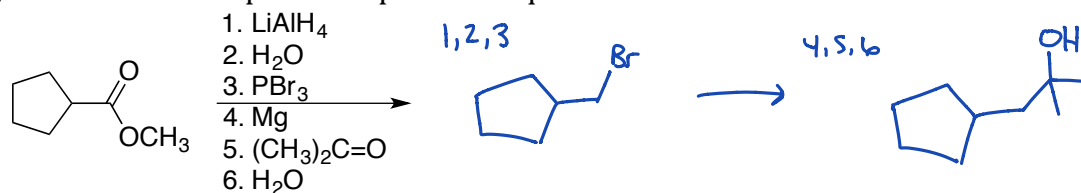


Synthesis

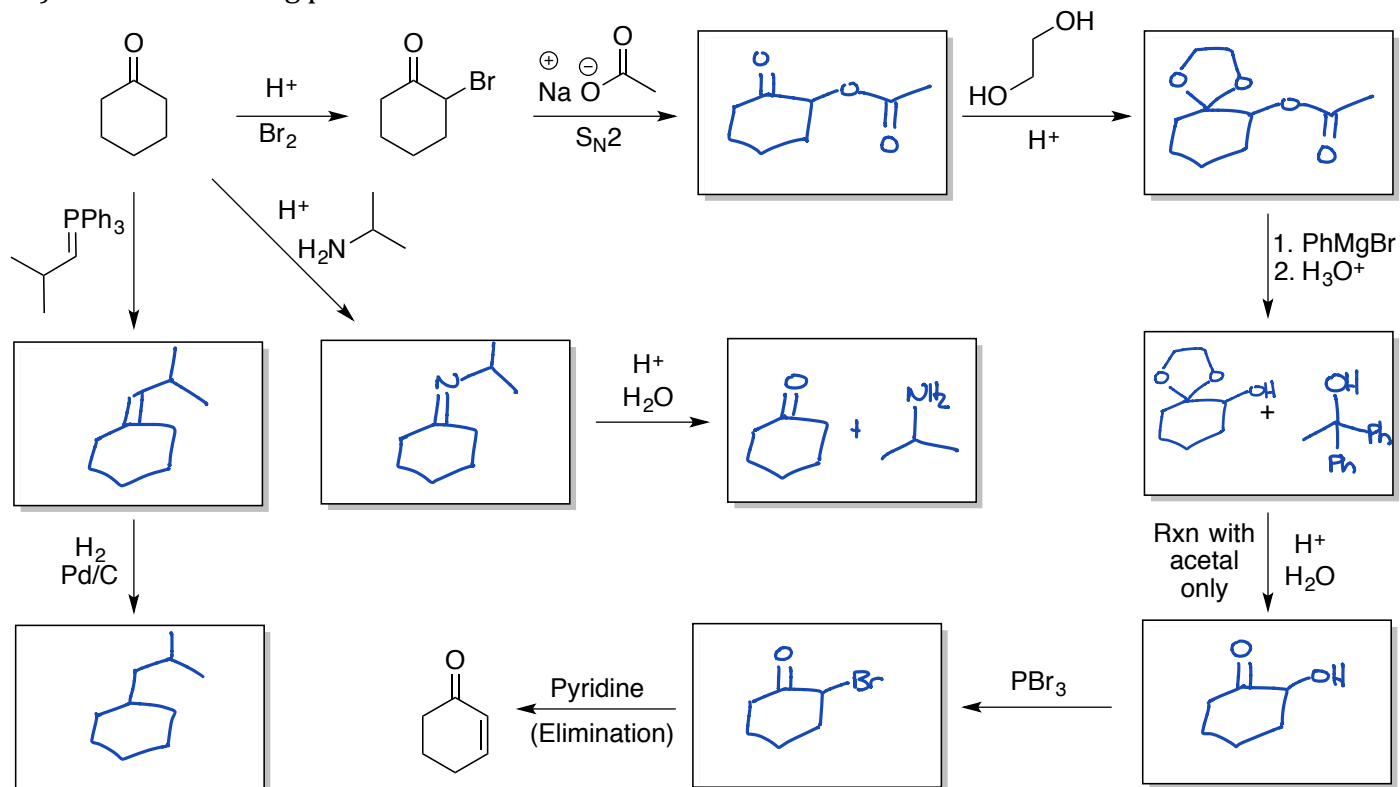
14) What Wittig reagent and what carbonyl compound are needed to prepare each alkene?



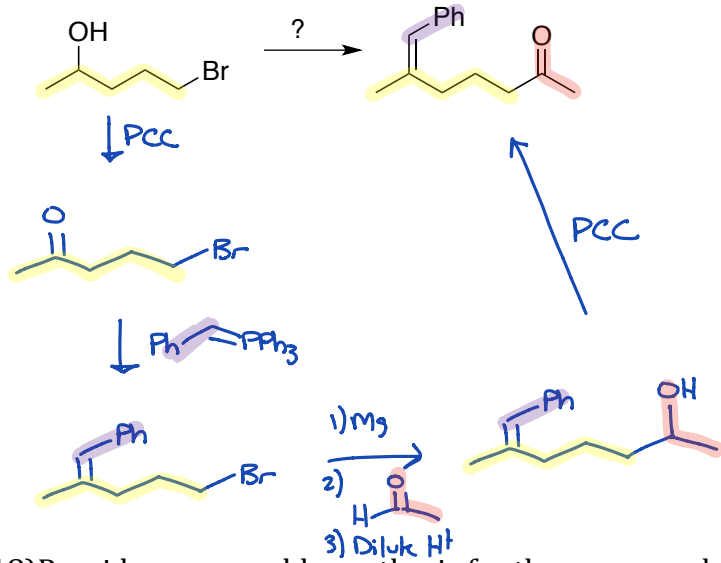
15) Provide the final product upon the sequence of reactions below.



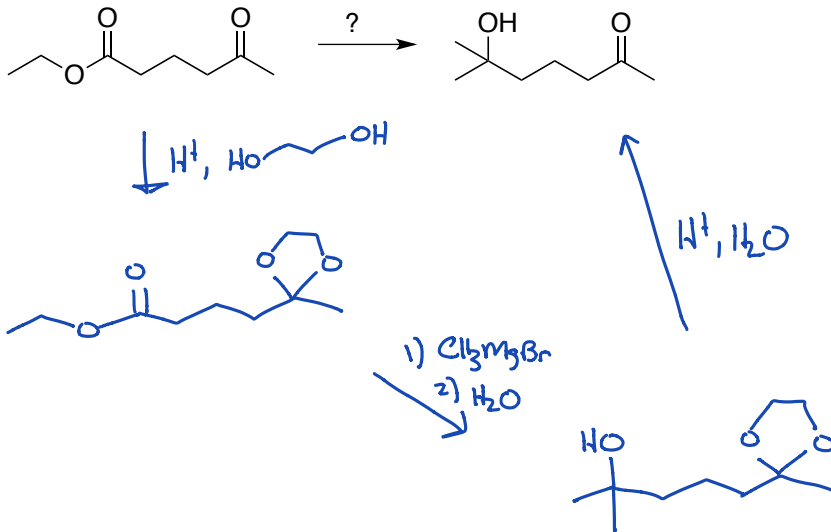
16) Fill in the missing products in each box below.



17) Provide a reasonable synthesis for the compound shown below.



18) Provide a reasonable synthesis for the compound shown below.



19) Provide a reasonable synthesis for the compound shown below.

