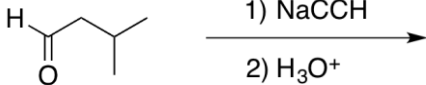
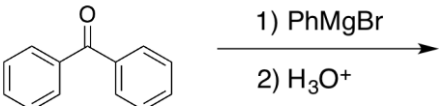
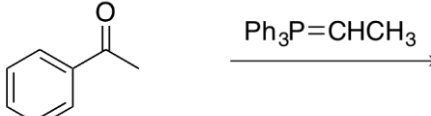

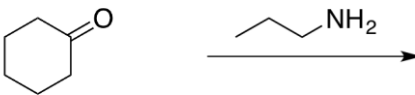
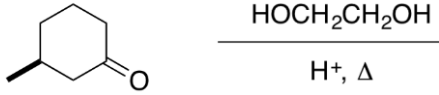
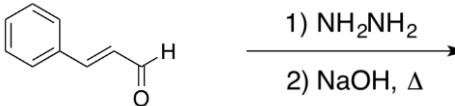
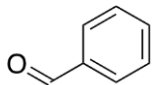
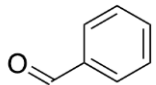
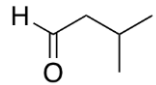
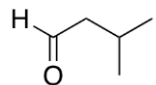
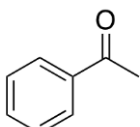
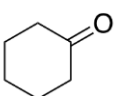
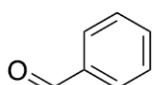
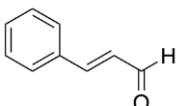
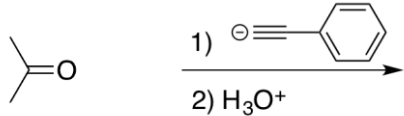

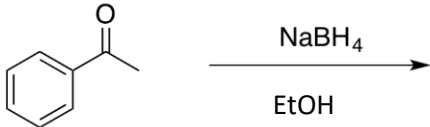


## Practice problem set -6

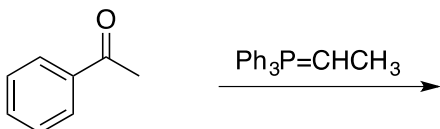
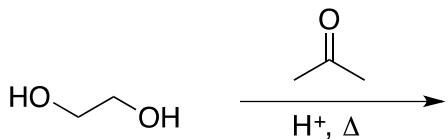
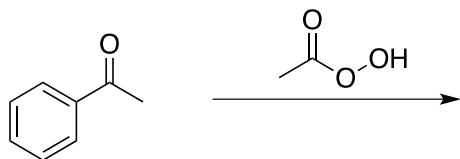
1. Complete the following reactions:

1	 <chem>CC(C)CC=O</chem> $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{NaCCH}}$	
2	 <chem>c1ccccc1C(=O)c2ccccc2</chem> $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{PhMgBr}}$	
3	 <chem>CC(=O)c1ccccc1</chem> $\xrightarrow{\text{Ph}_3\text{P}=\text{CHCH}_3}$	
4	 <chem>C1CCCC1C=O</chem> $\xrightarrow{\text{CH}_3\text{C}(=\text{O})\text{OOH}}$	
5	 <chem>C1CCCCC1=O</chem> $\xrightarrow{\text{CH}_3\text{CH}_2\text{NH}_2}$	
6	 <chem>CC1CCCCC1=O</chem> $\xrightarrow[\text{H}^+, \Delta]{\text{HOCH}_2\text{CH}_2\text{OH}}$	
7	 <chem>O=C/C=C/c1ccccc1</chem> $\xrightarrow[2) \text{NaOH}, \Delta]{1) \text{NH}_2\text{NH}_2}$	

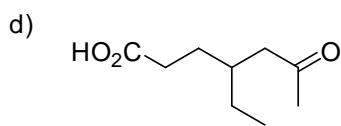
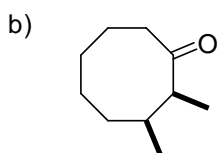
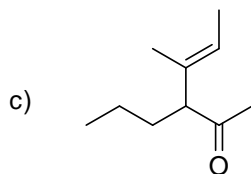
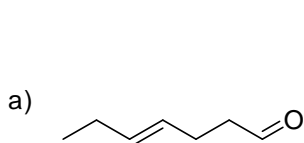
8	 $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{NaCCCH}_3}$	
9	 $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{BuMgBr}}$	
10	 $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{CH}_3\text{MgBr}}$	
11	 $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \ominus \text{C}\equiv\text{C}-}$	
12	 $\xrightarrow[2) \text{H}_3\text{O}^+]{1) \text{CH}_3\text{CH}_2\text{MgBr}}$	
13	 $\xrightarrow{\text{mCPBA}}$	
14	 $\xrightarrow[\text{EtOH}]{\text{NaBH}_4}$	
15	 $\xrightarrow{\text{Ph}_3\text{P}=\text{CH}_2}$	

16		
17		
18		

2. Complete these reactions and propose a detailed mechanism for the formation of the products.



3. Using IUPAC nomenclature, name the following organic compounds:

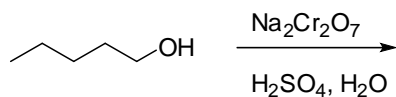


4. Draw the structures of these compounds:

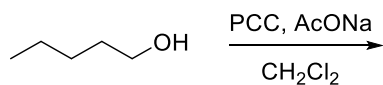
- E*-2-methylbut-2-enal
- 4-oxohexanal
- phenylethanone (or acetophenone)

5. Draw the products of each reaction and indicate using a mechanism the reason behind the different outcomes in parts i and ii.

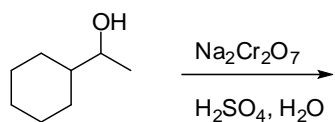
i.



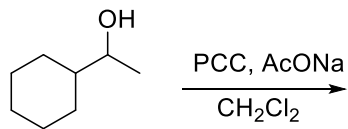
ii.



iii.

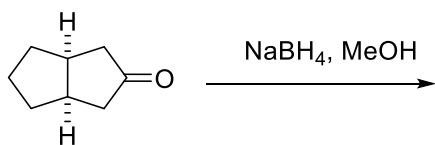
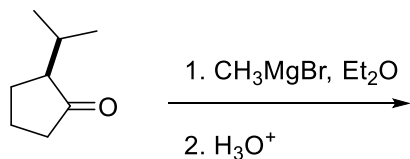
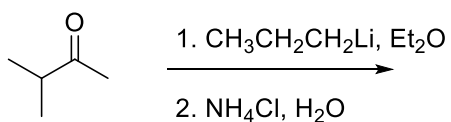


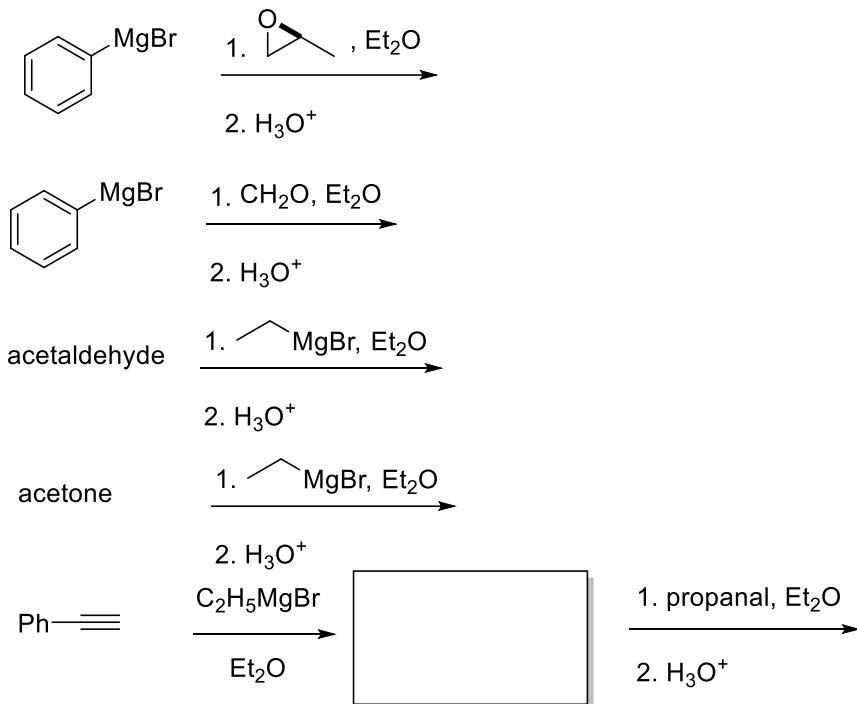
iv.



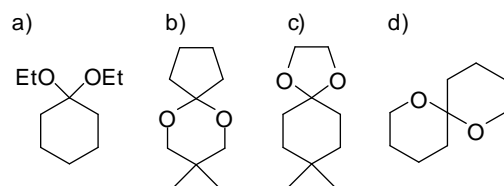
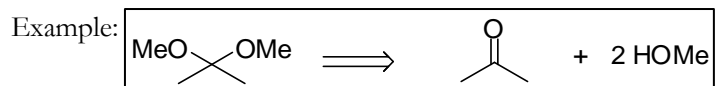
6. Can Grignard reactions be run in a protic solvent? Explain.

7. Identify the products of the following reactions:

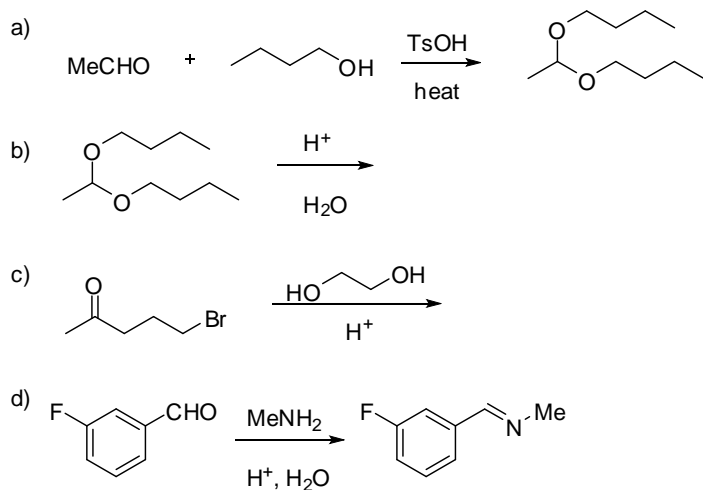




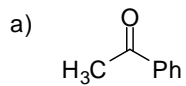
8. What are the reagents that can generate these acetals?



9. Draw the mechanism of these reactions and name the key intermediates:

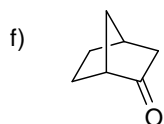
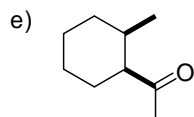
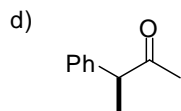


10. Give the products generated from the reactions with  $\text{RCO}_3\text{H}$  (i.e. MCPBA) and show the mechanism for just part a).

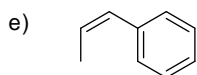
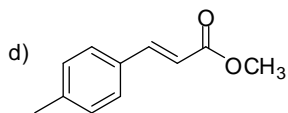
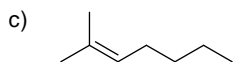
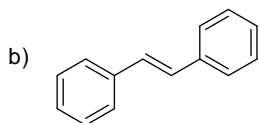
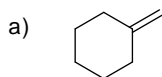


b) cyclopentanone

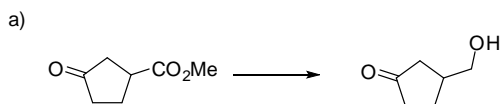
c) 3-methyl-2-butanone

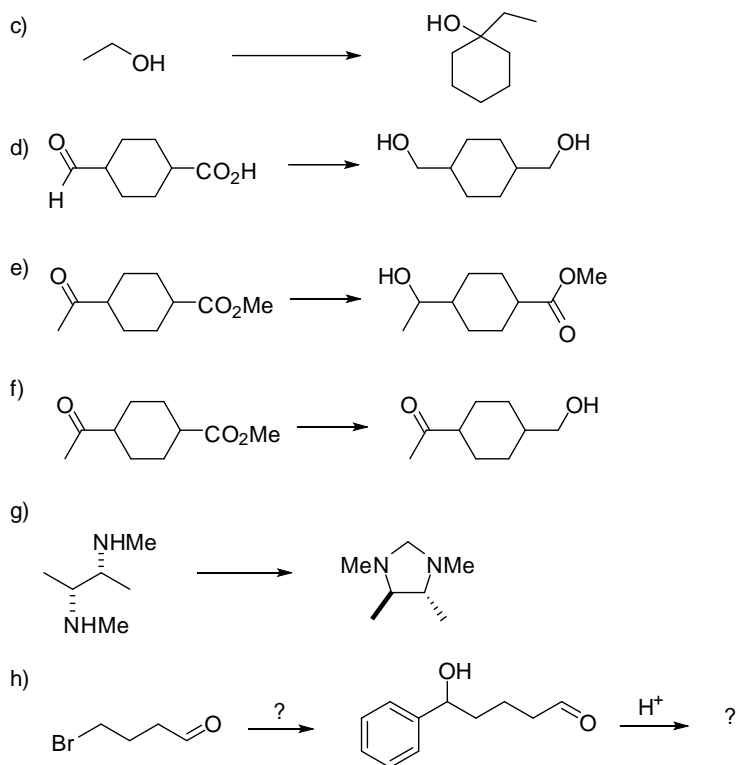


11. While using the Wittig reaction, suggest the synthesis of these products.

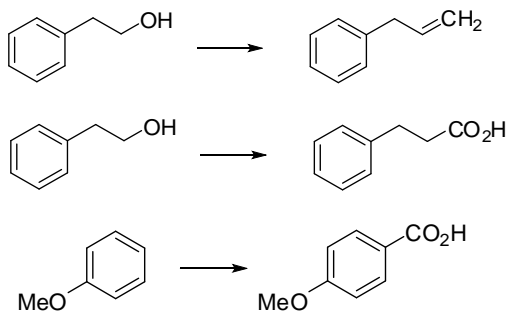


12. How can these following transformations be accomplished?

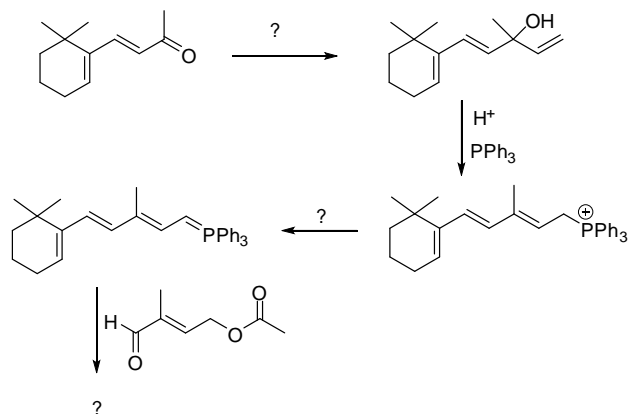




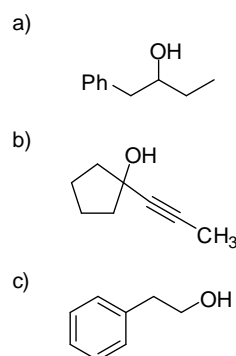
13. What are the necessary reagents for these transformations? (multiple steps are needed)



14. How can these different transformations be accomplished? Draw the mechanism for each step.



15. Propose the synthesis of these products from any alkene, alkyne or aromatic ring such as benzene.



16. Each of these reactions lead to the formation of acetal or similar product without the use of alcohol in the first two reactions or any carbonyl group in the 3rd reaction. How can these acetals be formed?

