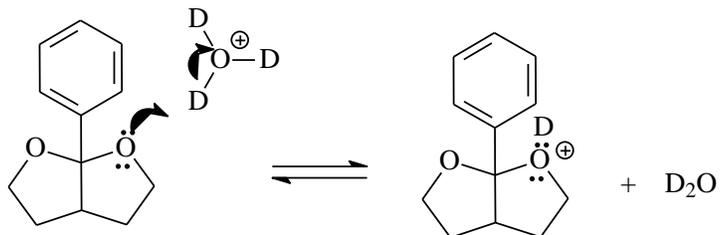


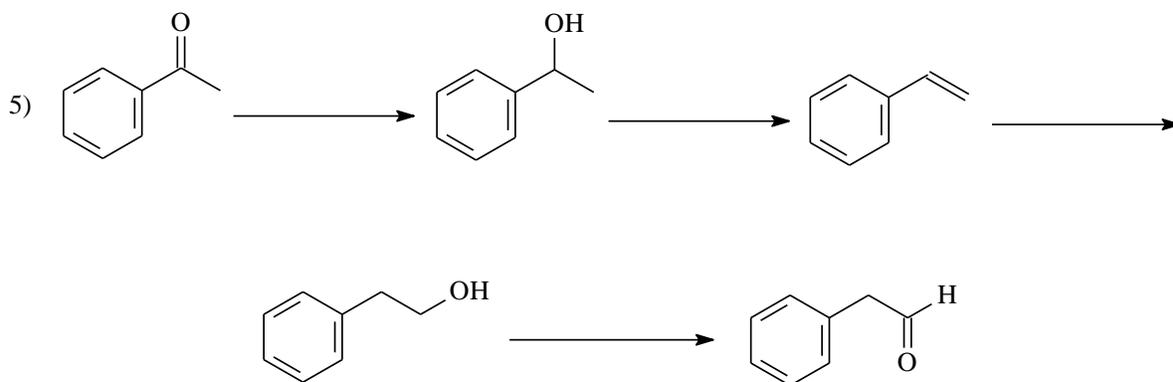
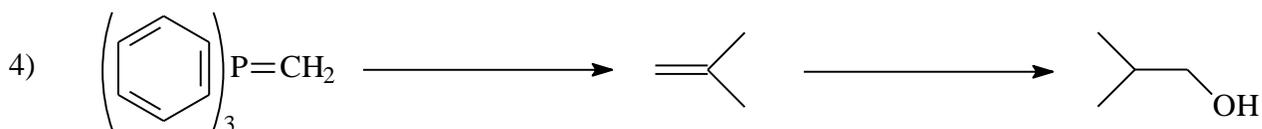
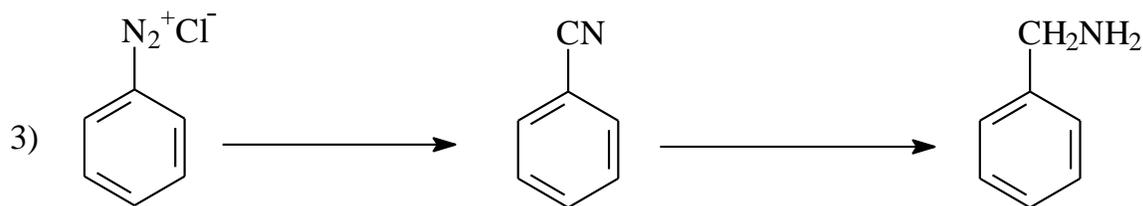
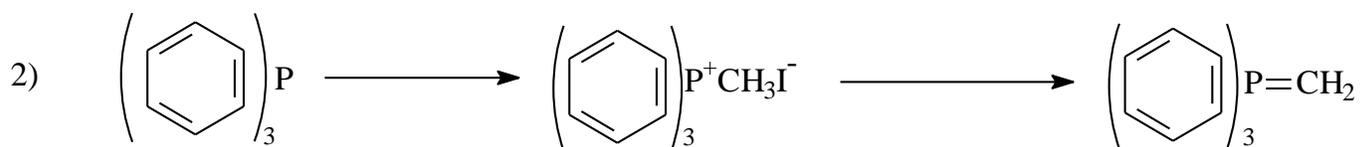
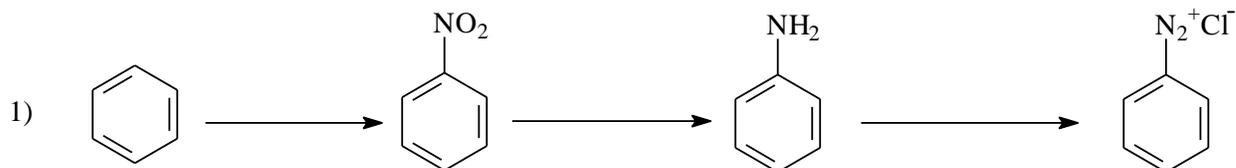
1. (15 points)

Please show the mechanism for the complete acid catalyzed hydrolysis of the compound below. You are asked to show each step in the mechanism using the curved arrow convention. I have started the process for you. The hydrolysis is to be carried out in deuterated (heavy) water (D_2O). Please show where you would find deuterium in your product when it was isolated. It is important that you write neatly and lightly. If we can't read it, we can't grade it.

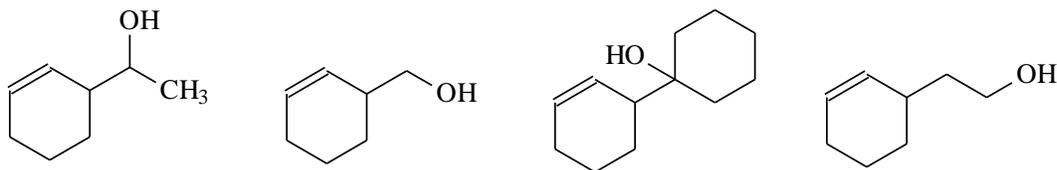


2. (15 points)

Each of the transformations below requires "a few" steps. Please show the reagents and conditions for each step.

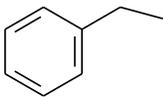
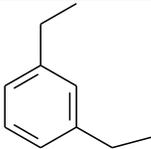
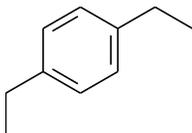
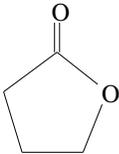
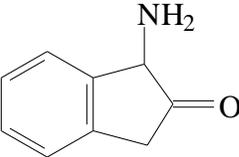
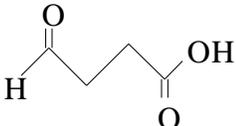
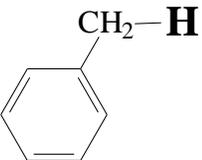
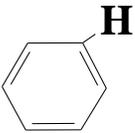
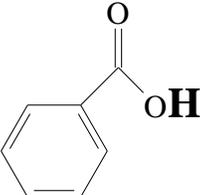
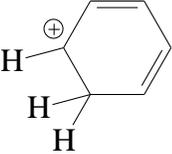
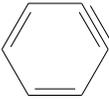
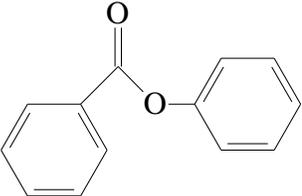


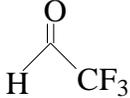
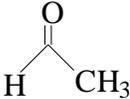
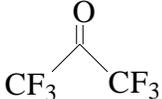
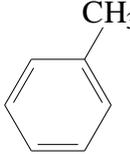
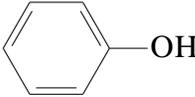
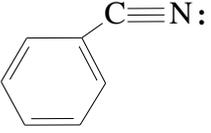
3. (5 points) Show how each of these products can be made from the same Grignard reagent. (Homework 16.4)



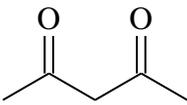
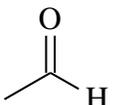
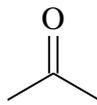
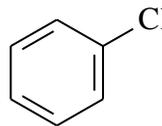
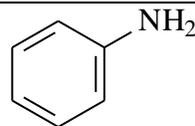
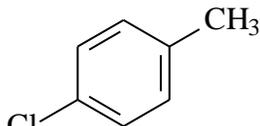
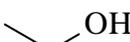
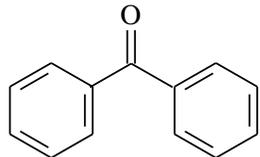
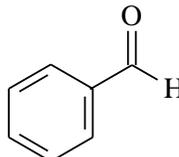
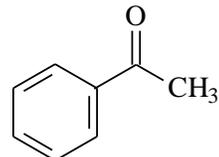
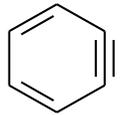
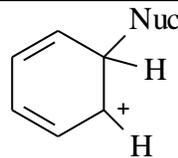
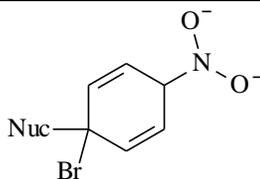
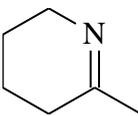
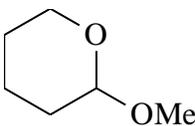
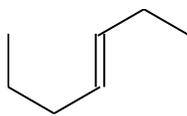
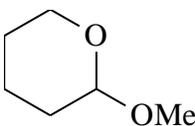
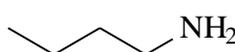
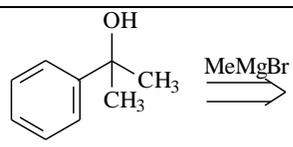
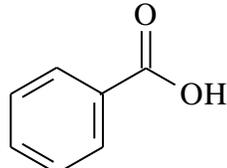
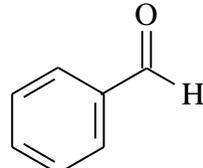
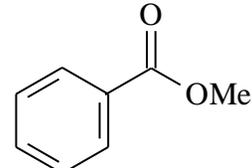
4. (5 points) Writing reactions with α -chloroethers can be used for the synthesis of aldehydes and ketones. (homework problem 16.27)

- Draw the structure of the triphenyl phosphonium salt and the Wittig reagent formed from chloromethyl methyl ether (ClCH₂-O-CH₃).
- Draw the structural formula of the product formed by treatment of the corresponding Wittig reagent with cyclopentanone. Note that the functional group is an enol ether or, alternatively, a vinyl ether.
- Draw the structural formula of the product formed on acid-catalyzed hydrolysis of the enol ether.

Not a possible Friedel-Crafts product			
reduces benzylic ketones to a secondary alcohols	NaBH ₄	H ₂ , Pd/C	H ₂ N-NH ₂ , KOH
This molecule is a ketone			
Reacts with a Grignard reagent	Acetal	THF	Ketone
Jones Reagent does not produce a carboxylic acid from	Primary Alcohols	Aldehydes	Secondary Alcohols
Select the molecule with labeled (in bold) Benzylic Hydrogen			
Benzyne Intermediate formed during a NAS			
Oxidizing Reagent	PCR	PCC	PCP
Can oxidize ethanol to acetic acid	PCR	NaBH ₄	Jones Reagent

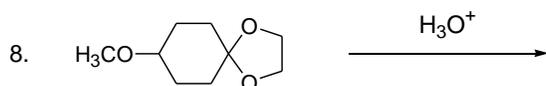
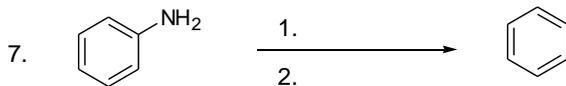
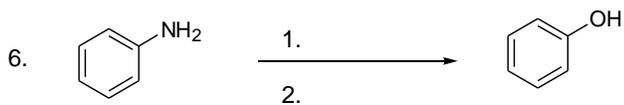
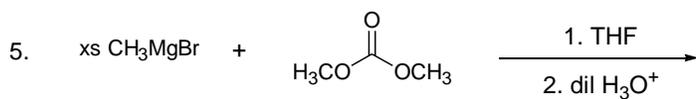
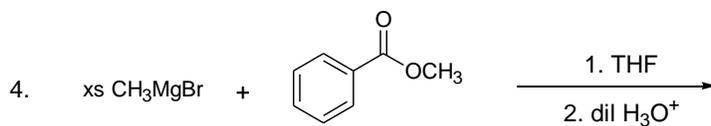
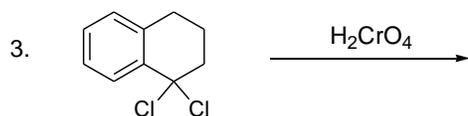
Has the highest equilibrium constant for hydrate formation			
Does not undergo Friedel-Crafts Alkylation			
Not a method of making a ketone	Oxidize a secondary alcohol	Ozonolysis of an alkene	Reduce a primary alcohol

7. (20 Pts) Circle the best answer for each question below.

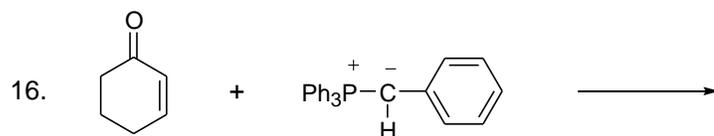
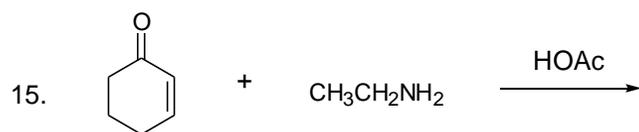
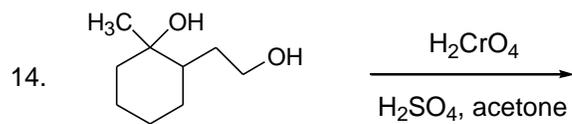
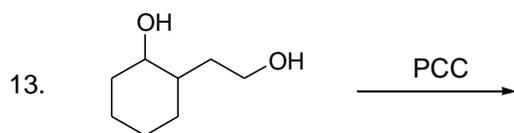
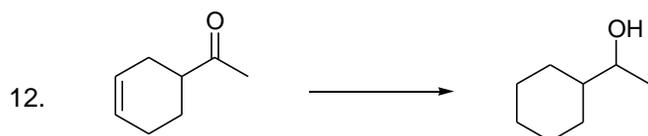
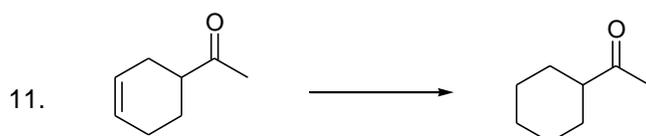
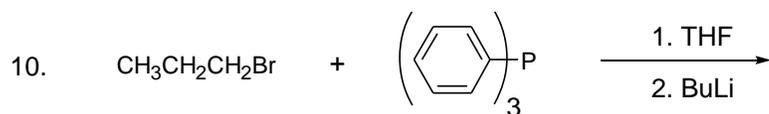
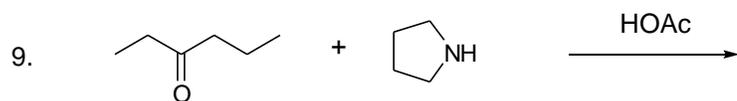
Most Acidic			
Reacts slowest in electrophilic aromatic substitution			
Acetal formation is not	An equilibrium rxn	A condensation rxn	Base catalyzed
Not a good solvent for Grignard reactions			
Not an ylide	$(\text{CH}_3)_3\text{N}^+ - \text{C}^-\text{HPh}$	$\text{Ph}_3\text{P} = \text{CHCH}_3$	$\text{Ph}_3\text{P}^+ - \text{CH}_2\text{CH}_3$
Will form an Enamine			
Intermediate in electrophilic aromatic substitution			
derived from a ketone			
not derived from an aldehyde			
			

7. (xx points)

Please complete the following reactions by supplying the missing reagents, starting materials, or products.



Chemistry 328N



Chemistry 328N

