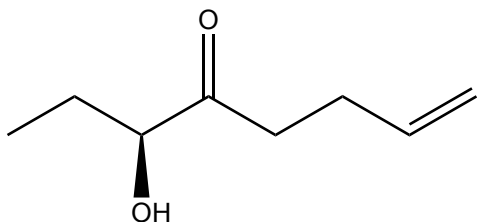
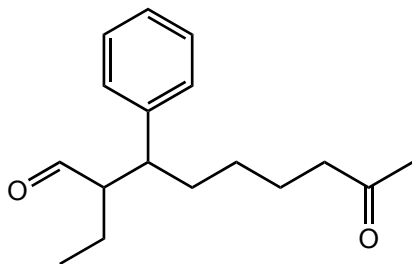


A. Nomenclature:

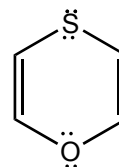
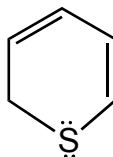
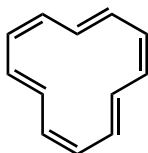
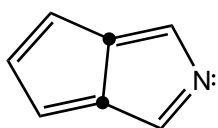
Give an acceptable name for each of the following compounds. Be sure to note stereochemistry where appropriate.



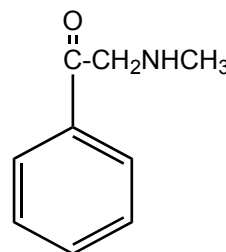
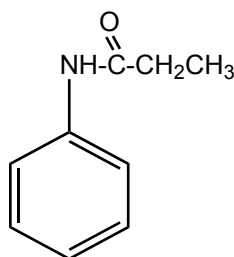
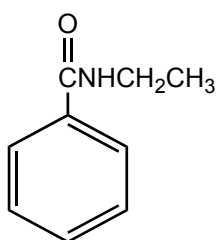
5-benzyl-2-(3-butenyl)aniline

B. Facts:

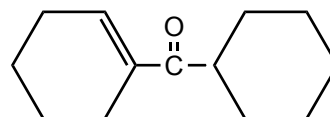
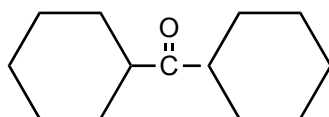
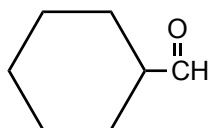
1. Label the following molecules as aromatic (**AR**), anti-aromatic (**AA**), or non-aromatic (**NA**). You may assume all are planar.



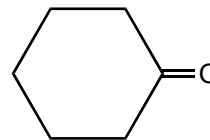
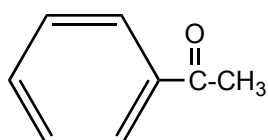
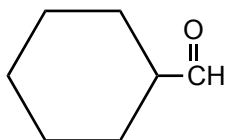
2. Rank the following substituted benzene compounds in order of increasing reactivity by electrophilic aromatic substitution (1= least reactive, 3= most reactive).



3. Rank the following compounds in order of increasing reactivity with a nucleophile. (1=least reactive, 3= most reactive)

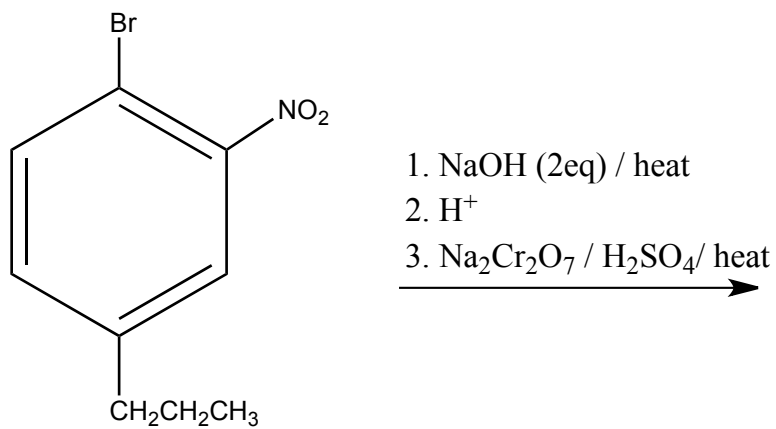
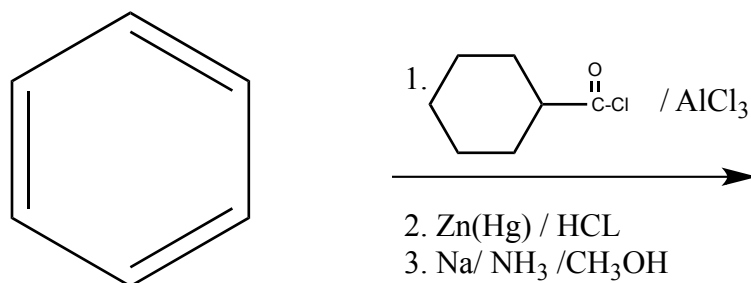
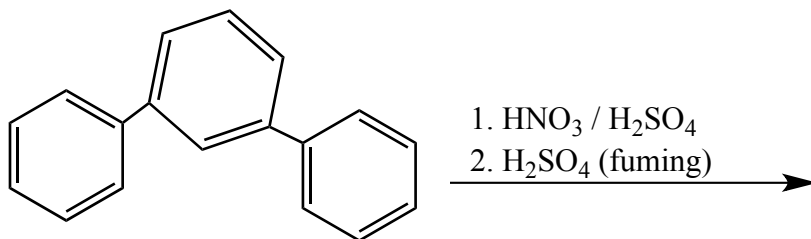


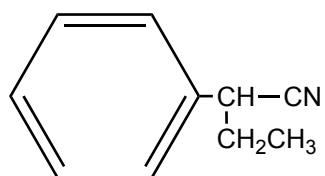
4. Place the following compounds in order of increasing frequency of the C=O stretch. (1=low 3=high)






C. Reactions

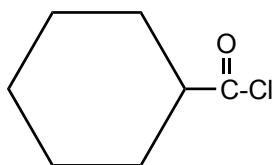
Please provide the major product or the reagents in the answer box. Be sure your drawing indicates **stereochemistry** if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below the reaction.



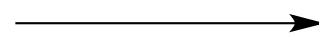


1. -MgBr , then H₃O⁺

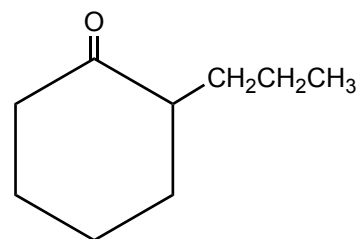
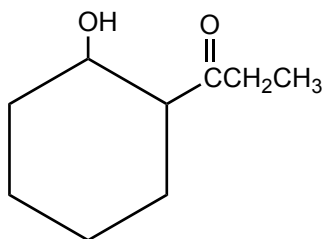
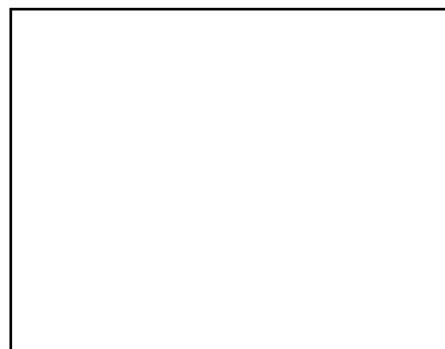
2. -C(H)=P-()₃



1. (CH₃CH₂CH₂)₂CuLi



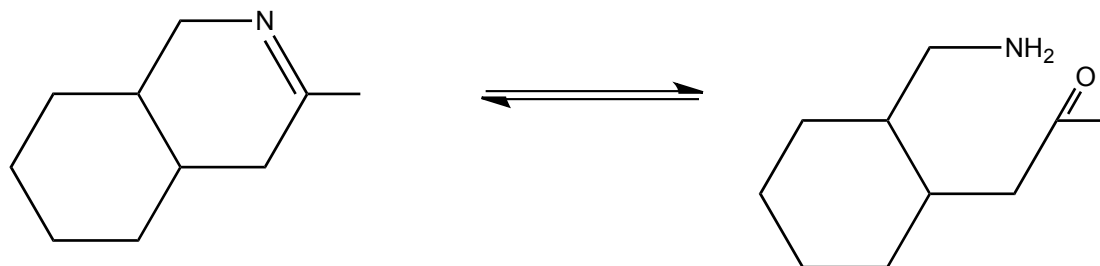
2. (CH₃CH₂)NH / H⁺



BEN:

D. Mechanism (12 points)

Provide a clear mechanism to explain the formation of the product. Use curved arrows to indicate 'electron flow'. Remember to show only one step at a time. **Show all intermediates and all formal charges.** **When more than one resonance contributor may be drawn, be sure to draw the most stable contributor.**



E. Synthesis (12 points)

Synthesize the molecule below using any of the following reagents: benzene, any **stable, one carbon** molecule, any inorganic reagents, any oxidizing or reducing agents, and any peroxyacids.

