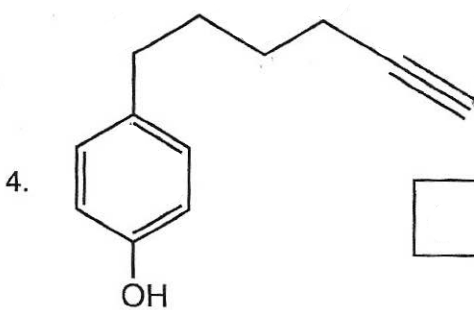
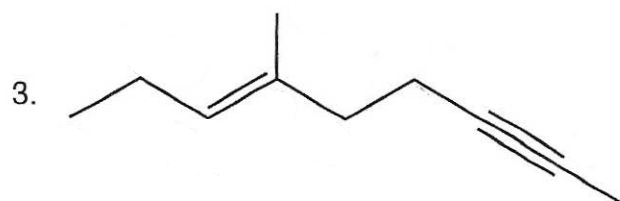
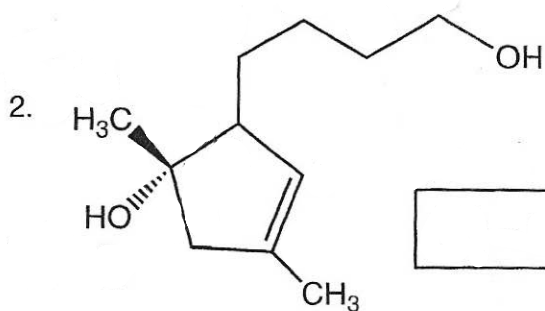
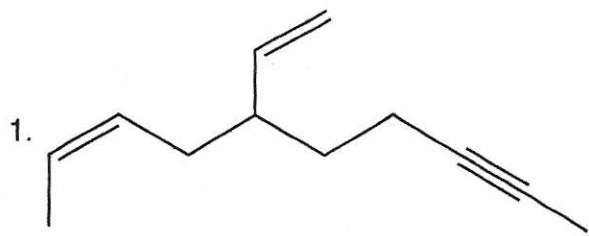


Exam 3, F2021

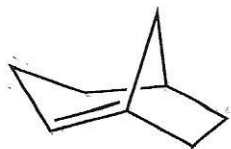
A. Nomenclature: (16 points)

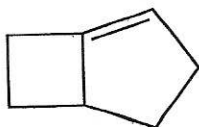
Give an acceptable IUPAC name for each of the following compounds. Be sure to include the stereochemistry when indicated and appropriate.

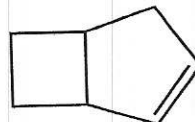


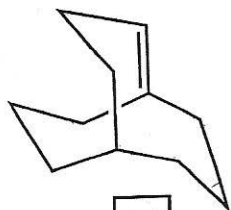
B. FACTS: Total = 24 points

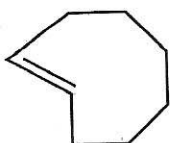
1. Label the cyclic compounds as stable (**S**) or unstable (**U**). (6 points)

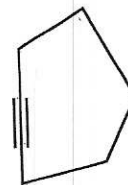




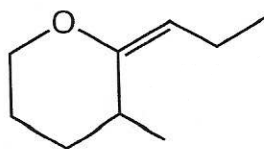


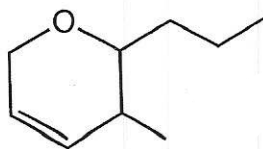


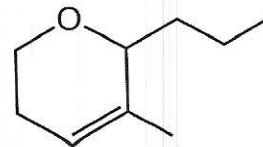




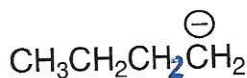
2. Place the carbon-carbon double bonds in order of increasing reactivity in H_3O^+ . (1=least reactive, 3=most reactive) (6 points)

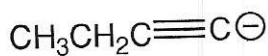


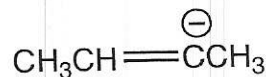




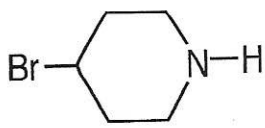
3. Place the carbanions in order of increasing basicity. (1=least basic, 3=most basic) (6 points)

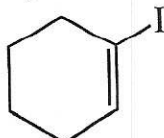


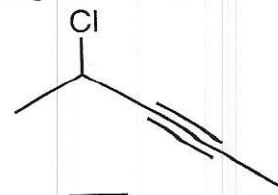


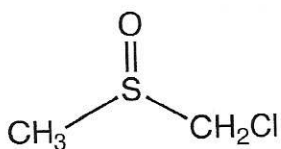


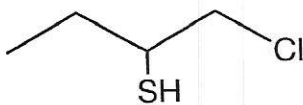
4. Place a "Y" in the box below any halide that will produce a useful Grignard reagent. Place an "N" in the box below any that will not. (6 points)

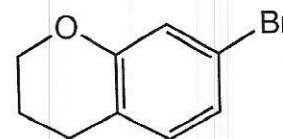








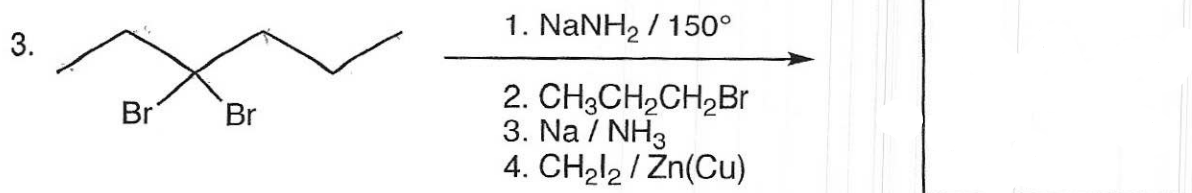
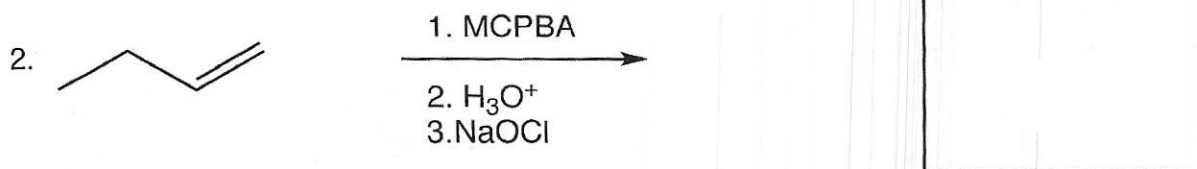
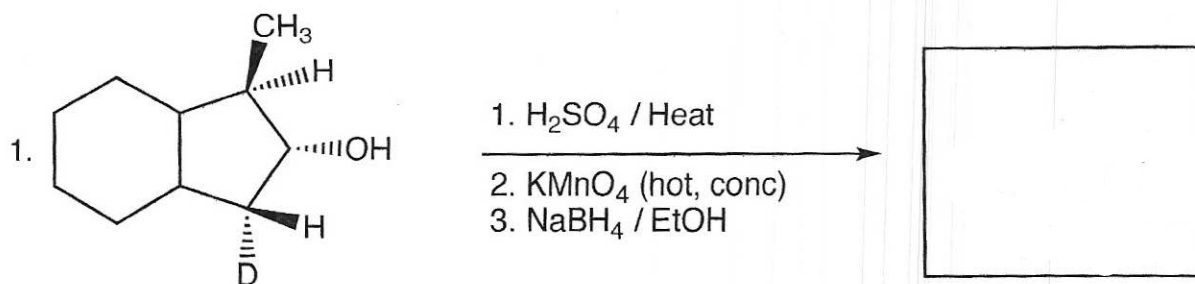


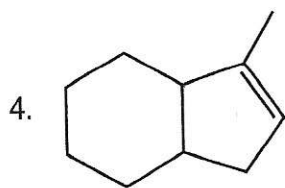


2

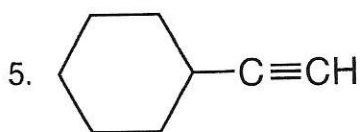
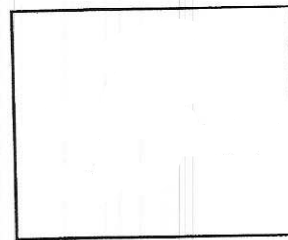
C. Reactions: Total = 36 points, 6 points each

Please provide the major product in the answer box. Indicate **stereochemistry** if applicable. **Full credit is awarded only when the product of each step in a multi-step reaction is shown below the reaction.**

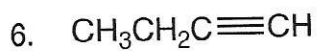
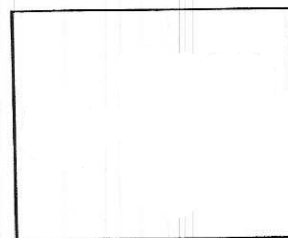


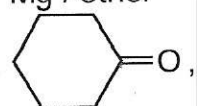


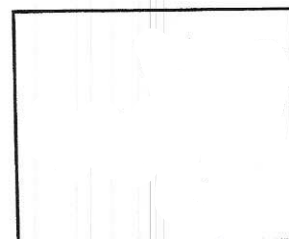
1. $\text{BH}_3 \cdot \text{THF}$
 2. $\text{H}_2\text{O}_2 / \text{OH}^-$
 3. $\text{pTsCl} / \text{pyridine}$
 4. $\text{CH}_3\text{S}^- \text{Na}^+ / \text{acetone}$



1. $\text{HgSO}_4 / \text{H}_2\text{SO}_4 / \text{H}_2\text{O}$
 2. $\text{CH}_3\text{C}\equiv\text{C} : ^- \text{Na}^+$, then H_3O^+
 3. $\text{H}_2 / \text{Pd}(\text{BaSO}_4) / \text{quinoline}$
 4. $\text{Hg}(\text{OAc})_2 / \text{CH}_3\text{OH}$
 5. NaBH_4

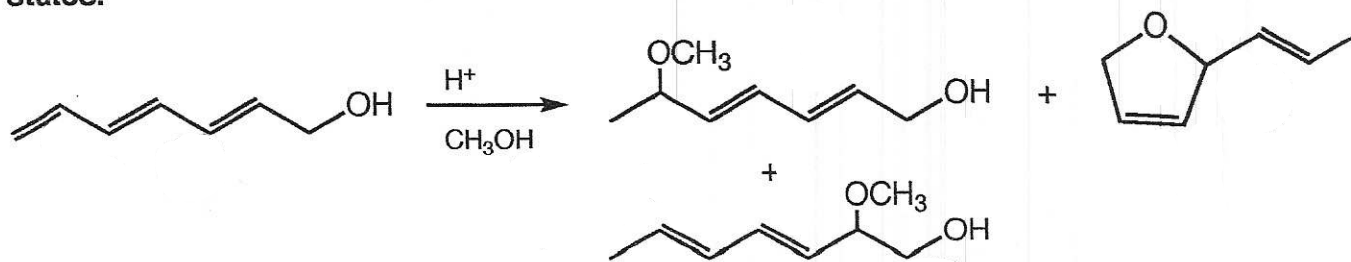


1. HBr (1 equivalent)
 2. Mg / ether
 3. , then H_3O^+



D. Mechanisms: (12 points)

The reaction below produces a mixture of products. Provide a clear mechanism to explain the formation of the products shown. Use curved arrows to indicate "electron flow". Remember to show only one step at a time. **Show all intermediates and all formal charges. Do not show transition states.**



E. Synthesis: (12 points)

Synthesize the molecule below from **cyclohexane**, **alcohols of four carbons or less**, any oxidizing or reducing agents, and any other inorganic reagents. (Please do not include mechanisms.)

