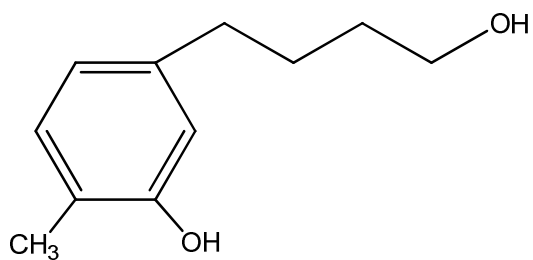


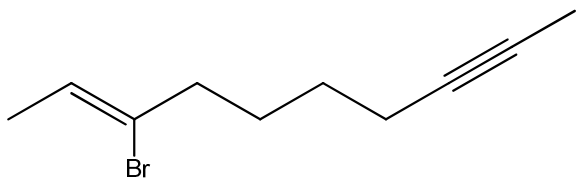
A. Nomenclature: (16 points)

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

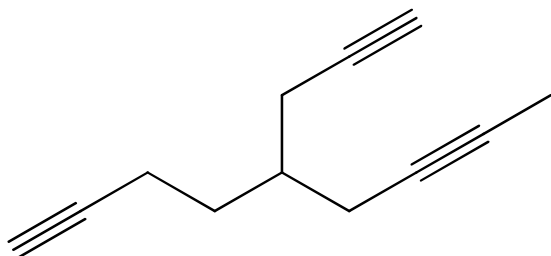
1.



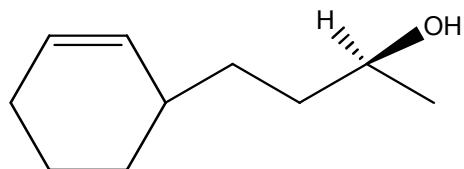
2.



3.

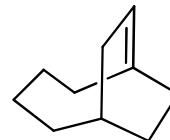
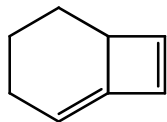
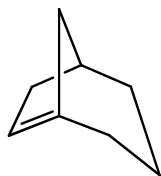


4.

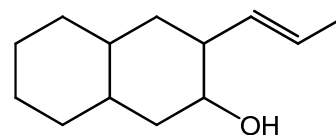
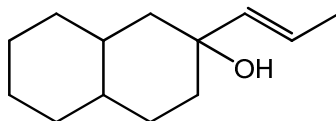
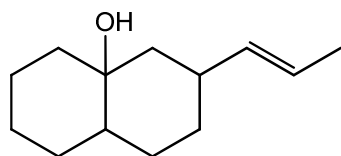


B. Facts: (24 points total)

1. Label the following alkenes as stable (**S**) or unstable (**U**). (6 pts.)



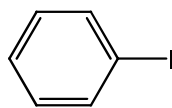
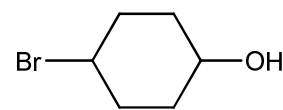
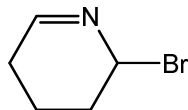
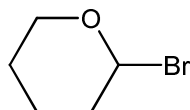
2. Place the following alcohols in order of increasing reactivity in an acid catalyzed dehydration. (1 = least reactive, 3 = most reactive) (6 pts.)



3. Place the following compounds in order of increasing acidity. (1 = least acidic, 3 = most acidic) (6 pts.)

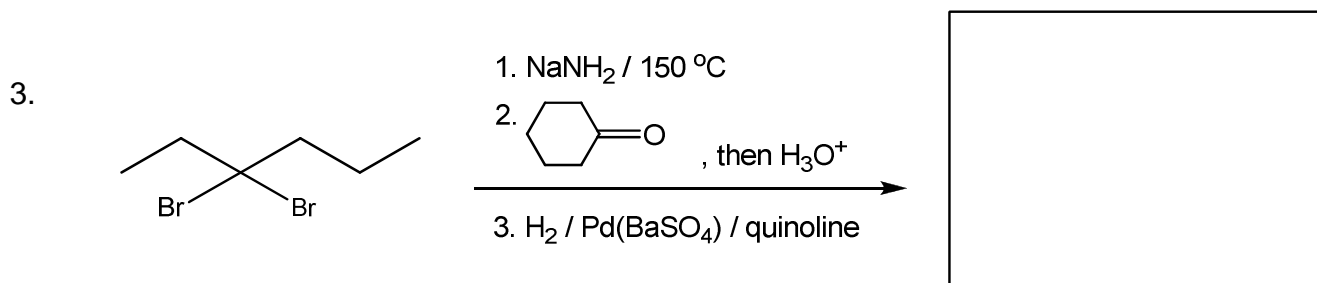
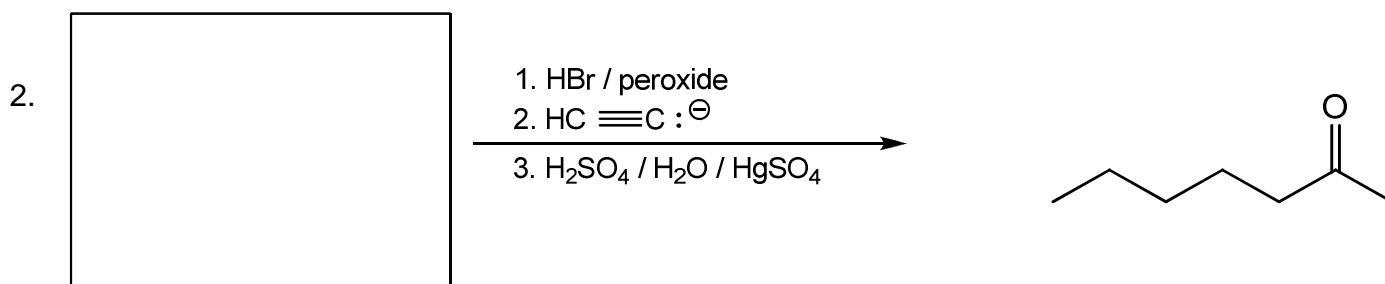
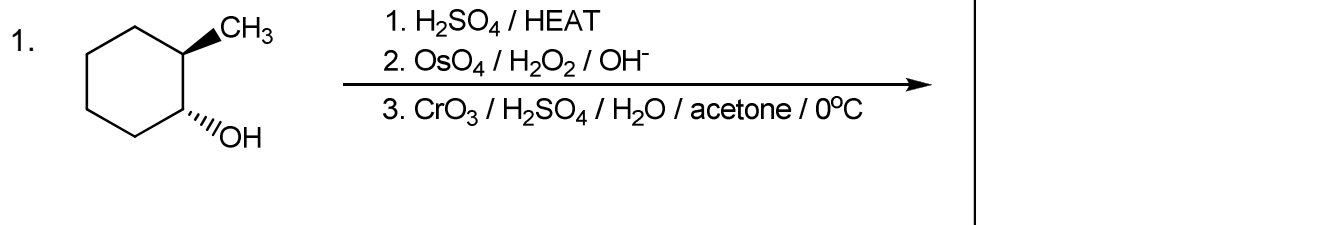


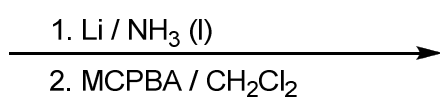
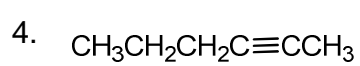
4. Place a **Y** in the box below any halide that will not produce a useful Grignard reagent when reacted with Mg in dry ether. Place an **N** in the box below any that will not. (6 pts.)



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

Please provide the major product, the starting material, 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.

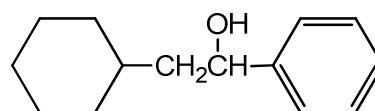
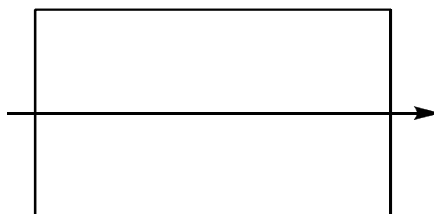
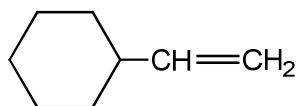




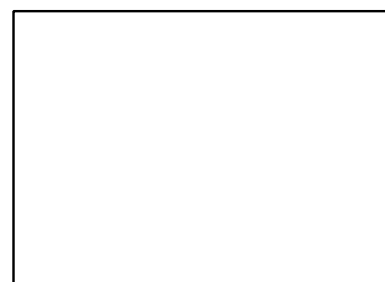
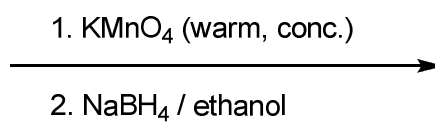
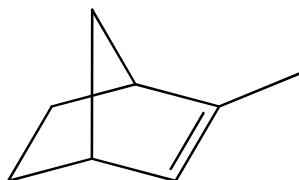
Note: MCPBA = meta-chloroperbenzoic acid



5.

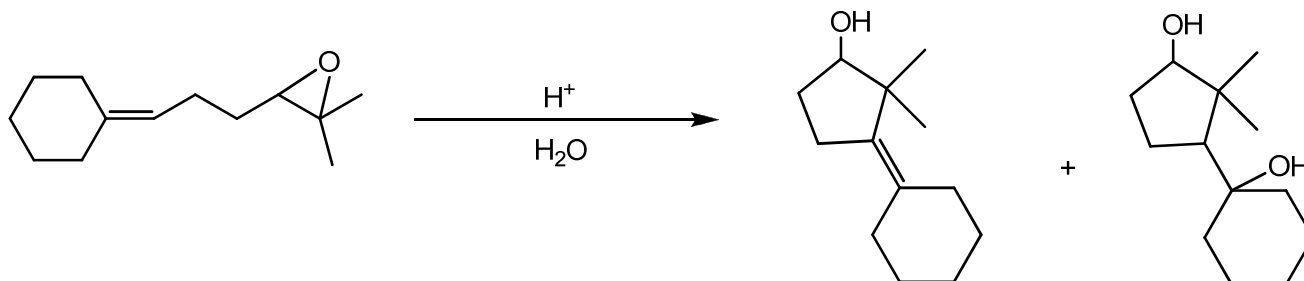


6.



D. Mechanisms: (12 points)

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 using any of the following reagents: alkanes or alcohols of **three carbons or less**, any inorganic reagents, any oxidizing or reducing agents.

