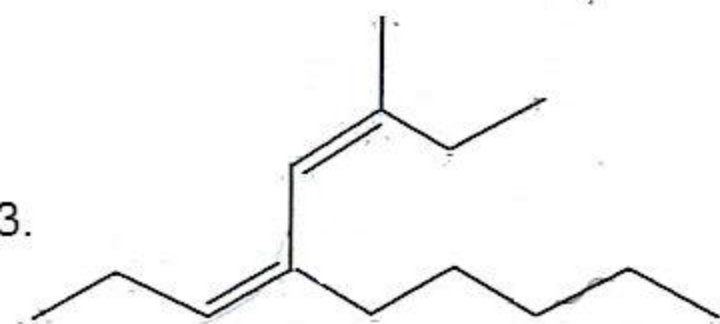
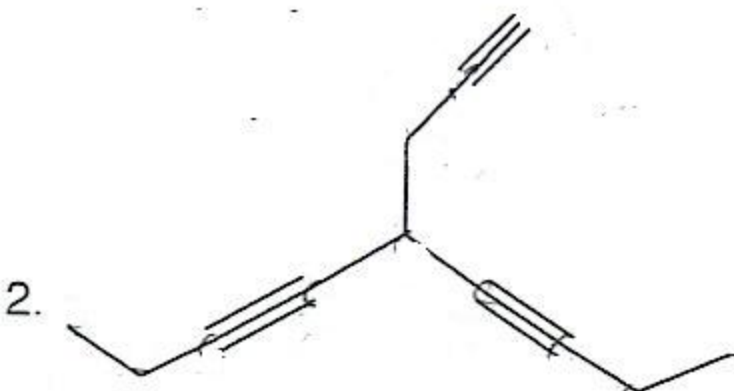
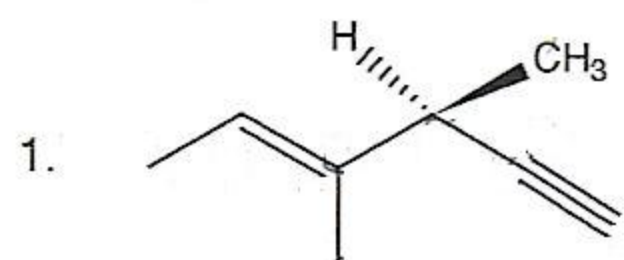


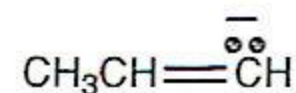
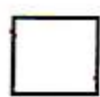
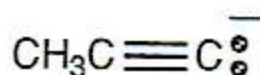
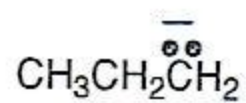
A. NOMENCLATURE: (15 points, 5 pts. each)

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

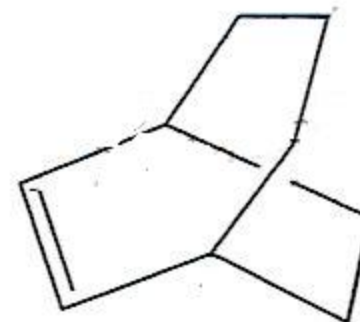
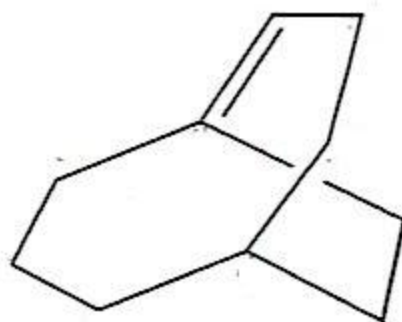


**B. Facts:** Total = 28 points

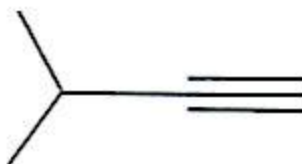
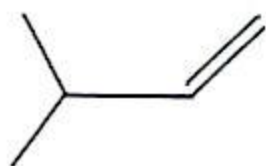
1. Place the following anions in order of increasing basicity (1=least basic, 3=most basic). (6 pts.)



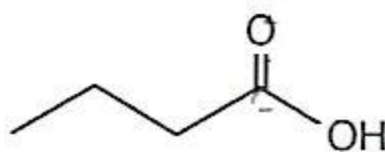
2. Label the alkenes as stable (S) or unstable (U). (6 pts.)



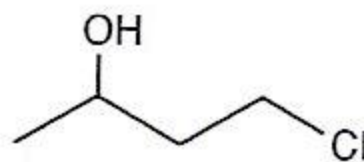
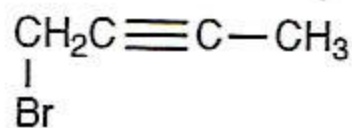
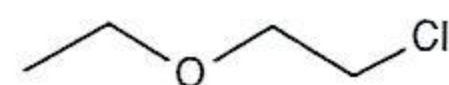
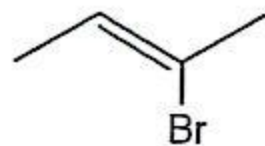
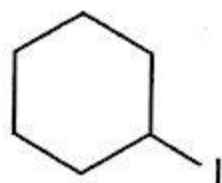
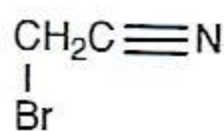
3. Place the following compounds in order of their increasing reactivity with  $\text{H}_3\text{O}^+$  (1=less reactive, 2=more reactive). (4 pts.)



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

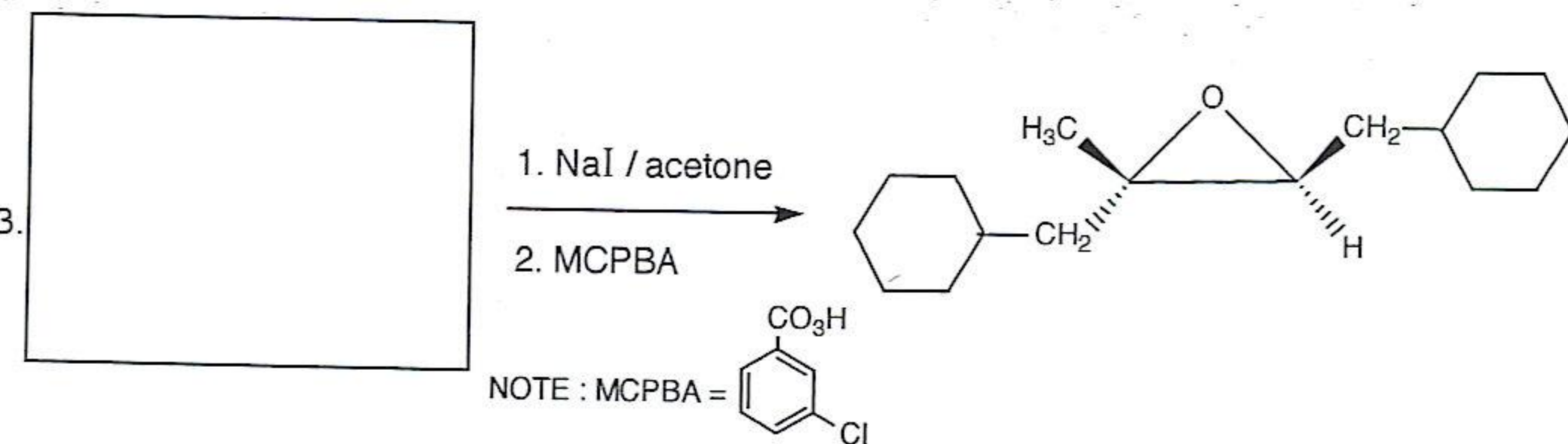
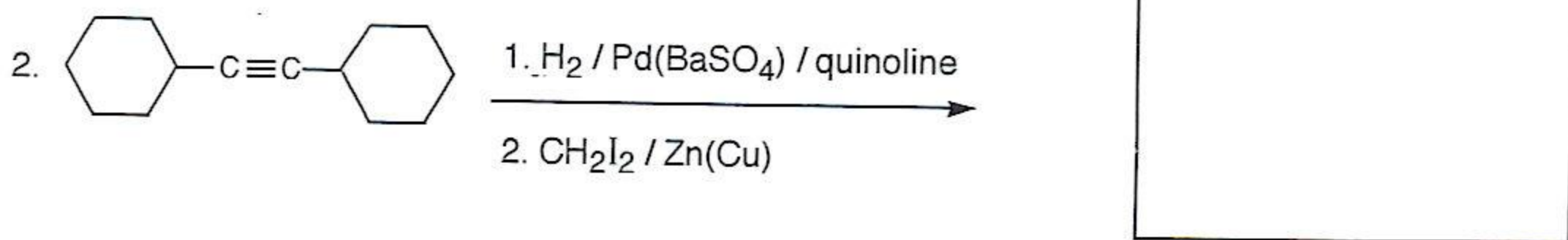
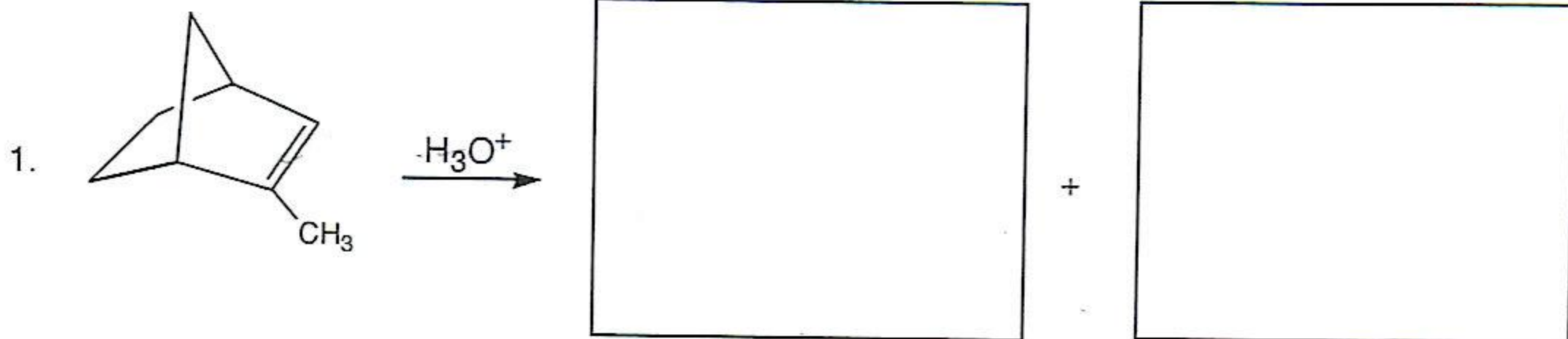


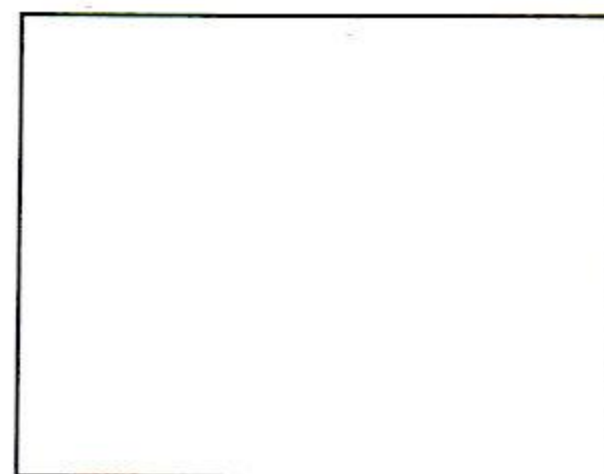
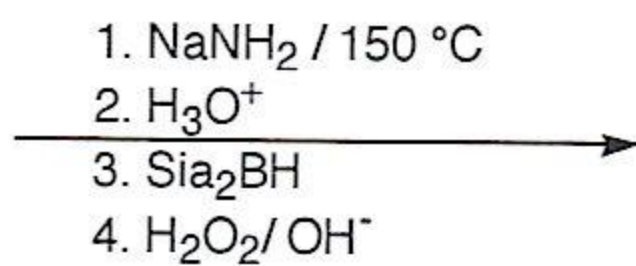
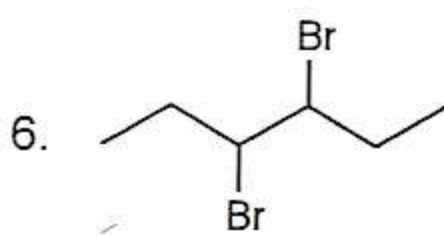
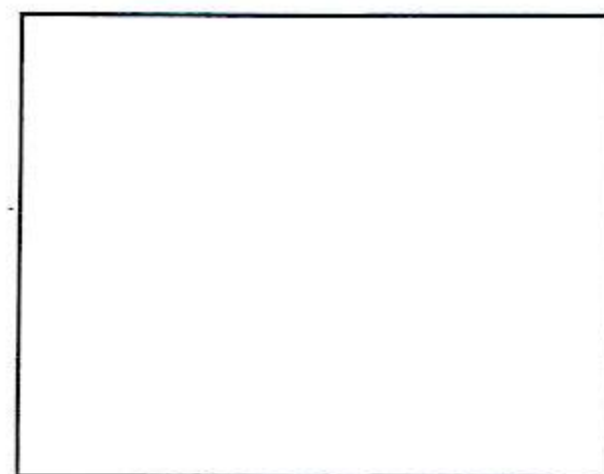
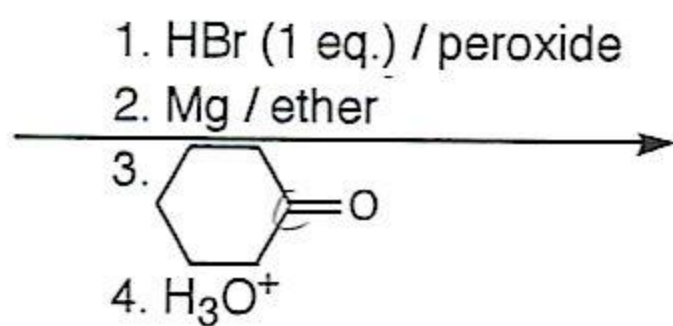
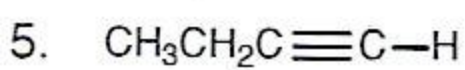
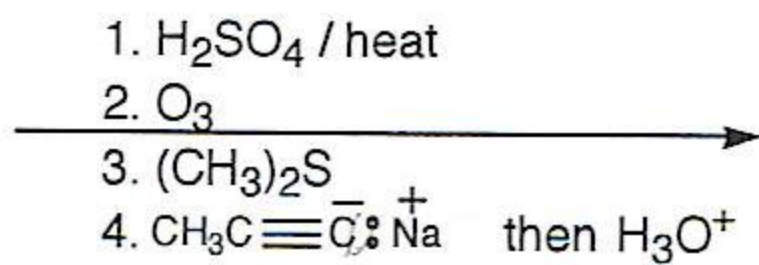
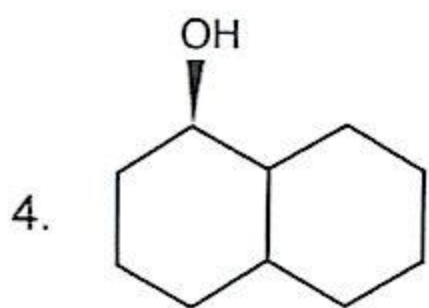
5. Place an "X" in the box below any halide that will produce a useful Grignard reagent on treatment with Mg in ether. (6 pts.)



C. REACTIONS: (36 points, 6 pts. each)

Please give the final **major** product unless otherwise indicated or the starting material for each of the following reactions in the box provided. Be sure your answers indicate **stereochemistry** where appropriate. Intermediate products may be placed below the reaction for partial credit but not in the answer box.

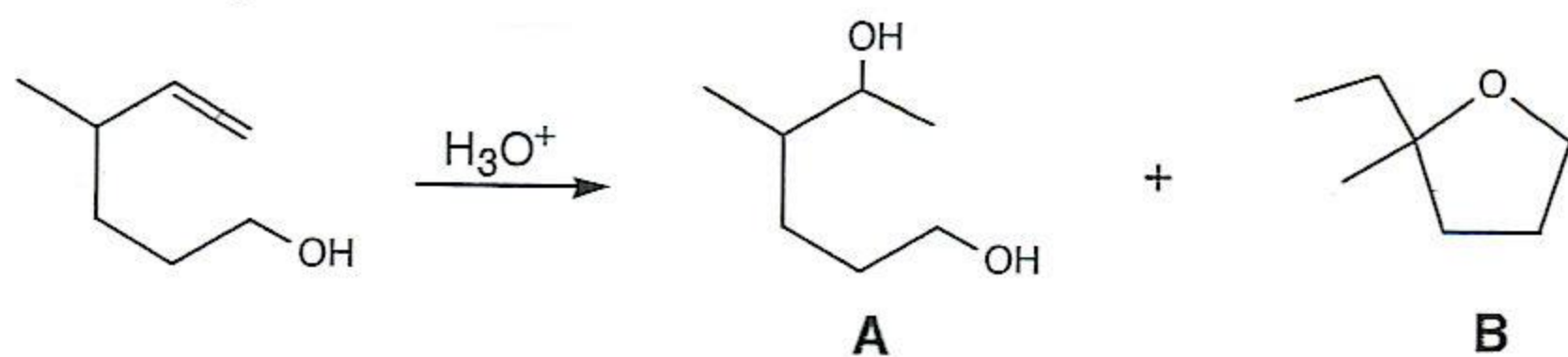






**D. Mechanism:** 10 points

The following reaction yields a mixture of products. Provide a clear mechanism for the formation of **A** and **B**. Use curved arrow notation to indicate "electron flow," and show all intermediates and formal charges.



**E. Synthesis: 11 Points**

From cyclohexane, any alkanes or alkenes (remember, carbon and hydrogen only!) of three carbons or less, and any inorganic reagents, synthesize the compound below.

