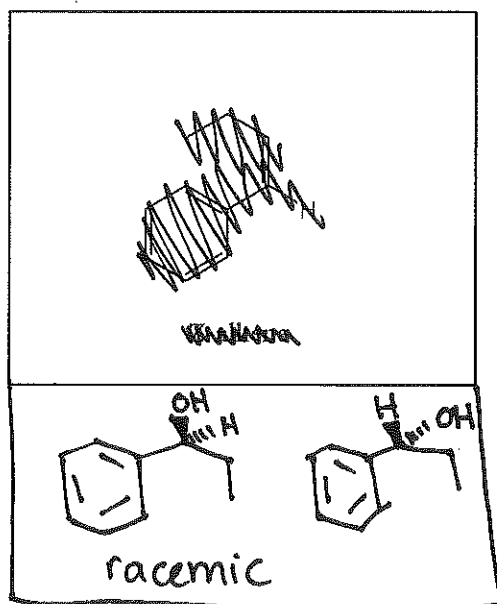
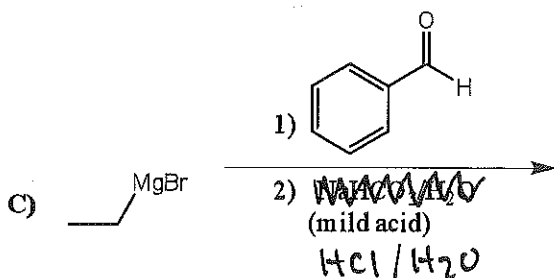
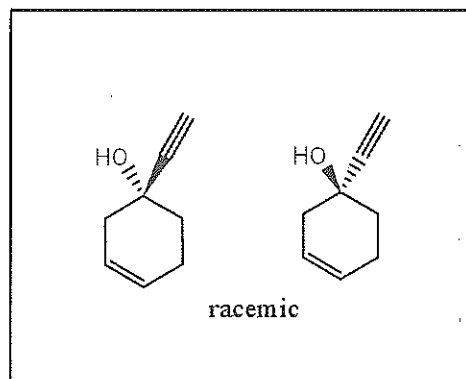
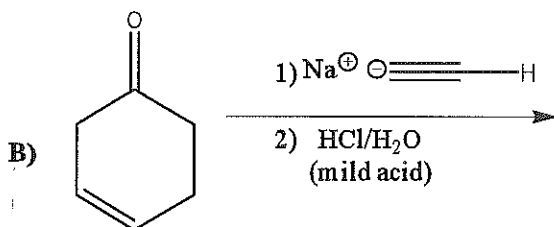
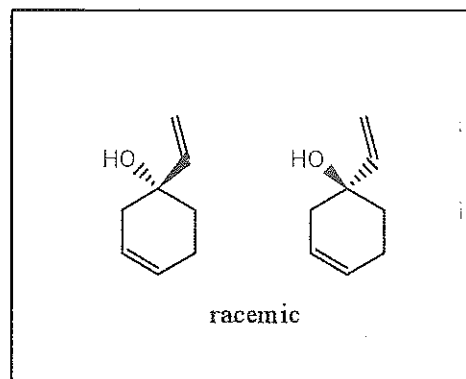
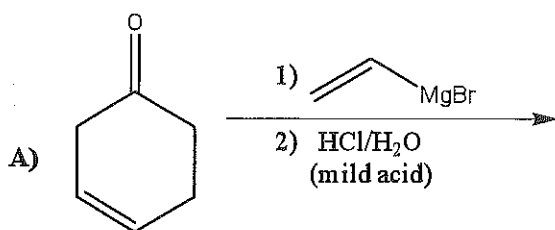
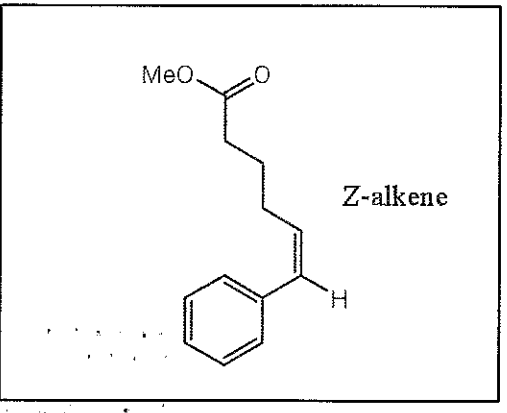
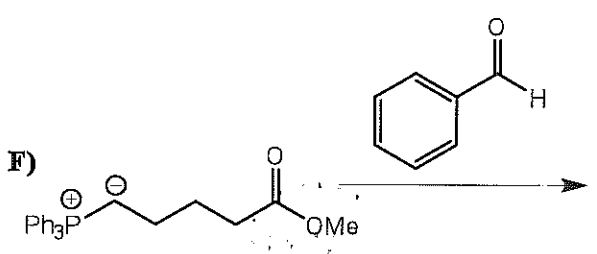
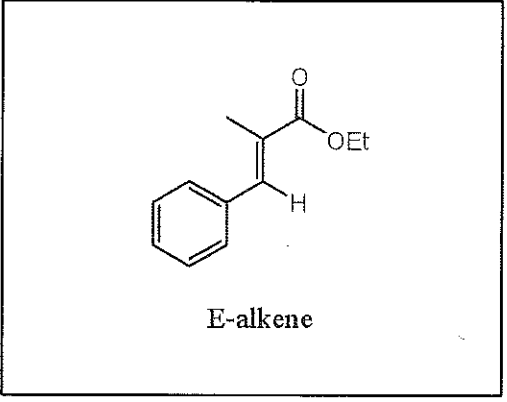
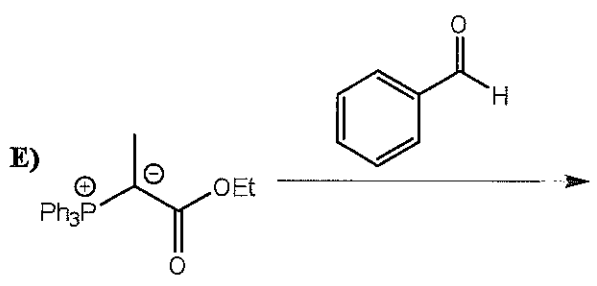
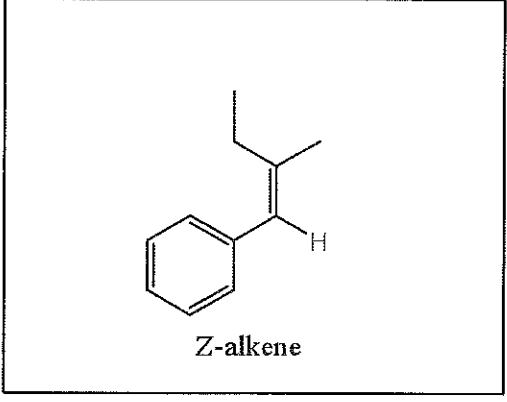
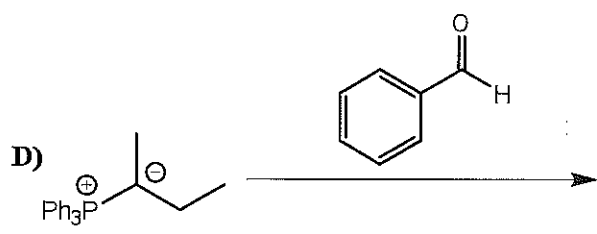
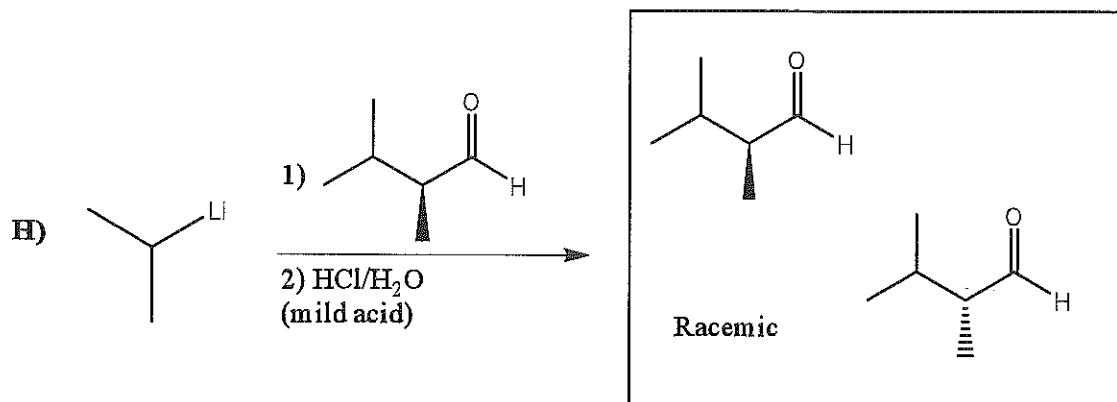
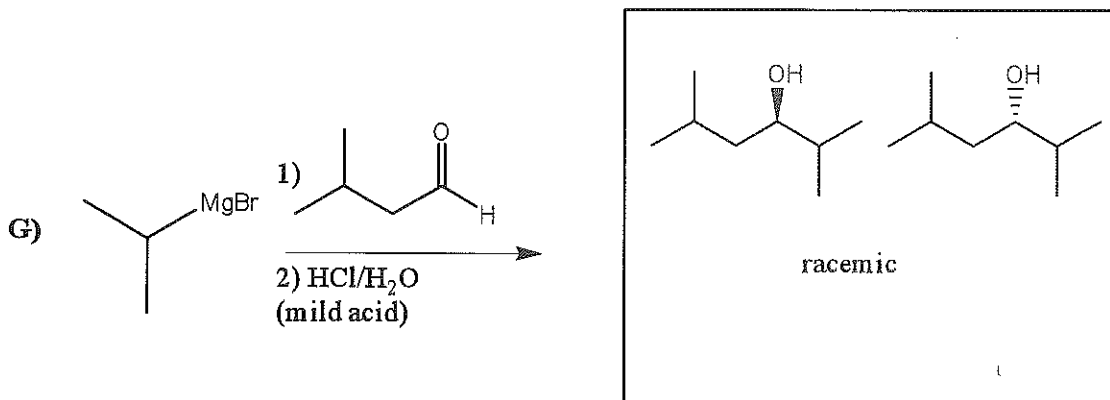


# KEY

Write the predominant product or products that will occur for each transformation. If a new chiral center is created and a racemic mixture is formed, you must draw both enantiomers and write "racemic" under the structure. Use wedges and dashes to indicate stereochemistry. To get full credit, you only need to write the major organic product for these. You do not have to worry about the other products.

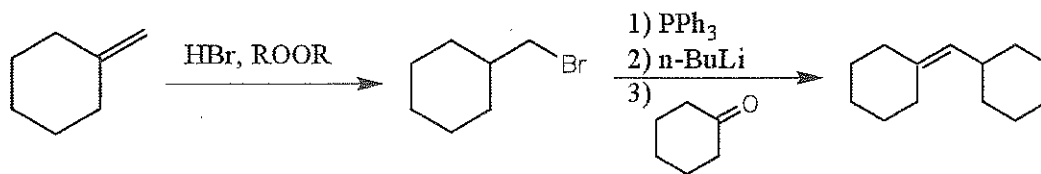
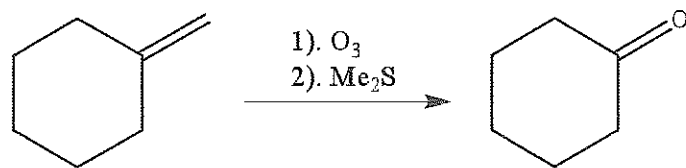
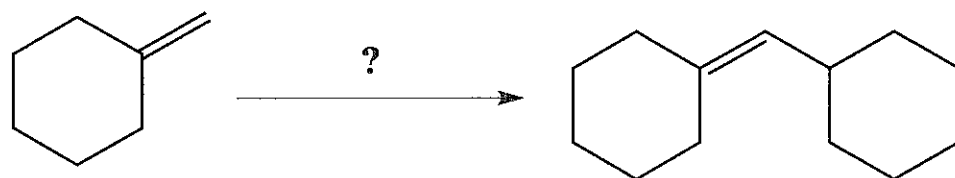


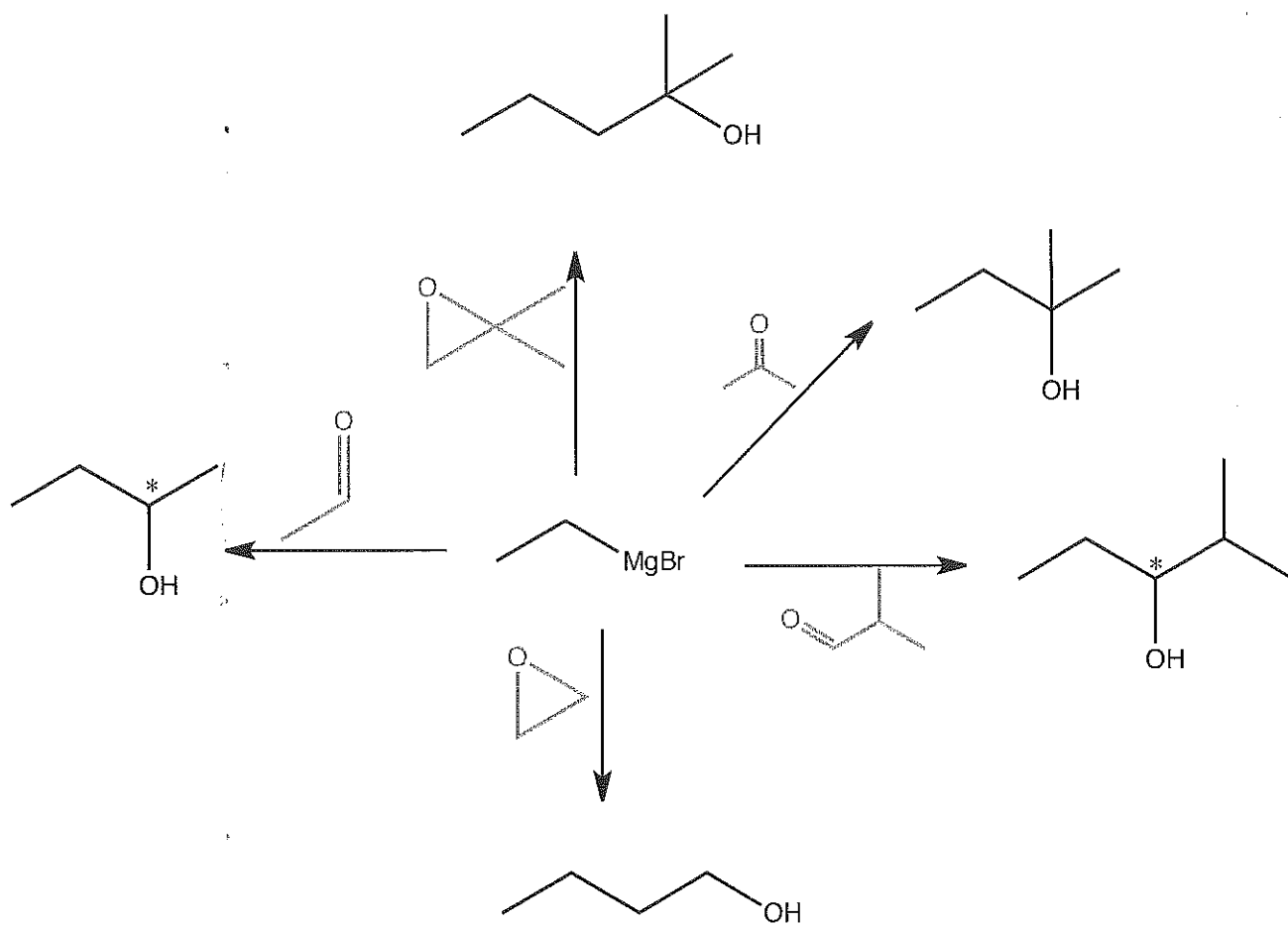




These are synthesis questions. You need to show how the starting material can be converted into the product(s) shown. You may use any reactions we have learned. Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry. If a racemic mixture is made, draw both enantiomers using wedges and dashes and make sure to write "racemic".

**All of the carbon atoms of the products must come from the starting materials for this one!**







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**All of the carbon atoms of the products must come from the starting materials for this one!**

