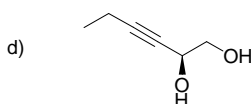
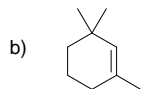
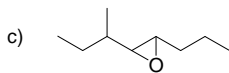
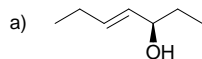
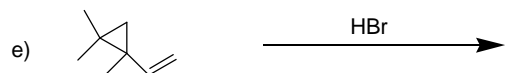
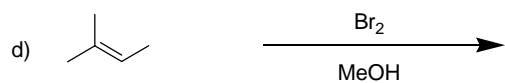
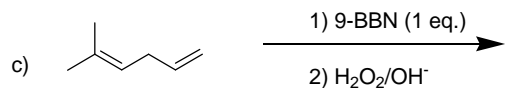
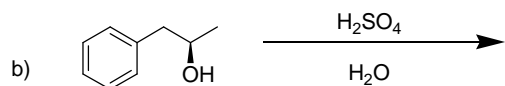
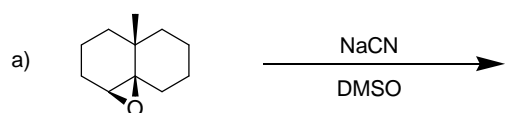


Note: This exam included all of Chapters 10 and 11. Some of the material will not have been covered this year when we take this exam. Just consider the parts you feel are relevant. Consider the *forms* of the questions as examples of the sort of question you might see this year.

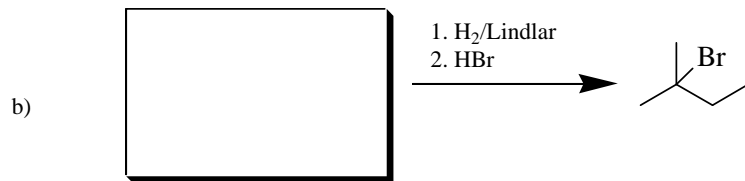
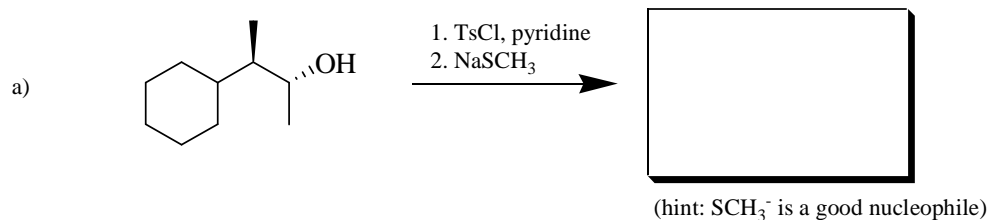
(10) 1. Name the following compounds.



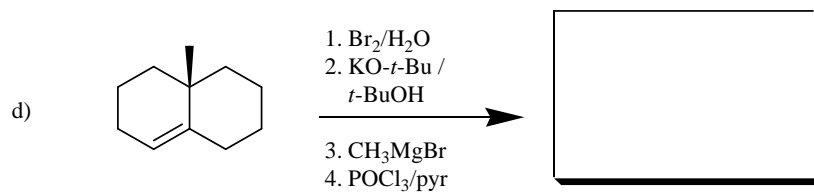
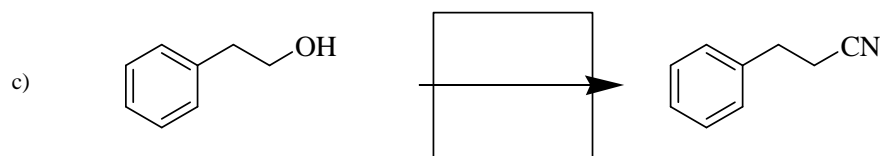
(15) 2. Indicate the products of the following reactions.



(20) 3. Fill in the missing information in each reaction shown below. If a reactant is required, and it has a stereocenter, **indicate the stereochemistry**. If a reagent is required, be aware that there may be more than one correct answer; you just need to indicate one of them. If a product is needed, indicate only the **major** product and **whether or not you expect a racemic mixture**. **NOTE THAT ALL REACTIONS INVOLVE TWO OR MORE SYNTHETIC STEPS.**



(hint: The first reaction was discussed Monday; it is the reduction of an alkyne to an alkene.)



Please show products of each step below. (Hint: CH₃MgBr is a good nucleophile that is equivalent to "CH₃⁻")

(30) 4. Starting with acetylene, brainstorm a series of reactions that synthesize a variety of compounds. That is, write several reactions, then take those products and write one or more reactions of them to produce new products. Then take those and write reactions that produce more products. I've shown three arrows; you can add as many as you like. **Do not use any reagent other than simple acids or bases more than once.** Three points per reaction; ten are needed for full credit. Don't do more than you need to here! **Show reagents, not just arrows.**

(25) 5. Propose a short synthesis that converts A to B. Other than compound A, use only compounds having **three or fewer carbons** (but any other elements; this restriction does not apply to reagents such as Et₃N or pyridine, just the reactants that become part of the target compound). Your work will go more smoothly if you take the time to think through the problem in your head a bit before you start writing. What C-C bonds do you think you need to make? *There's more than one way to do this!* Full credit will be awarded only for reactions producing a majority of the desired product. [HINT: I know how to do this in three steps. You might want to use a reaction we learned Monday, namely that alkynes and alkenes can be reduced to alkanes using H₂ and Pd/C catalyst.]

