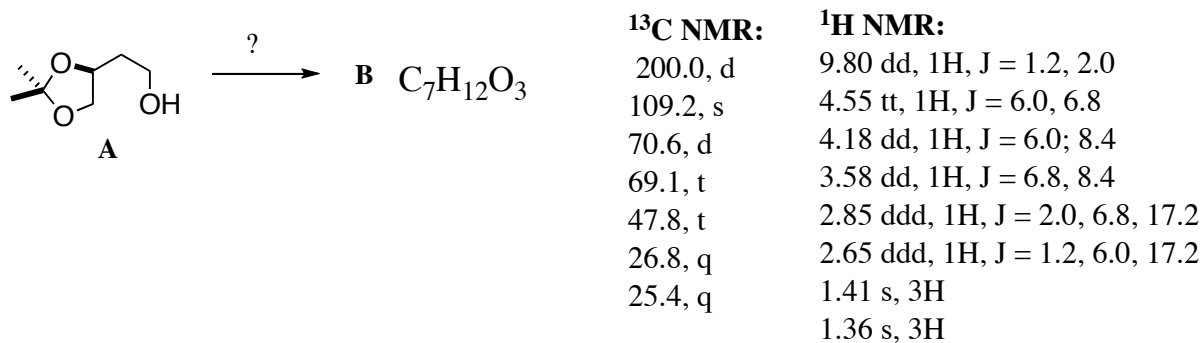
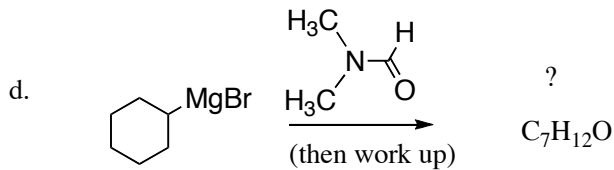
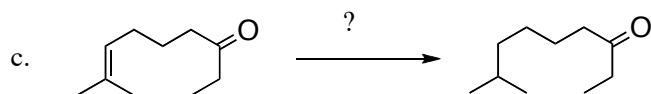
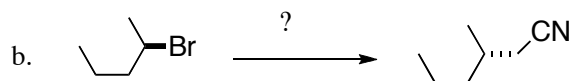
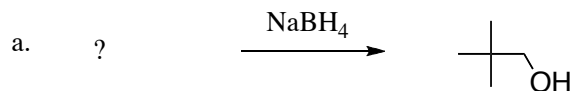


This is an open-book, open notes exam. Please show your work in detail.

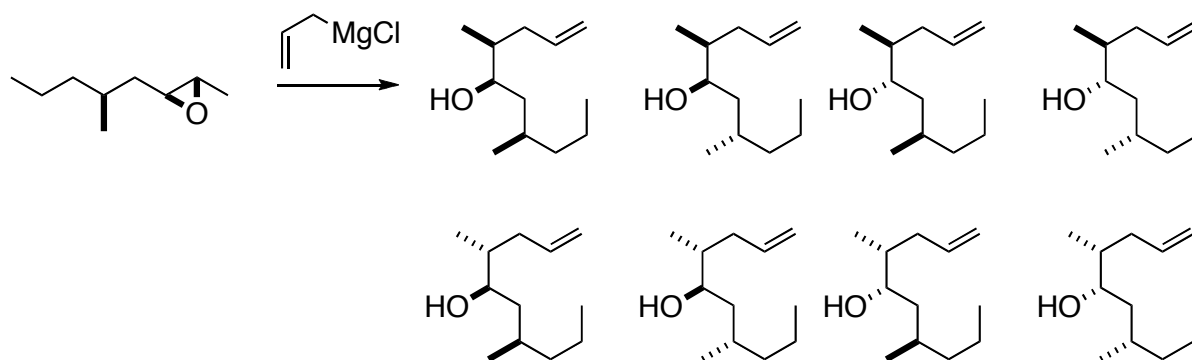
1. (20 points) Deduce the structure of **B**, and fill in the missing reagent(s). You do not need to show mechanisms.



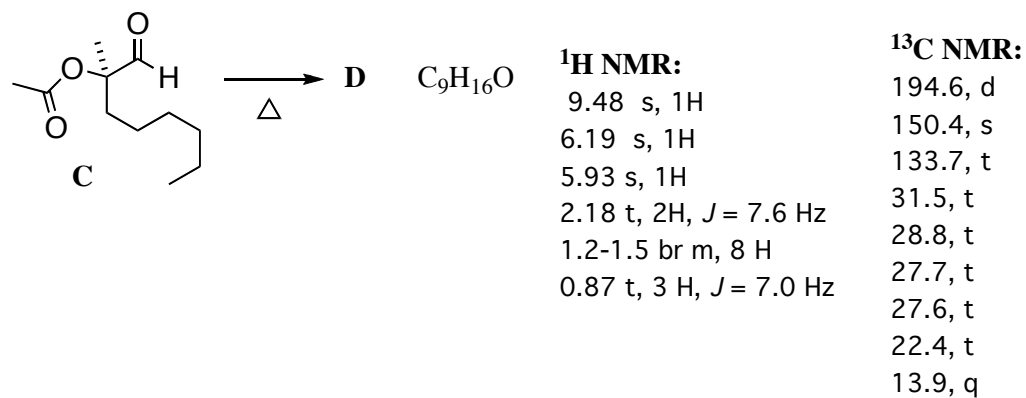
3. (20 points) Fill in the missing starting material, reagent for product.



3. (20 points) Which product would be formed, and why?



4. (20 points) Deduce the structure of **D**, and draw an arrow-pushing mechanism for the transformation.



5. (20 points) Draw a detailed arrow-pushing mechanism for the transformation of **E** to **F**.

