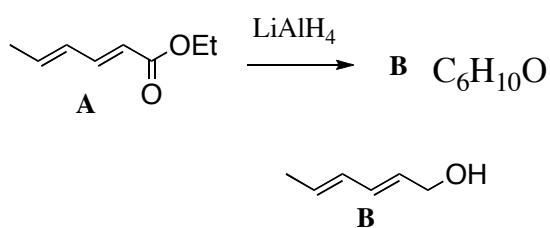


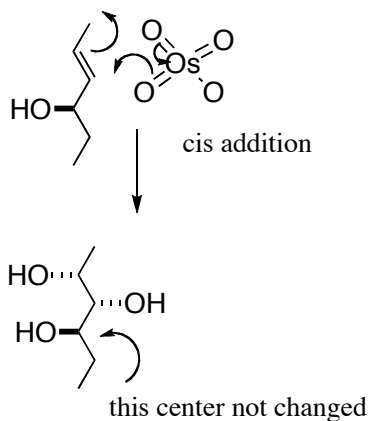
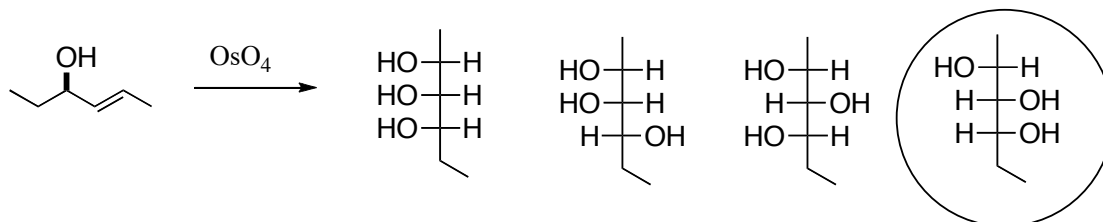
This is an open-book, open notes exam. Please show your work in detail.

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

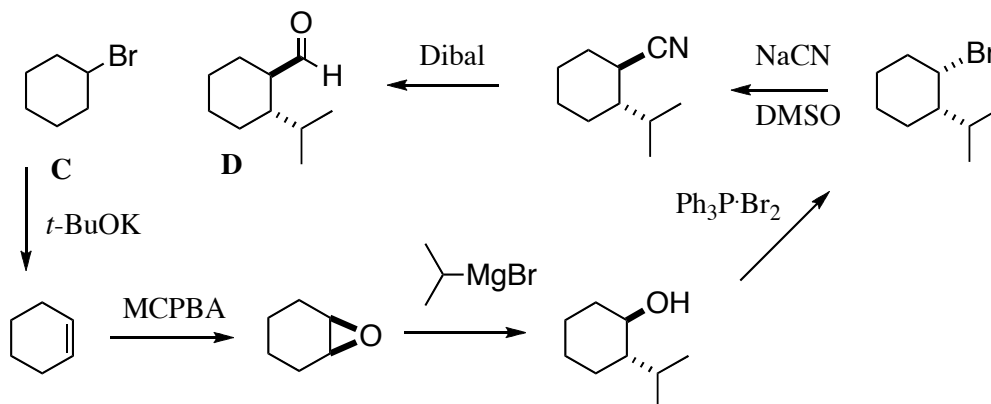


¹³ C NMR:	¹ H NMR:
131.7, d	1.76, d, J = 7.2 Hz, 3H
130.8, d	2.42, bs, 1H (exchanges)
129.8, d	4.13, d, J = 7.8 Hz, 2H
129.3, d	5.7, m, 2H
69.3, t	6.2, m, 2H
18.1, q	

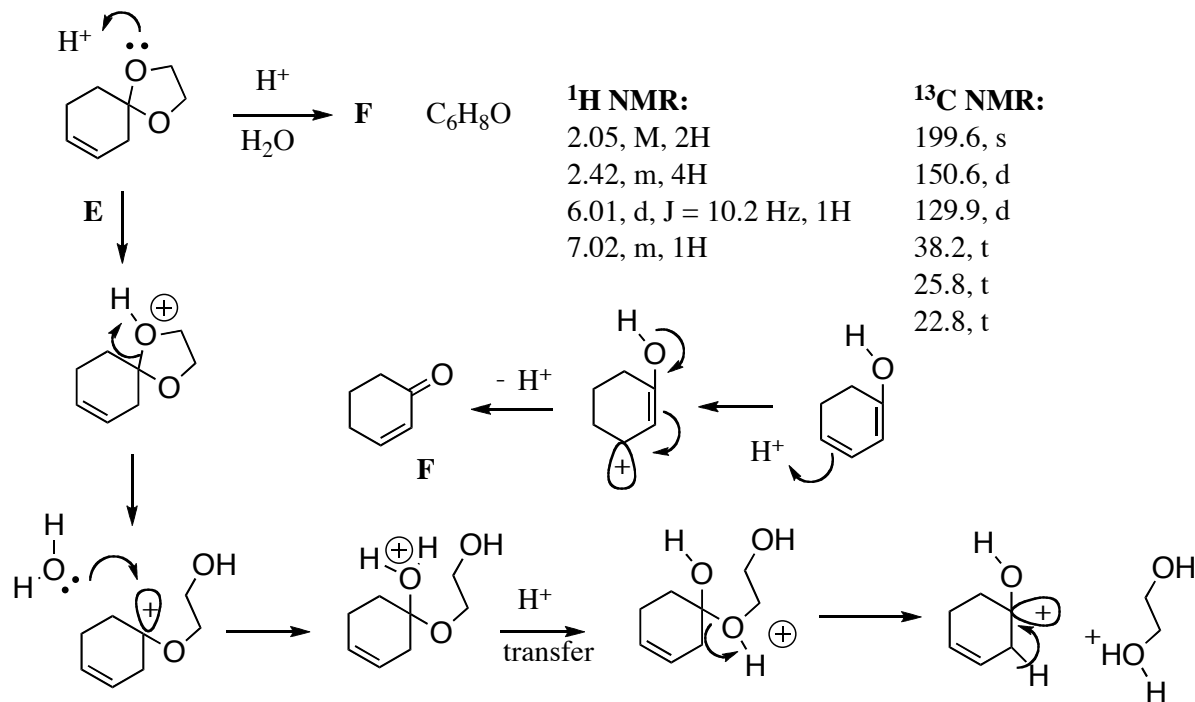
2. (20 points) Which product would be formed, and why?



3. (20 points) Outline a synthesis of **D**, starting with **C**. You may use any reagent that contributes three or fewer carbons to the final product. Your route must control relative configuration, leading to the diastereomer illustrated.



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



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

