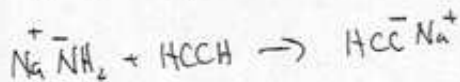
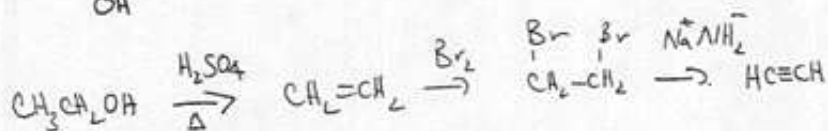
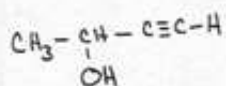
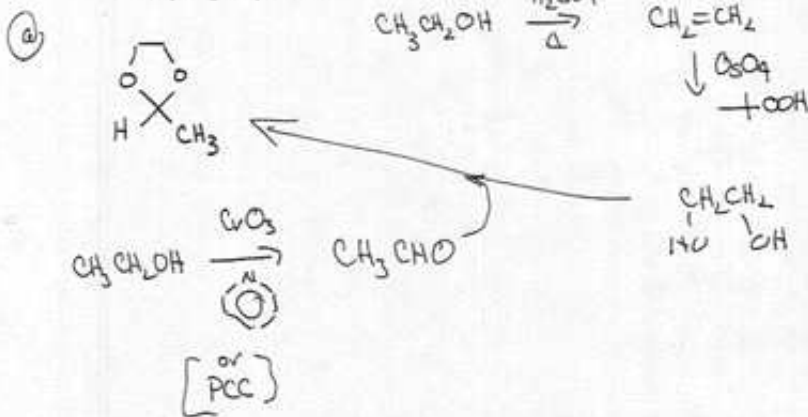
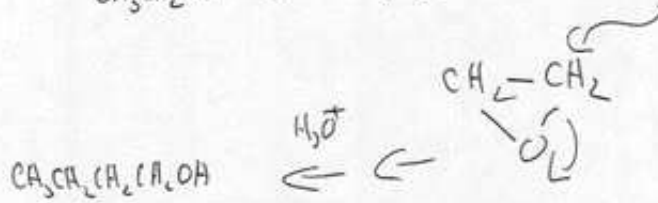
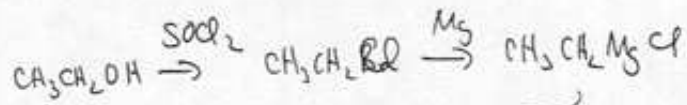
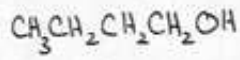
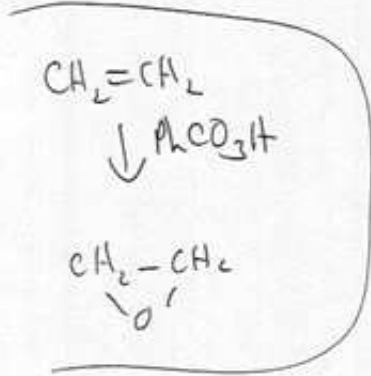
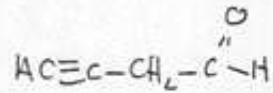
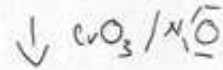
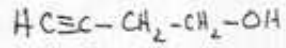
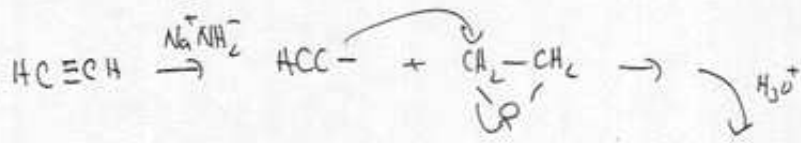
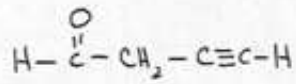


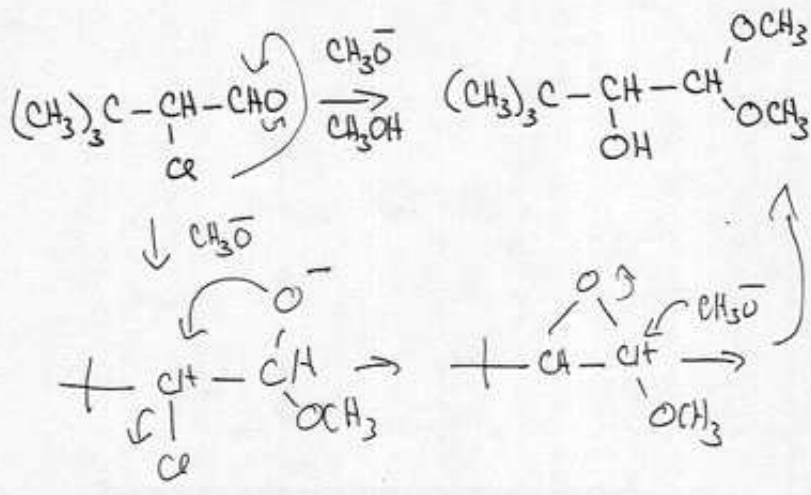
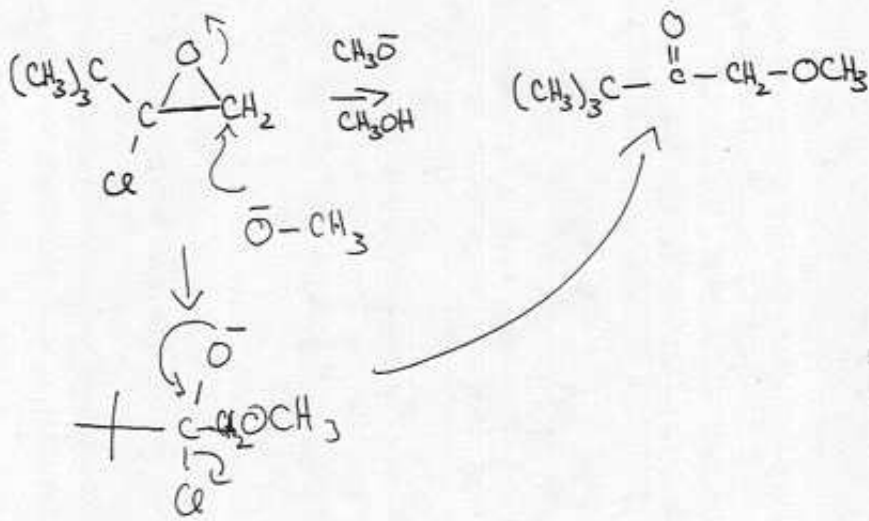
Name: Key (please print)

1. (20 pts) Using ethanol as the carbon source, carry out the following transformations. Use any reagents you like.

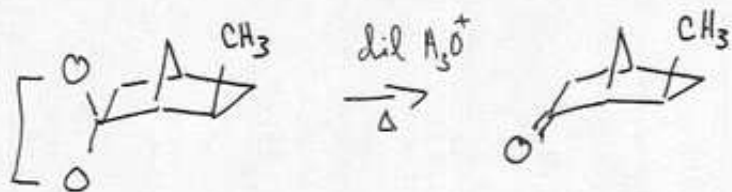
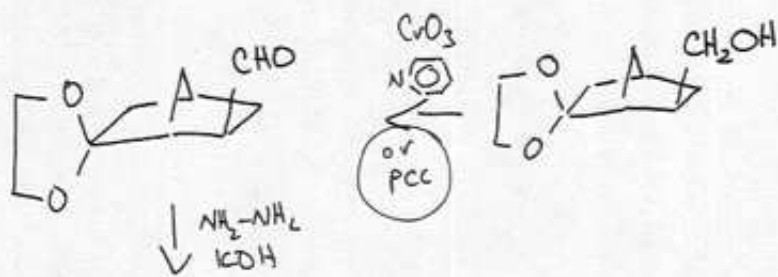
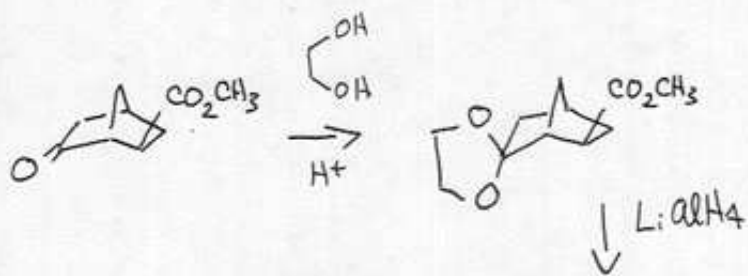




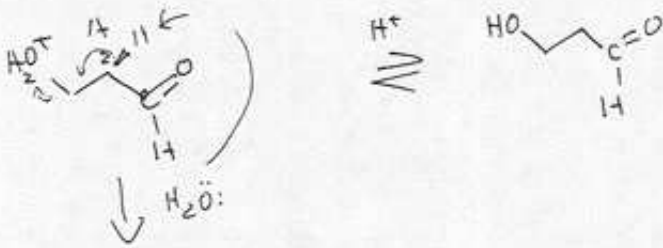
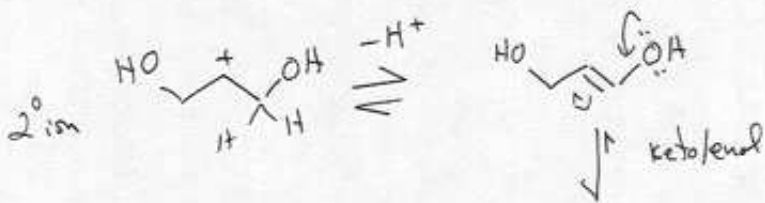
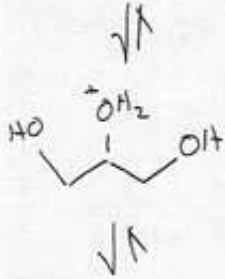
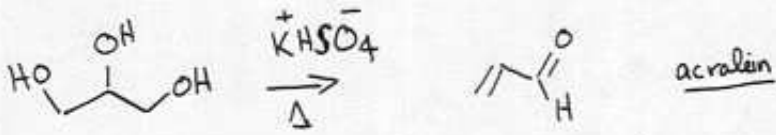
2. (10 pts) What is the mechanism of these reactions?



3. (10 pts) What reagents are needed to carry out the following transformations?

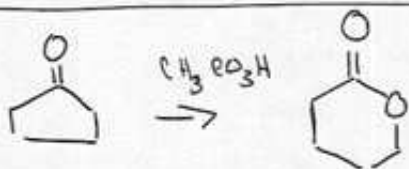
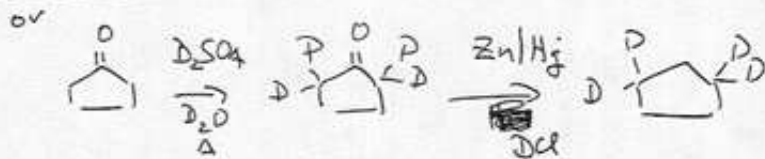
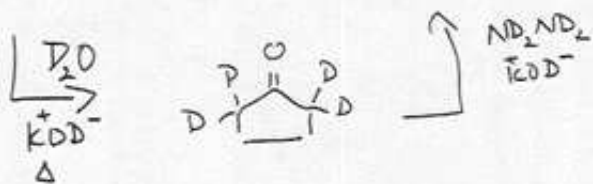
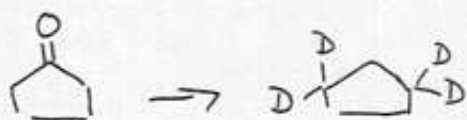


4. (10 pts) When 1, 2, 3 propanetriol is heated in KHSO_4 , acrolein is produced. What is the mechanism?

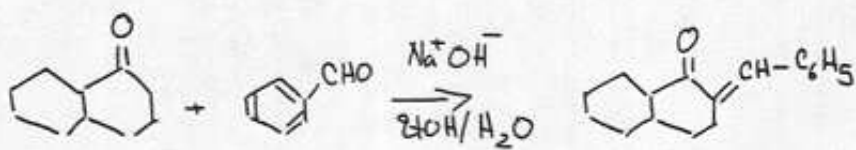


~~CHO~~ \checkmark CHO distills out

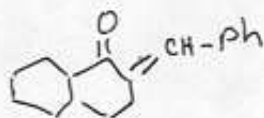
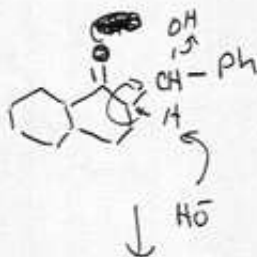
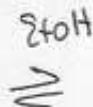
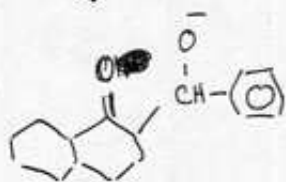
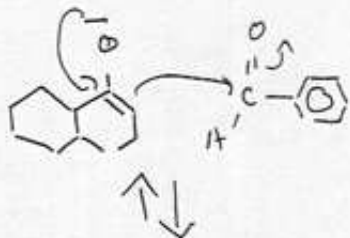
5. (10 pts) Starting with cyclopentanone, carry out the following transformation. Use any reagents you like.



6. (10 pts) What is the mechanism of this reaction?

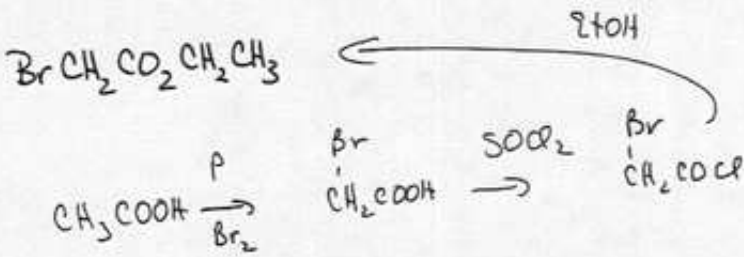
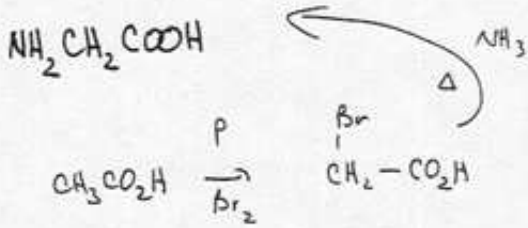


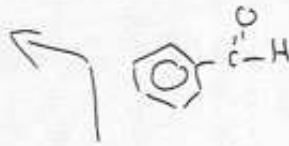
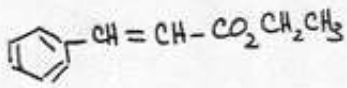
[no stereochemistry implied]



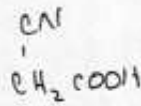
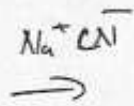
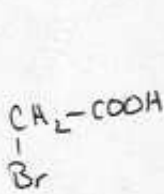
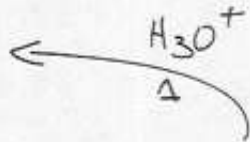
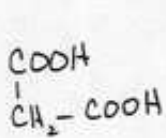
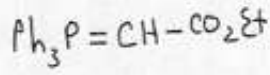
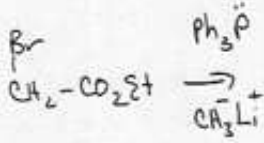
irreversible

7. (20 pts) Starting with acetic acid, carry out the following transformation. Use any reagents you like.





Wittig



8. (10 pts) What is the mechanism of these reactions?

