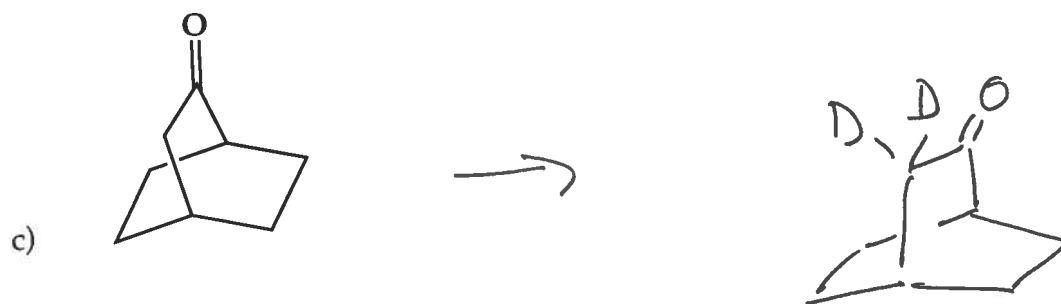
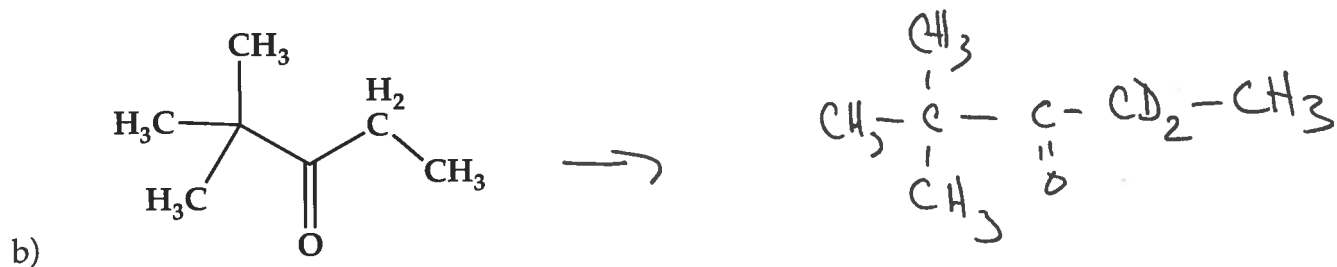
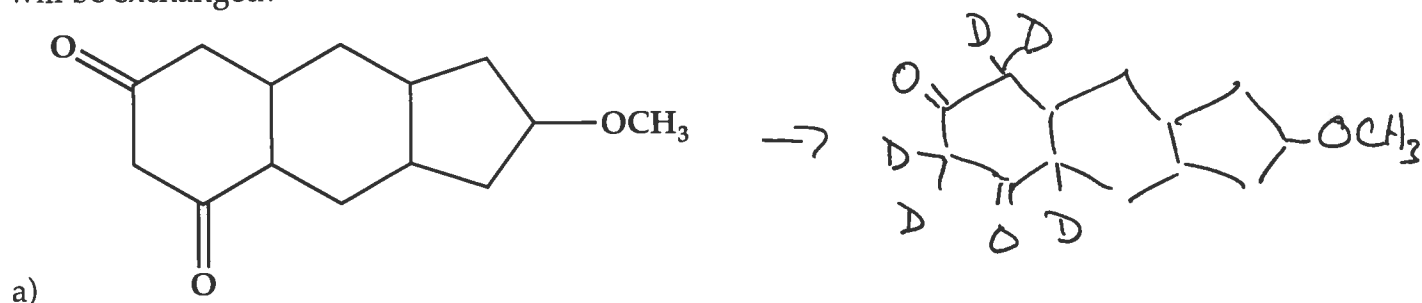


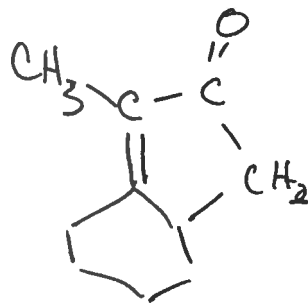
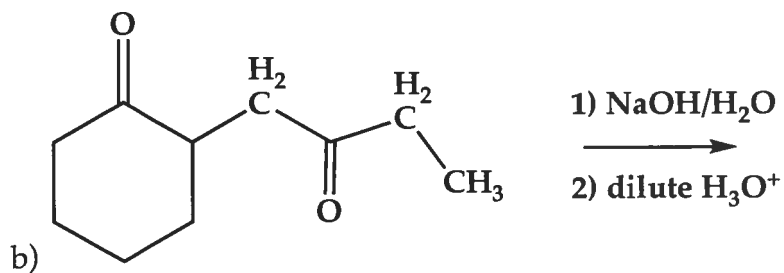
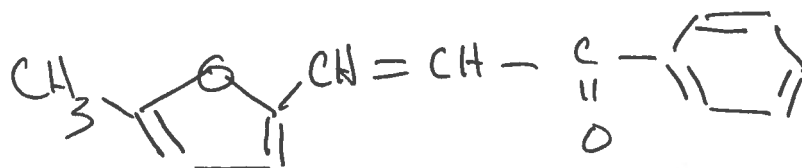
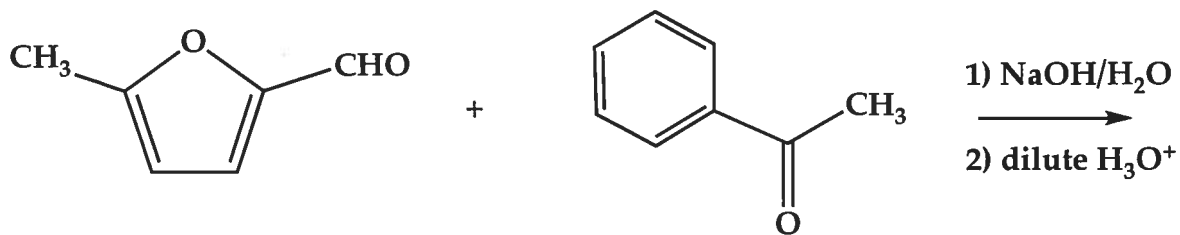
Chemistry 3331-100
 Organic Chemistry / Dr. Barney Ellison
 Tuesday: Nov. 12th @ 7:00pm @ 9:00 / 3rd Exam / Hale Science 230-270)

Name: Key (please print)

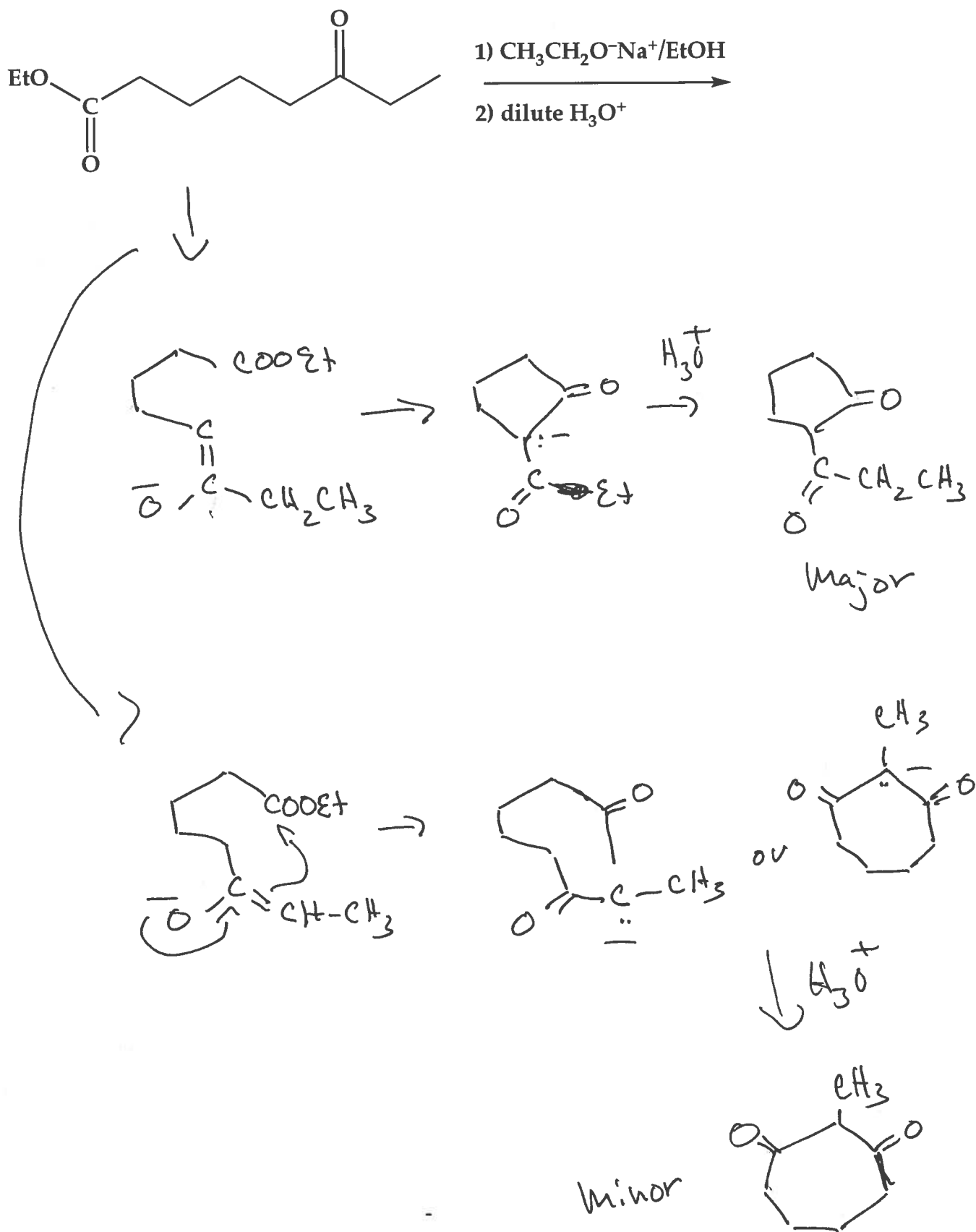
1. (10 pts) When the following molecules are treated with NaOD/D₂O, which protons will be exchanged?



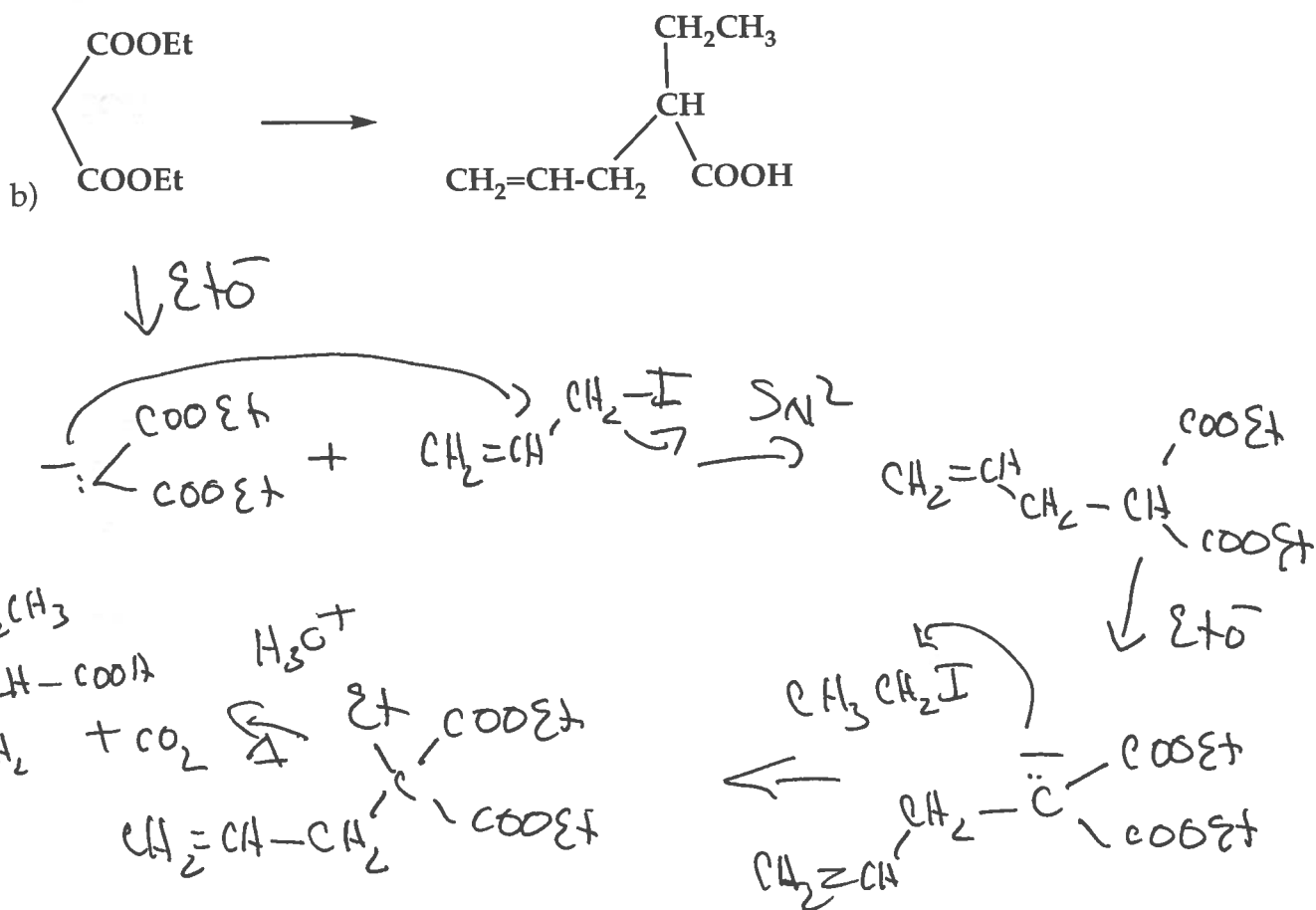
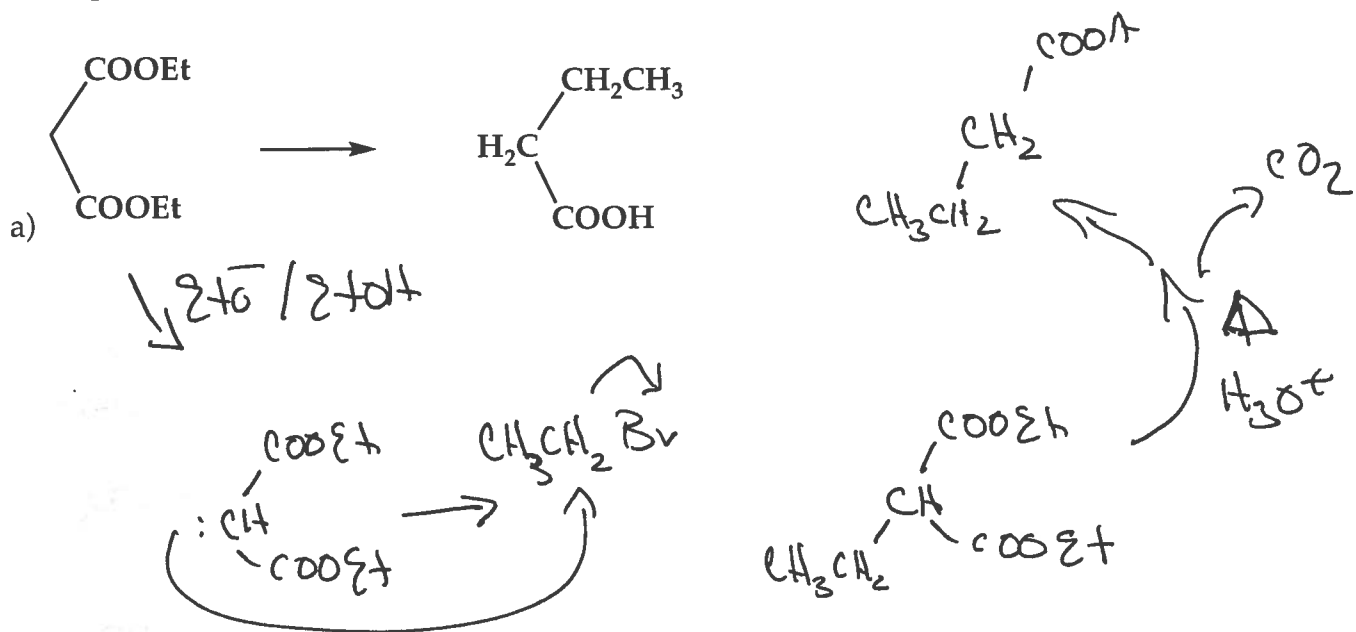
2. (10 pts) Predict the products of the following reactions.

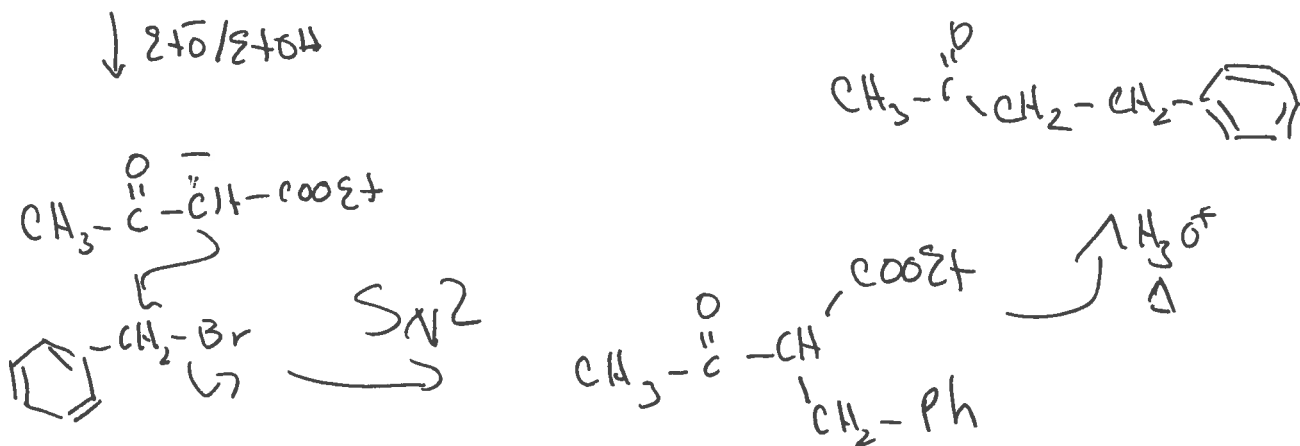
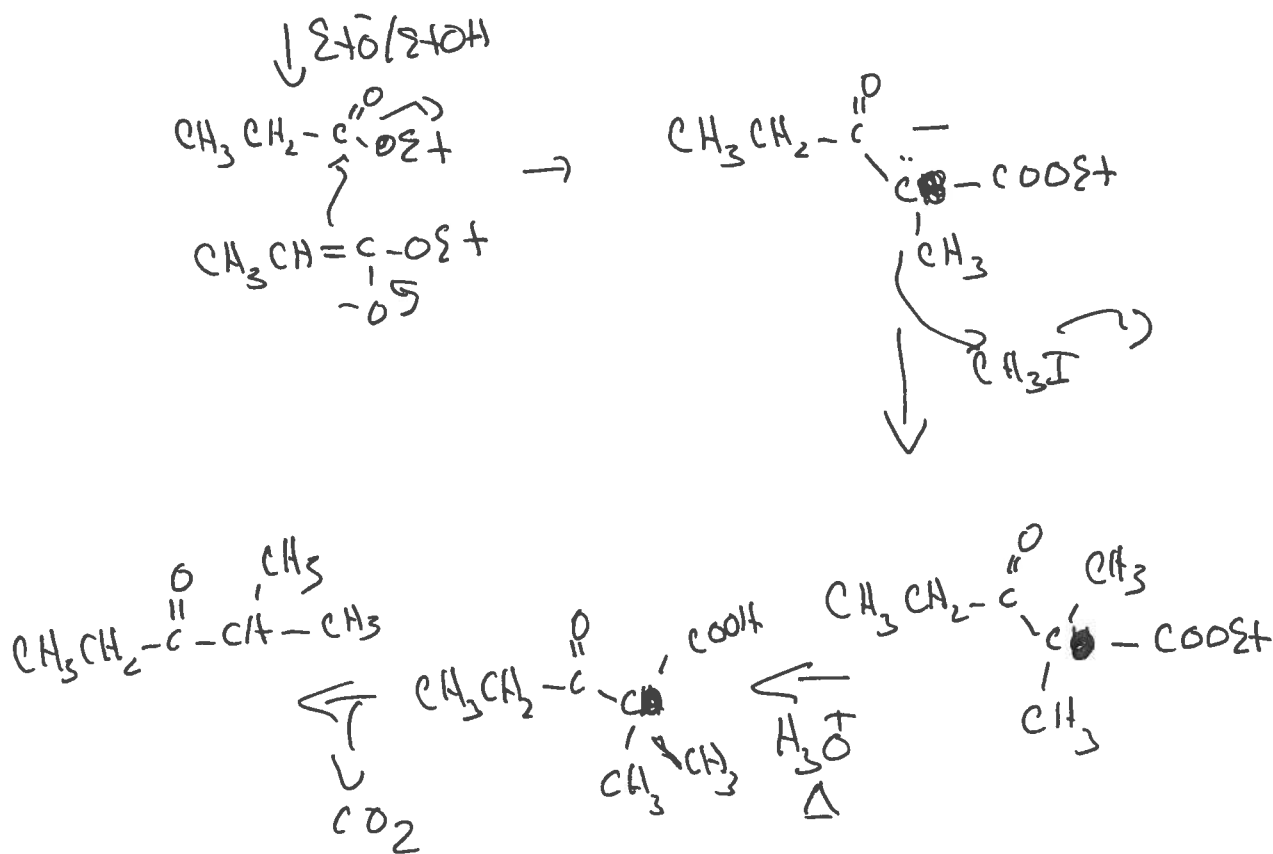
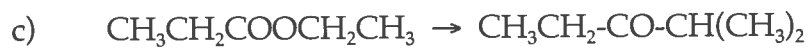


3. (10 pts) What products are expected when the following ester is treated with EtONa/EtOH and then worked up in dilute acid?

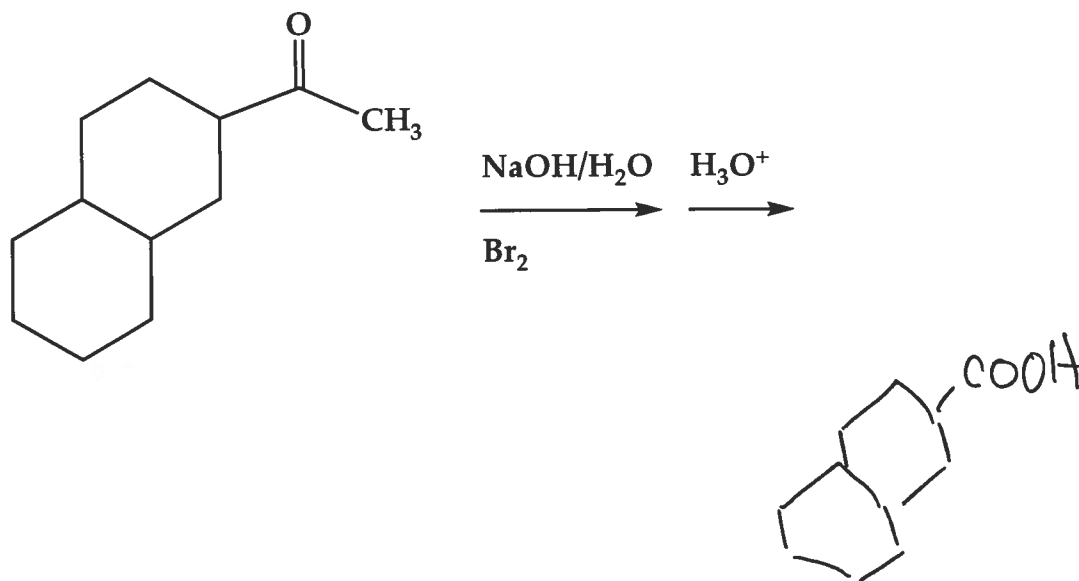


4. (20 pts) Devise a synthesis of each of the following.

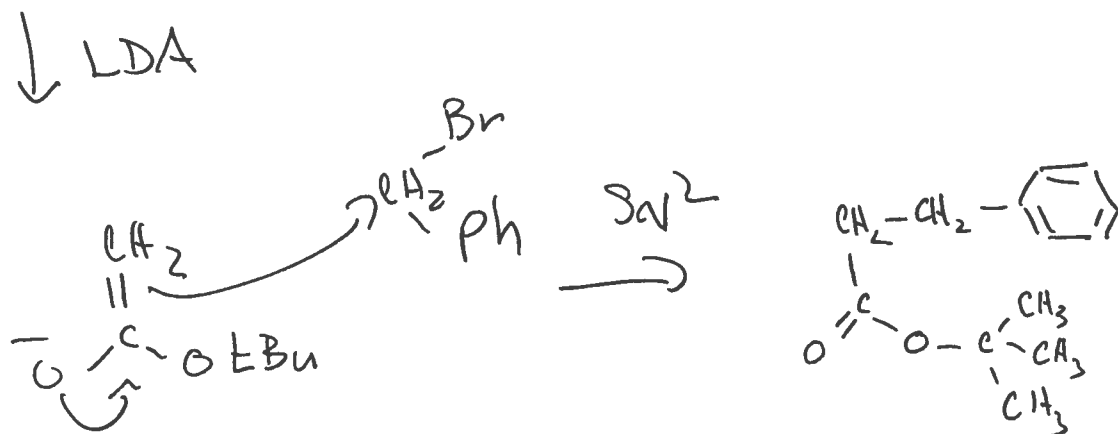
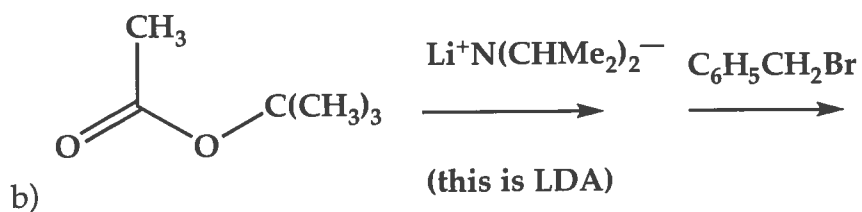
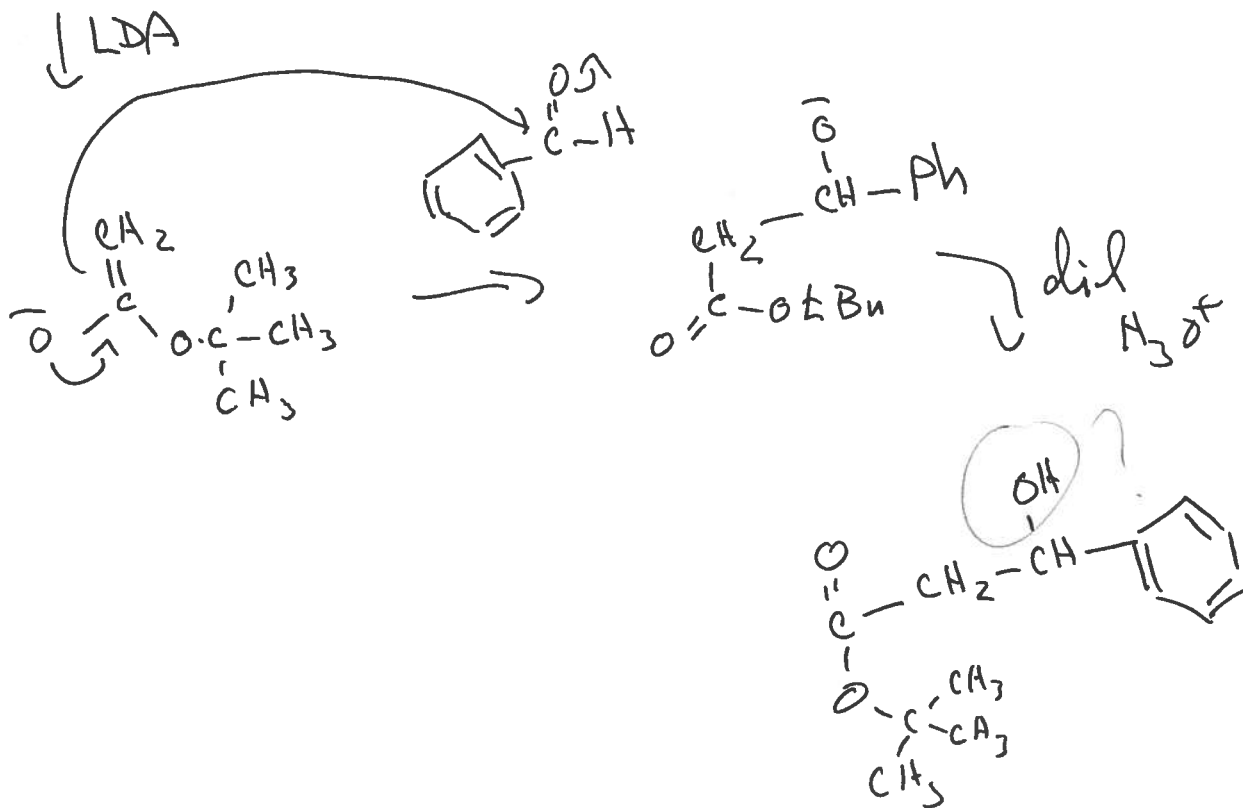
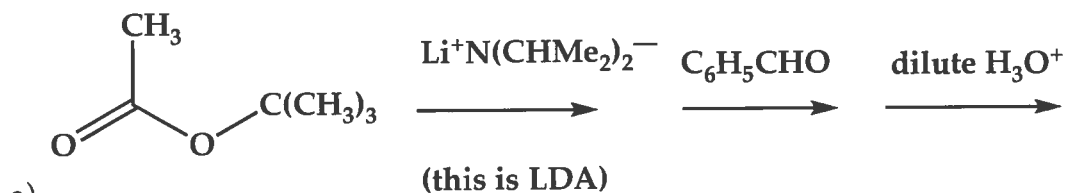




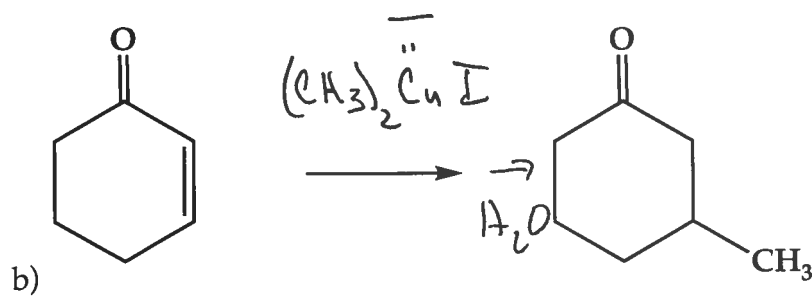
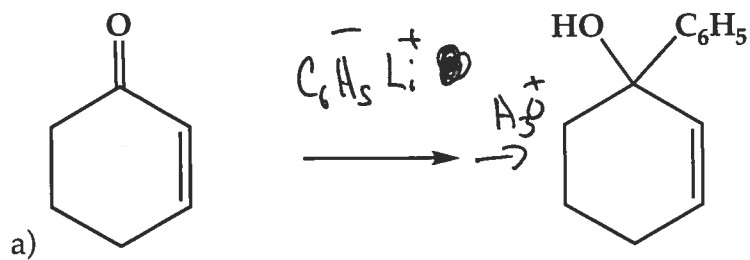
5. (10 pts) What is the product of the following reaction?



6. (10 pts) What are the products of the following reactions?

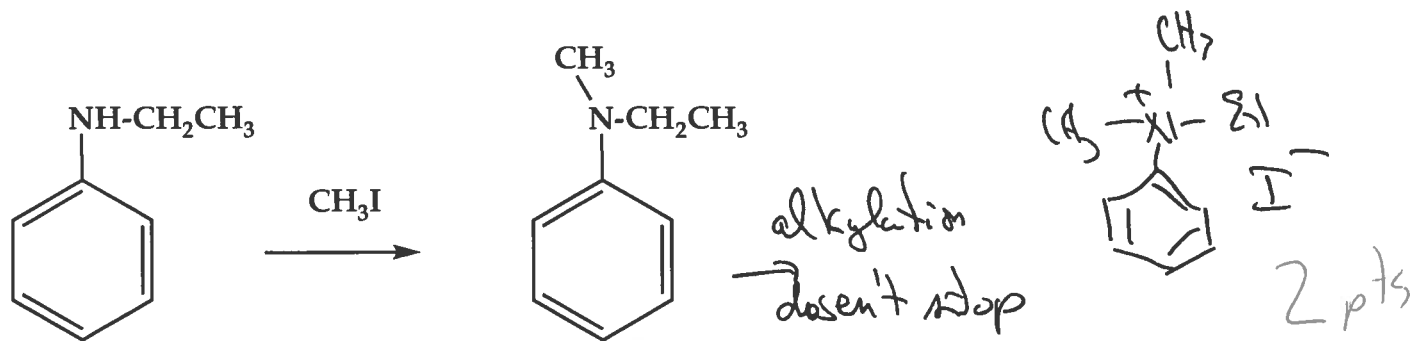


7. (10 pts) Devise a synthesis to carry out the following transformations.

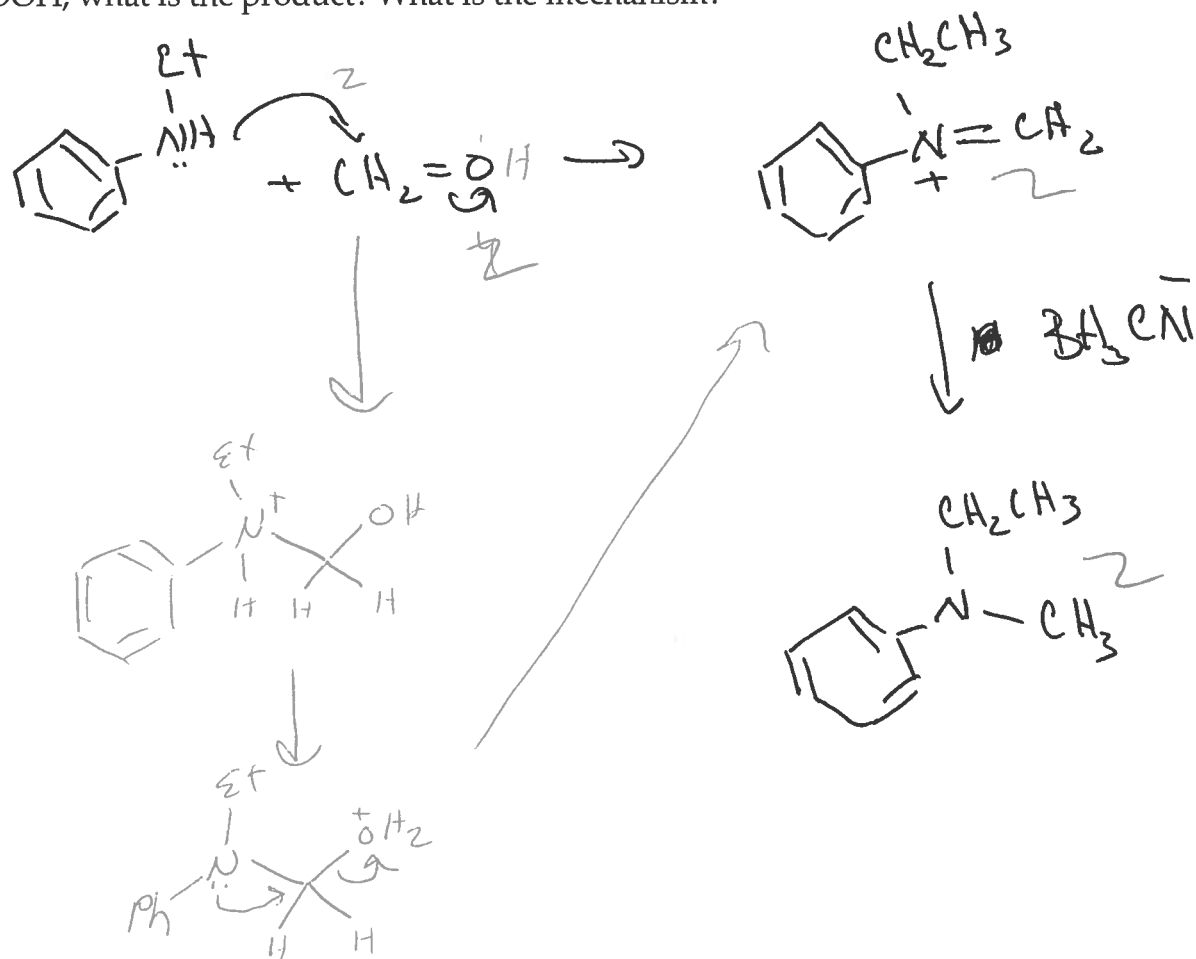


8. (10 pts)

a) If you attempt to methylate ethylphenyl amine, the reaction fails. Why?



b) If the ethylphenyl amine is treated with $\text{CH}_2=\text{O}$ in the presence of $\text{Na}^+\text{BH}_3\text{CN}^-$ / CH_3COOH , what is the product? What is the mechanism?



9. (10 pts) What is the product of the following reactions?

