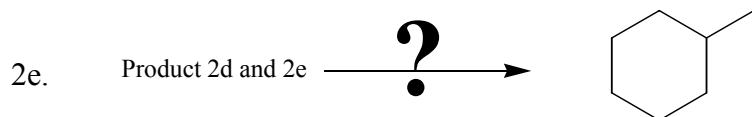
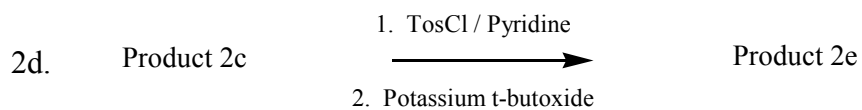
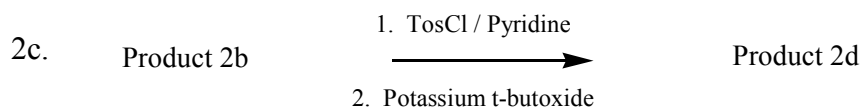
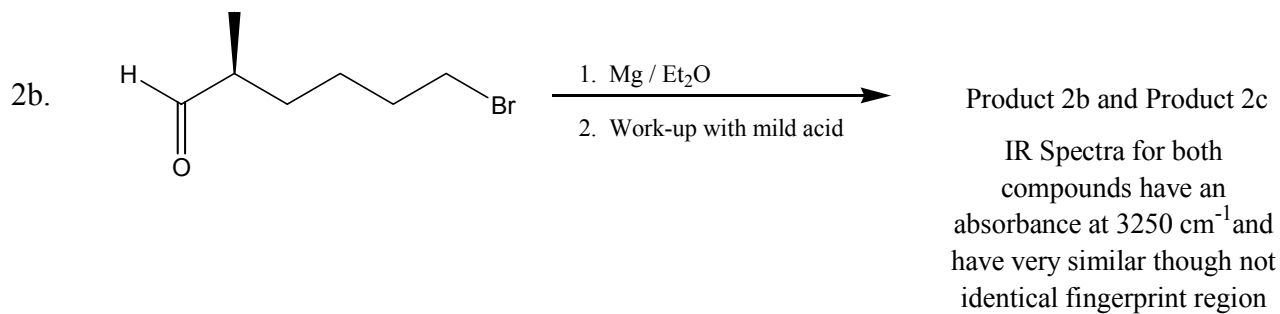
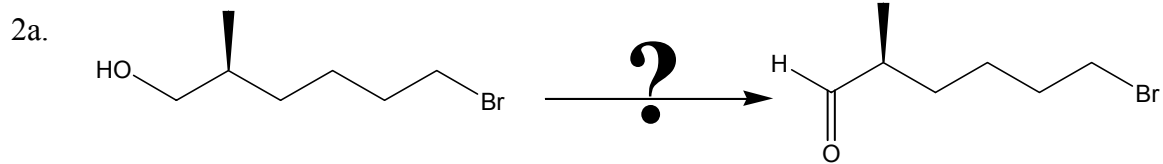
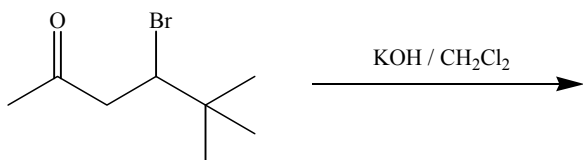


2. Predict products or reagents for the following reactions and briefly explain your answer.
(5 @ 8 pts = 40 points)



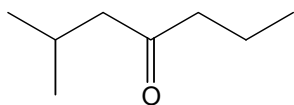
3. Consider the following reaction: (32 points)



3a. What are three possible 2nd order reaction products?

3b. How would you SPECIFICALLY AND IN A DETAILED MANNER use spectroscopy to differentiate the three products? You do not have to describe the entire spectra for each molecule but you should show SPECIFICALLY how each spectrum would differentiate the products. Include relevant information gained from the spectral data from ¹H NMR, ¹³C NMR and FTIR Spectroscopy. If there are complex NMR signals that would benefit from an explanation, please show your work to explain. Your answer must be exceptionally organized – use scratch paper and then compose your final answer here.

4. Consider the following problem: (26 points)



====> From any alkane with four
or less carbons

Make this

4a. Conduct a retrosynthetic analysis for the above problem. Investigate more than one method to make the desired molecule; the various methods do not have to be completely correct, but rather should show that you have thought of alternative routes. (13 points)

4b. Using the best approach from problem 4a, synthesize the desired molecule. Mechanisms are not required, but reagents and conditions are required. (13 points)