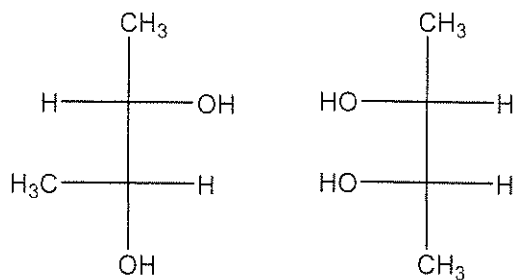
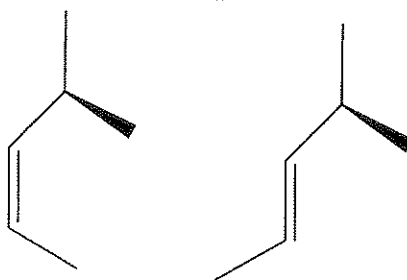


1. What is the relationship between the following two molecules? Are they identical, constitutional isomers, enantiomers or diastereomers? (7 pts)

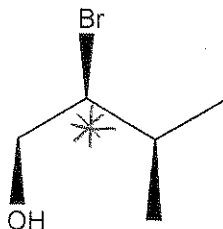


Identical is correct answer (credit also given for enantiomers, diastereomers).

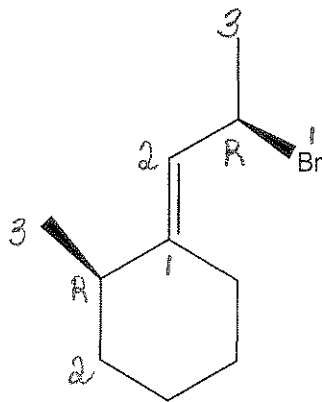
2. What is the relationship between the following two molecules? Are they identical, constitutional isomers, enantiomers or diastereomers? (7 pts)



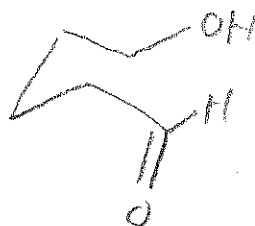
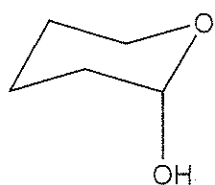
3. Label each chiral center in the molecule below with a star. (7 pts)



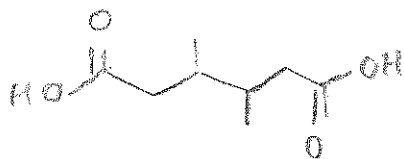
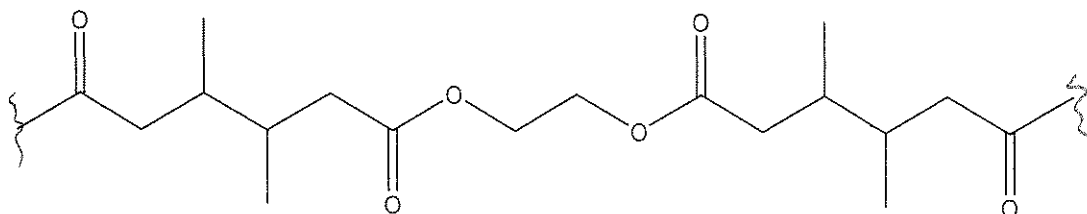
4. Determine the R/S configuration of all chiral centers in the molecule shown below. Make sure to clearly indicate the priority (1, 2, 3 or 4) of each group attached to a chiral carbon. (12 pts)



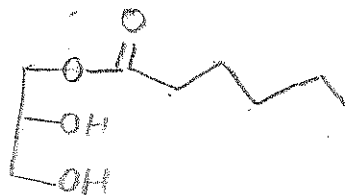
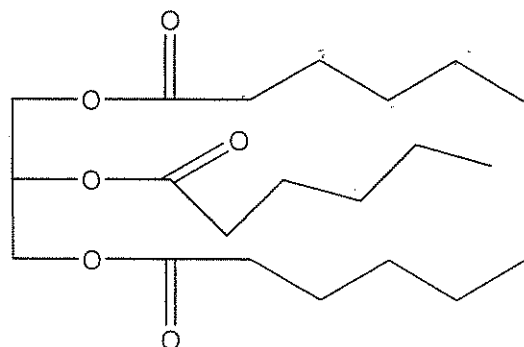
5. Which functional group (acetal or hemiacetal) is shown below? (12 pts)
 Draw the structure of the ketone/aldehyde plus alcohol(s) that were used to synthesize it.



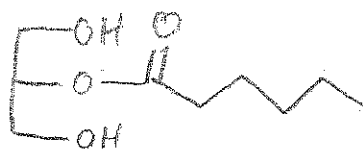
6. Draw the structure of the two monomers that were used to create the following polyester. (7pts)



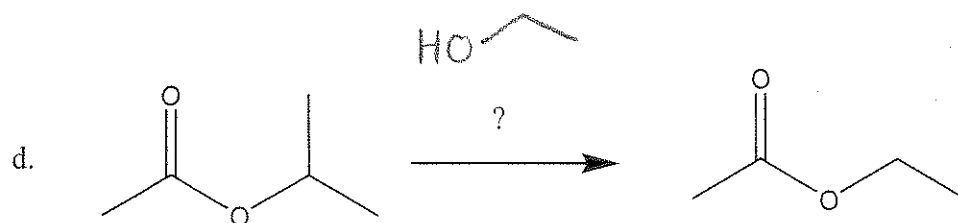
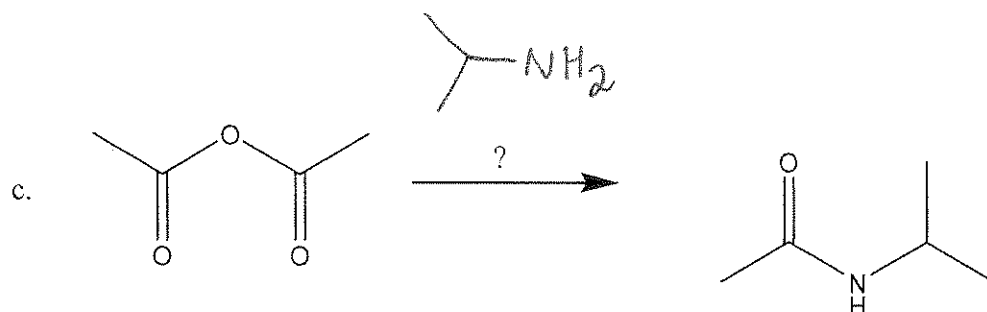
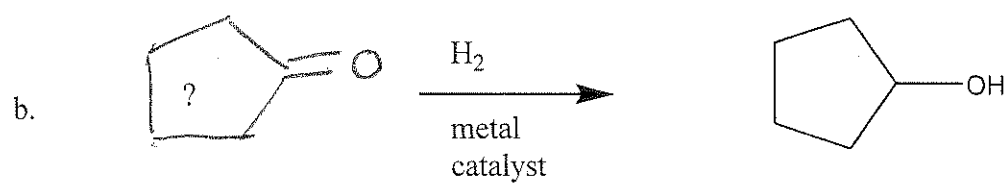
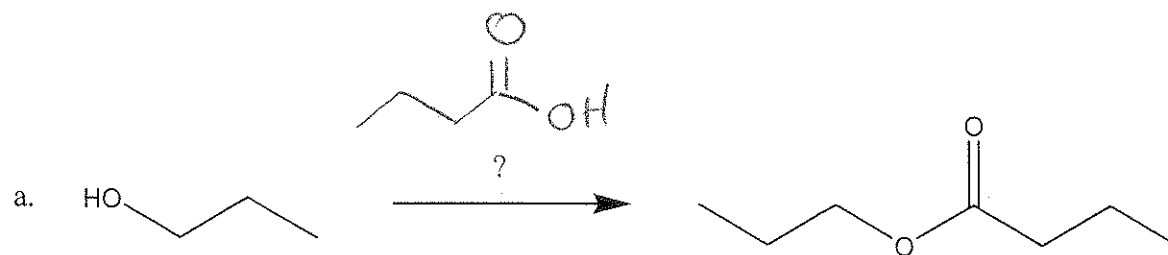
7. Draw the structure that this fat would form if it was converted to a monoglyceride. (8 pts)



or



8. Fill in the missing reagent(s) needed to accomplish each of the following reactions. (20 pts)



9. Give the product(s) of each of the following reactions. (20 pts)

