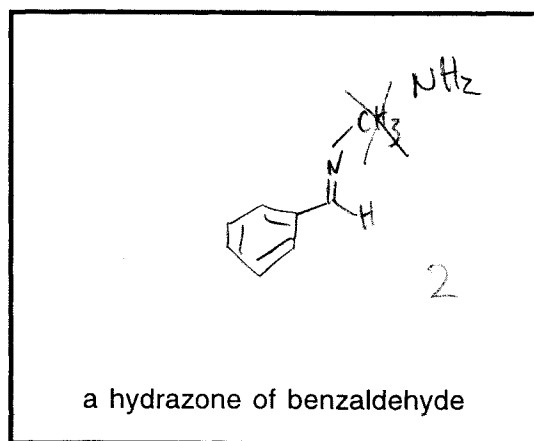
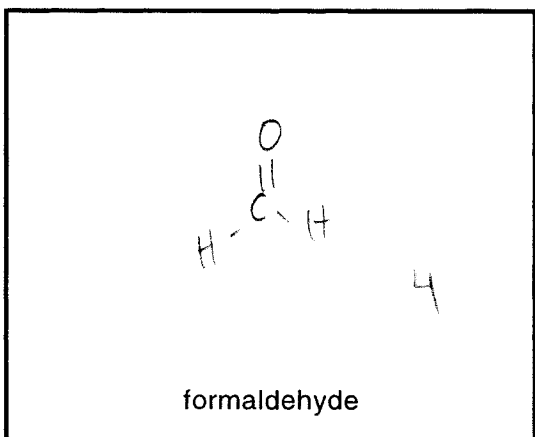
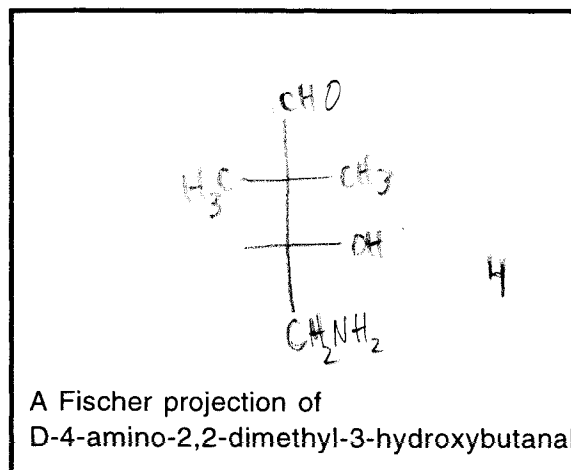
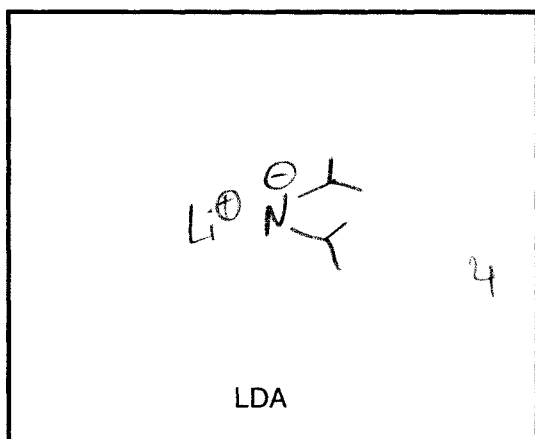


1. A. Unless otherwise stated, provide one real example for each of the following terms or, write a structure for a given chemical name (16 pts).



B. (11 pts)

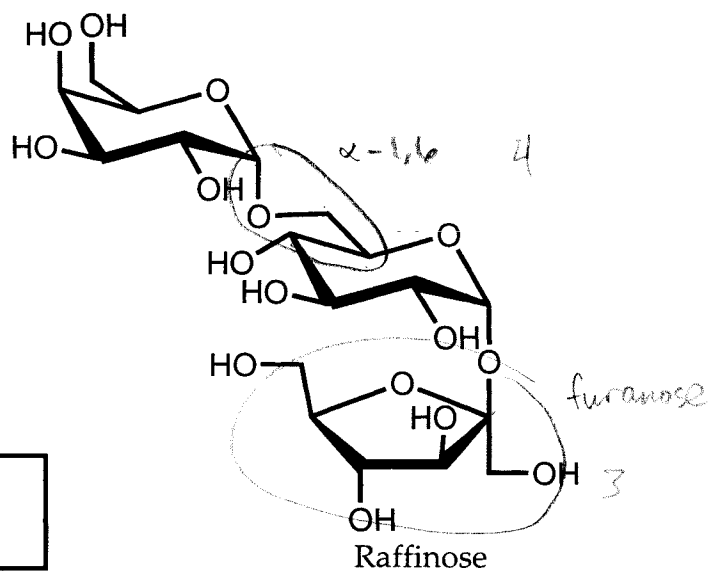
*Is this trisacharride a (circle one):

reducing sugar non-reducing sugar ⁴

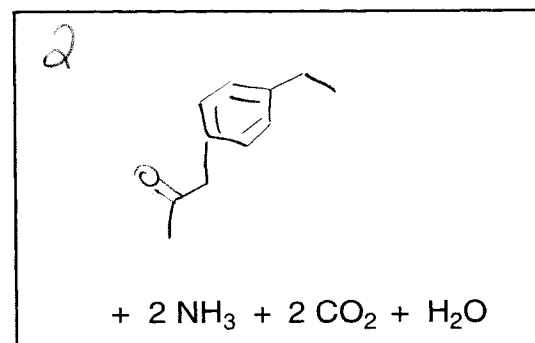
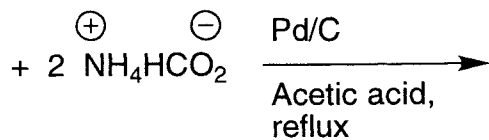
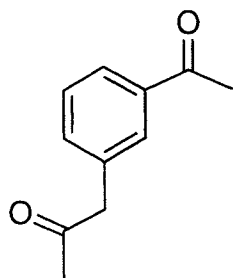
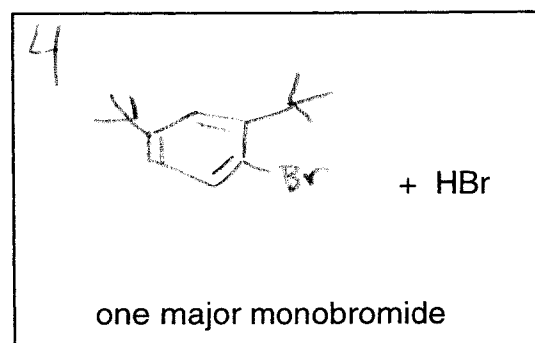
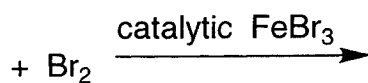
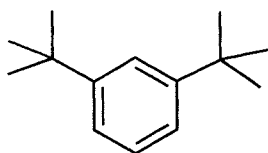
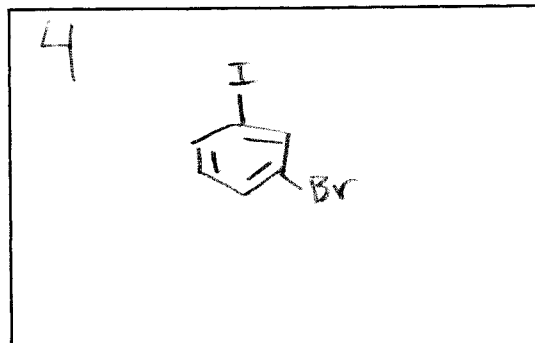
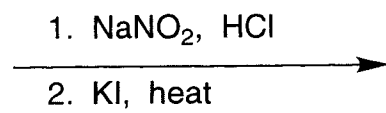
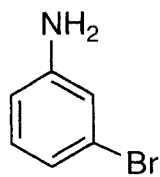
triose aldopentose

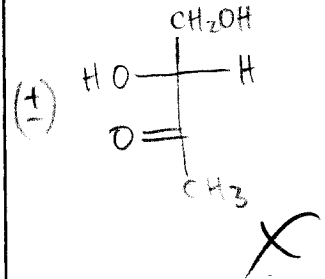
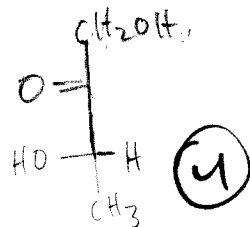
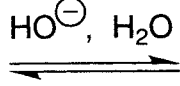
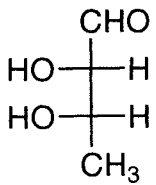
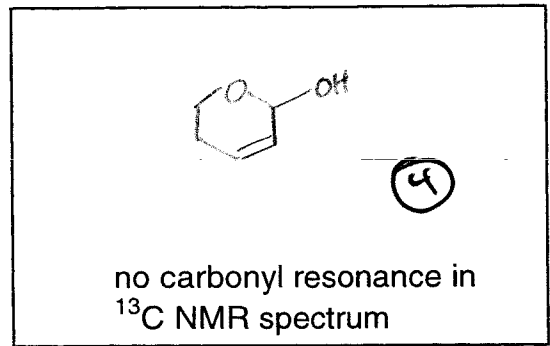
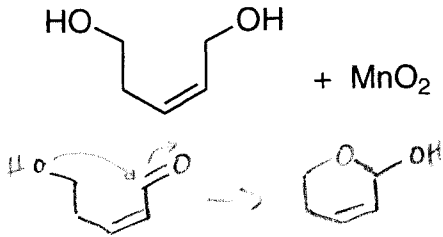
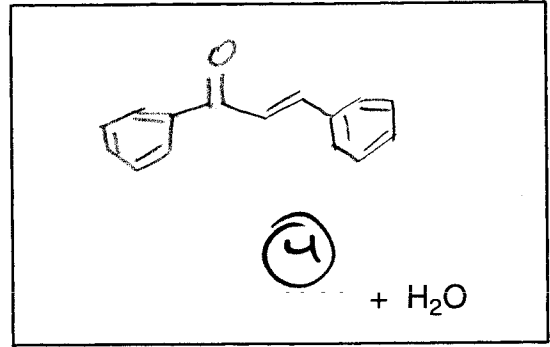
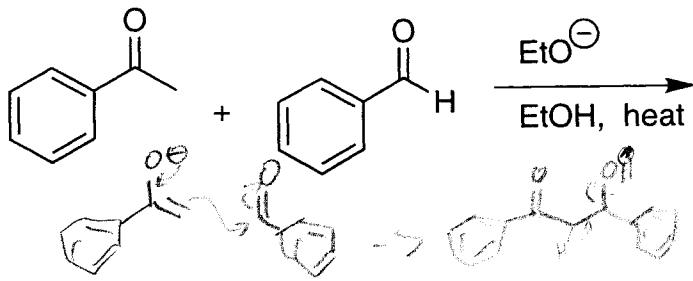
*Circle a α -1,6 glycosidic linkage and label α -1,6

*Circle a furanose and label furanose



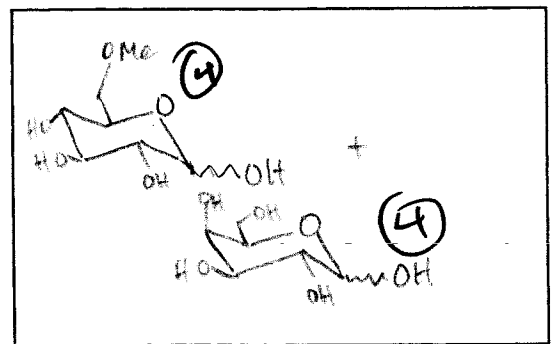
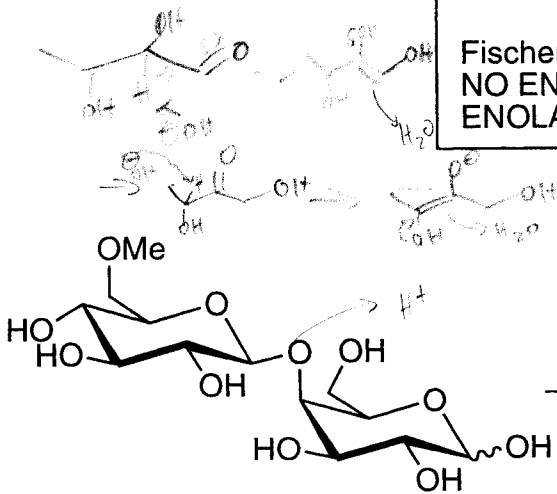
2. Predict the product(s) from the following reactions. (36 pts)





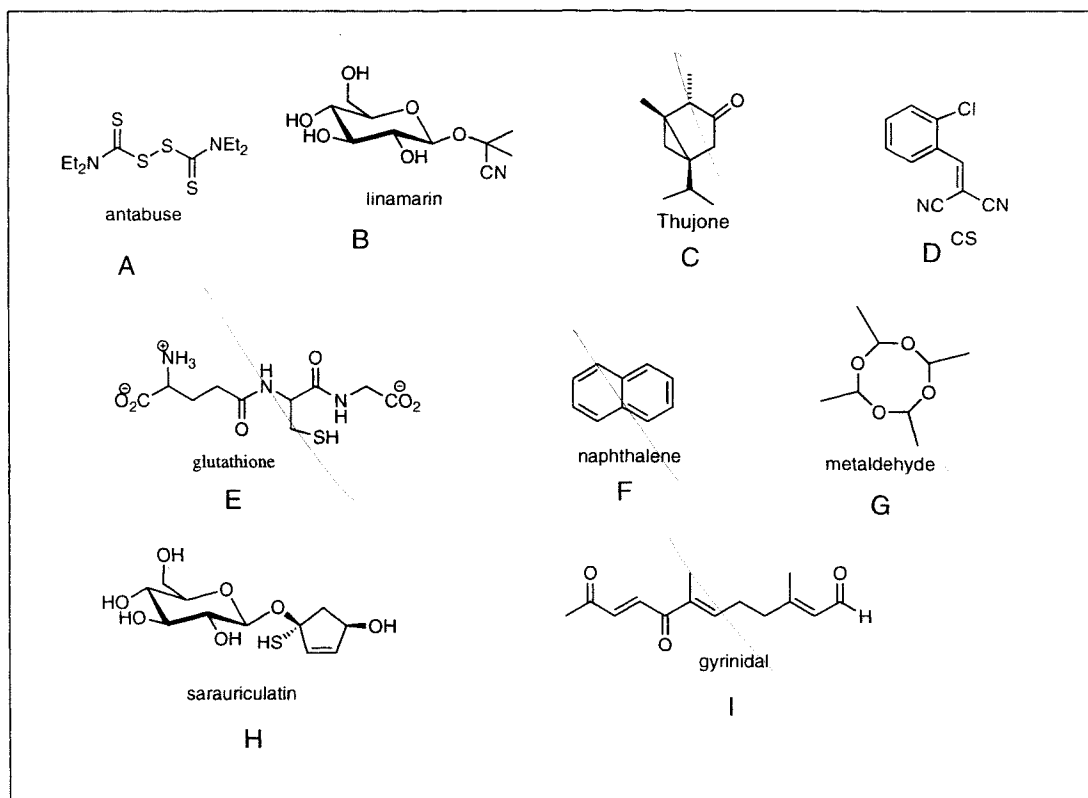
Fischer projection only.
NO ENOLS OR ENOLATES

Fischer projection only.
NO ENOLS OR ENOLATES



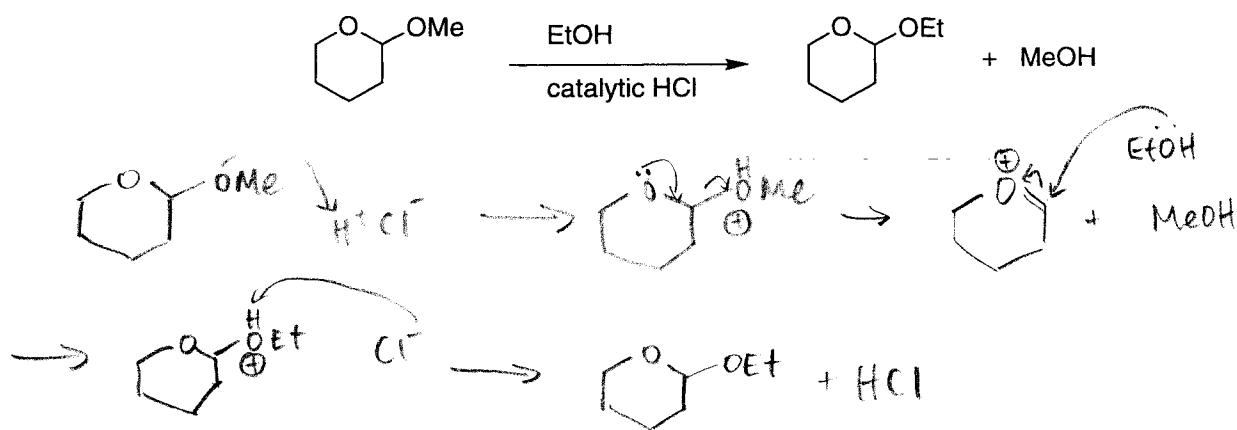
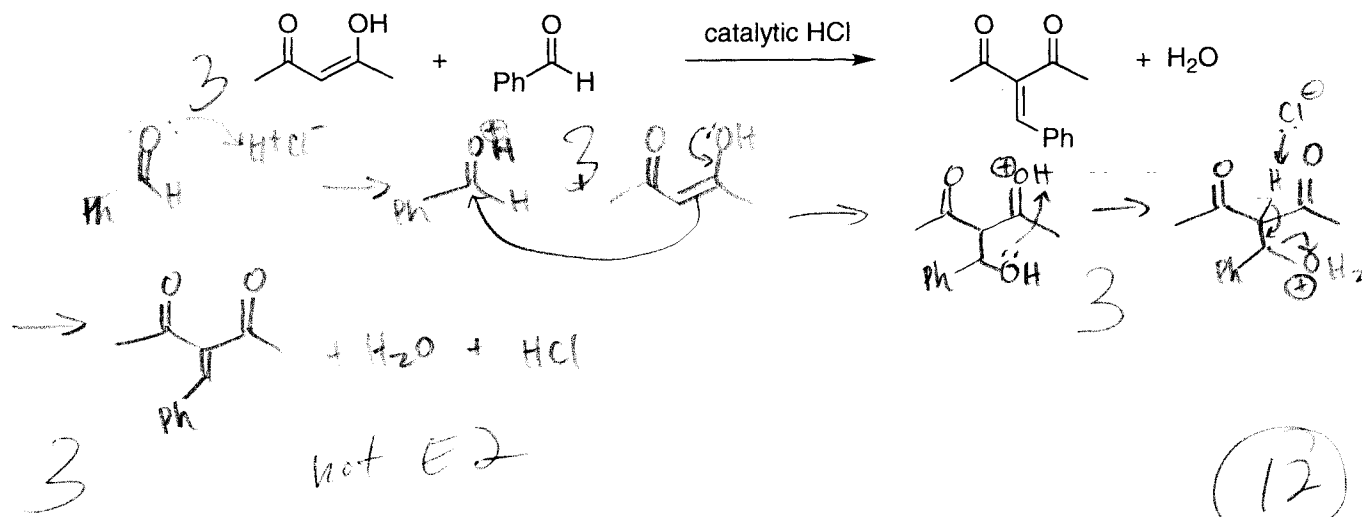
3. Match the molecules shown below with the statements (18 pts).

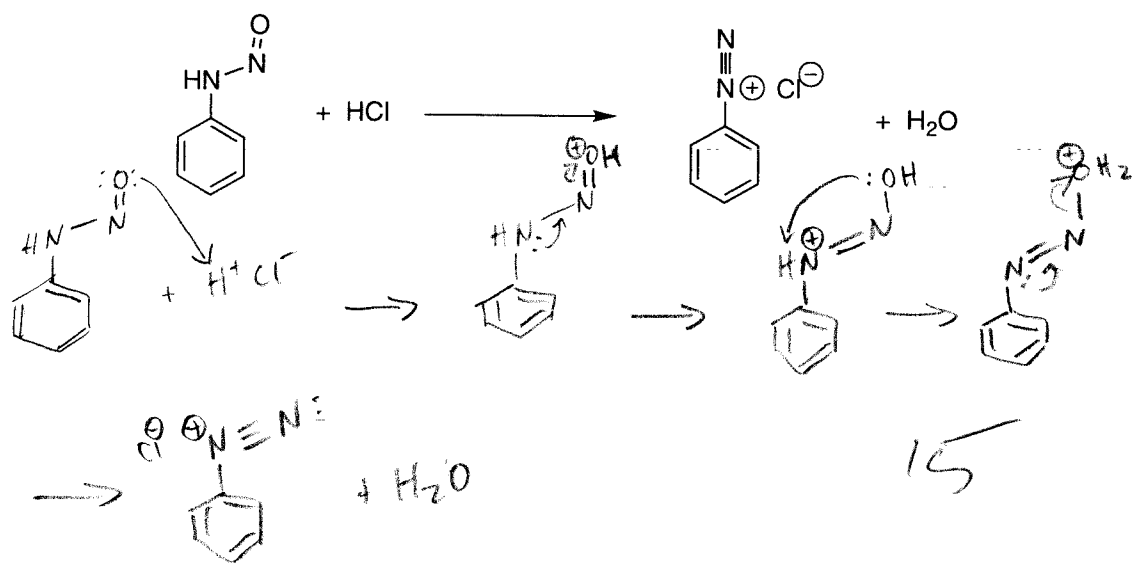
- a. When combined with alcohol, this compound will lead to the worst of hangovers. A
- b. An enone scavenger that leads to water-soluble adducts. E
- c. Protestors beware of this tear-jerker. D
- d. Heliconius sara transforms epivolkinin into this harmless derivative. H
- e. Patooy went the bass as it tried to make a snack out of the water beetle. I
- f. A compound used by plants to thwart off the appetites of hungry insects and animals. B
- g. An advertisement slogan for this compound could be "Snail Stopper". G
- h. Referring to Absinthe, Oscar Wilde said "Finally you see things as they really are and that is the most frightening thing of all." C
- i. The latest taggant. F

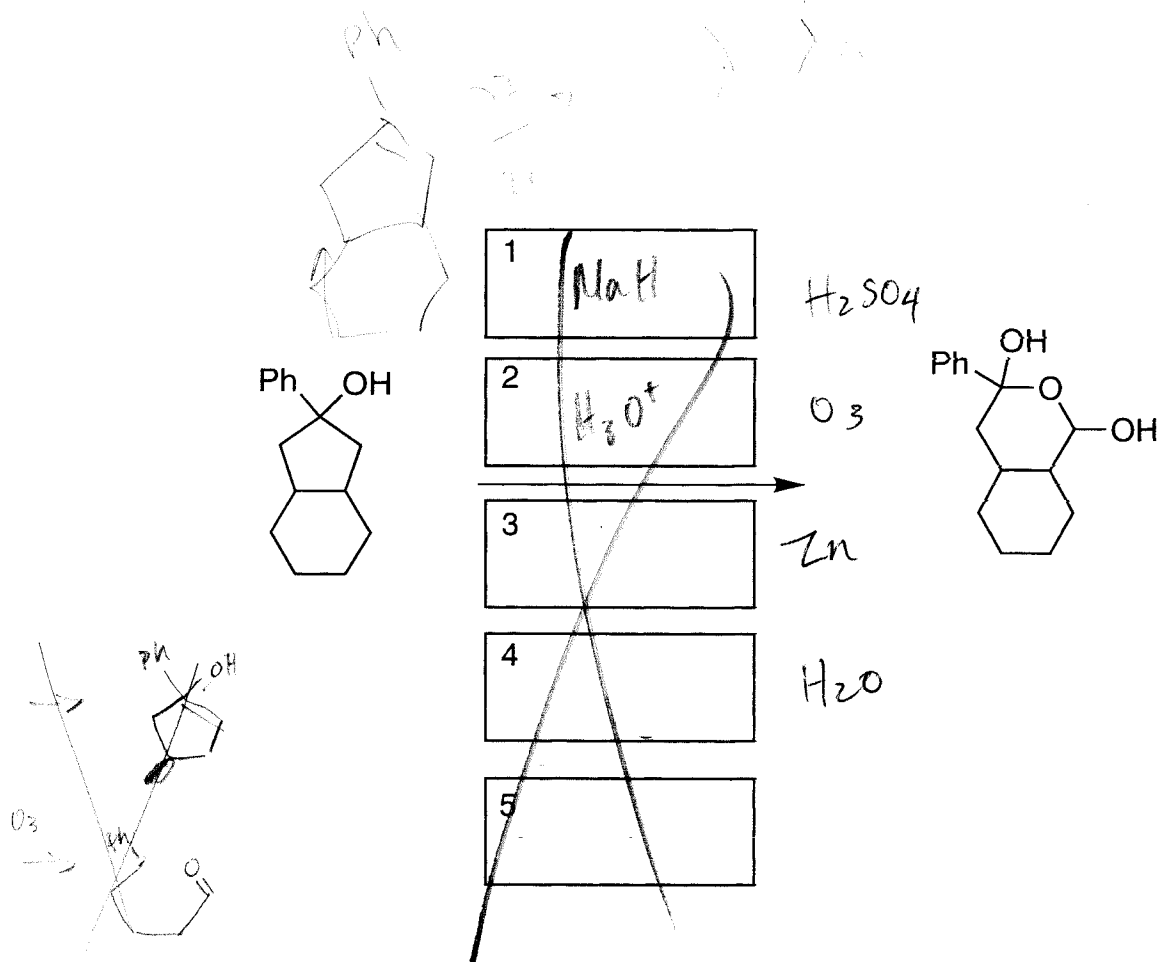


18

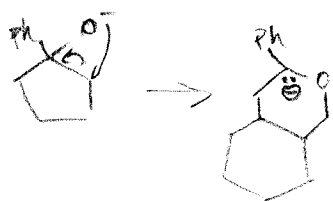
4. Provide a rational arrow pushing mechanism for each of the following reactions. (45 pts)



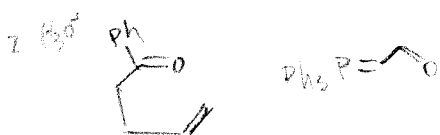
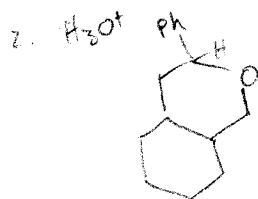
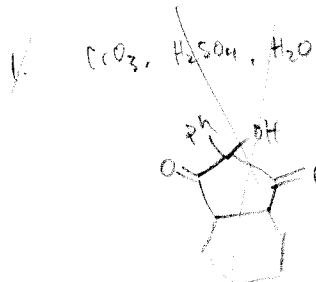




1. NaH

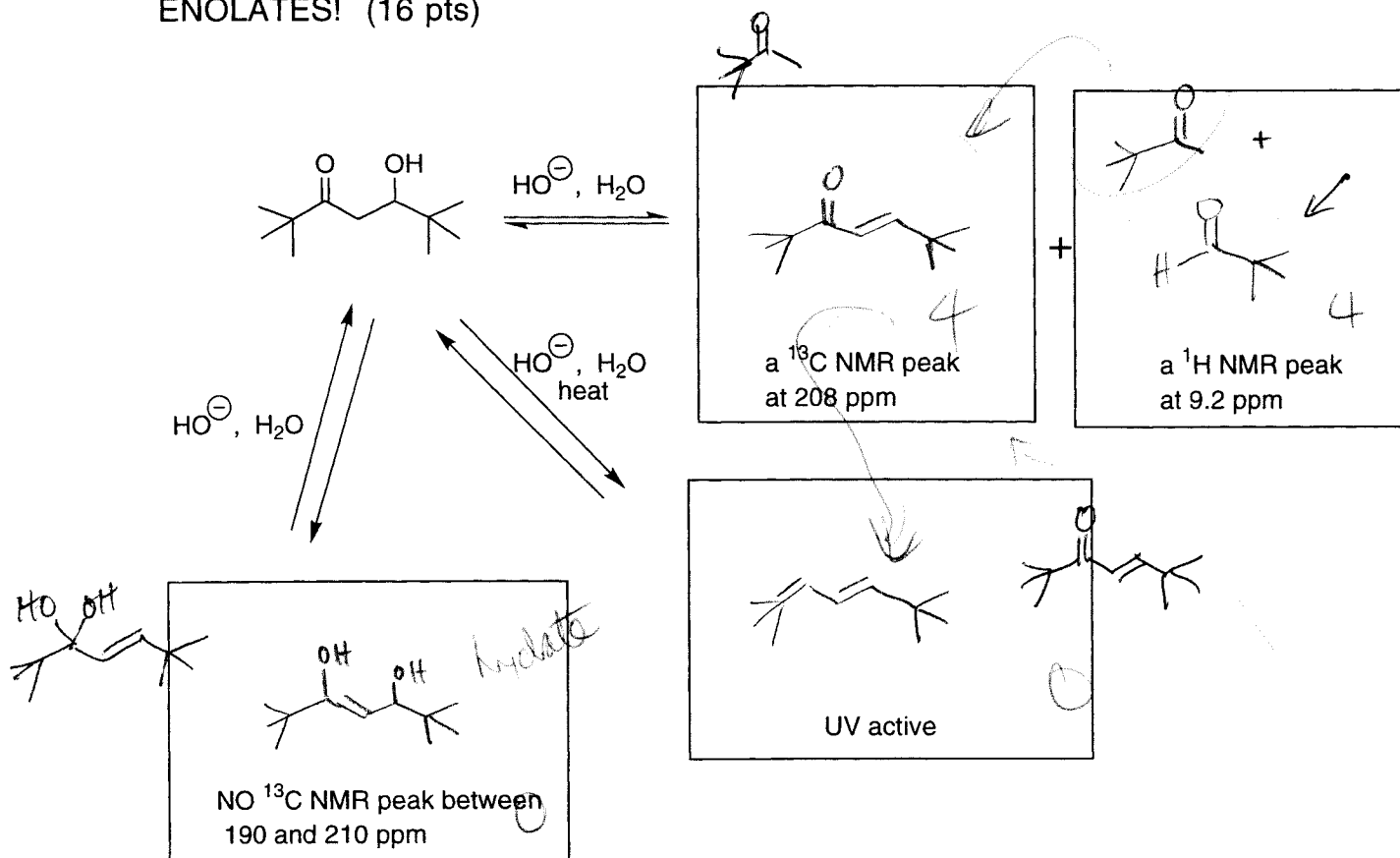


2. H_3O^+

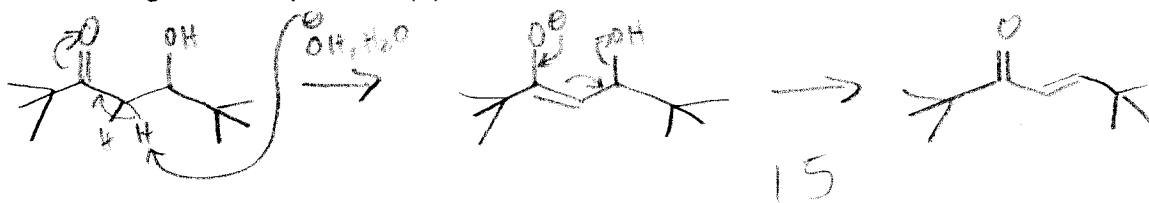


Handwritten signature

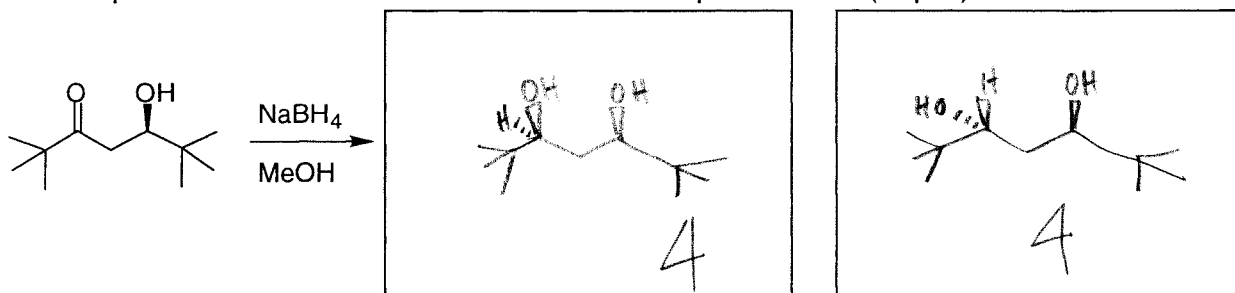
6. A. The following aldol product can enter into several different equilibria in the presence of aqueous base. Use the limited spectroscopic data in each box to identify the appropriate products. NONE OF THE PRODUCTS ARE ENOLS OR ENOLATES! (16 pts)



B. Pick any ONE of the above equilibria and write a rational arrow pushing mechanism leading to the product(s) in the box(s). (15 pts)



C. Reduction of the optically active ketone shown below with NaBH_4 in methanol led to two products. Draw these in the boxes provided. (8 pts)



D. Using ONLY (this means ONLY) the reagents and organic compounds shown in the box below propose a synthesis of the aldol product shown in part A. You may use any of these reagents or substrates as many times as you want. Your synthesis can be linear, meaning you perform several sequential steps leading to your product or it can be convergent, meaning you synthesize different fragments in separate steps and then bring them together at the end. These two approaches are illustrated below. (15 pts)

