NAME (Print): _____

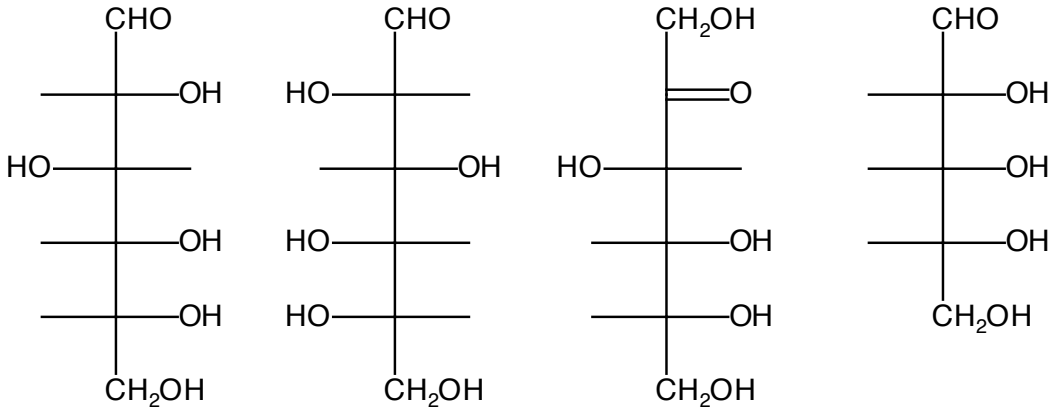
SIGNATURE: _____

Chemistry 310N
Dr. Brent Iverson
10th Homework
Apr 25, 2008

Please print the first three letters of your last name in the three boxes

Score: _____

For the following carbohydrates, draw a circle around all of the D-carbohydrate(s), and draw a rectangle around all of the L-carbohydrate(s). On the first two lines below the four structures, indicate whether each is an aldose or ketose, and whether each is a pentose or hexose, respectively. On the third line below each structure, construct a compound name from all of these elements. For example, answers might be L-ketopentose or L-aldohexose. Finally, on the fourth line under each structure write the specific name (i.e. D-glucose) for each structure. You should use table 25.1 or other structures named in the book to identify these exact sugar names. (You will NOT need to know them for the test).

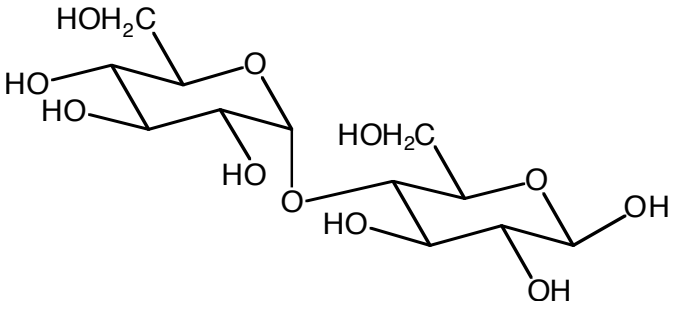


_____ _____ _____ _____ (aldose or ketose?)

_____ _____ _____ _____ (pentose or hexose?)

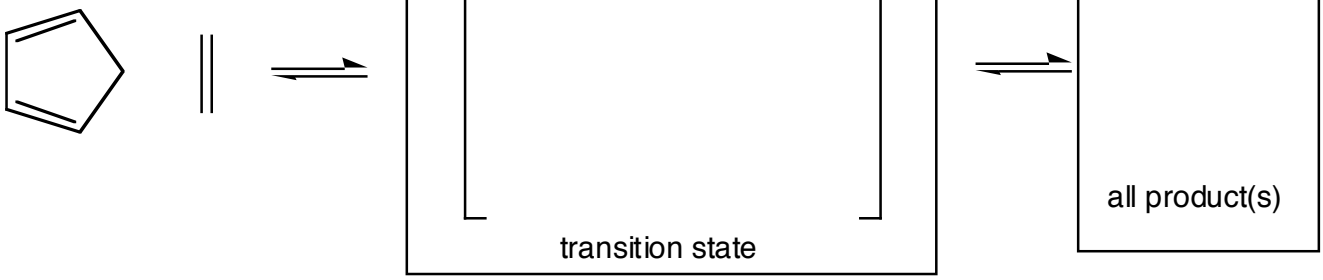
_____ _____ _____ _____ (compound name)

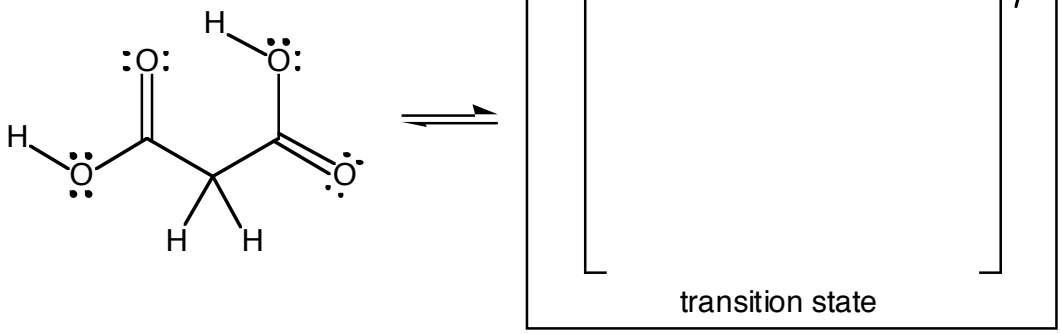
_____ _____ _____ _____ (exact name)

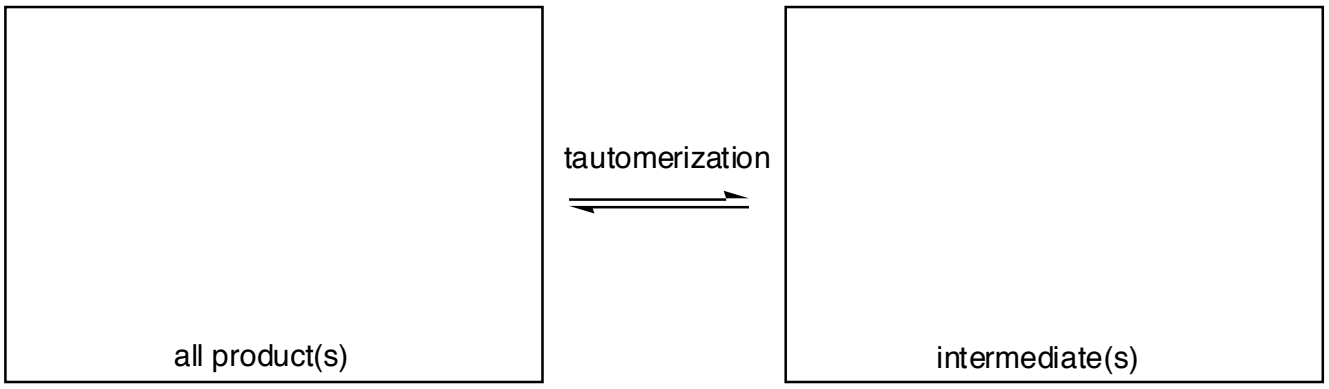


For the disaccharide of glucose on the left, draw a circle around any glucose residue that is/are α. Draw a box around any glucose residue that is/are β. Next, draw a box around the glyocosidic bond linkage. Finally, circle all anomeric carbon atoms.

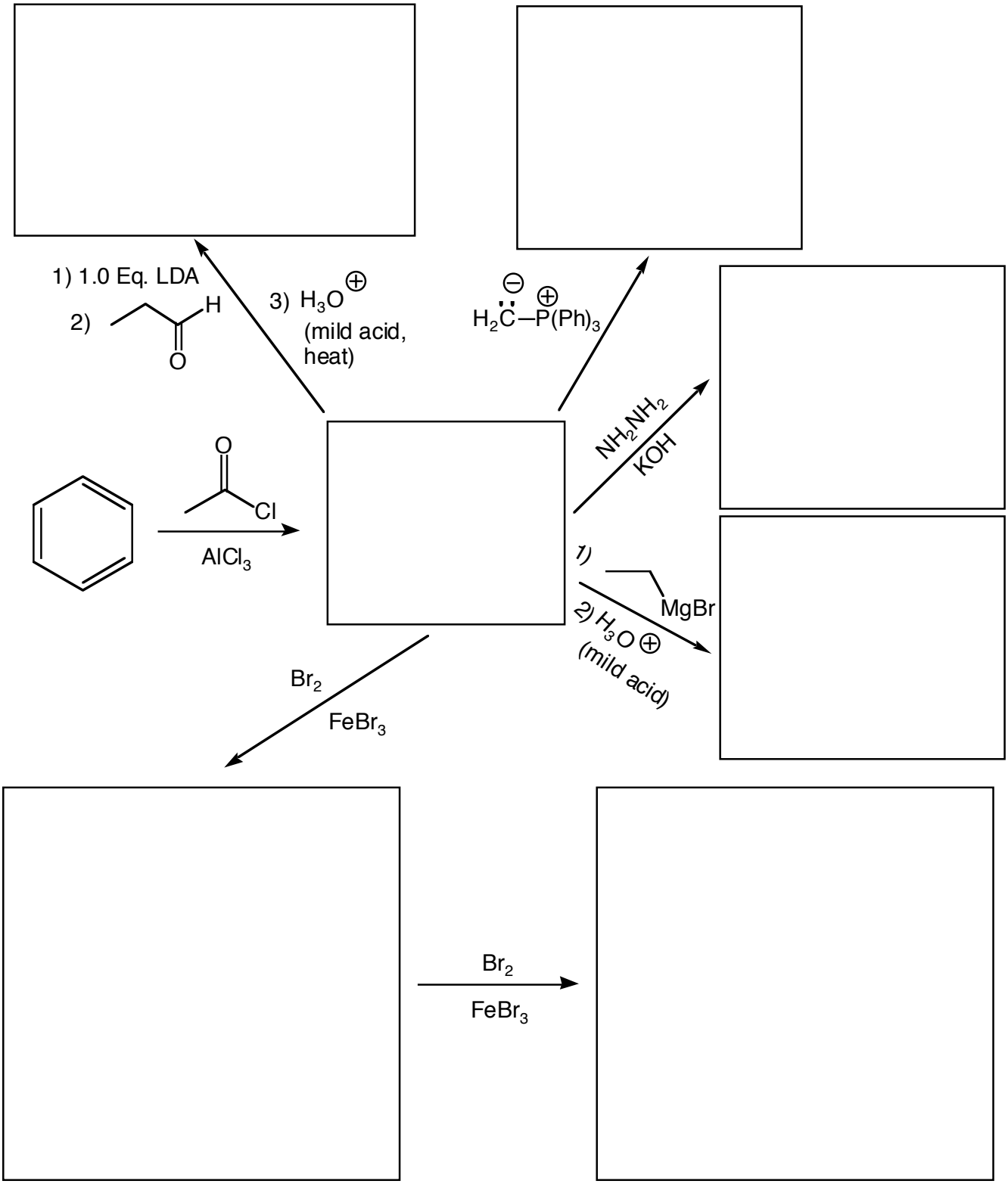
The following two reactions involve single steps and therefore transition states, not intermediates. On the starting materials shown, draw arrows to indicate the flow of electrons that leads to the transition states you draw in the boxes provided. Use broken lines (- - - - - -) to indicate bonds being formed or broken in the transition states. Finally draw the products of these steps of the reactions. For the second reaction draw the final product that is observed after tautomerization in the space provided. We have given you a lot of room, so please draw large, clear transition state structures.







For the following reactions, fill in theboxes with the predominant product or products. When ortho/para products are both produced, you must draw both. When a new chiral center is produced, put an asterisk (*) next to it. If a racemic mixture is produced, you must write racemic. If an E/Z mixture is produced, just draw one product, then write "E/Z mixture". I know these are complicated directions, so you might want to read them again so you know what we want.



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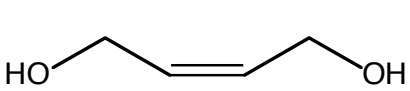
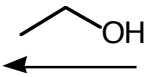
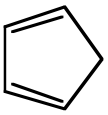
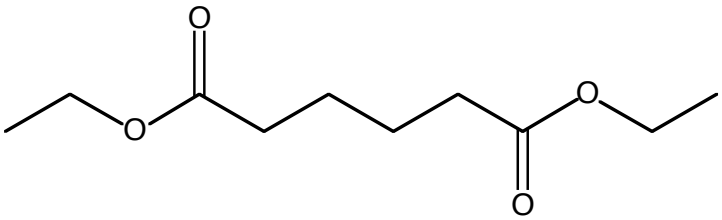


H_2CrO_4

$SOCl_2$







1) 2.0 Eq. LiOH
2) mild $H_3O^{\oplus}$

1) 1.0 Eq. NaOEt
2) mild $H_3O^{\oplus}$

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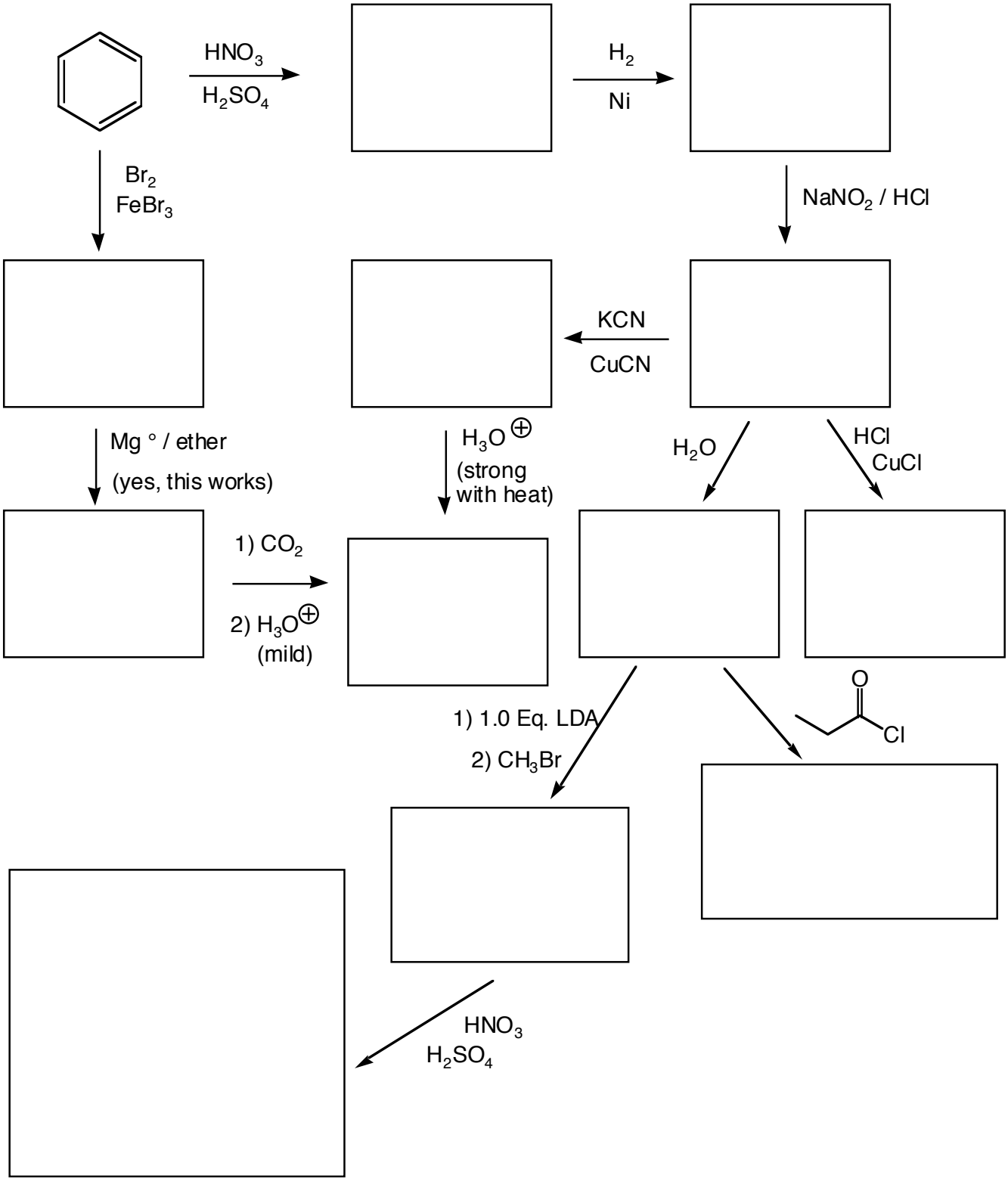
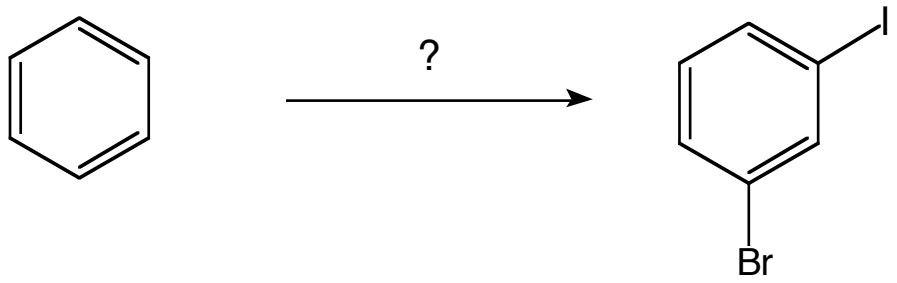


Using any reagents, synthesize the product molecule using the listed starting material(s) as the sole source of carbon atoms. Draw all molecules synthesized along the way, and your schemes must always rely on making predominant products when there are stereochemistry or regiochemistry considerations. Note that you can isolate either the ortho or para product as needed in reactions that create ortho/para products.

(13 pts)



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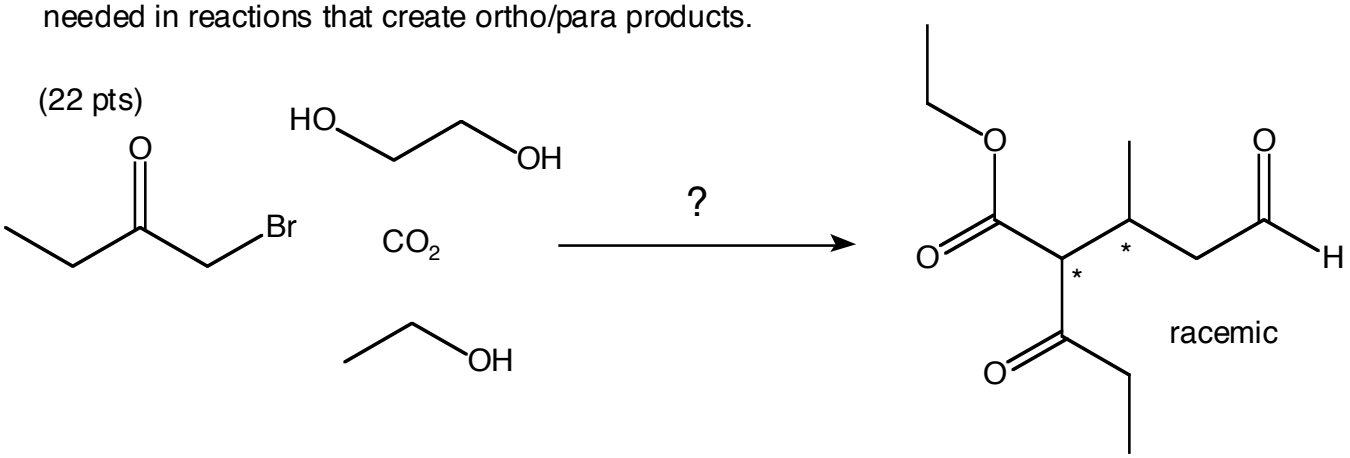
(22 pts)



Here is a change of pace. For the following reactions, circle the nucleophile and draw a box around the electrophile. Draw the product(s) of the reactions, using the standard format for your answers.