

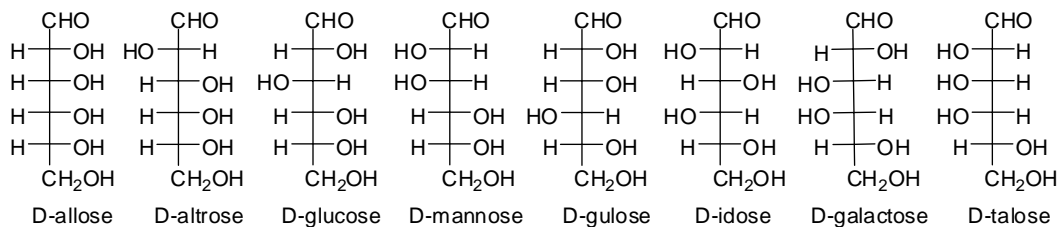
Organic Chemistry 2
Second Examination
April 4, 2008
Prof. Malachowski

Name: _____

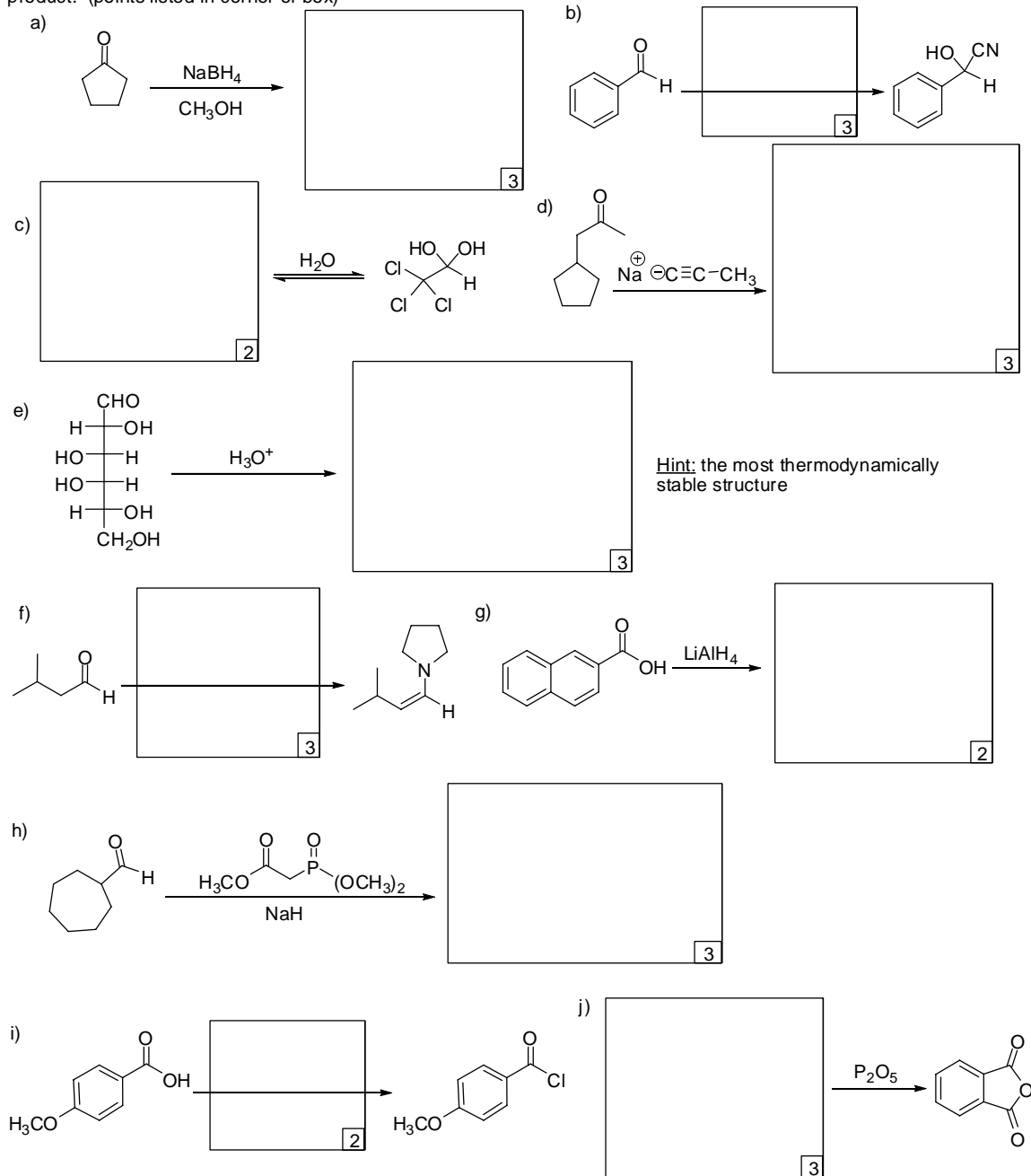
The examination has seven questions on four pages. The point values for each question are found with the question. Partial credit will be given where appropriate.

Read each question carefully before answering. Be certain you understand everything the question is requesting. Do the easy questions first. If questions appear confusing or exceedingly complex, then you may need to rethink the question. Keep in mind the intended examination topics.

In organic chemistry, hand-drawn pictures convey specific information. Be sure the drawing you have made conveys the essential information required to answer the question. Make certain that three-dimensional pictures display the correct atom arrangements. Don't forget to include lone pairs of electrons and formal charges when appropriate.



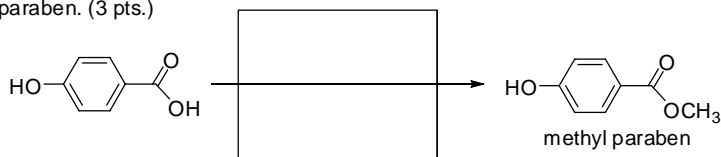
1. Complete the following reactions by providing the necessary information: starting material, reagent or major product. (points listed in corner of box)



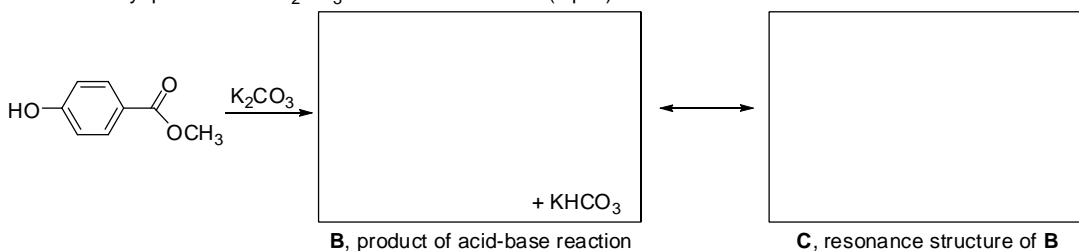
2. Choose one reaction listed in question 1 a-h and write 'Nu' next to the nucleophile in the reaction and 'E+' next to the electrophile. (2 pts.)

5. Avid food package readers (and other wackos like Dr. Mal) will recognize methyl paraben as a common food additive and preservative which inhibits bacteria growth.

a) Show a reagent or combination of reagents that can transform the inexpensive p-hydroxybenzoic acid into methyl paraben. (3 pts.)



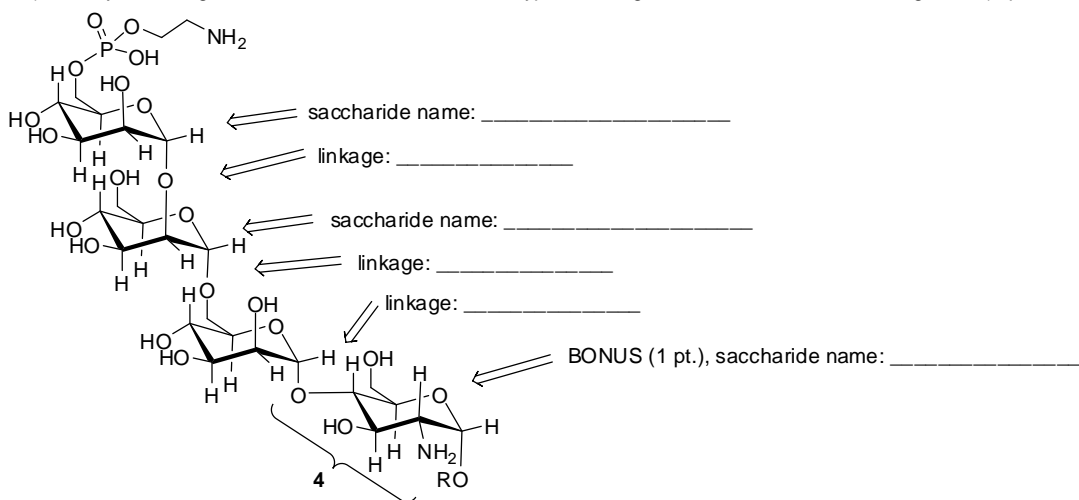
b) Methyl paraben has an acidic proton that can react with a base such as K_2CO_3 . Show the product of the reaction between methyl paraben and K_2CO_3 in the box labeled **B**. (3 pts.)



c) Methyl paraben is more acidic than phenol. Show the resonance structure in box **C** to the right (above) that shows why methyl paraben is more acidic than phenol. Include the curved electron flow arrows which show how **B** is transformed into **C**. (5 pts.)

6. The polysaccharide shown below was recently synthesized and is believed to assist the malaria virus in the initial infection process through cell surface interactions.

a) Identify the designated monosaccharides and the type of linkages in this tetrasaccharide fragment. (2 pts. each)



b) Circle the anomeric carbon on the monosaccharide labeled '4' and label it with an 'A'. (1 pt.)

c) Place a box around the configurational carbon on this saccharide and label it with 'C'. (1 pt.)

7. Synthesize the molecule on the right from the starting material on the left. You may use any inorganic or organic materials. (10 pts. each)

a) 5-bromo-2-pentanone -----> 5-oxohexanoic acid

