

Name \_\_\_\_\_

PID \_\_\_\_\_

**CHEMISTRY 252**  
**Exam 2 – 100 pts.**  
**Section 703 – Grand Rapids**  
**10 August 2006**

- Make sure you have all 8 exam pages
- You will have 90 minutes to complete the 5 questions
- Please sign your name at the bottom of this page.
- Try to make your answers as **clear** as possible. You don't need to be an artist, but if an answer is ambiguous it may be marked incorrect.
- Keep all answers inside the designated boxes.
- Read the directions, and don't be distracted by the large molecules.
- **Good luck!**

By signing this test, I certify that this is my own work and that my work is in accordance with MSU's policy on academic honesty, as stated in the Academic Freedom Report.

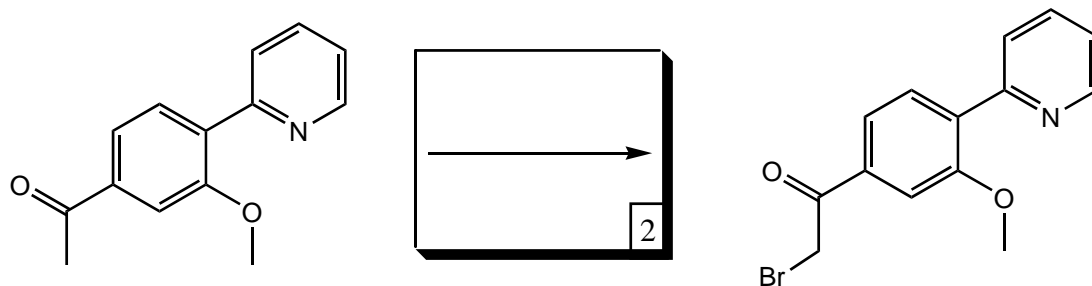
I		28
II		14
III		24
IV		16
V		18
Total		100

X \_\_\_\_\_

I. (28 pts.)

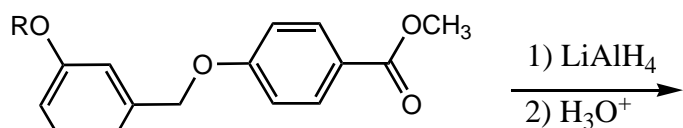
Complete the following reactions and syntheses. Use numbers (1,2,etc.) where necessary to indicate subsequent steps.

a) Synthesis of glutamate receptor antagonist for treatment of psychiatric and neurological disorders (*Bioorg. Med. Chem.* **2004**, 12, 17-21).



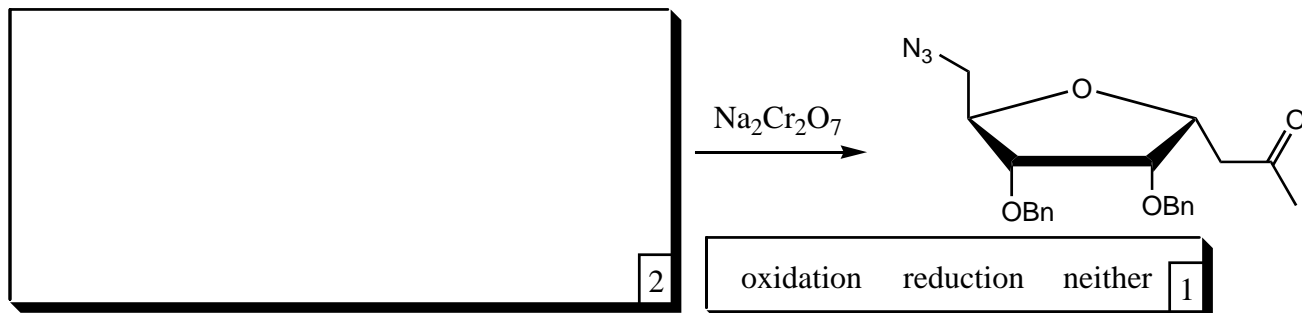
oxidation reduction neither 1

b) from *J. Am. Chem. Soc.* **2006**, 128, 6713-6720.



oxidation reduction neither 1

c) Synthesis of enzyme-inhibiting azasugars (*Tetrahedron*, **2005**, 61, 11716-11722).

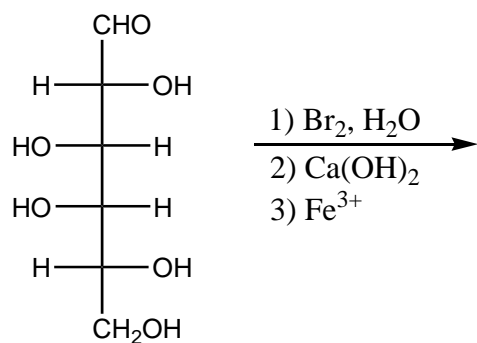


oxidation reduction neither 1

**Bonus!** What is the name of the reagent used above?

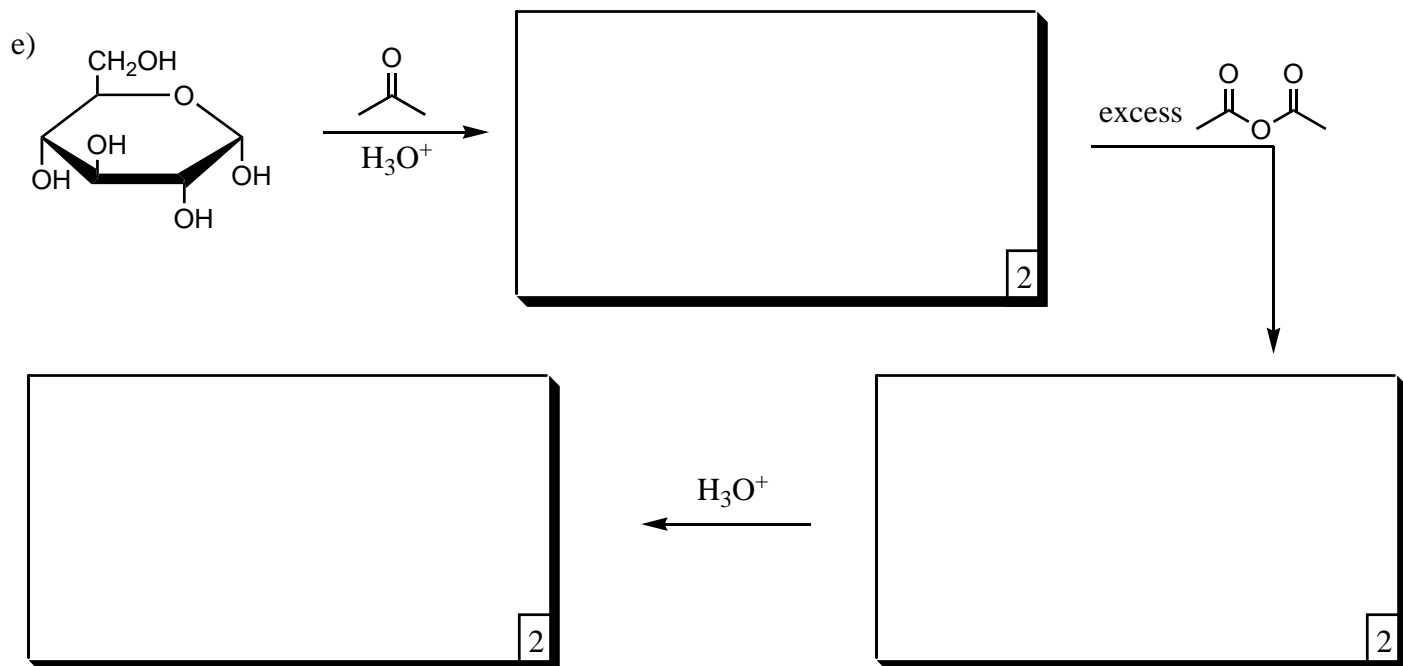
1

d)

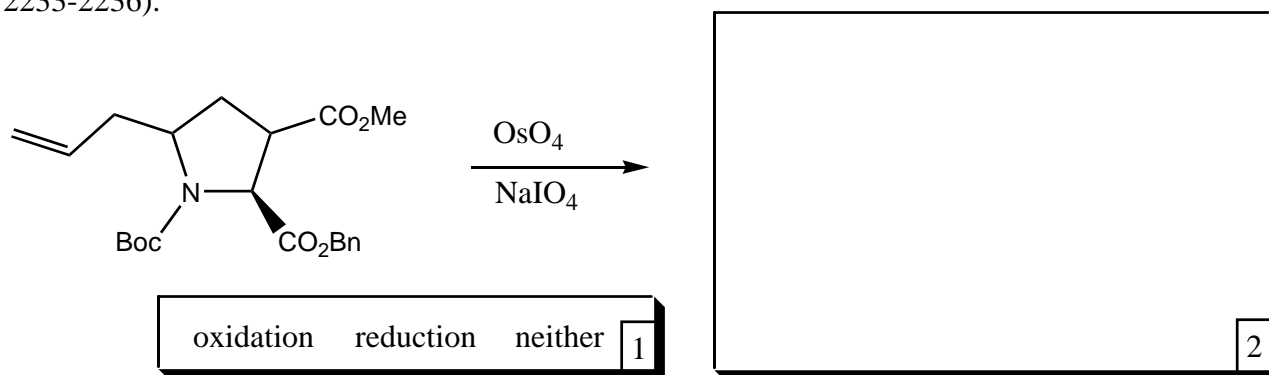


**Bonus!** Name this reaction:

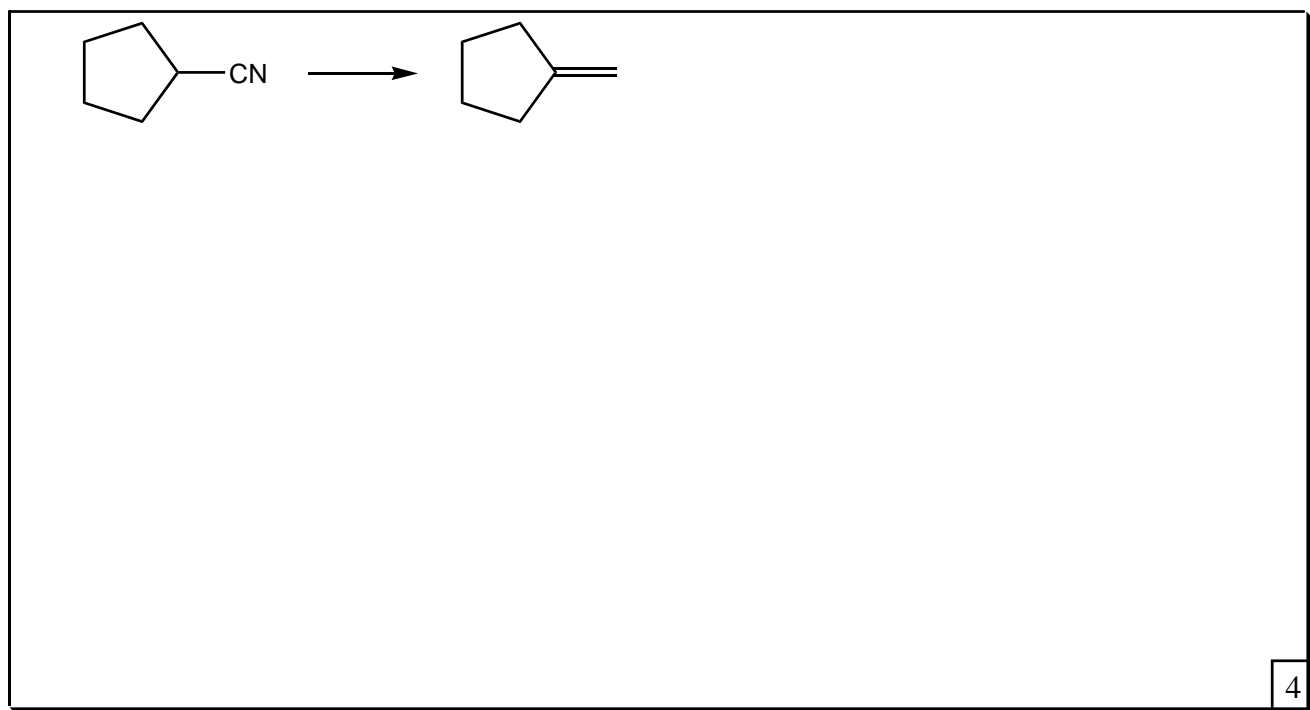
1



f) Synthesis of chimeric peptides to interact with CCK and opioid receptors (*Tetrahedron Lett.* **2006**, *47*, 2233-2236).

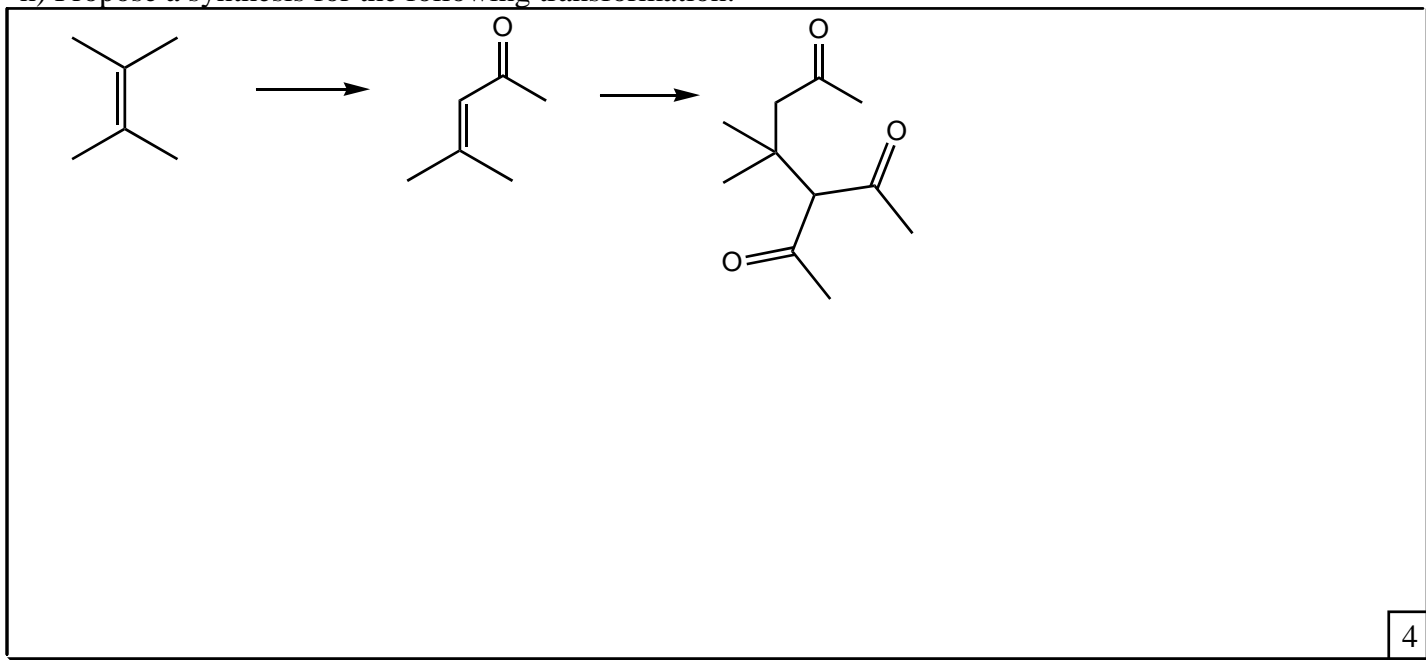


g) Propose a synthesis for the following transformation:



I. continued

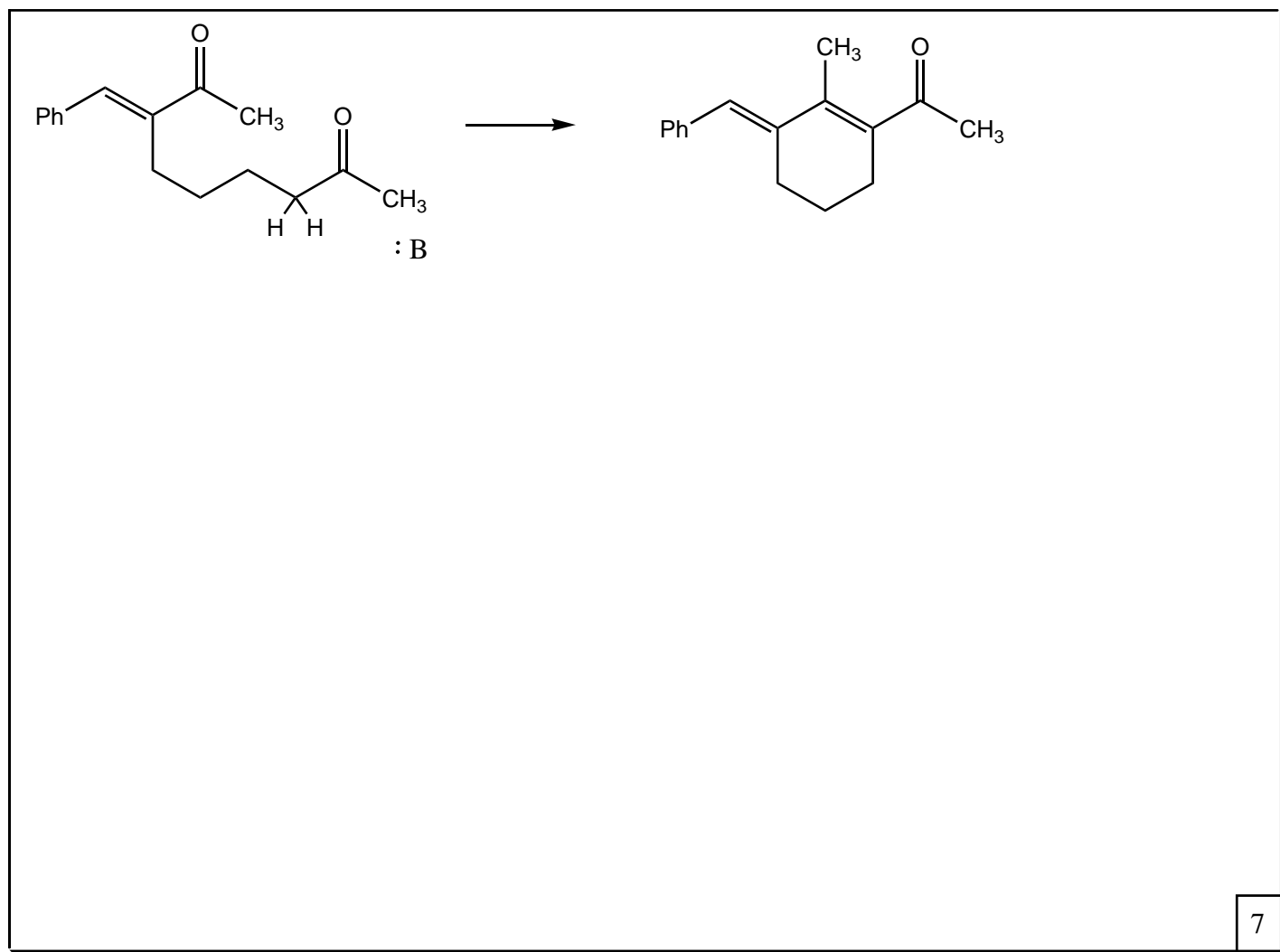
h) Propose a synthesis for the following transformation:



II. (14 pts.)

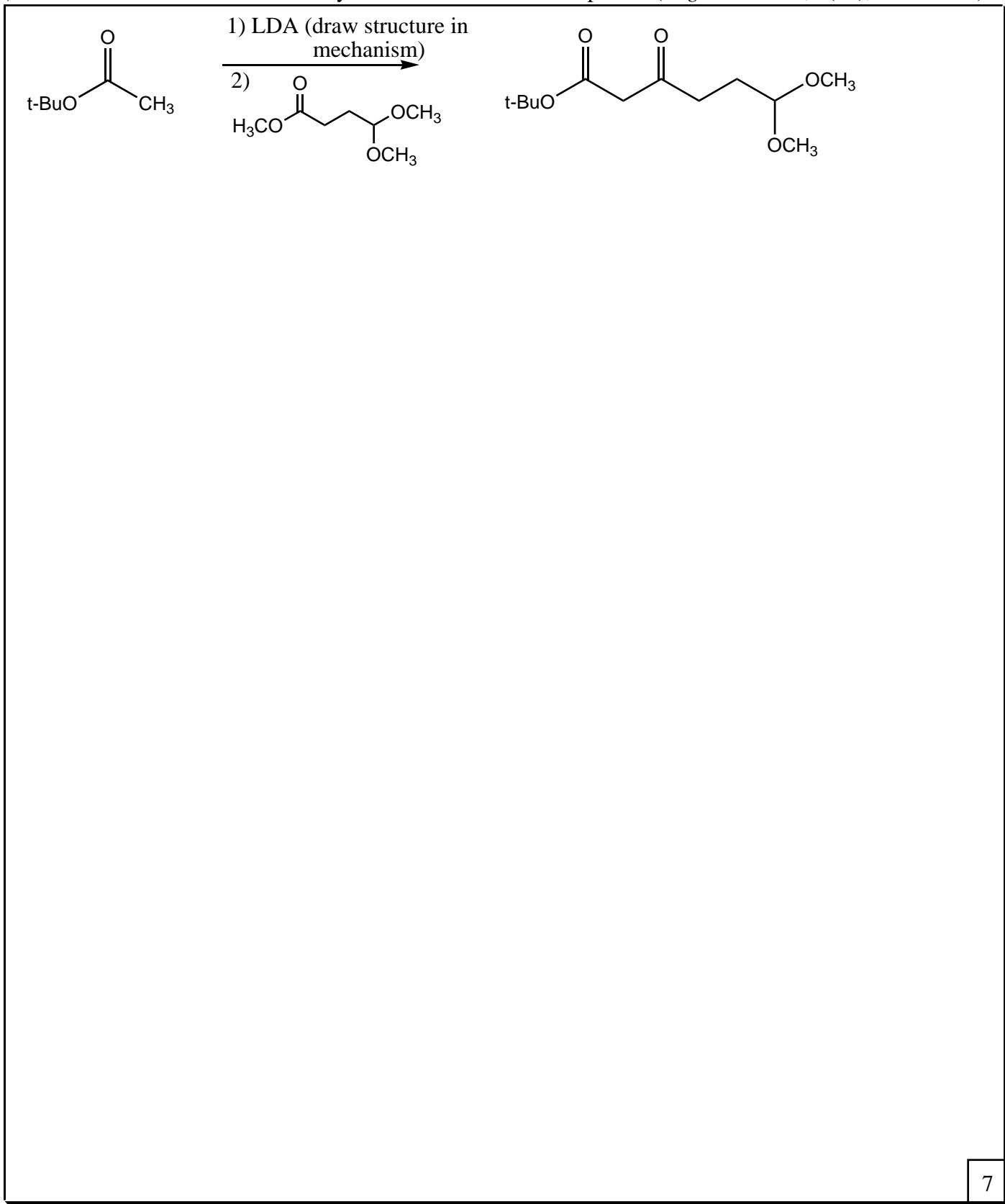
Draw mechanisms for the following condensation reactions.

a) Intramolecular aldol condensation (*Tetrahedron Lett.* **2006**, *47*, 1833-1837).



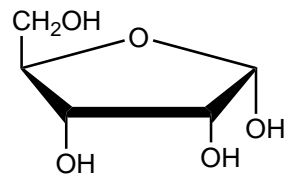
II. continued

b) Claisen condensation used in the synthesis of an ant-secreted poison (*Org. Lett.* **2005**, 7(20), 4423-4426).

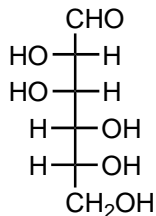


**III.** (24 pts.)

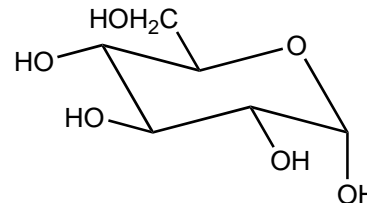
a) Using the structures below, draw the appropriate carbohydrate conformations:



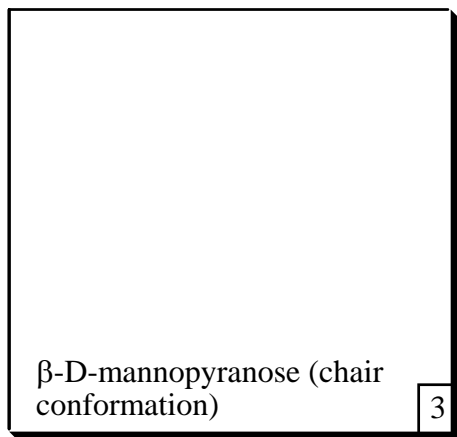
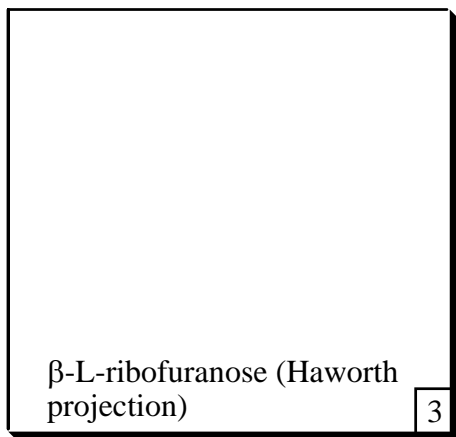
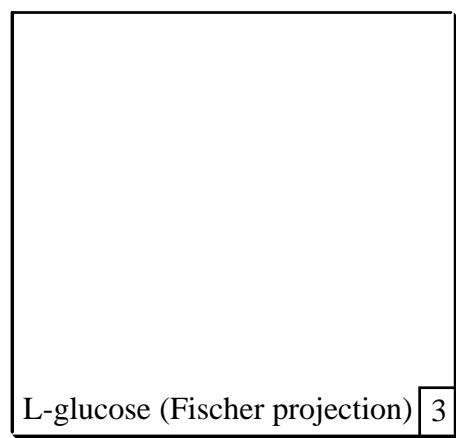
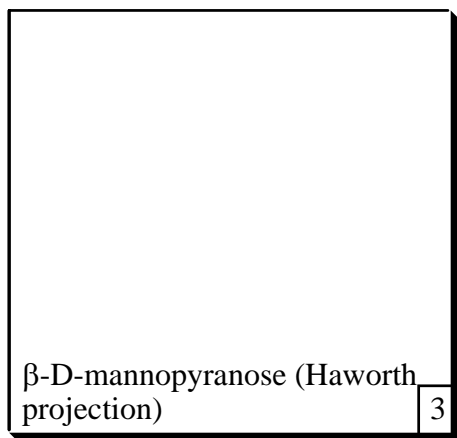
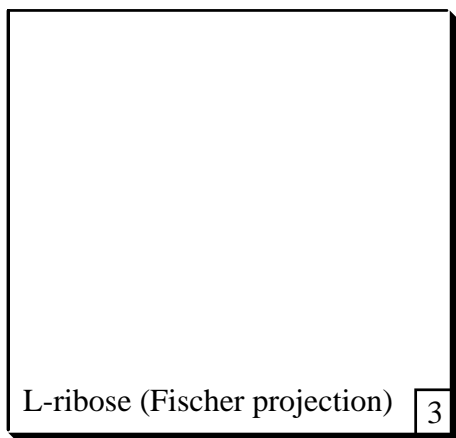
$\alpha$ -D-ribofuranose



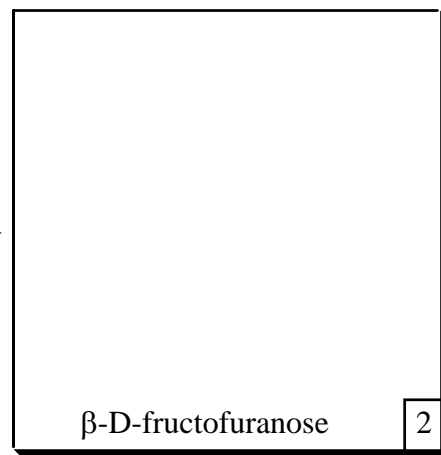
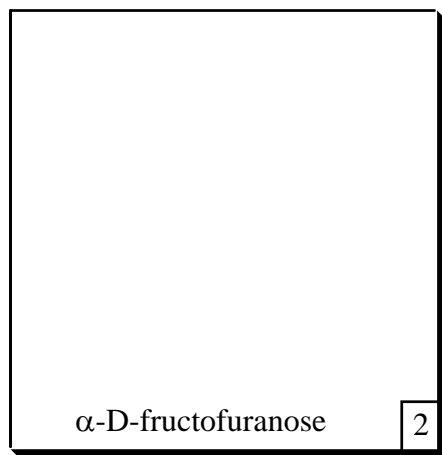
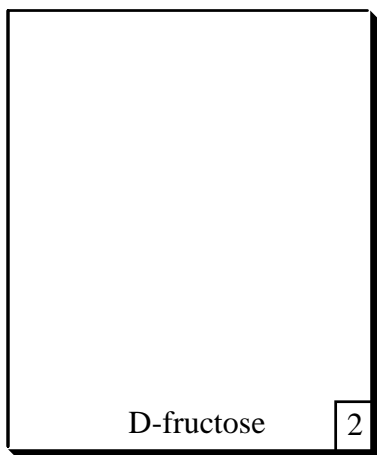
D-mannose



$\alpha$ -D-glucopyranose

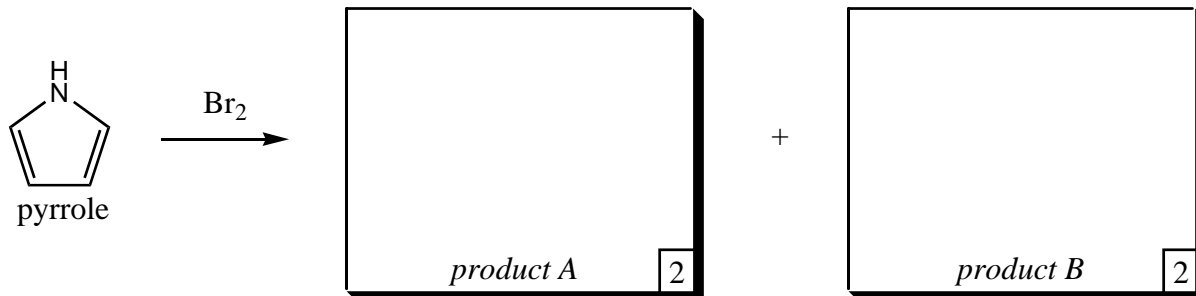


b) Draw the structures in the following reaction:

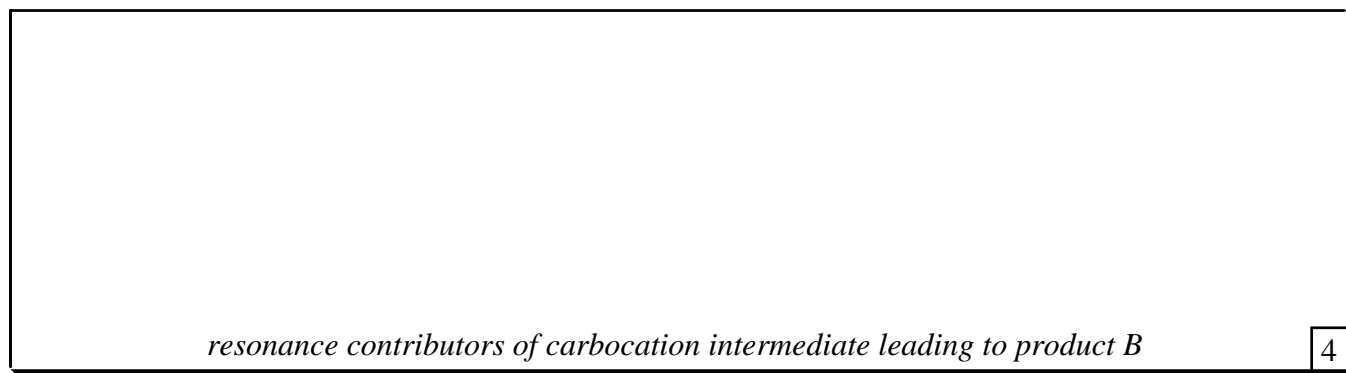
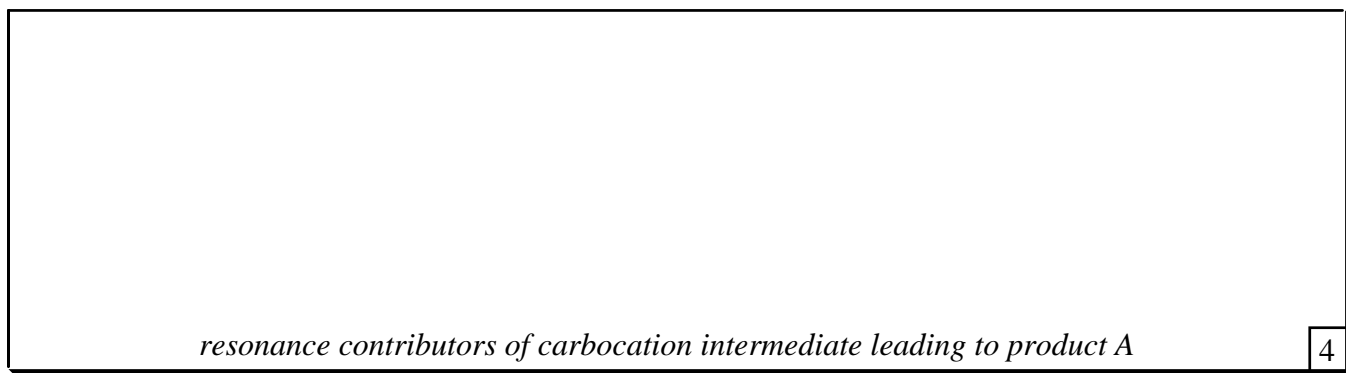


IV. (16 pts.)

a) Draw the two possible products of monobromination of pyrrole:



b) Draw all contributing resonance structures of the carbocation intermediates from the reaction in part (a).

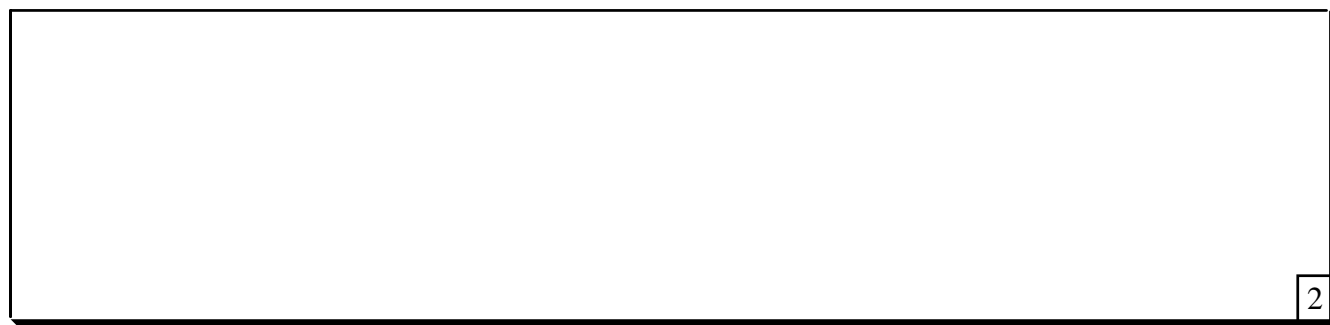


c) Which product will be produced in greater yield (circle one)?

Product A       Product B

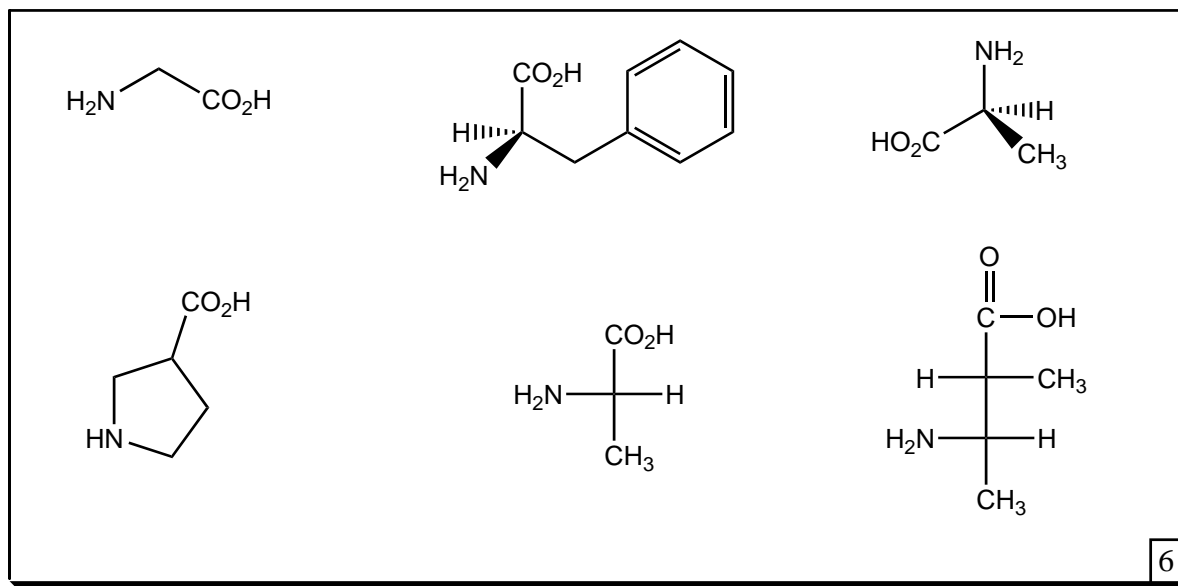
2

d) Why?

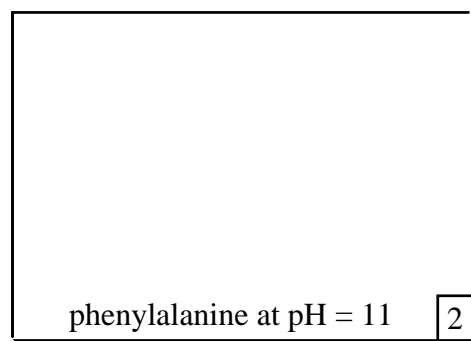
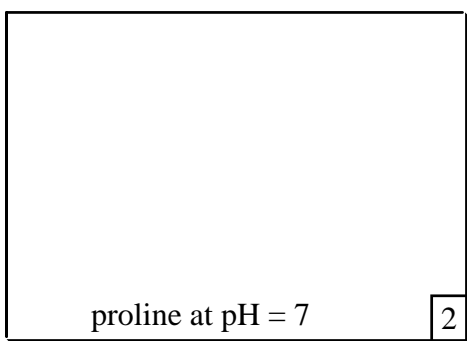
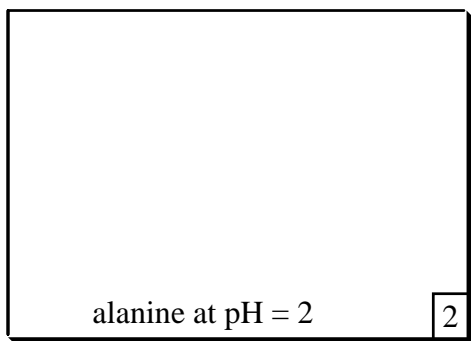


V. (18 pts.)

a) Which of the following are **not** naturally-occurring amino acids (circle them)?



b) Draw the following amino acids:



c) Propose a synthesis of the peptide glycine-alanine-proline-glycine from the amino acids:

