

Chemistry 334

Examination #3

November 15, 2004

Professor Charonnat

Name: \_\_\_\_\_

Be certain that your examination has five (5) pages including this one.

Put your name on **each** page of this examination booklet.

By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

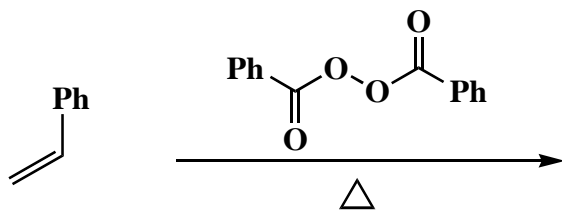
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: \_\_\_\_\_

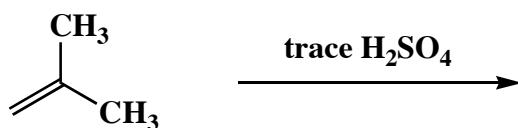
1. (25 points)

Denote the major organic product for each of the following five (5) questions. Specify stereochemistry clearly, if relevant.

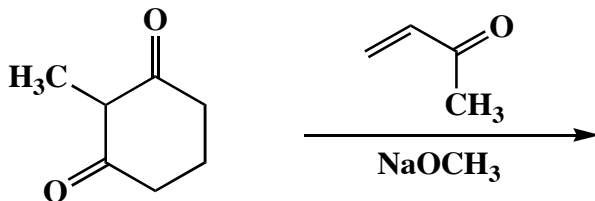
A.



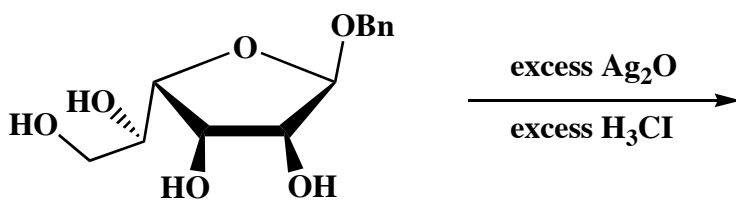
B.



C.

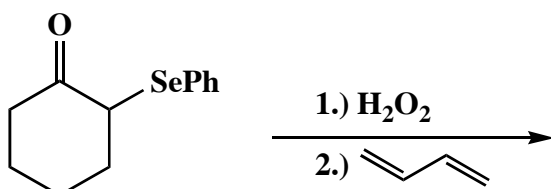


D.



Bn = benzyl

E.



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2. (25 points)

Circle the number that corresponds to the correct answer for each of the following five (5) questions.

A. Dacron is

1. an addition homopolymer
2. an addition copolymer
3. a condensation homopolymer
4. a condensation copolymer

B. The product of an aldol condensation is

1. an  $\alpha$ -hydroxy carbonyl compound
2. a  $\beta$ -hydroxy carbonyl compound
3. a  $\gamma$ -hydroxy carbonyl compound

C. D-(-)-Ribose and D-(+)-glucose are

1. enantiomers
2. diastereomers
3. not stereoisomers

D. Which of the following carbohydrates will react with Tollens reagent?

1. methyl  $\alpha$ -D-fructofuranoside
2. sucrose
3. maltose

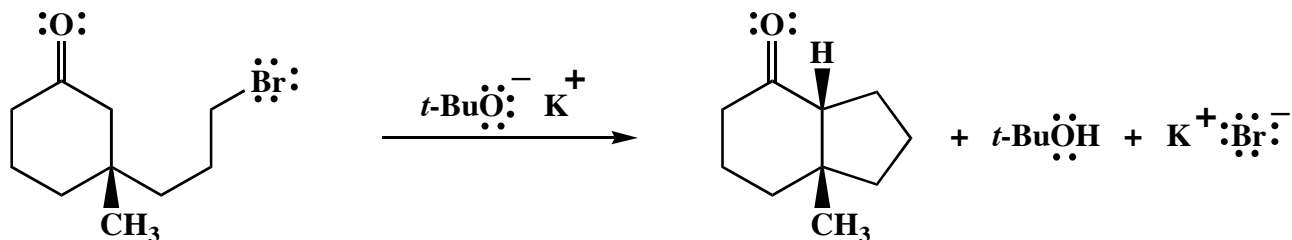
E. The "anomeric effect" energetically favors

1. the  $\alpha$ -anomer
2. the  $\beta$ -anomer
3. the  $\gamma$ -anomer

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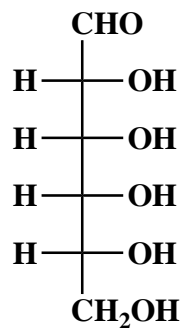
3. (20 points)

Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates, unshared electrons, formal charges and countercharges. Explain why two molecules of the starting material do not bond together, but rather a five-membered ring is formed, instead. Also, explain why aldol condensation is not an important side-reaction.



4. (10 points)

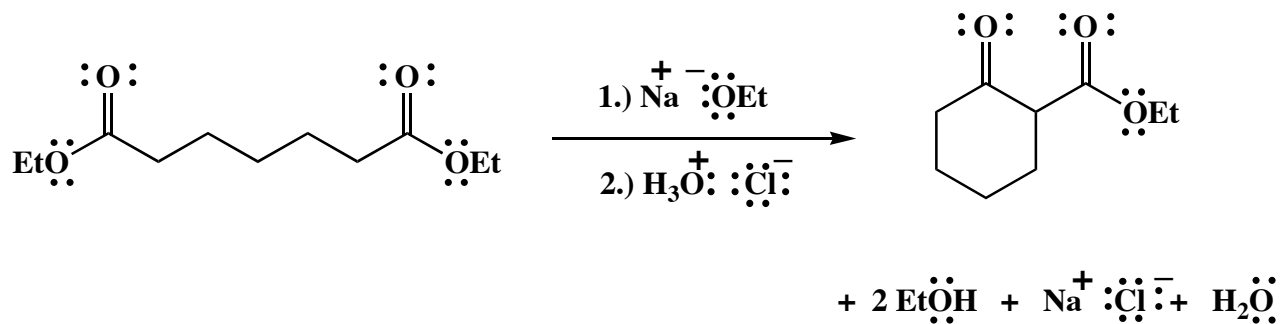
Draw the most stable conformation of the pyranose  $\alpha$ -anomer of the monosaccharide, D-(+)-allose. Denote all 1,3-diaxial interactions clearly.



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5. (20 points)

Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates, unshared electrons, formal charges and countercharges. Specify reversibility or irreversibility for each primary mechanistic step.



**Congratulations!**

1	/25
2	/25
3	/20
4	/10
5	/20
<hr/> Total:	/100