

Chemistry 334

Hour Examination #3

May 3, 1999

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.

Name: _____

1. (20 points)

For each of the following five (5) questions, circle the number that corresponds to the correct answer.

A. Amylose contains D-glucose molecules linked together by

1. α -1,4'-glycosidic bonds
2. α -1,6'-glycosidic bonds
3. β -1,4'-glycosidic bonds

B. All D-aldoses contain

1. a hydroxyl group pointing to the left on the penultimate carbon of the Fischer representation
2. a hydroxyl group pointing to the right on the penultimate carbon of the Fischer representation
3. a hydroxyl group pointing to the right on the α -carbon of the Fischer representation

C. The backbone of RNA is composed of

1. a homopolymer of ribose units
2. a block copolymer of ribose and phosphate units
3. an alternating copolymer of ribose and phosphate units

D. A stretched rubber band snaps back due to

1. increased entropy
2. increased enthalpy
3. decreased steric interactions

E. Individual chains of Nylon-8 do not slide relative to each other due to

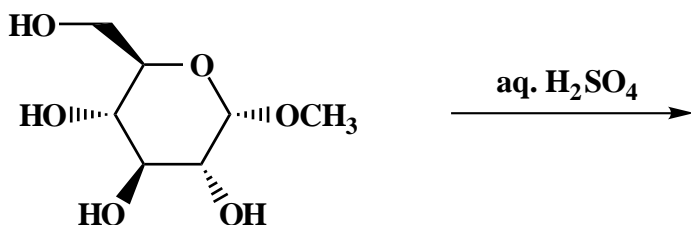
1. steric interactions
2. intermolecular hydrogen bonding
3. intramolecular hydrogen bonding

Name: _____

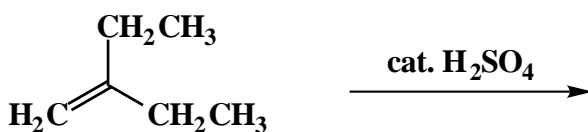
2. (25 points)

For each of the following five (5) questions draw the structure of the expected major organic product. If relevant, **clearly** specify the relative and/or absolute stereochemistry of the product.

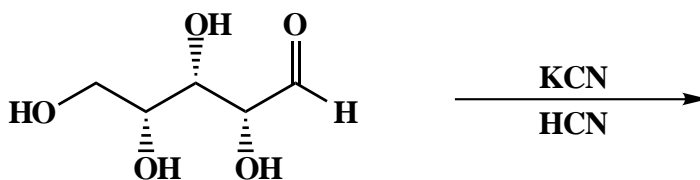
A.



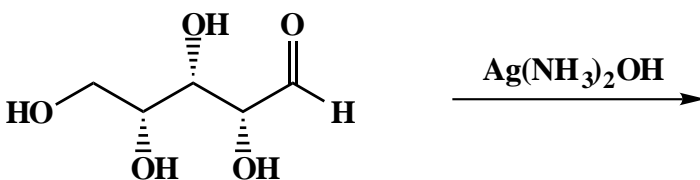
B.



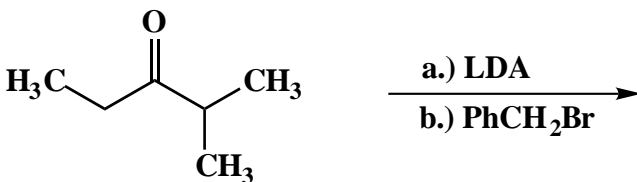
C.



D.



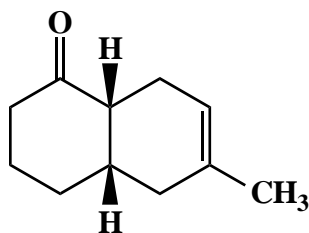
E.



Name: _____

3. (20 points)

Design a synthesis of a racemic mixture of the bicyclic ketone **1** from cyclohexanol and mono- or difunctional organic compounds containing five carbons or less. Show all reagents and stable synthetic intermediate compounds. (**N.B.** Do not draw mechanisms for each synthetic transformation!)



1

4. (10 points)

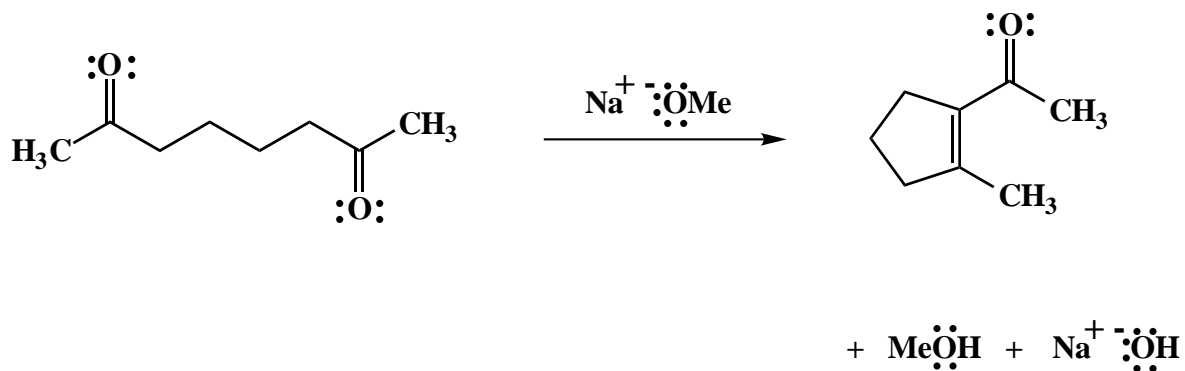
Answer the following question precisely, succinctly and with correct grammar.

How are two anomers related to each other, stereochemically? Draw the structures of a specific pair of anomers to illustrate your answer.

Name: _____

5. (25 points)

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



Congratulations!

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