

Chemistry 333

Examination #2

June 30, 2003

Professor Charonnat

Name: _____

Be certain that your examination has seven (7) 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.

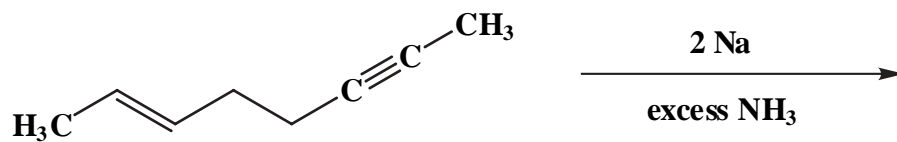
Molecular models are allowed for this examination. Calculators are unnecessary and are not allowed.

Name: _____

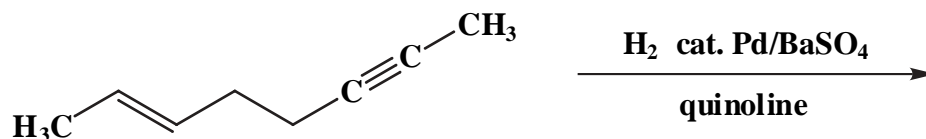
1. (25 points)

Draw the major organic product for each of the following five (5) reactions. Clearly specify stereochemistry, if relevant.

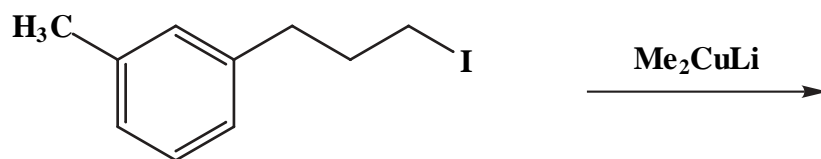
A.



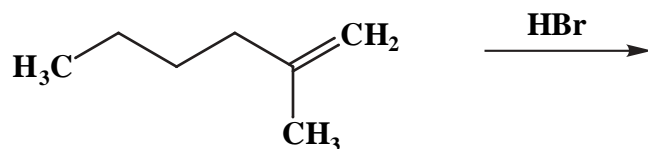
B.



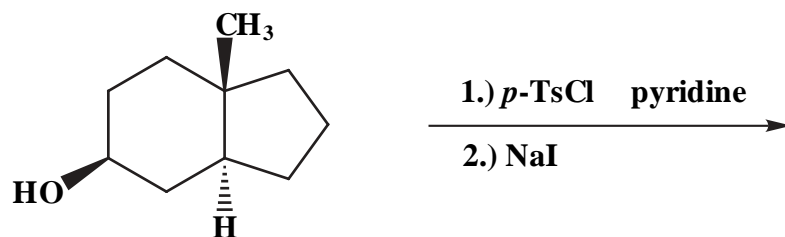
C.



D.



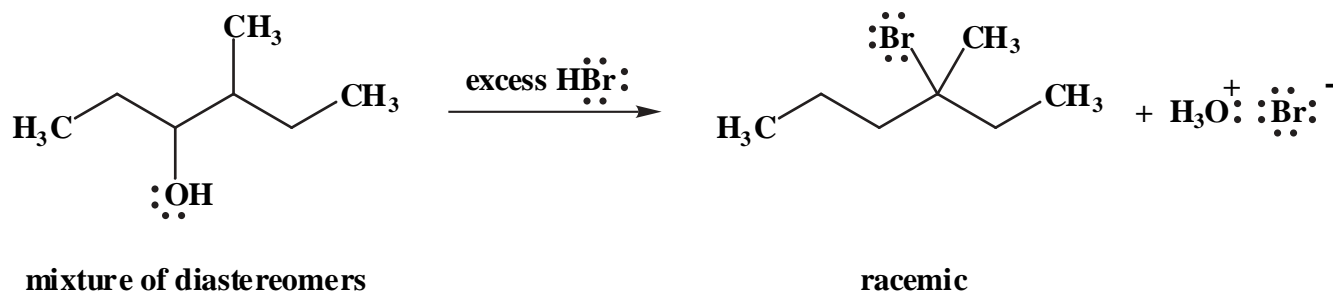
E.



Name: _____

2. (30 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** lone pairs, nonzero formal charges and countercharges. Finally, explain why a racemic mixture is obtained.



Name: _____

3. (25 points)

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

A. A horizontal line in a Fischer projection specifies a bond that:

1. is in the plane of the page
2. projects back into the page
3. projects out of the page

B. An achiral molecule is:

1. superimposable on its mirror image
2. not superimposable on its mirror image
3. superimposable on a different conformation

C. Which of the following is not true?

1. stereoisomers have identical molecular formulas
2. stereoisomers have identical spatial orientation of bonds
3. stereoisomers have the same sequence of bonds

D. Specific rotation is a function of:

1. pathlength
2. concentration
3. neither pathlength nor concentration

E. If the specific rotation of a compound is positive, then the specific rotation of its diastereomer will be:

1. negative
2. positive
3. either negative or positive

Name: _____

4. (30 points)

Answer the following three (3) questions precisely, succinctly and with correct grammar.

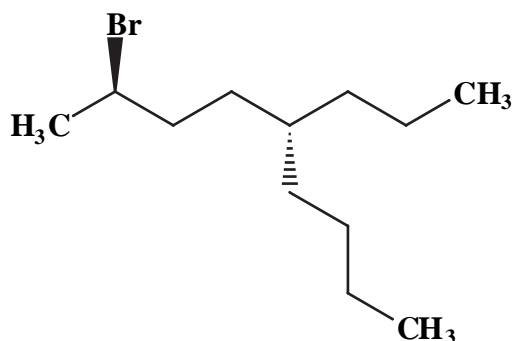
A. Explain why a 75:25 mixture of two enantiomers has a nonzero specific rotation.

B. Explain why the rate of an E1 reaction is independent of base concentration.

C. Explain why the iodide anion of tetranonylammonium iodide is more nucleophilic than the iodide anion of sodium iodide.

5. (10 points)

Use IUPAC nomenclature to write the systematic name of the following alkyl halide.

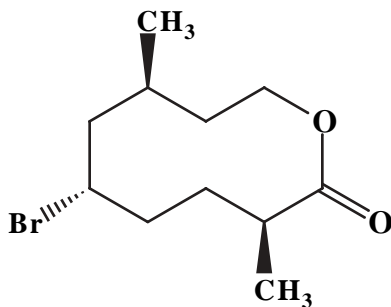
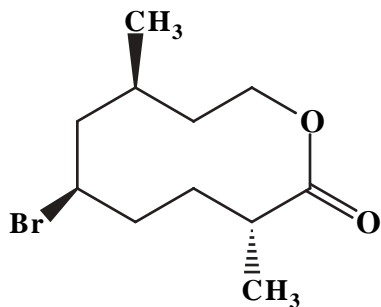


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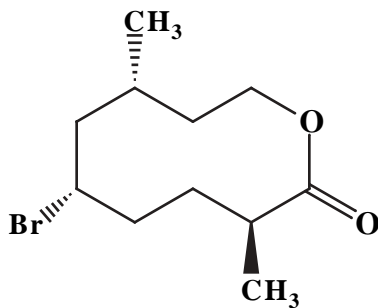
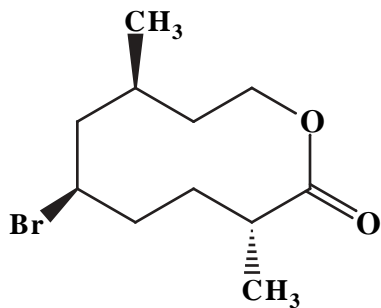
6. (20 points)

State the relationship between each of the following four (4) pairs of structures (identical, enantiomers, diastereomers, structural isomers, conformational isomers, different compounds that are not isomeric).

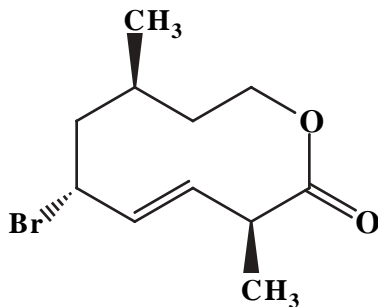
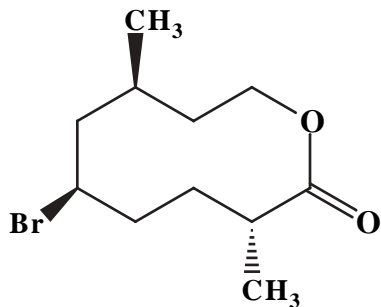
A.



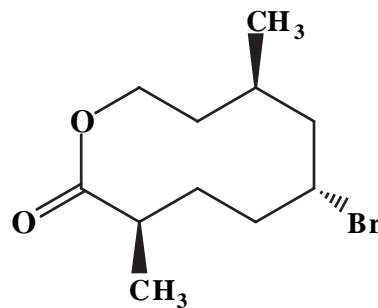
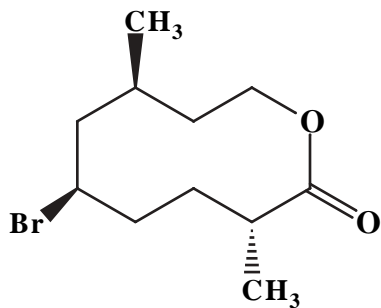
B.



C.



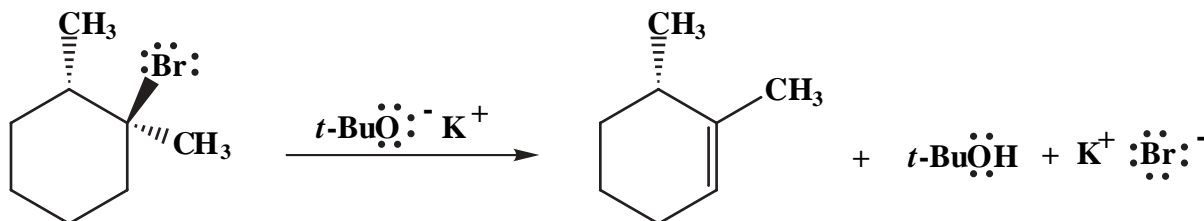
D.



Name: _____

7. (10 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** lone pairs, nonzero formal charges and countercharges. Draw a three-dimensional picture to show why the observed regiochemical result is obtained.



Congratulations!

1	/25
2	/30
3	/25
4	/30
5	/10
6	/20
7	/10
Total:	/150