

Chemistry 333

Examination #2

April 3, 2000

Professor Charonnat

Name: _____

Be certain that your examination has six (6) pages including this one.

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

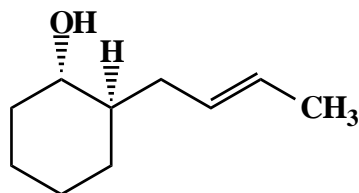
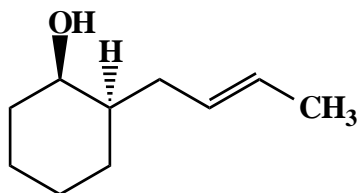
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: _____

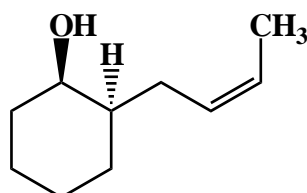
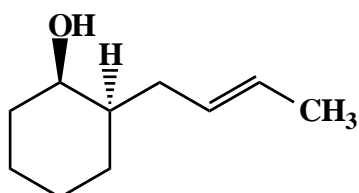
1. (20 points)

State the relationship between each of the following five (5) pairs of structures (identical, enantiomers, diastereomers, structural isomers, different compounds that are not isomeric).

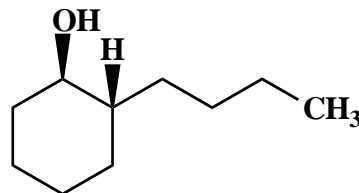
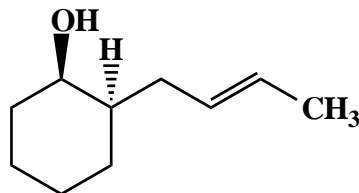
A.



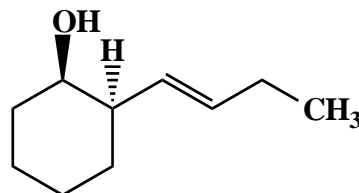
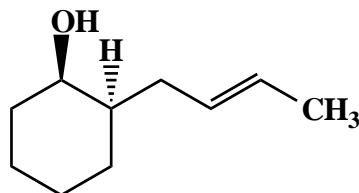
B.



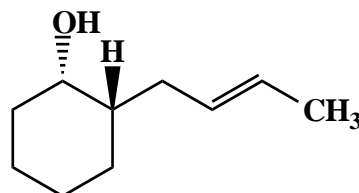
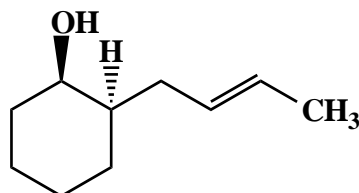
C.



D.



E.

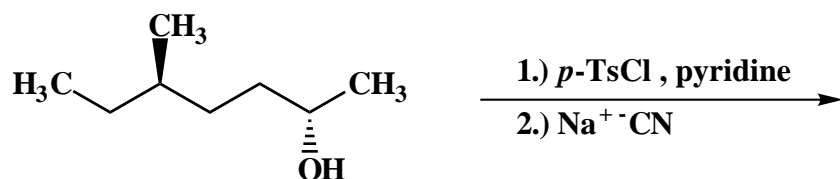


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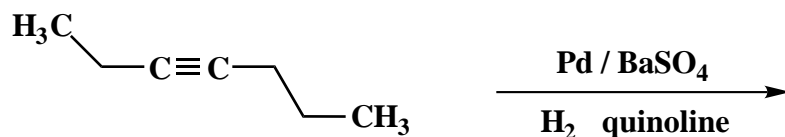
2. (15 points)

For each of the following three (3) questions draw the structure of the expected major organic product. If relevant, clearly specify absolute and/or relative stereochemistry.

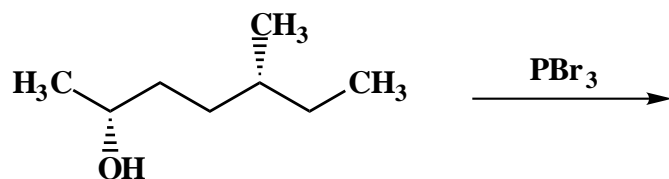
A.



B.

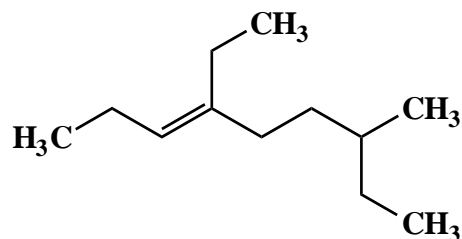


C.



3. (10 points)

Use IUPAC nomenclature to write the systematic name of the following alkene.

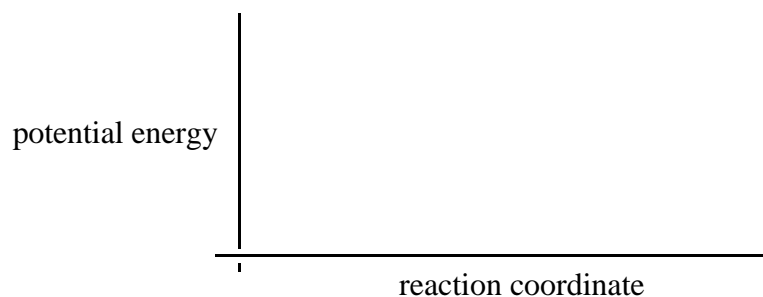


Name: _____

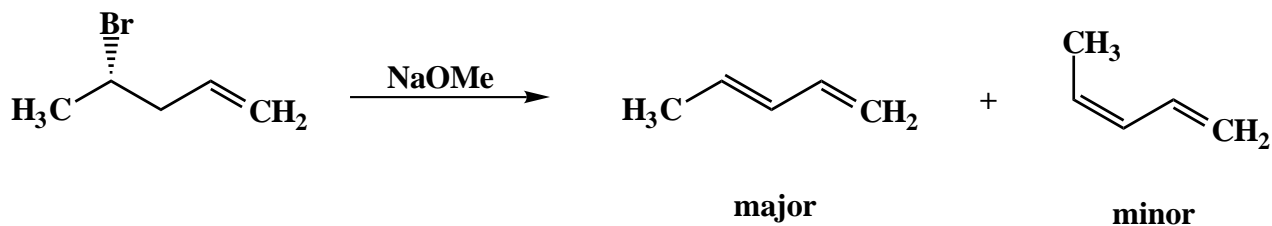
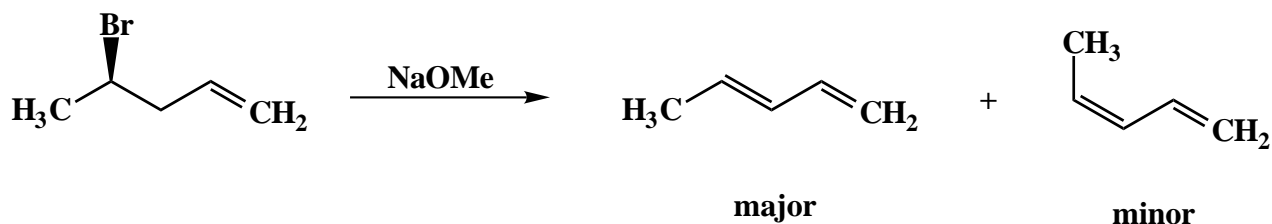
4. (20 points)

Answer the following two (2) questions clearly, succinctly and with correct grammar.

A. Why are the rates of E1 eliminations independent of base concentration? Draw a labeled reaction profile (graph of potential energy versus reaction coordinate) to illustrate your answer.



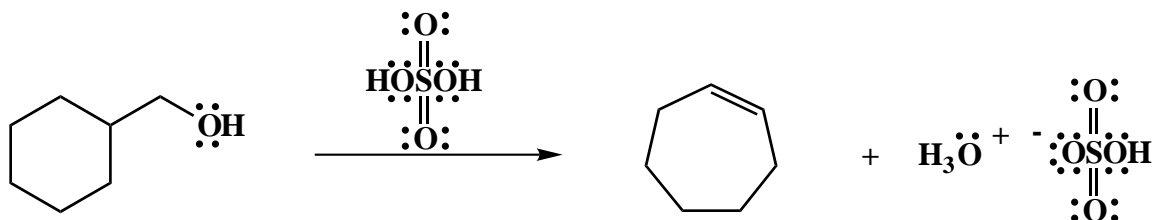
B. Are the following reactions nonstereoselective, partially stereoselective or completely stereoselective? If the reactions are completely stereoselective, are they stereospecific?



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5. (15 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. Clearly denote reversibility or irreversibility for each primary mechanistic step.



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6. (20 points)

For each of the following four (4) questions, circle the number that corresponds to the correct answer.

A. The preferred solvent for an S_N1 reaction is a:

1. nonpolar solvent
2. polar, protic solvent
3. polar, aprotic solvent

B. In E2 reactions, a primary kinetic isotope effect is observed:

1. sometimes
2. always
3. never

C. In E1 reactions, rearrangements are observed:

1. sometimes
2. always
3. never

D. Which of the following substrates is preferred for an S_N2 reaction?

1. a primary alkyl halide
2. a secondary alkyl halide
3. a tertiary alkyl halide

Congratulations!

1	/20
2	/15
3	/10
4	/20
5	/15
6	/20
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Total:	/100