

Chemistry 333

Examination #3

December 4, 2006

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.

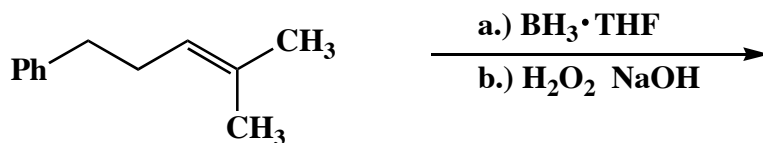
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

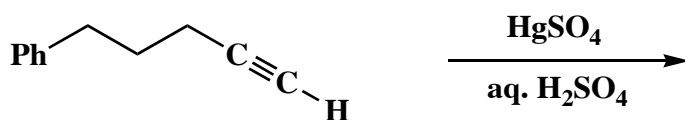
1. (25 points)

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

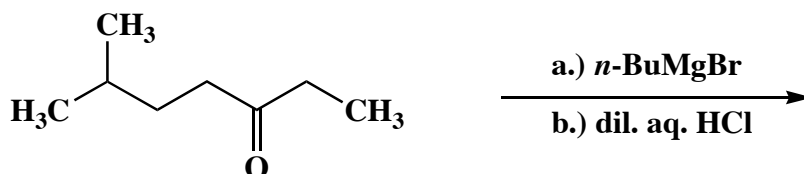
A.



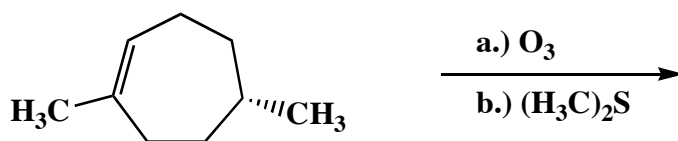
B.



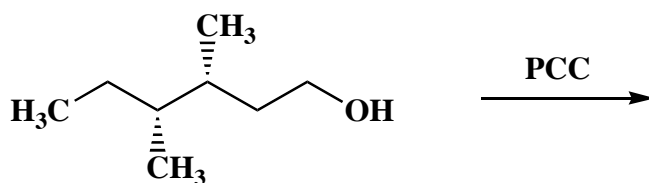
C.



D.



E.



Name: _____

2. (30 points)

Circle the number that corresponds to the correct answer for each of the following six (6) questions.

A. The reaction of molecular bromine with *cis*-hex-3-ene affords

1. one enantiomer
2. a racemic mixture
3. an achiral product

B. The reaction of osmium tetroxide and aqueous *N*-methylnmorpholine-*N*-oxide with *cis*-hex-3-ene affords

1. one enantiomer
2. a racemic mixture
3. an achiral product

C. In the absence of peroxides, the reaction of anhydrous hydrogen bromide with 2-methylhept-2-ene occurs via

1. a free-radical mechanism
2. an ionic mechanism
3. a concerted mechanism

D. In the presence of peroxides, the reaction of anhydrous hydrogen bromide with 2-methylhept-2-ene occurs via

1. a free-radical mechanism
2. an ionic mechanism
3. a concerted mechanism

E. The reaction of (*R*)-heptan-3-ol with thionyl chloride affords an alkyl chloride with

1. complete retention of configuration
2. racemization
3. complete inversion of configuration

F. Singlet carbenes have

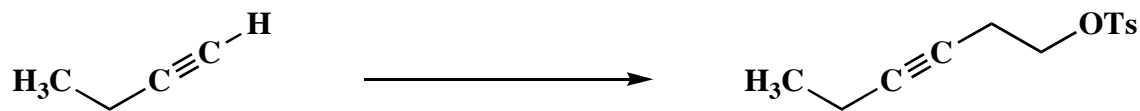
1. negative formal charge
2. neutral formal charge
3. positive formal charge

Name: _____

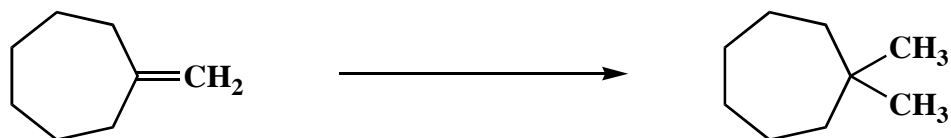
3. (20 points)

Draw the specific reagent(s) necessary to effect the following two (2) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



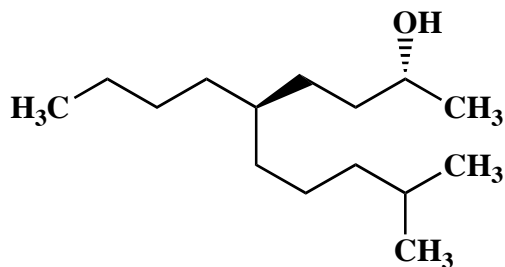
B.



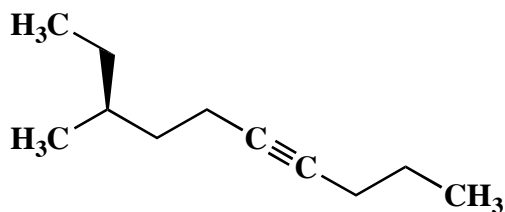
4. (10 points)

Use IUPAC nomenclature to write the systematic names of the following two (2) compounds.

A.



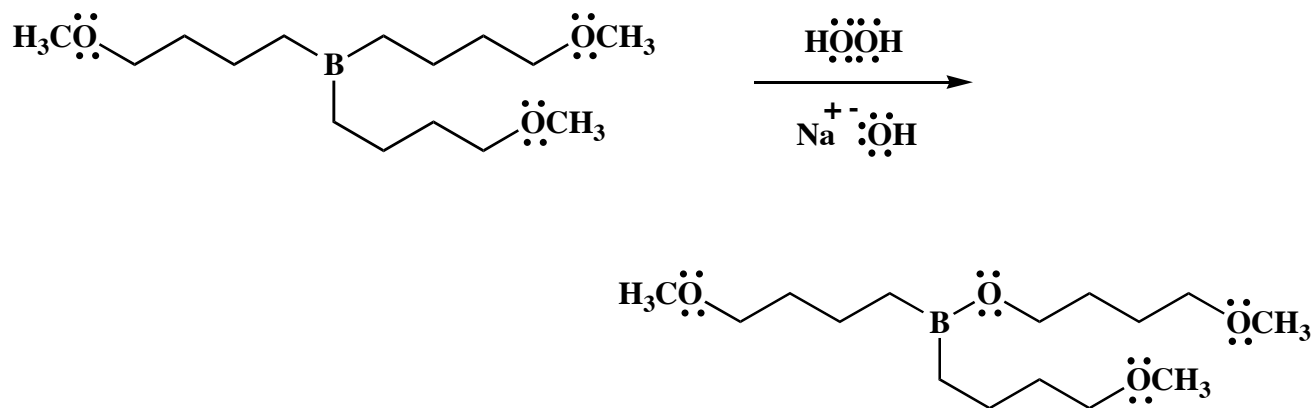
B.



Name: _____

5. (15 points)

Use the curved-arrow notation to draw the mechanism of the following transformation, which is part of the oxidative workup of an organoborane. Show all intermediates and denote all lone pairs, nonzero formal charges, countercharges, and reversibility or nonreversibility.



Congratulations!

1	/25
2	/30
3	/20
4	/10
5	/15
<hr/> Total:	<hr/> /100