Chemistry 333

Examination #3

April 21, 2008 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.

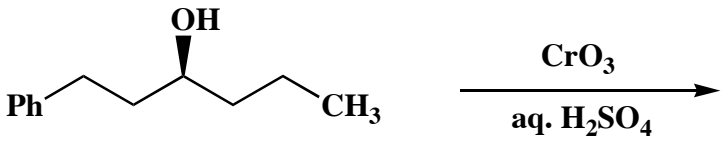
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

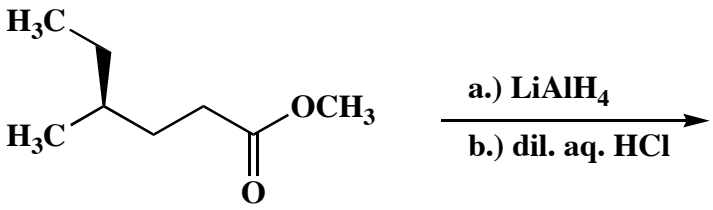
1. (25 points)

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

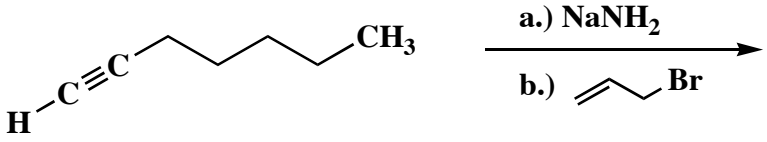
A.



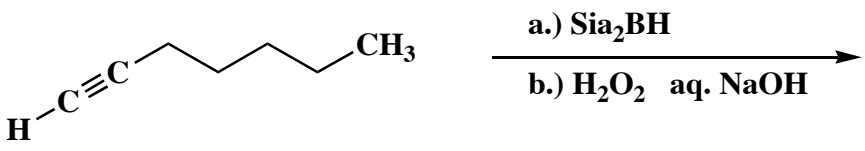
B.



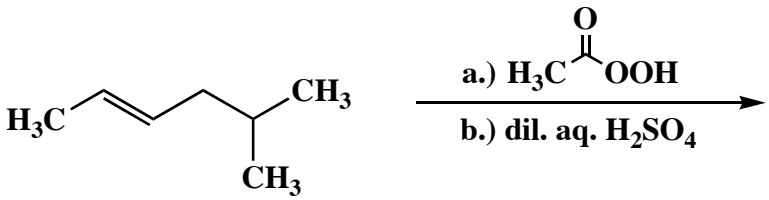
C.



D.



E.



Name: _____

2. (30 points)

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

A. Triplet carbenes act as

1. carbanions
2. 1,1-zwitterions
3. 1,1-diradicals

B. Ozone adds to an alkene via

1. an S_N2 pathway
2. an E2 pathway
3. a 1,3-dipolar cycloaddition pathway

C. Which of the following compounds is the most stable alkene?

1. 3-methylcyclohex-1-ene
2. 1-methylcyclohex-1-ene
3. 4-methylcyclohex-1-ene

D. Which of the following reactions is stereospecific?

1. reaction of (*R*)-heptan-3-ol with phosphorus tribromide
2. reaction of (*R*)-heptan-3-ol with anhydrous hydrogen bromide
3. reaction of (*R*)-heptan-3-ol with anhydrous hydrogen chloride

E. Which of the following compounds can be oxidized to a carboxylic acid?

1. pentan-2-ol
2. pentan-1-ol
3. 2-methylpentan-2-ol

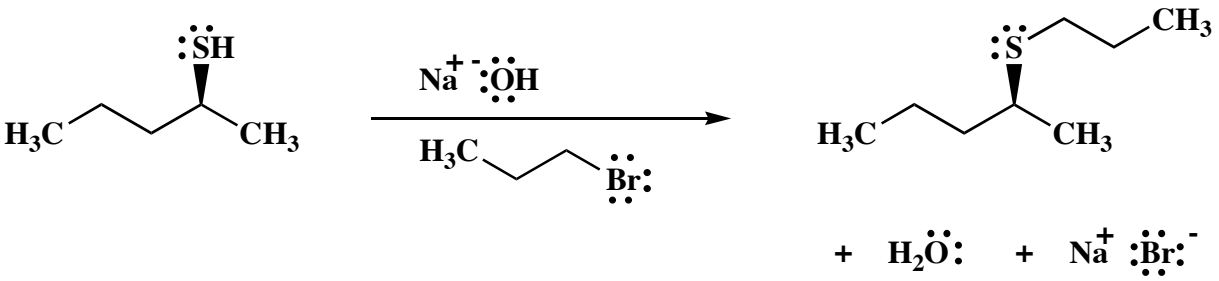
F. Catalytic hydrogenation of alkenes is

1. exothermic
2. endothermic
3. neither

Name: _____

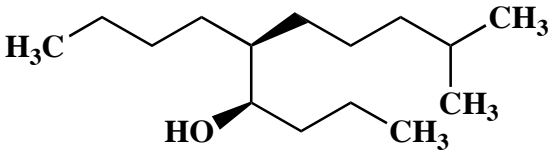
3. (15 points)

Draw the mechanism of the following transformation, using the curved-arrow notation to indicate the reorganization of electron density. Denote **all** intermediates, lone pairs, nonzero formal charges, countercharges, and reversibility or nonreversibility. Finally, explain why the sulfide product is enantiomerically pure.



4. (10 points)

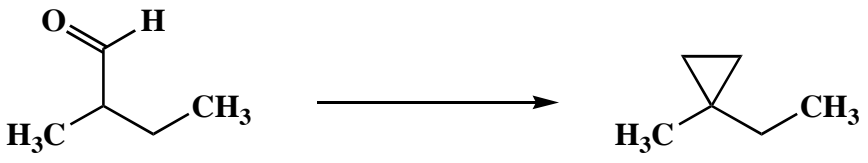
Use IUPAC nomenclature to write the systematic name of the following alcohol.



Name: _____

5. (20 points)

Design a synthesis of the cyclopropane **2** from the racemic aldehyde **1**, and any organic or inorganic reagents. Write **specific** reagents and denote each step carefully. Show all stable, synthetic intermediate compounds. (**N.B.** Do not draw mechanisms!)



1 **2**

Congratulations!

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