

Chemistry 333

Examination #3

November 19, 2007

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.

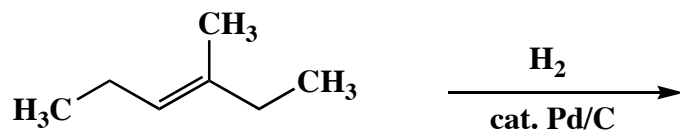
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

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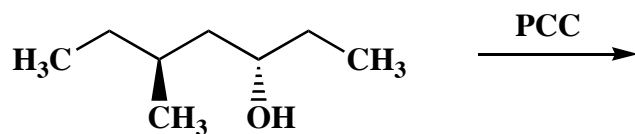
1. (25 points)

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

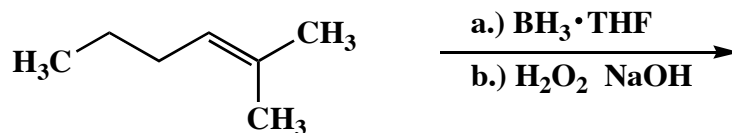
A.



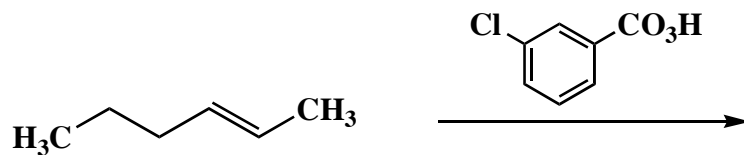
B.



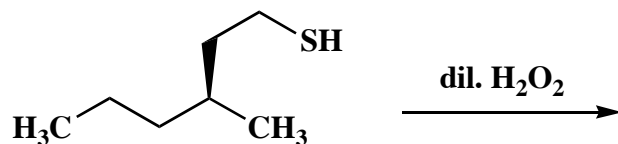
C.



D.



E.



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2. (30 points)

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

A. Lithium aluminum hydride reduction of an ester affords a

1. tertiary alcohol
2. secondary alcohol
3. primary alcohol

B. Rank the following compounds from most to least acidic.

1. $n\text{-PrNH}_2$, $n\text{-PrOH}$, $n\text{-PrSH}$
2. $n\text{-PrSH}$, $n\text{-PrOH}$, $n\text{-PrNH}_2$
3. $n\text{-PrNH}_2$, $n\text{-PrSH}$, $n\text{-PrOH}$

C. Acid-catalyzed hydration occurs most readily with

1. 2-methylpent-2-ene
2. *trans*-4-methylpent-2-ene
3. 4-methylpent-1-ene

D. The reaction of organolithium reagents with unsymmetrical epoxides occurs at

1. the less hindered carbon of the epoxide
2. the more hindered carbon of the epoxide
3. both positions equally likely

E. The reaction of osmium tetroxide with *cis*-pent-2-ene affords a

1. meso 1,2-diol by syn addition
2. racemic 1,2-diol by anti addition
3. racemic 1,2-diol by syn addition

F. The addition of anhydrous hydrogen bromide to 3-ethylhex-3-ene affords

1. an achiral product
2. an optically active chiral product
3. a racemic mixture

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3. (20 points)

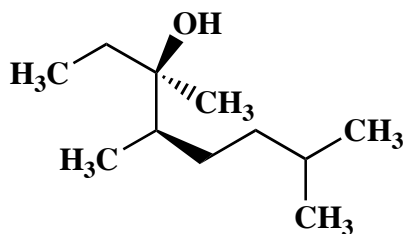
Answer the following two (2) questions precisely, succinctly and with correct grammar.

A. Why is acetylene ($\text{HC}\equiv\text{CH}$) more acidic than ethylene ($\text{H}_2\text{C}=\text{CH}_2$)?

B. Why are singlet carbenes synthetically more useful than triplet carbenes?

4. (10 points)

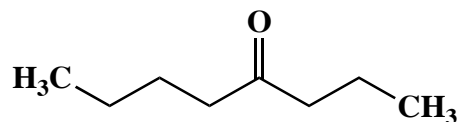
Use IUPAC nomenclature to write the systematic name of the following alcohol.



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5. (15 points)

Design a synthesis of the following ketone from acetylene, organic compounds that contain three or less carbons, and any inorganic reagents. Show specific reagents and all stable synthetic intermediate compounds. (**N.B.** Do not draw mechanisms for each synthetic transformation!)



Congratulations!

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