

Chemistry 334

Examination #1

July 23, 1998

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.

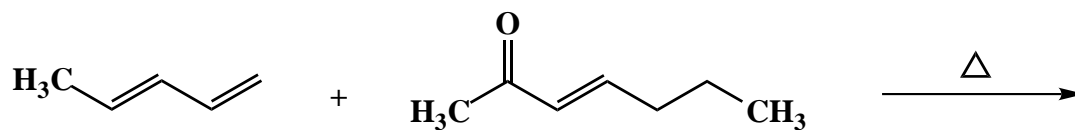
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: _____

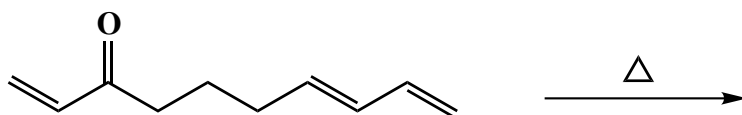
1. (25 points)

For each of the following five (5) questions, draw the structure of the expected major organic product. If relevant, explicitly specify absolute and/or relative stereochemistry.

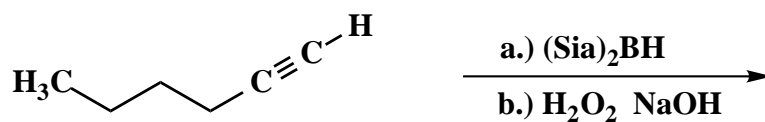
A.



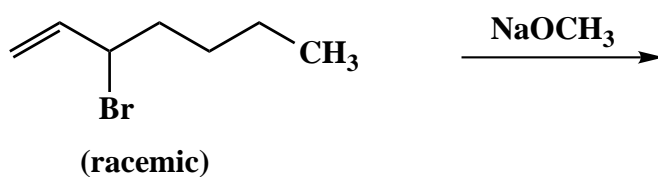
B.



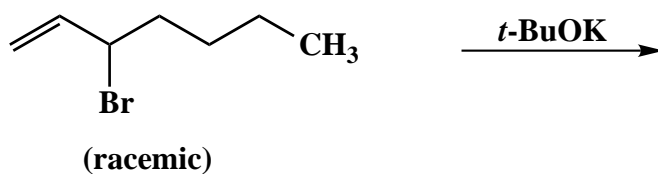
C.



D.



E.



Name: _____

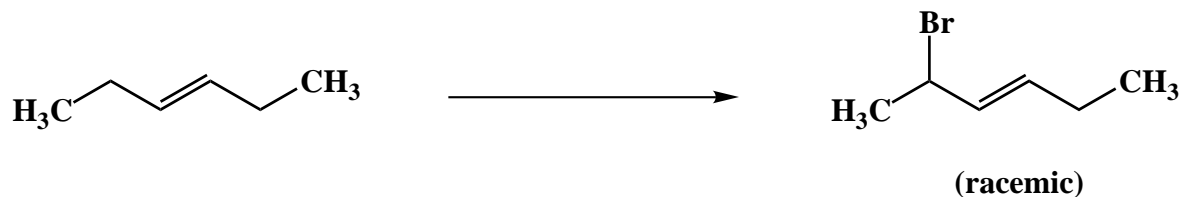
2. (25 points)

For each of the following five (5) questions, draw the specific reagent(s) necessary to effect the transformation shown. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



B.



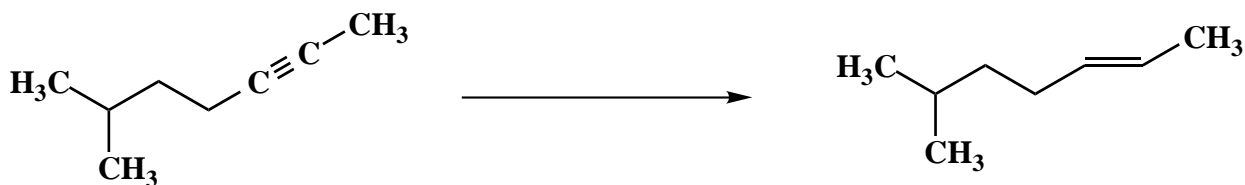
C.



D.



E.



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3. (20 points)

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

A. The carbon-carbon triple bond of an alkyne is composed of

1. one sigma bond and two pi bonds
2. two sigma bonds and one pi bond
3. three sigma bonds

B. What type of diene is 1,5-hexadiene?

1. conjugated
2. cumulated
3. isolated

C. What is the highest occupied molecular orbital of the allyl radical?

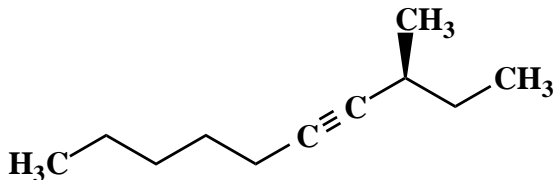
1. Π_1
2. Π_2
3. Π_3^*

D. The cation formed by cleavage of the C-Br bond of 1-bromo-2,4,6-cycloheptatriene is:

1. antiaromatic
2. nonaromatic
3. aromatic

4. (10 points)

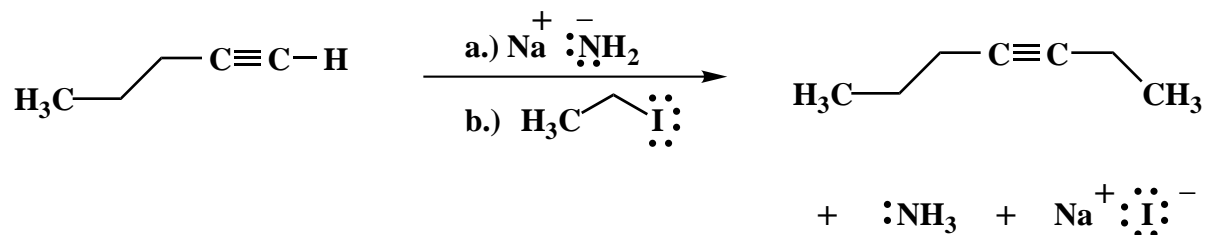
Use IUPAC nomenclature to write the systematic name of the following alkyne.



Name: _____

5. (25 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 pair electrons, formal charges and countercharges where appropriate.

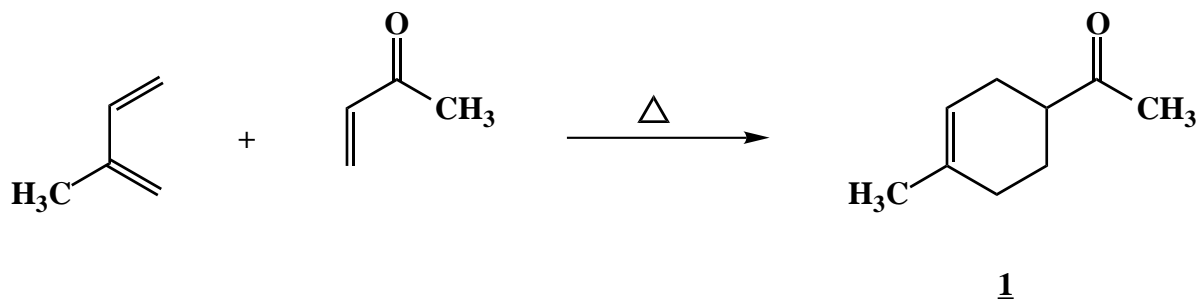


Name: _____

6. (20 points)

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

A. Why does the following reaction afford a racemic mixture of the cyclohexene derivative 1?

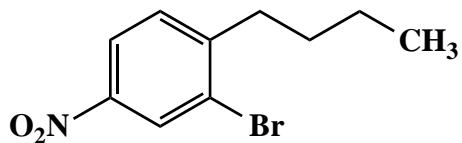


B. What effect does increased conjugation have on the position of the maximum absorbance, λ_{max} ?
What is the basis for this observed effect?

Name: _____

7. (25 points)

Design a synthesis of the substituted aromatic compound 2 from benzene. Use any inorganic and organic reagents that are necessary. Show all reagents and stable synthetic intermediate compounds. (N.B. Do not draw mechanisms for each synthetic transformation!)



2

Congratulations!

1	/25
2	/25
3	/20
4	/10
5	/25
6	/20
7	/25
Total:	<hr/> /150