

Chemistry 334

Hour Examination #1

March 8, 1999

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.

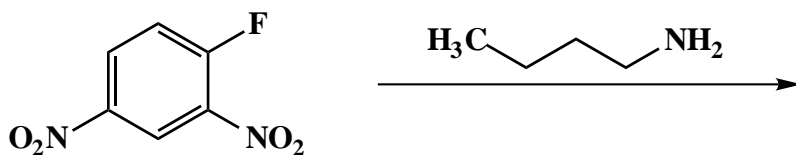
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: \_\_\_\_\_

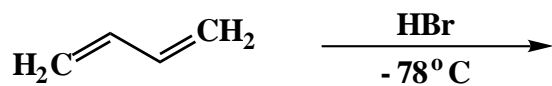
1. (25 points)

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.

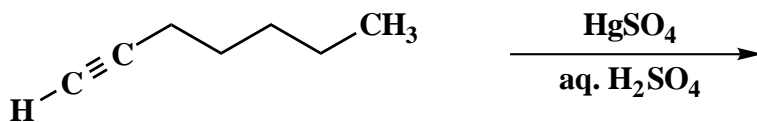
A.



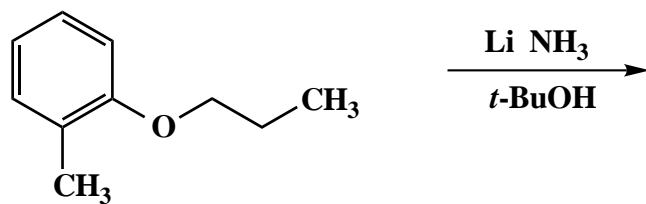
B.



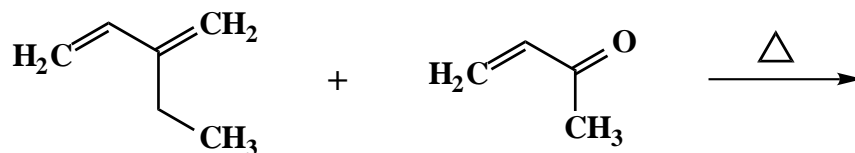
C.



D.



E.

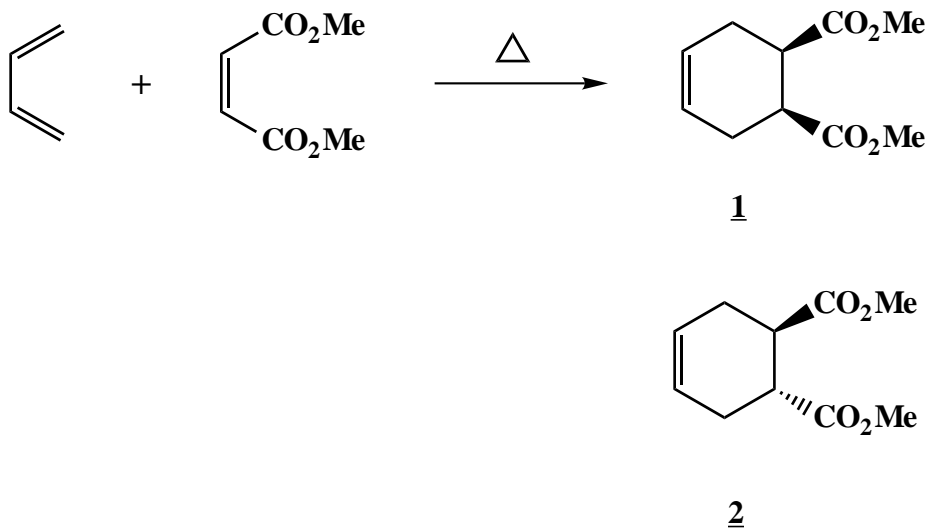


Name: \_\_\_\_\_

2. (20 points)

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

A. Why does the following reaction afford the diester 1, not the diastereomeric diester 2, as the product?



B. Use resonance theory to describe the electronic distribution of the allyl radical.  
Draw structures to illustrate your answer.

Name: \_\_\_\_\_

3. (20 points)

For each of the following five (5) questions, circle the number that corresponds to the correct answer.

A. Halogens are ortho, para-directing substituents due to:

1. sterics
2. induction
3. resonance

B. Halogens are deactivating substituents due to:

1. sterics
2. induction
3. resonance

C. The C<sub>2</sub>-C<sub>3</sub> bond of 1,3-butadiene is:

1. a single bond
2. a double bond
3. in between a single and a double bond

D. If a longer pathlength cell is used to obtain an ultraviolet/visible spectrum, the absorbance will be:

1. larger
2. the same
3. smaller

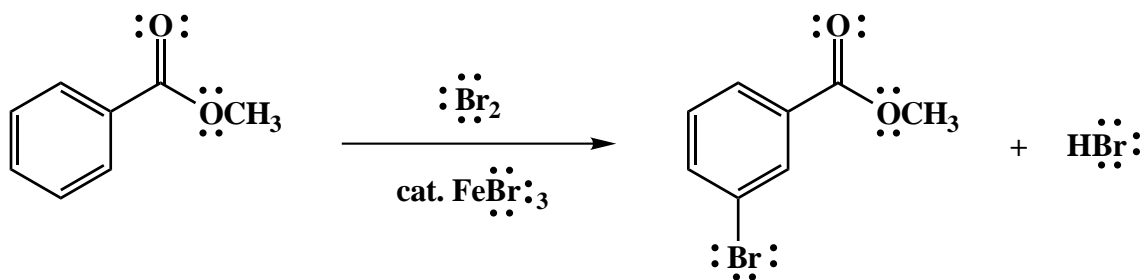
E. Free-radical bromination of 1-butene yields:

1. one regioisomeric product
2. two regioisomeric products
3. three regioisomeric products

Name: \_\_\_\_\_

4. (20 points)

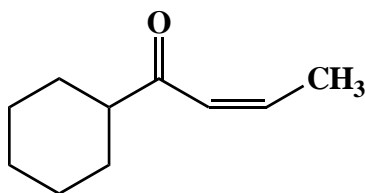
Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show **all** intermediates and denote **all** lone pair electrons, formal charges and countercharges where appropriate. Draw important resonance structures for intermediates. Clearly denote reversibility or irreversibility for each primary mechanistic step. Explain concisely the observed regiochemical control.



Name: \_\_\_\_\_

5. (15 points)

Design a synthesis of the  $\alpha,\beta$ -unsaturated ketone **3** from propyne. 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!)



3

**Congratulations!**

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