

Chemistry 334

Examination #3

August 20, 1999

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.

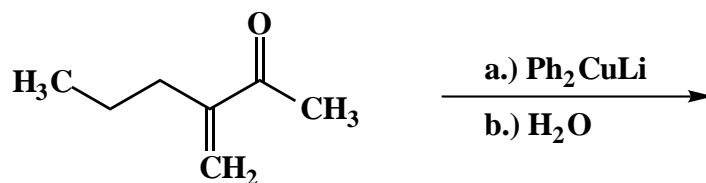
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

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

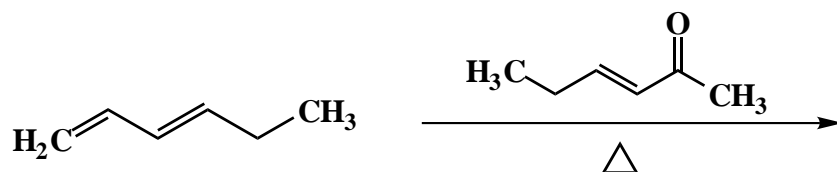
1. (25 points)

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

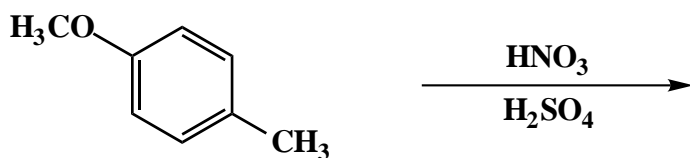
A.



B.



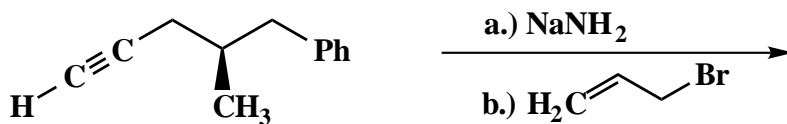
C.



D.



E.



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

2. (20 points)

Circle the number that corresponds to the correct answer for each of the following five (5) questions.

A. The electron-impact mass spectrum of an organic compound has a molecular ion at  $m/z = 171$ .  
The compound contains:

1. carbon, hydrogen and bromine
2. carbon, hydrogen and oxygen
3. carbon, hydrogen and nitrogen

B. A glycoprotein is an example of:

1. a conjugated protein
2. an unconjugated protein
3. a simple protein

C. Halogenation of an enolate affords:

1. an  $\alpha$ -halo carbonyl compound
2. a  $\beta$ -halo carbonyl compound
3. a  $\gamma$ -halo carbonyl compound

D. Which of the following criteria must be met for a substrate to bind to an enzyme?

1. complementary sterics, only
2. complementary electrostatics, only
3. complementary sterics and electrostatics

E. The "induced-fit" model of substrate binding involves:

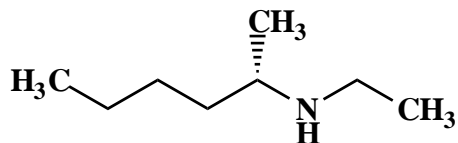
1. a conformational change
2. a configurational change
3. an isomerization

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

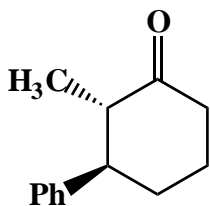
3. (20 points)

Use IUPAC nomenclature to write the systematic name for both of the following two (2) compounds.

A.

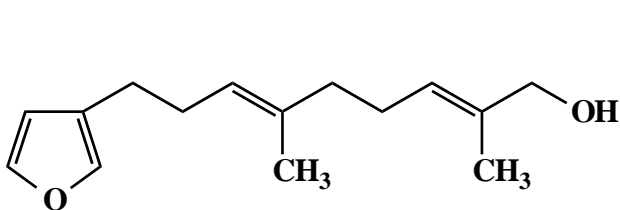


B.

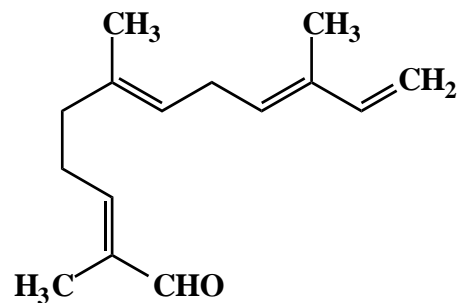


4. (20 points)

Circle the "isoprene" units in the following two (2) terpenes. Draw an arrow pointing to each "head-to-tail" connection between "isoprene" units.



neotorreyol



$\alpha$ -sinensal

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

5. (20 points)

Draw the structure of a specific example for each of the following ten (10) categories.

A. any naturally-occurring, optically active triacylglycerol:

B. any naturally-occurring, optically inactive triacylglycerol:

C. any D-aldopentose:

D. any L-ketohexose:

E. any steroid:

F. any nonreducing carbohydrate:

G. any alternating copolymer:

H. any homopolymer:

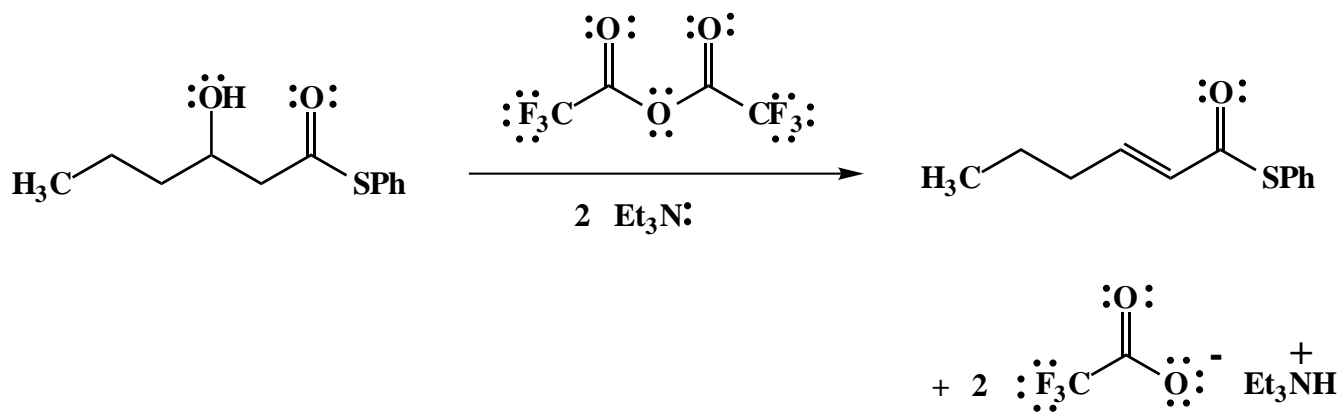
I. any naturally-occurring, acidic  $\alpha$ -amino acid:

J. any naturally-occurring, basic  $\alpha$ -amino acid:

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

6. (25 points)

Fatty acid biosynthesis involves the enzyme-catalyzed dehydration of a  $\beta$ -hydroxy thioester to afford the corresponding  $\alpha,\beta$ -unsaturated thioester. The reaction shown below uses completely different reagents, but is an example of the same overall transformation. Draw the mechanism of this latter 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.

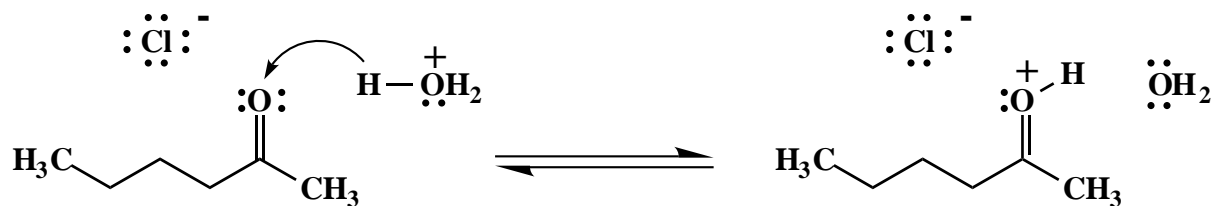


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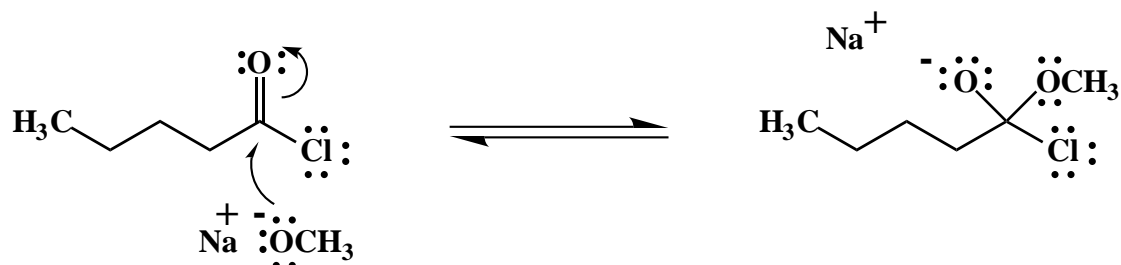
7. (20 points)

Use one or two sentences to state the mechanistic error(s) for both of the following two (2) questions. Then redraw each primary mechanistic step properly.

A.



B.



**Congratulations!**

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