

Chemistry 334
Final Examination

May 26, 2004

Professor Charonnat

Name: _____

Be certain that your examination has eleven (11) 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.

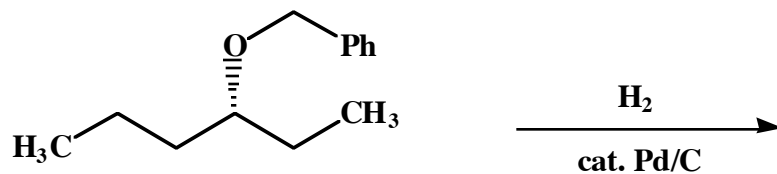
Molecular models are allowed for this examination. Calculators are unnecessary and are not allowed.

Name: _____

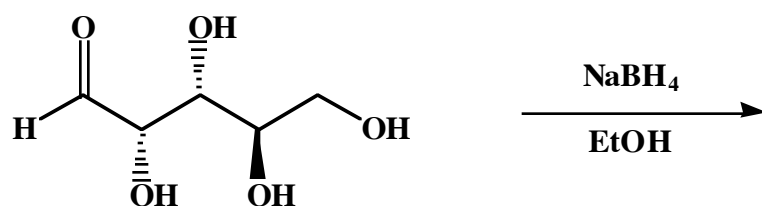
1. (50 points)

Draw the major organic product for each of the following ten (10) reactions.

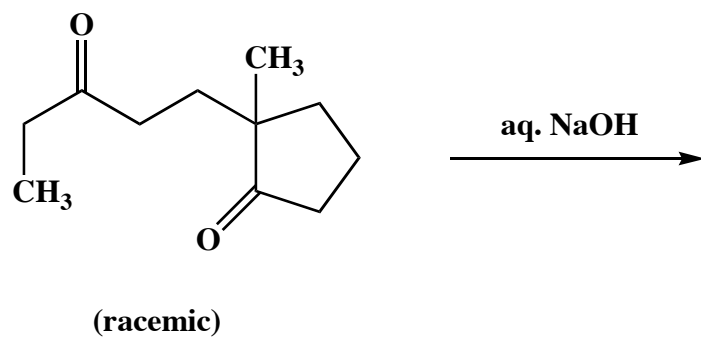
A.



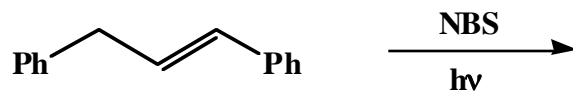
B.



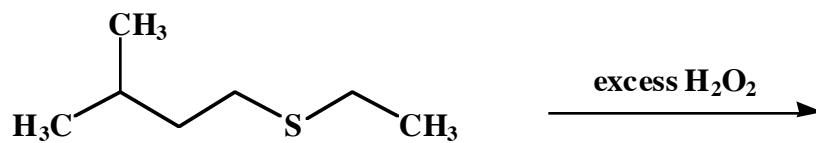
C.



D.



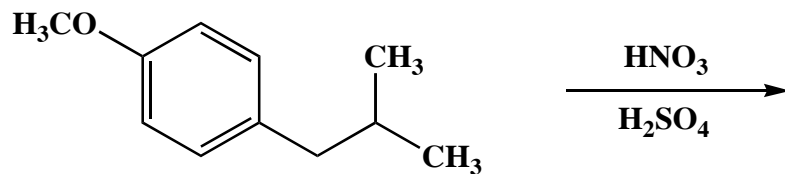
E.



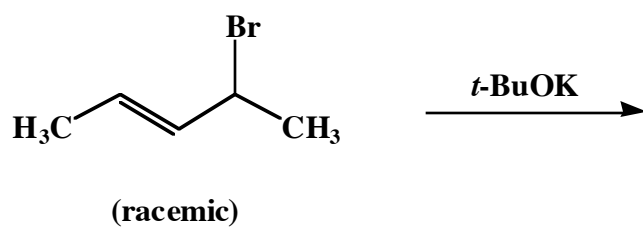
Name: _____

1. (continued)

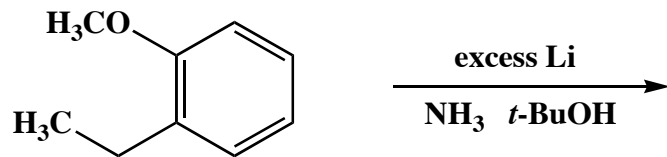
F.



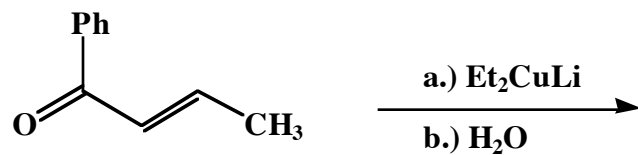
G.



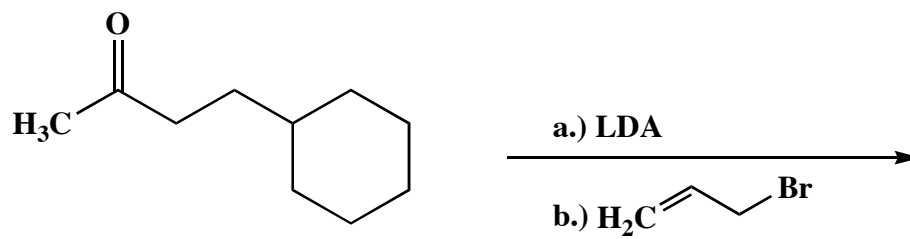
H.



I.



J.

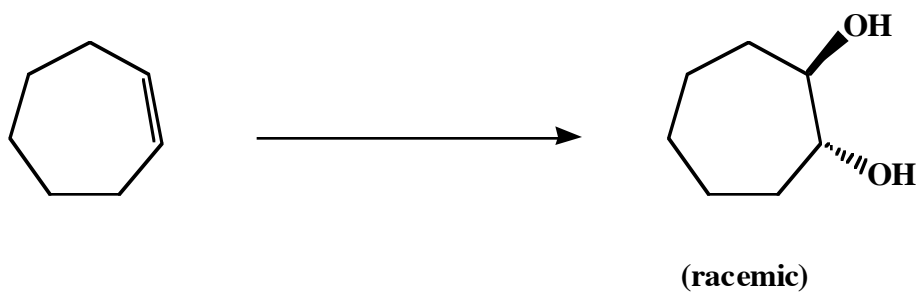


Name: _____

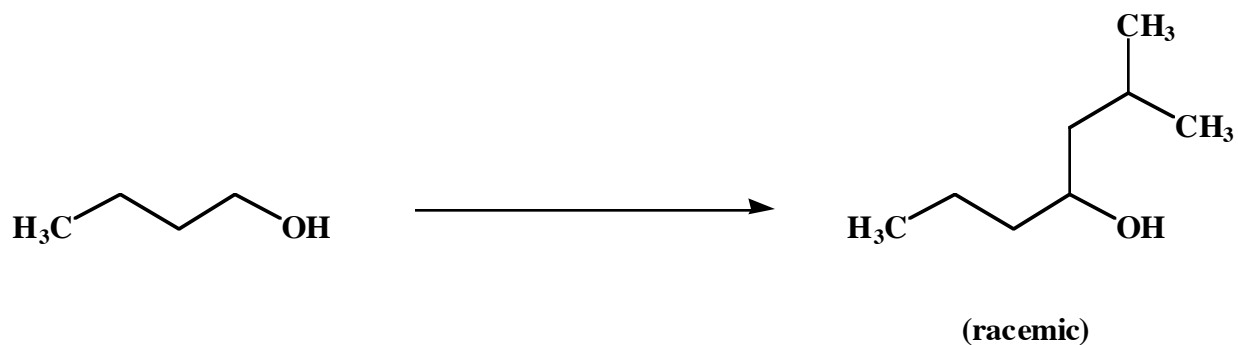
2. (25 points)

Draw the specific reagent(s) necessary to effect the transformation shown for each of the following three (3) questions. If more than one step is required, be certain to specify each step separately.

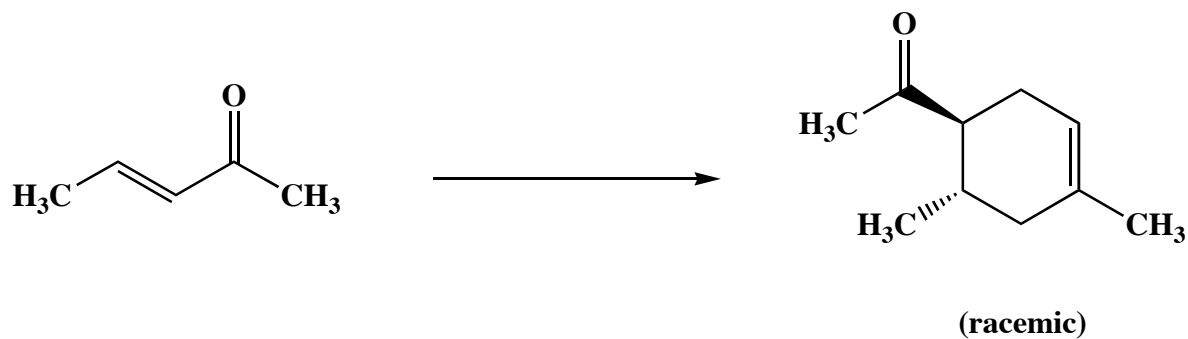
A.



B.



C.

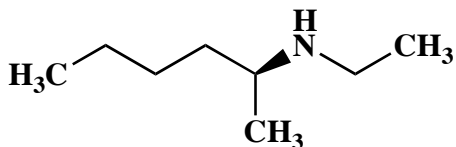


Name: _____

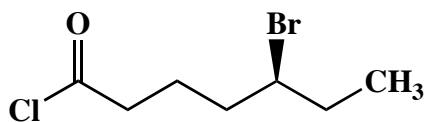
3. (20 points)

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

A.

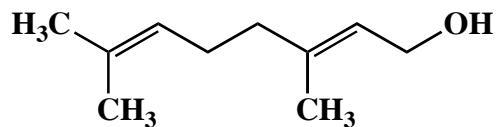


B.



4. (10 points)

Circle the "isoprene" units in the following terpene. Clearly label the head (h) and tail (t) of each "isoprene" unit.



geraniol

Name: _____

5. (30 points)

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

A. Globular proteins:

1. are soluble only in aqueous environments
2. are soluble only in nonpolar environments
3. may be soluble in either an aqueous or a nonpolar environment

B. The Gabriel synthesis of α -amino acids involves the reaction of an imide anion with:

1. an α -haloester
2. a β -haloester
3. a γ -haloester

C. Lithium aluminum hydride reduction of a nitrile, followed by an aqueous workup, yields a:

1. tertiary amine
2. secondary amine
3. primary amine

D. The principal benefit of the Merrifield solid-phase peptide synthesis is that it:

1. is stereoselective
2. is regioselective
3. minimizes yield losses due to transfers

E. The reaction of a primary alkyl halide with sodium azide affords an alkyl azide via:

1. an S_N1 mechanism
2. an S_N2 mechanism
3. a nucleophilic addition/elimination mechanism

F. Soap molecules form which structure in aqueous environments?

1. monolayers
2. bilayers
3. micelles

Name: _____

6. (25 points)

Draw the structure of a specific example for each of the following twelve (12) categories.

A. any naturally-occurring saturated fatty acid:

B. any naturally-occurring unsaturated fatty acid:

C. any naturally-occurring wax:

D. any naturally-occurring triacylglycerol:

E. any detergent:

F. any prostaglandin:

G. any sesquiterpene:

H. any steroid:

I. any naturally-occurring acidic α -amino acid:

J. any naturally-occurring neutral α -amino acid:

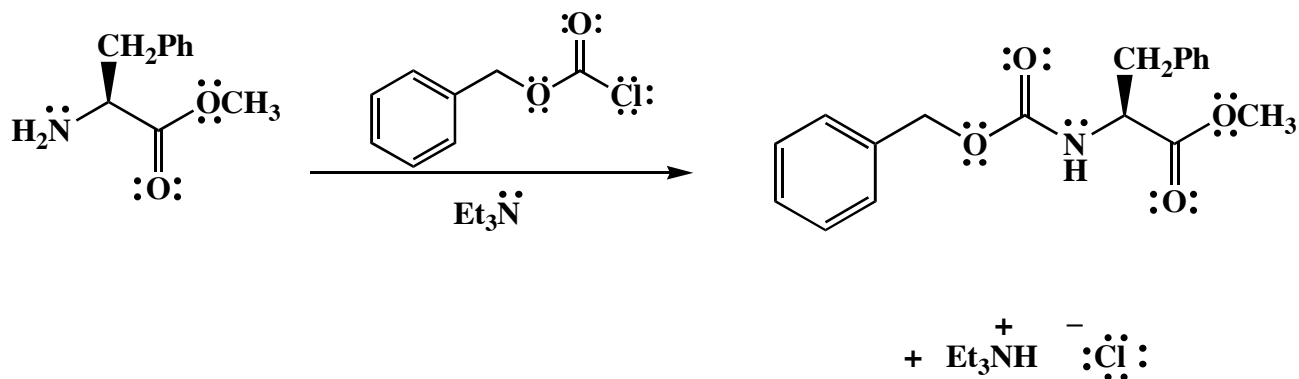
K. any naturally-occurring essential α -amino acid:

L. any naturally-occurring nonessential α -amino acid:

Name: _____

7. (15 points)

An alternative amine protecting group is the carbobenzyloxy (Cbz or Z) group. It is prepared by the reaction of an amine with benzyl chloroformate. A specific example of its use is shown below. Draw the mechanism of this reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates, unshared electrons, formal charges and countercharges.



Name: _____

8. (continued)

Molecular formula consistent with mass spectral data:

^{13}C NMR assignments:

chemical shift (ppm)

assignment

explanation of multiplicity

Congratulations!

1	/50
2	/25
3	/20
4	/10
5	/30
6	/25
7	/15
8	/25
<hr/>	
Total:	/200

course grade: _____