

Chemistry 334

Final Examination

December 13, 1995

Professor Charonnat

Name: _____

Be certain that your examination has nine (9) 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: _____

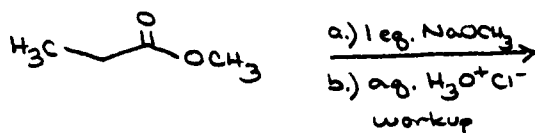
1. (25 points)

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

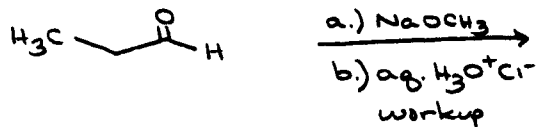
A.



B.



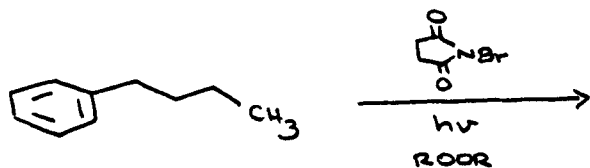
C.



D.



E.

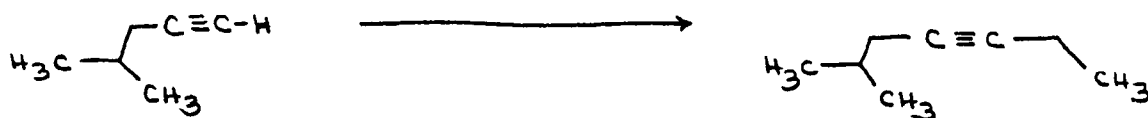


Name: _____

2. (25 points)

For each of the following five (5) questions denote the reagent or reagents necessary to effect the transformation shown.

A.



B.



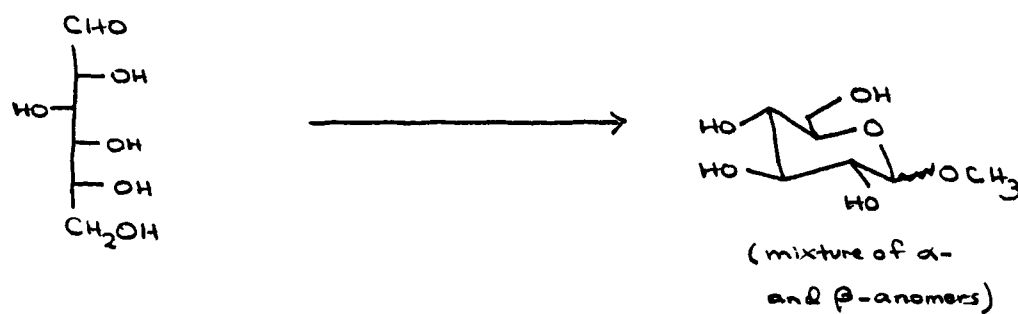
C.



D.



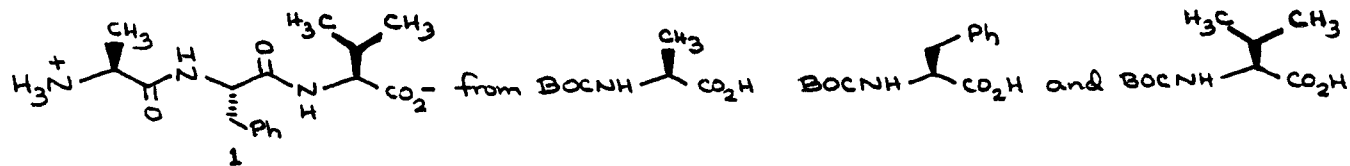
E.



Name: _____

3. (25 points)

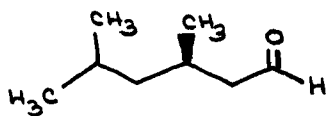
Design a synthesis of the zwitterionic tripeptide **1** from the BOC-protected α -amino acids shown. Use any inorganic and organic reagents that you deem necessary. Draw clearly **all** reagents and isolable synthetic intermediate compounds. (N.B. Do **not** draw mechanisms for each synthetic transformation!)



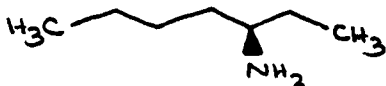
4. (25 points)

Use IUPAC rules to give the systematic names of the following two (2) compounds.

A.



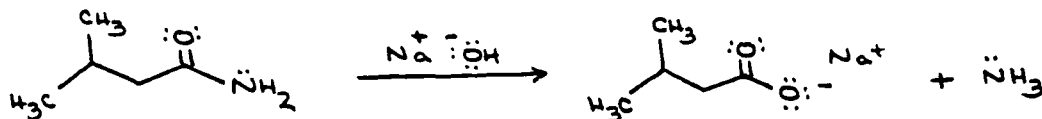
B.



Name: _____

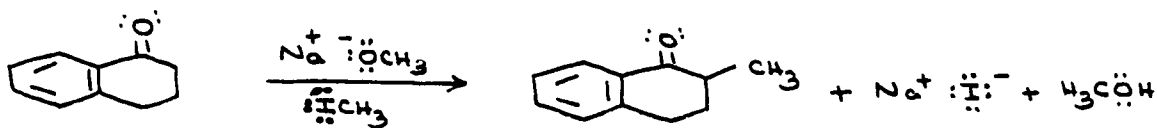
5. (25 points)

Draw the mechanism of the following transformation, using the curved-arrow notation to indicate the reorganization of electron density. Show **all** intermediates and denote **all** lone pairs, formal charges and countercharges.



6. (25 points)

Draw the mechanism of the following transformation, using the curved-arrow notation to indicate the reorganization of electron density. Show **all** intermediates and denote **all** lone pairs, formal charges and countercharges.



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7. (25 points)

Draw a specific example of:

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 monoterpene:

H. any sesquiterpene:

I. any steroid:

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: _____

8. (25 points)

The infrared, ^1H NMR and ^{13}C NMR (broadband ^1H decoupled) spectra of compound A ($\text{C}_9\text{H}_{21}\text{N}$) are shown below. Clearly assign all the resonances that you can identify with certainty and draw the structure of compound A. (Correlation tables are included separately.)

The infrared spectrum is unavailable due to copyright considerations.

Name: _____

8. (cont.)

The ^1H NMR and ^{13}C NMR spectra are unavailable due to copyright considerations.

Name: _____

8. (cont.)

Infrared absorption assignments:

wave number (cm ⁻¹)	functional group	type of vibration (stretch or bend)
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¹H NMR assignments:

chemical shift (ppm)	assignment	explanation of multiplicity
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¹³C NMR assignments:

chemical shift (ppm)	assignment	explanation of multiplicity
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structure of compound A:

Congratulations!

1	/25
2	/25
3	/25
4	/25
5	/25
6	/25
7	/25
8	/25
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Total:	/200