

Chemistry 334

Examination #2

October 27, 2014

Professor Charonnat

Name: _____

Be certain that your examination has five (5) 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.

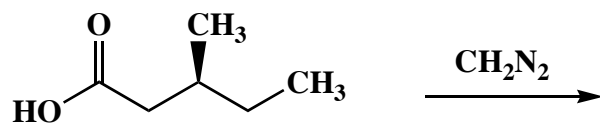
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

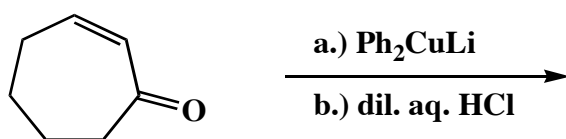
1. (25 points)

Draw the structure of the expected major organic product for each of the following five (5) questions. Specify stereochemistry, if relevant.

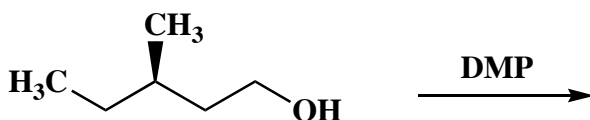
A.



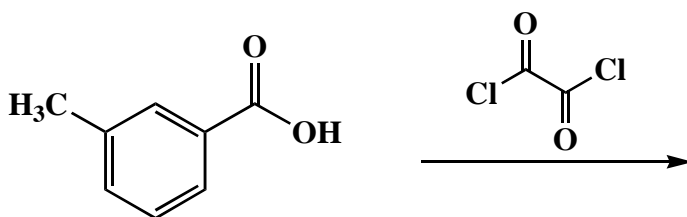
B.



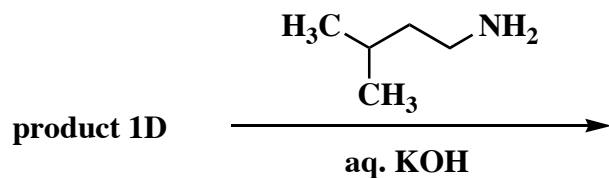
C.



D.



E.



Name: _____

2. (25 points)

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

A. The reaction of 1-bromodecane with potassium cyanide gives a nitrile. This reaction proceeds via an

1. S_N1 mechanism
2. S_N2 mechanism
3. addition/elimination mechanism

B. The ^1H NMR spectrum of an aldehyde has a triplet at 9.83 ppm with a 2.1 Hz coupling constant. This aldehyde possesses

1. three alpha protons
2. one alpha proton
3. two alpha protons

C. The reaction of cyclohexanone with ethane-1,2-dithiol ($\text{HSCH}_2\text{CH}_2\text{SH}$) and catalytic boron trifluoride etherate ($\text{BF}_3 \cdot \text{OEt}_2$) affords a

1. sulfide
2. disulfide
3. dithioacetal

D. The $\text{p}K_a$ of bromoacetic acid is

1. lesser than the $\text{p}K_a$ of acetic acid
2. equal to the $\text{p}K_a$ of acetic acid
3. greater than the $\text{p}K_a$ of acetic acid

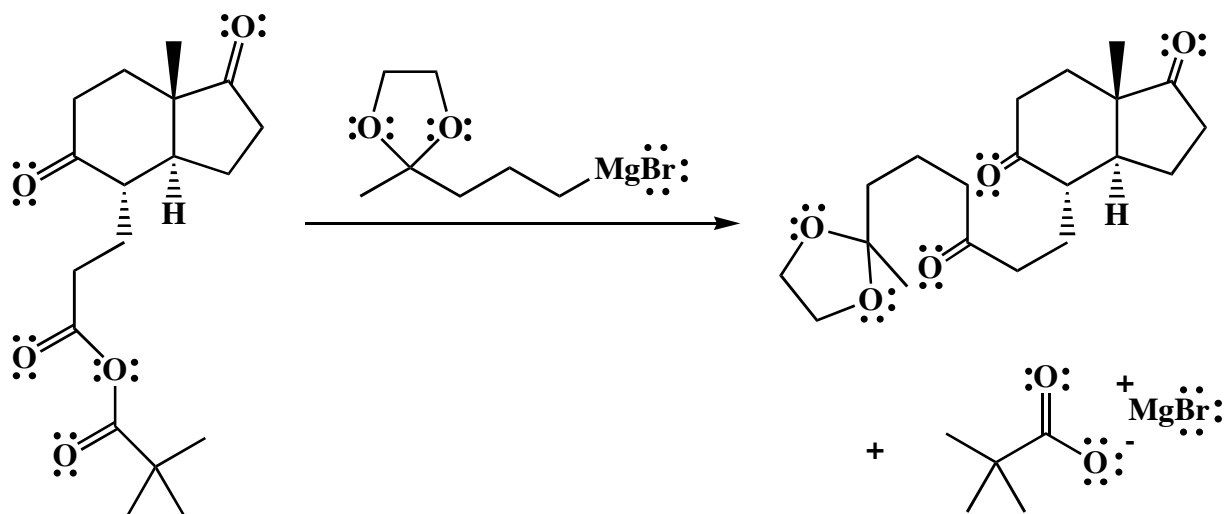
E. The reaction of heptan-2-one with diethylamine [$(\text{H}_3\text{CCH}_2)_2\text{NH}$] in mildly acidic conditions yields an

1. amine
2. enamine
3. imine

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3. (20 points)

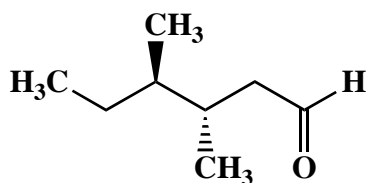
The following reaction is a critical step in an elegant, large-scale synthesis of steroids. Draw the mechanism of this transformation, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates and denote all unshared electrons, nonzero formal charges, countercharges, and reversibility or irreversibility. Finally, explain why there is selectivity (both regio- and functional-group selectivity) in the reaction of the Grignard reagent with the starting material.



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4. (10 points)

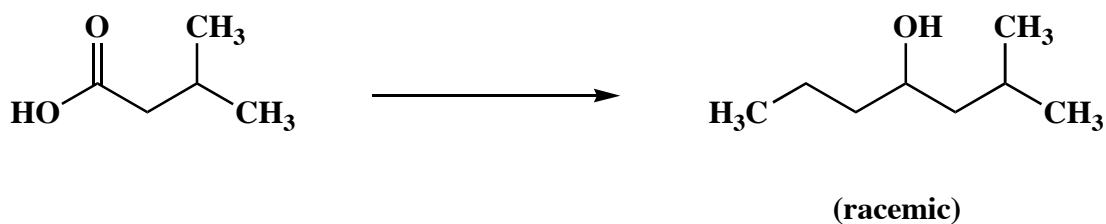
Use IUPAC nomenclature to write the systematic name of the following carbonyl compound.



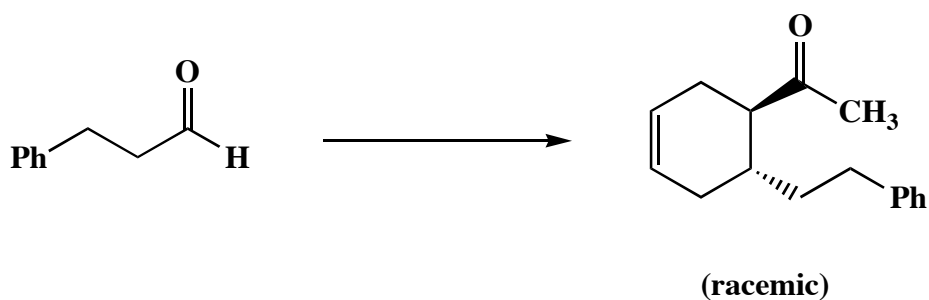
5. (20 points)

Draw the specific reagent(s) necessary to effect the following two (2) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



B.



Congratulations!

1	/25
2	/25
3	/20
4	/10
5	/20
total:	/100