CHEM3331 Wang Spring 2014 Midterm 3

Student ID _____ Name KZY

TA _____

Cumulative:
A: >256
B: 220-255
C: 174-219
D: 145-173

page points:

2_____(30)
3_____(14)
4_____(20)
5_____(20)
6_____(16)
Total_____(100)

Average:69
Median: 70.5
A: 84-95
B: 71-83
C: 55-70
D: 40-55

Periodic Table

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Ha	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

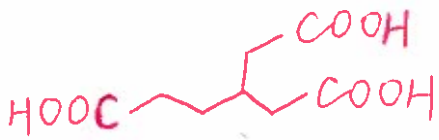
Please sit with an empty seat between you and your neighbors.

Unless specifically asked, you do not have to draw mechanisms for reactions.

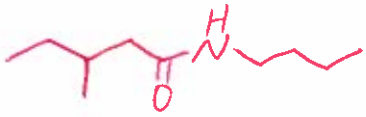
Feel free to ask questions about the questions, but please don't ask questions about your answers, it distracts your neighbors.

1. Draw the structure of each of the following molecule (4 pts each).

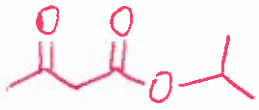
a) 3-(carboxymethyl)hexanedioic acid



b) *N*-butyl-3-methylpentanamide

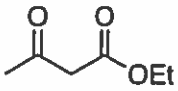


c) isopropyl acetoacetate



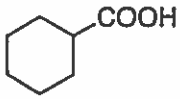
2. Provide the pKa value for each of the following molecule. (3pts each)

a)



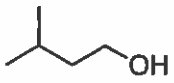
11

b)



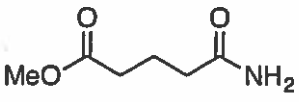
5

c)



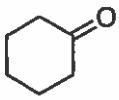
17

d)



16

e)



19

f) $^{i}Pr_2NH$

36

$\Delta \leq 2$ 3 pts

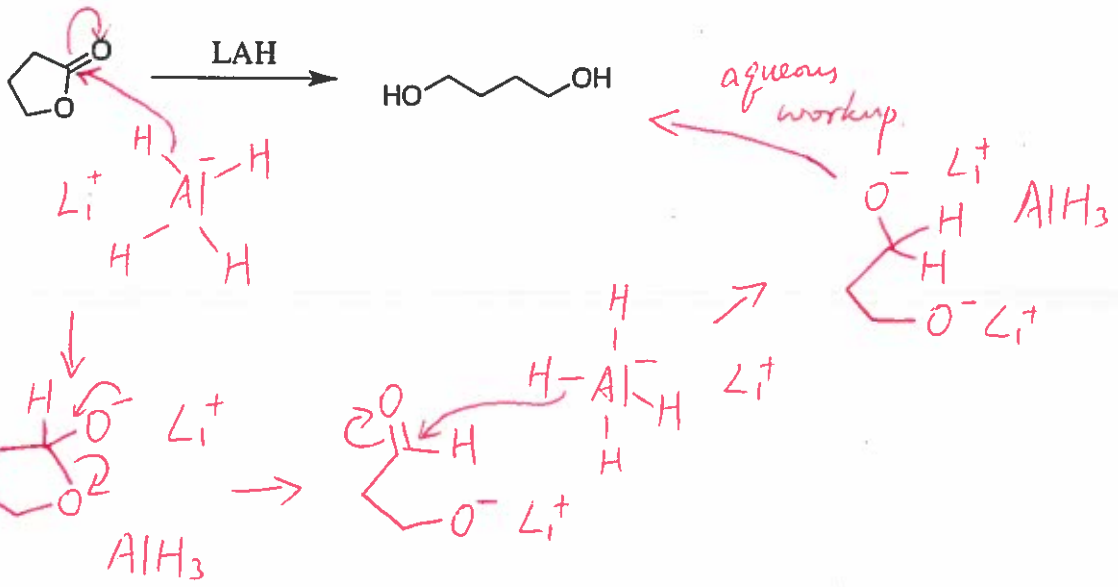
$2 < \Delta \leq 4$ 2 pts

$4 < \Delta \leq 6$ 1 pts

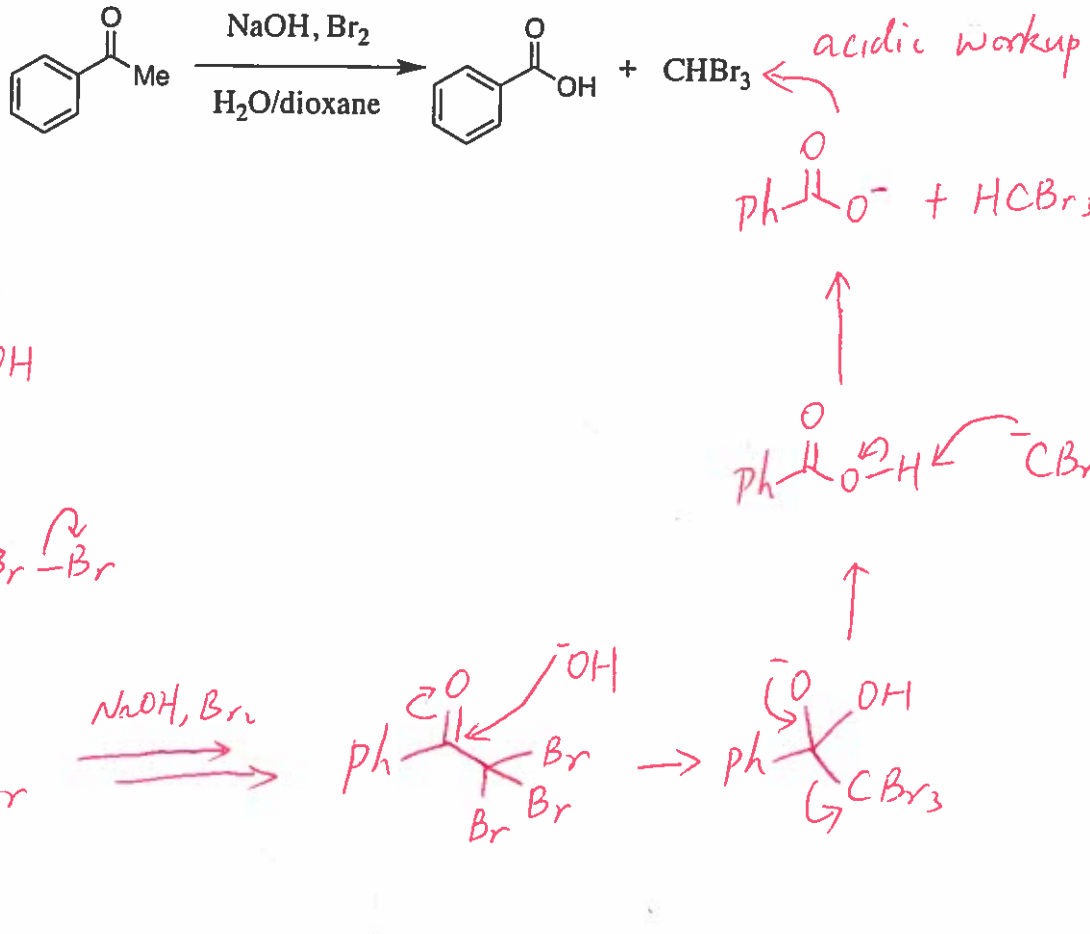
$6 < \Delta$ 0

3. Use curved arrow or fishhook notation to draw the mechanism for each of the following reactions.

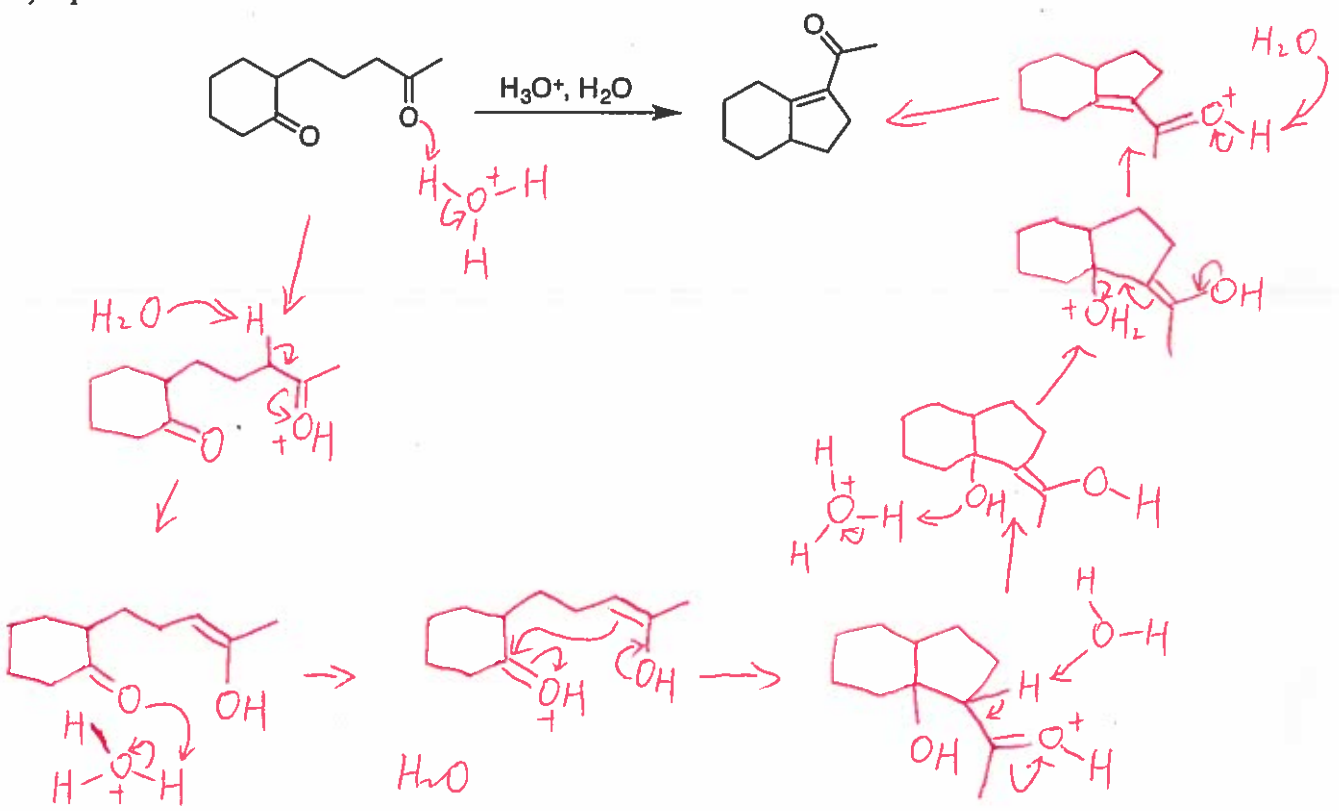
a) 6pts



b) 8 pts

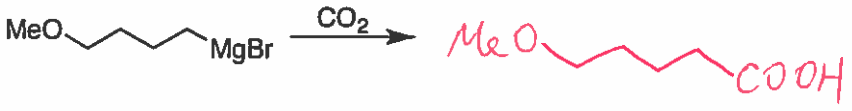


c) 8 pts

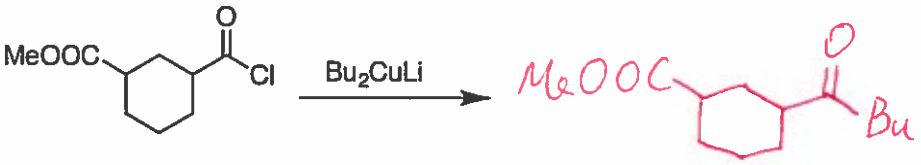


4. Provide the major product of the following reaction. If the reaction produces a racemic mixture as the major products, draw only one enantiomer. (4 pts each)

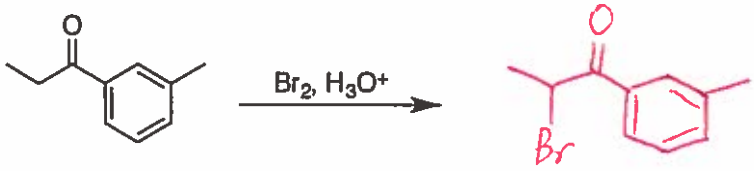
a)



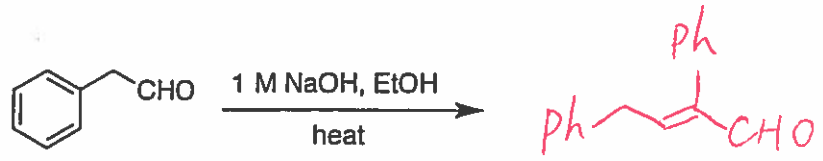
b)



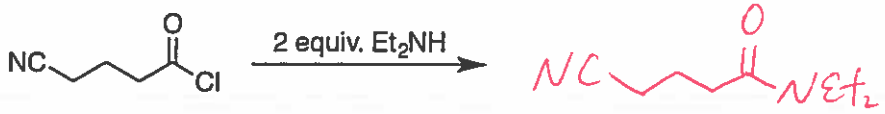
c)



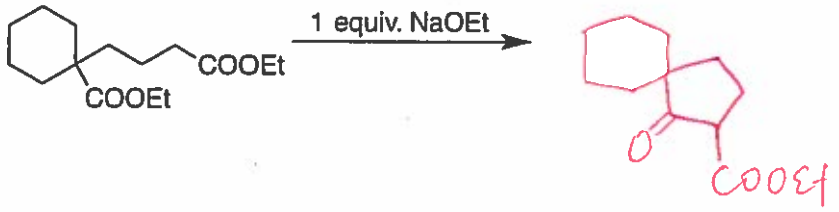
d)



e)

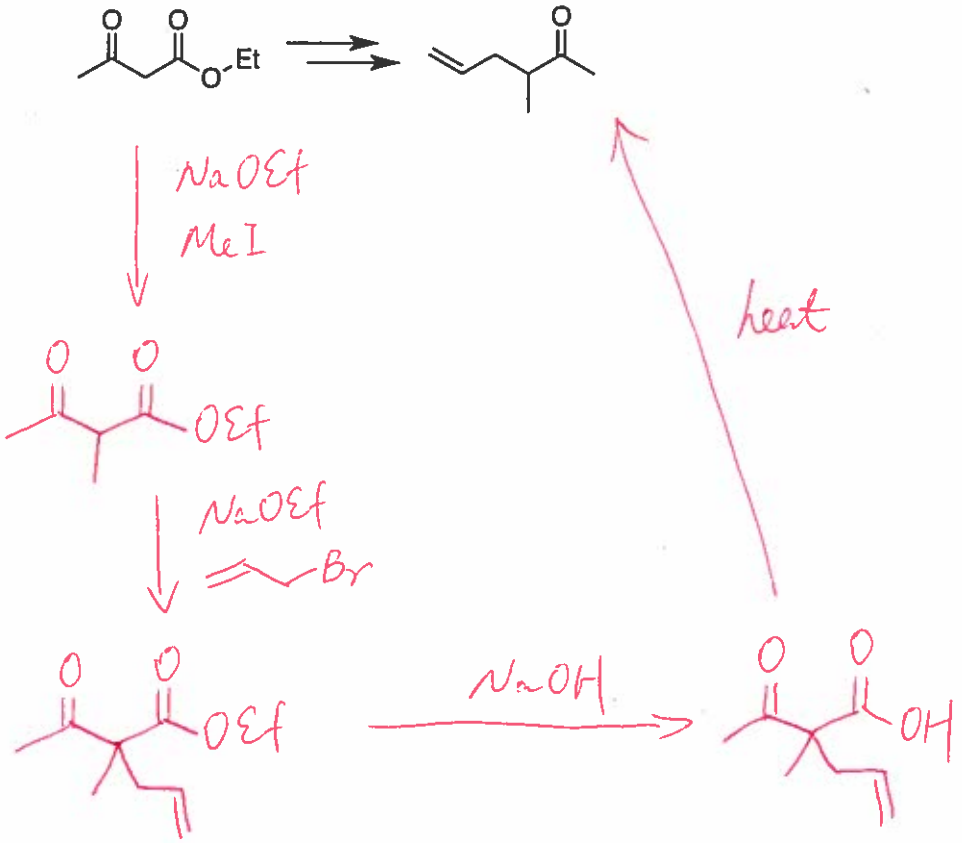


f)

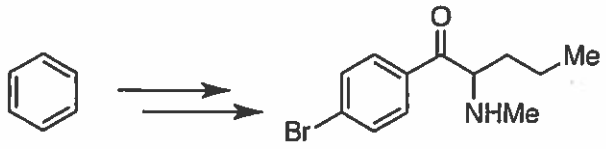


5. Complete the following syntheses using any organic molecule of 4 carbons or less and any inorganic reagents you need. You do not have to show the synthesis of the 4-carbon or less molecule you use. If your synthesis requires more than one step, provide the product after each step. All chiral products are racemic mixtures.

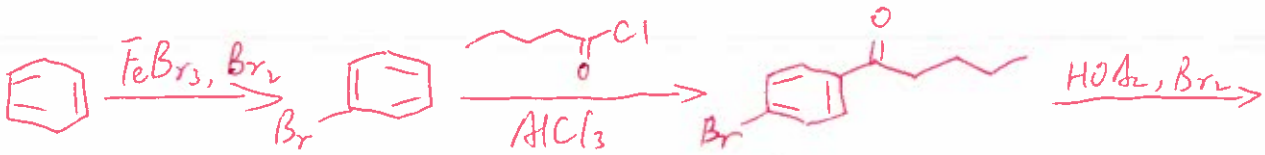
a) 8 pts

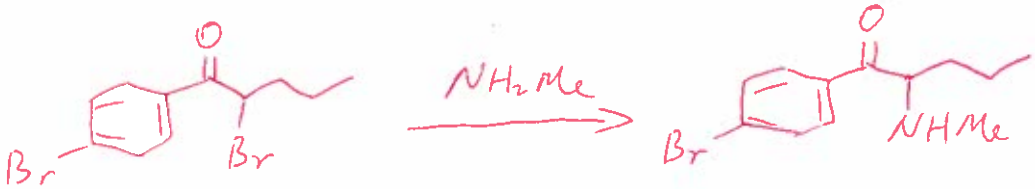


b) 8ps

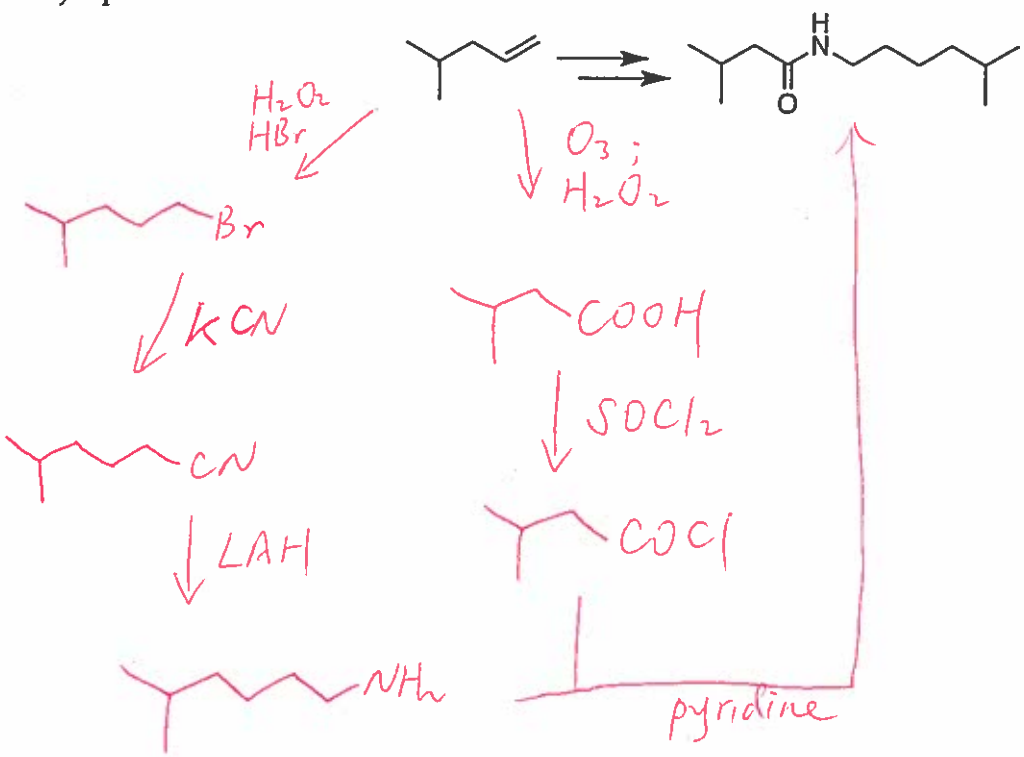

O
Me
Br
NHMe


Li
CO2
COOH
SOCl2
Cl
O


FeBr3, Br2
Br
Cl
O
AlCl3
HOAc, Br2


O
Br
Br
NH2Me
NHMe

c) 8 pts


H2O2
HBr
O3 ;
H2O2
Br
KCN
CN
LAH
NH2
COOH
SOCl2
COCl
pyridine
H
N
O

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