CHEM 51C LEC A (40550)

Midterm 1 (Fall Qtr 2014) - LETTER SIZE

ver. A

6010 (2586)

Assigned Seat#:_____

Instructions to Instructor:

Do not alter this coversheet in ANY way. Substantial delays and additional fees may apply.

Instructions to Student:

1. Clearly print your Last Name, First Name and the Date
2. Clearly print your Student ID number in the boxes provided. Use large, dark numbers. These numbers are captured automatically during the scanning process.
3. Bubble in each number of your Student ID completely. The bubbles are used only if your written ID number is not captured.
4. Write your Name and Student ID number in the upper right corner of all following pages of your exam.

Last Name, First Name: KEY Date: ____/____/____

STUDENT ID: *For Access UCI student, leave first column blank then enter your 7-digit Student ID number.*

1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9
0	0	0	0	0	0	0	0	0

---------- (This space for Instructor/TA use only) ----------

Question	1	2	3	4	5	Total
Score	18	25	12	16	12	83

DO NOT OPEN YOUR EXAMS UNTIL INSTRUCTED TO DO SO.

Answer the questions you understand best first.

Your answers must be neat and legible.

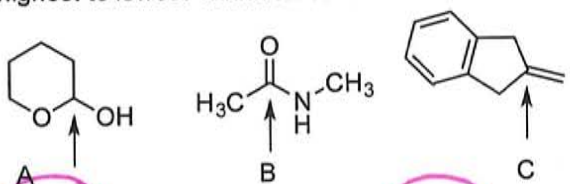
18

Midterm 1, Chem 51C, Jarvo, Fall 14

Initials: A

1. (22 points)

a. Rank highest to lowest oxidation state

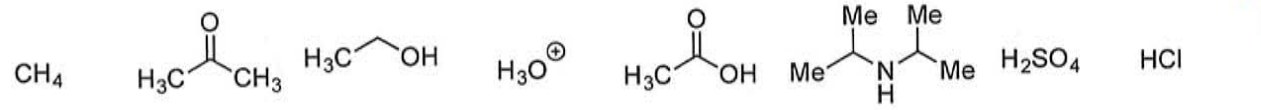


WS 2 #1b

2 B > A > C 2

b. Provide pKa's for **any 6** of the following compounds (if you do them all, we will count your best 6).

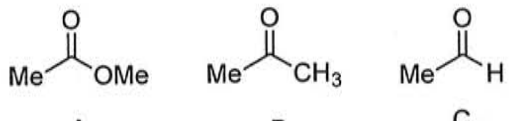
Practice #1c



50	20	16	-2	5	36	-10	-7
45-55	18-22	14-18	-4-0	3-6	32-40	-11 to -8	-8 to -6

6 acceptable range

c. Rank fastest to slowest reaction with $LiAlH_4$



WS1 #1g

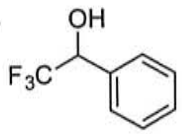
2 C > B > A 2

d. Fill in the correct nucleophile and electrophile from the table to complete the retrosyntheses.

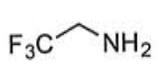
WS 3 #dii

Nucleophiles		Electrophiles	
A	PhLi	E	F_3C, OCH_3
B	Ph_2CuLi	F	F_3C, H
C	$NaBH_4$	G	F_3C, OH
D	$LiAlH_4$	H	F_3C, NH_2

Products

i. 

⟹ F + A

ii. 

⟹ D + H

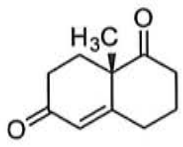
Practice 2g

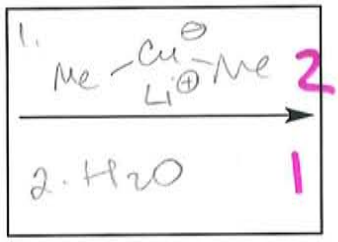
25

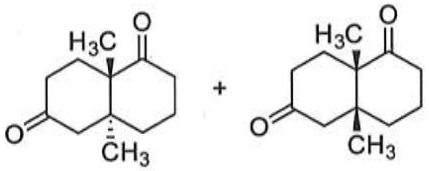
2. (19 points) Fill in the boxes with the appropriate starting material, reagent or major product. Show stereochemistry where appropriate. Initials: A

WS

3 a.



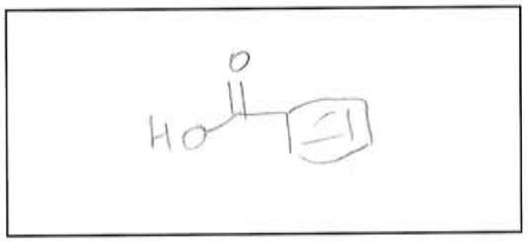


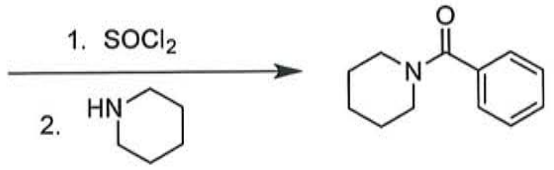


What is the relationship between the products? diastereomers 1

1

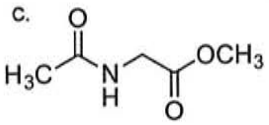
3 b.

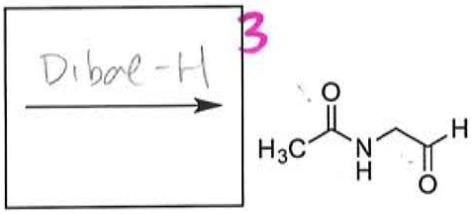


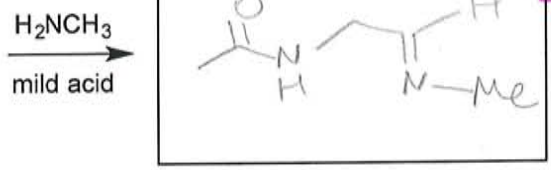


WS 2 #2f

6 c.

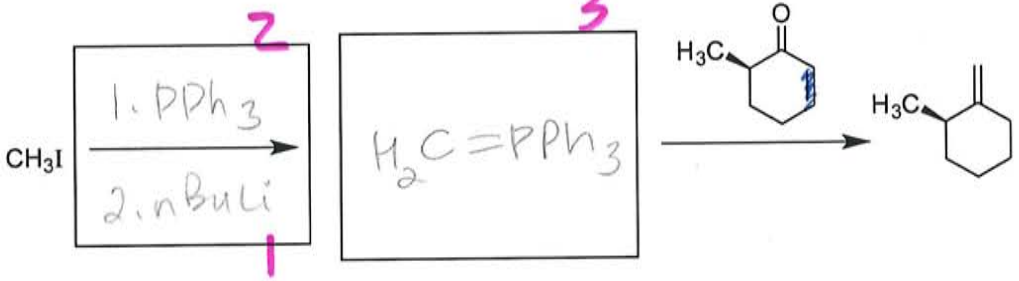






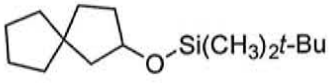
WS 3 #2a

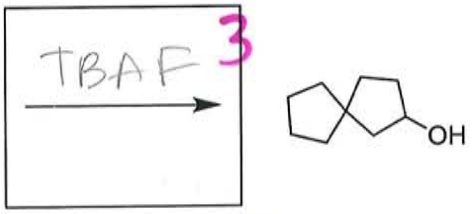
6 d.



WS 3 #2c

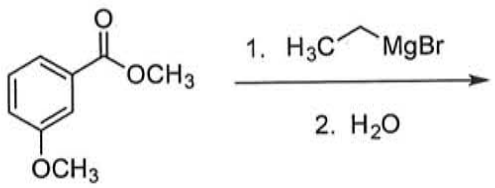
3 e.

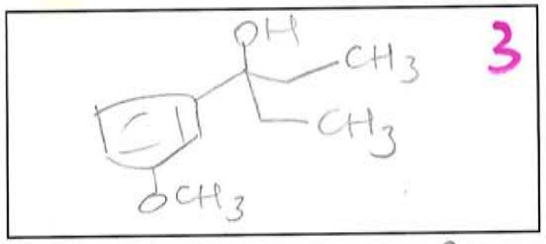




Practice target 4B

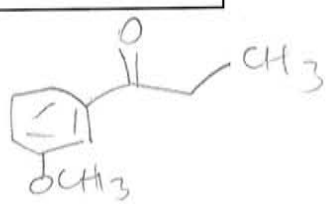
3 f





WS2 #2c

0 points for



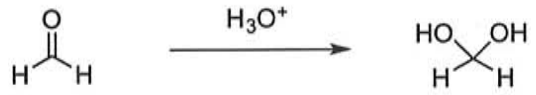
12
~~13~~

Initials: A

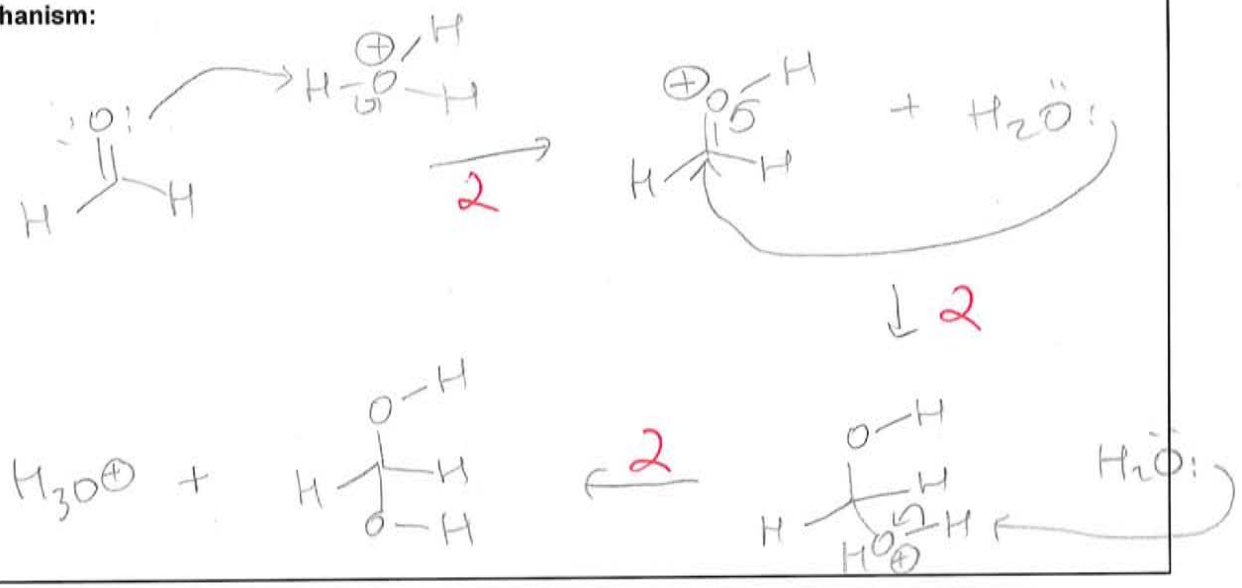
3. Provide an arrow-pushing mechanism (~~10~~ points).

WS3 #3c+d

a.

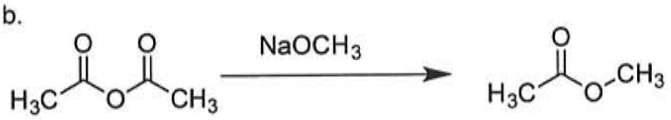


Mechanism:



6

b.

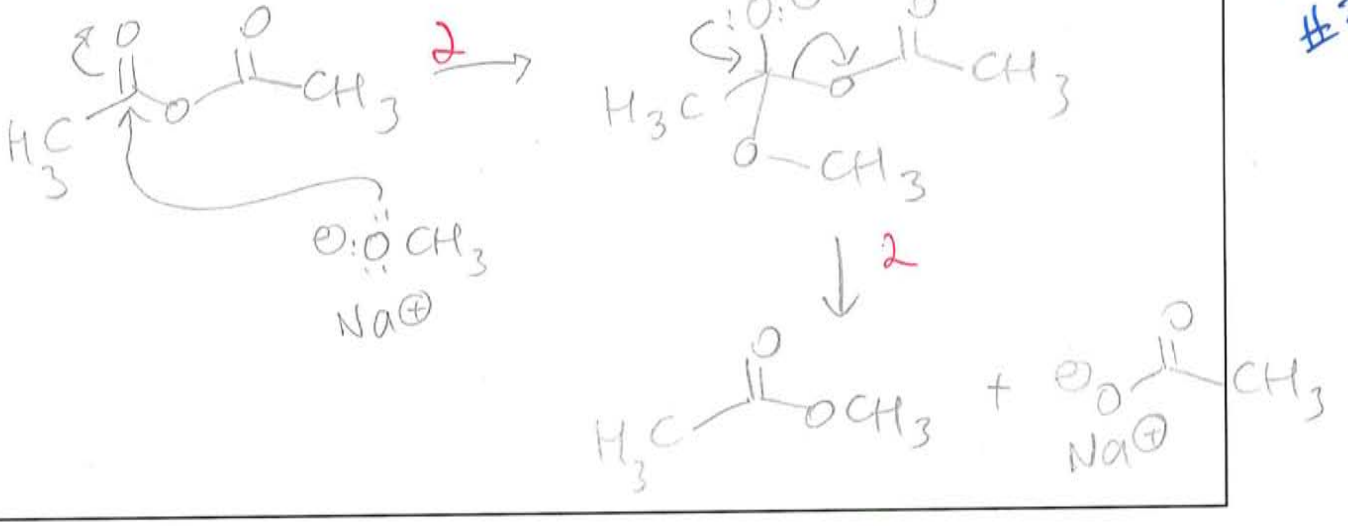


Is this reaction an oxidation, reduction, or neither?

neither

2

Mechanism:



Practice #3a

8

4

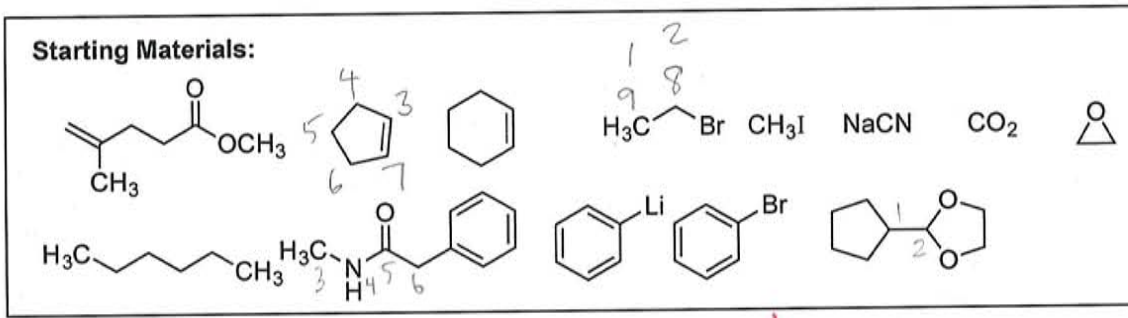
- errors: missing ⊖ or ⊕ charge
  -0.5 points

16
~~12~~

Initials: A

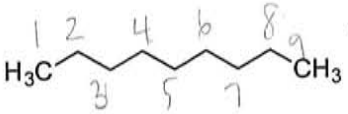
4. Propose syntheses of the targets below (10 points).
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

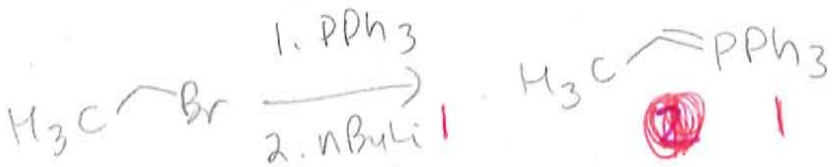
Starting Materials:



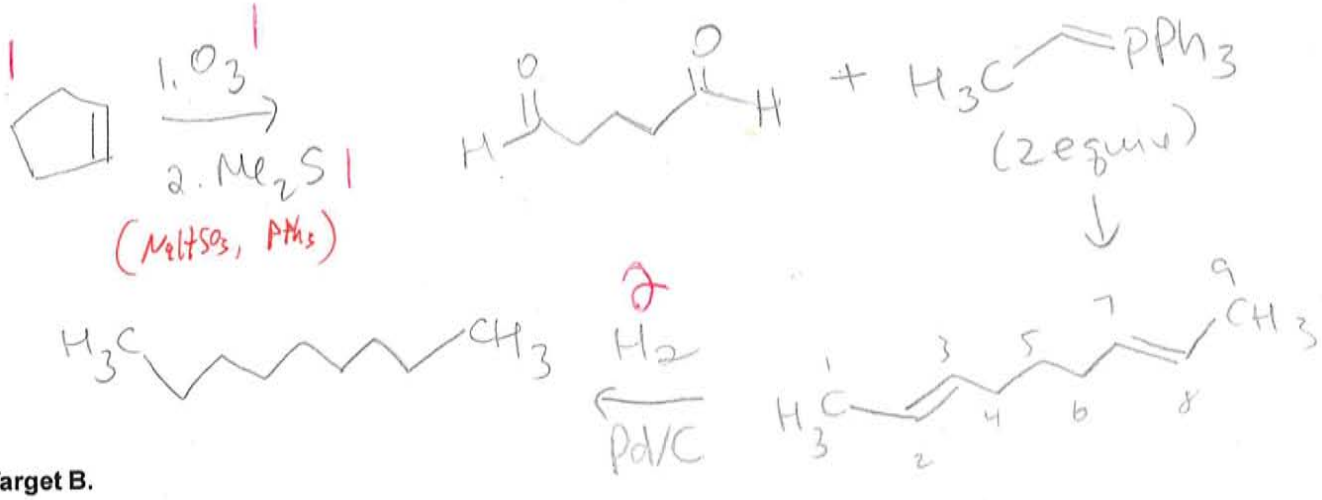
8

Target A.



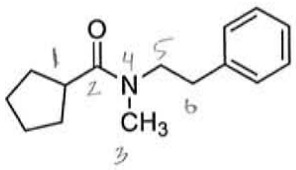


WS3
#5e
5d



WS4
#5c

Target B.



8

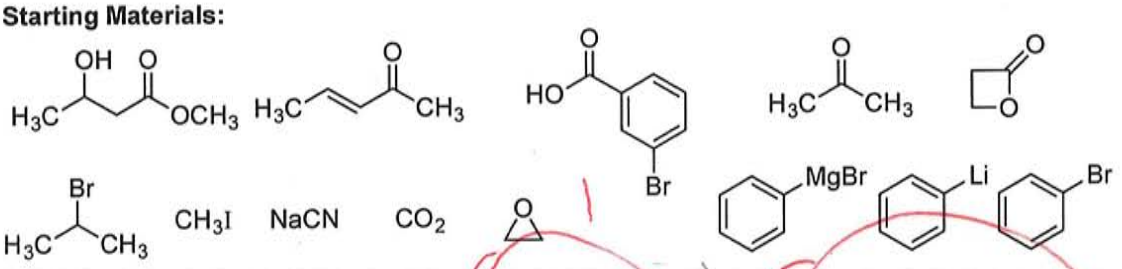
WS5
#5d
5b

12

Initials: A

5. Propose syntheses of the targets below (14 points).
All carbons must come from the starting materials provided, you can use any reagent you wish.
YOU CAN IGNORE STEREOCHEMISTRY.

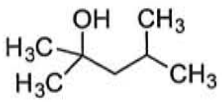
Starting Materials:



WS3 #1diii

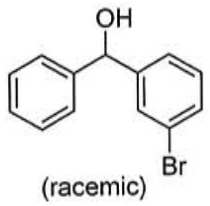
Target A.

6



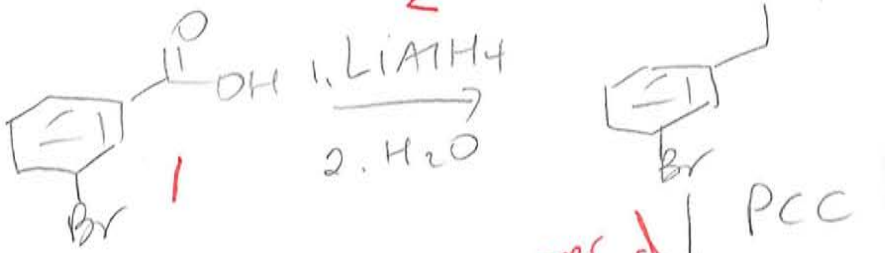
cuprate 1st, Grignard 2nd - 2

Target B.



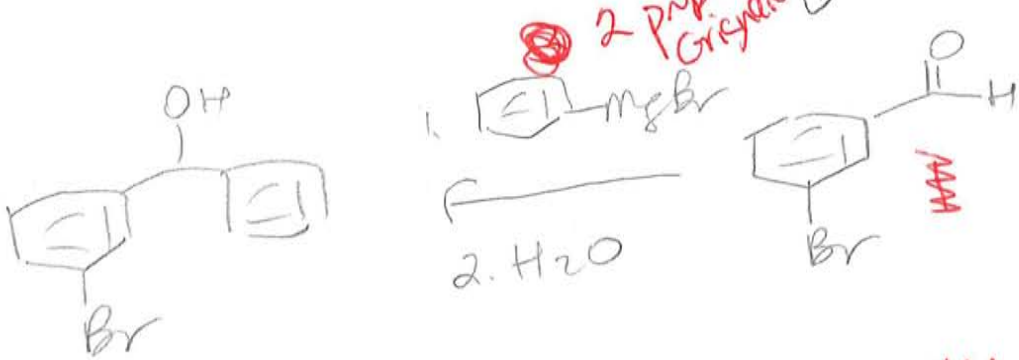
6

2 correct use



WS 3 #4b

WS 4 #5b



(note: PhLi also ok)