Chem 3331 Wang Spring 2012 Midterm 2

Student ID _____ Name_____

Ave. 66

page	points:
2	(15)
3	(15)
4	(21)
5	(18)
6	(31)
7	(10)
Total	(110)

90 — A
70 – 89 B
40 – 69 C
<40 D

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															

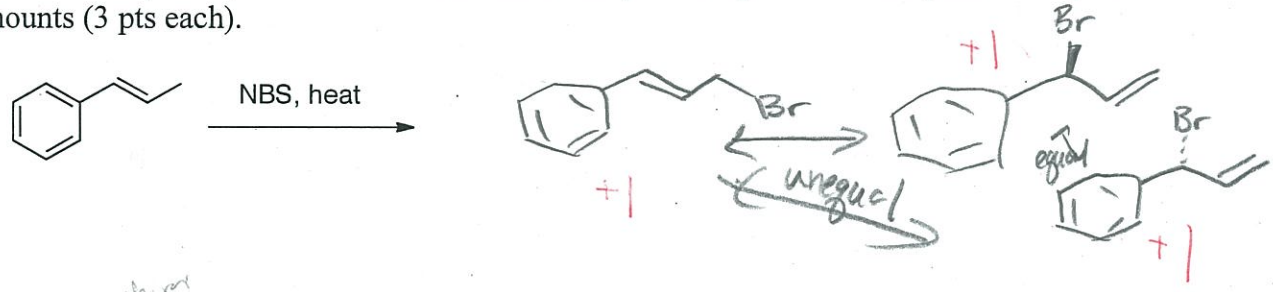
Please sit with an empty seat between you and your neighbors.

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

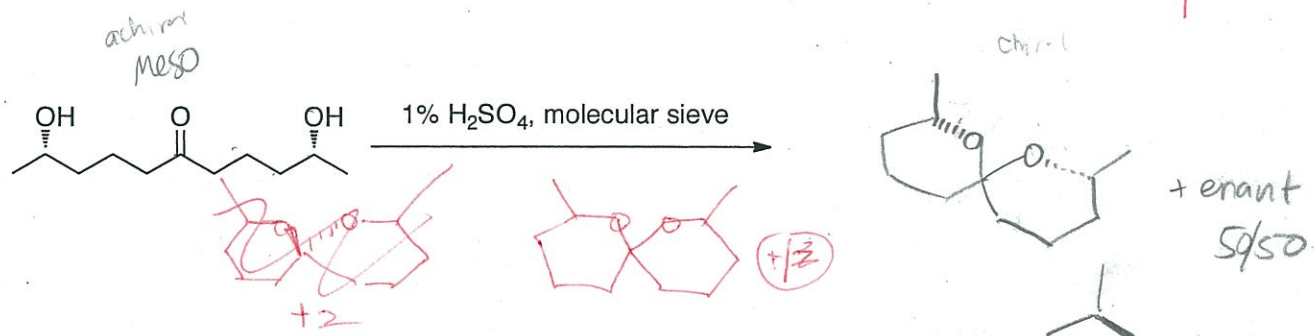
Feel free to ask questions about the questions, but please don't ask questions about your answers, it distracts your neighbors.

1) Provide the products of the following reactions (all reactions have an appropriate aqueous work up). If no reaction would occur, write NR. If a reaction would produce stereoisomers, draw the isomers and indicate if they will be produced in equal or unequal amounts (3 pts each).

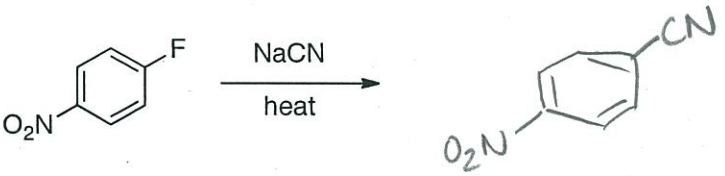
a)



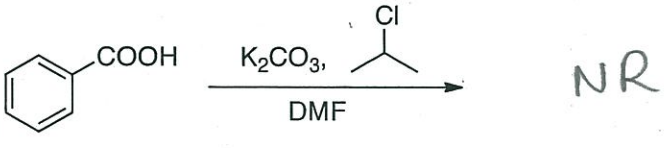
b)



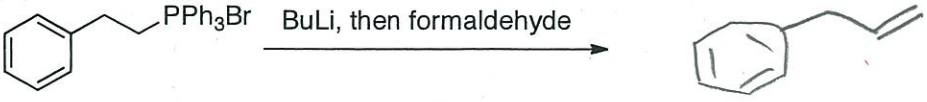
c)



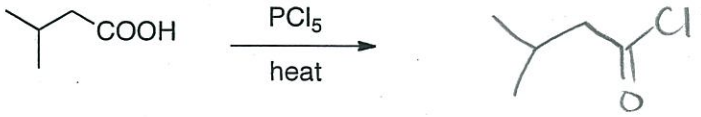
d)

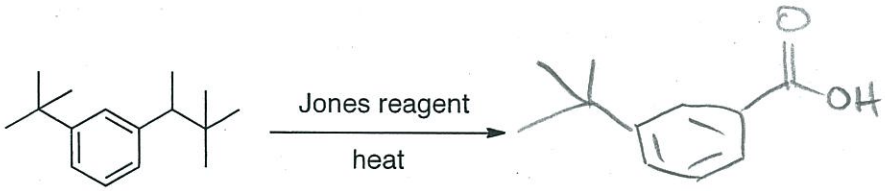


e)

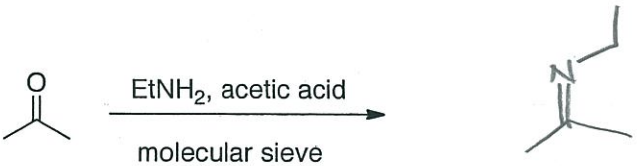


Ayman

f) 
COOH
PCl5
heat
Cl
O

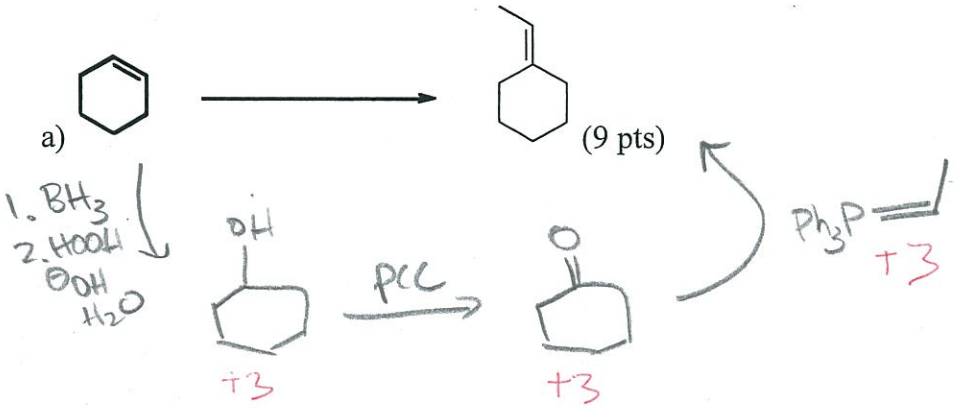
g) 
Jones reagent
heat
O
OH

h)
MeOOC
COOH
Et
heat
O
MeO

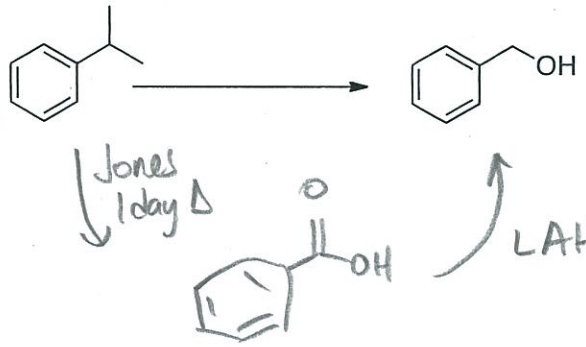
i) 
O
EtNH2, acetic acid
molecular sieve
N

j)
O
COOH
LiAlH4
HO
OH

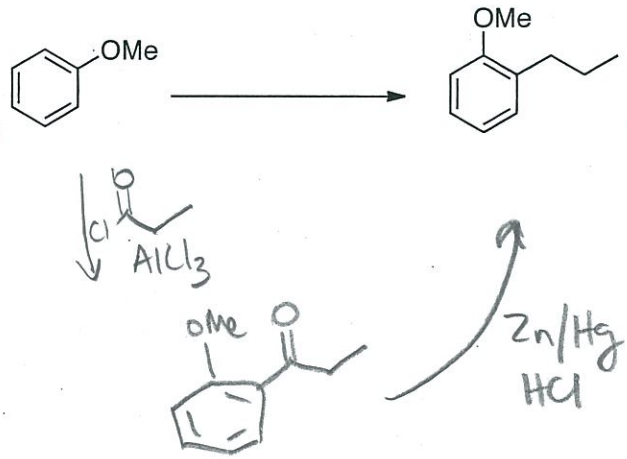
2) Complete the following syntheses using any reagents you need. You do not have to show the synthesis of the reagents you use, but **you must use the starting material indicated**. If your synthesis requires more than one step, **provide the product after each step**. All chiral products are racemic mixtures.

a) 

(9 pts)

b) 

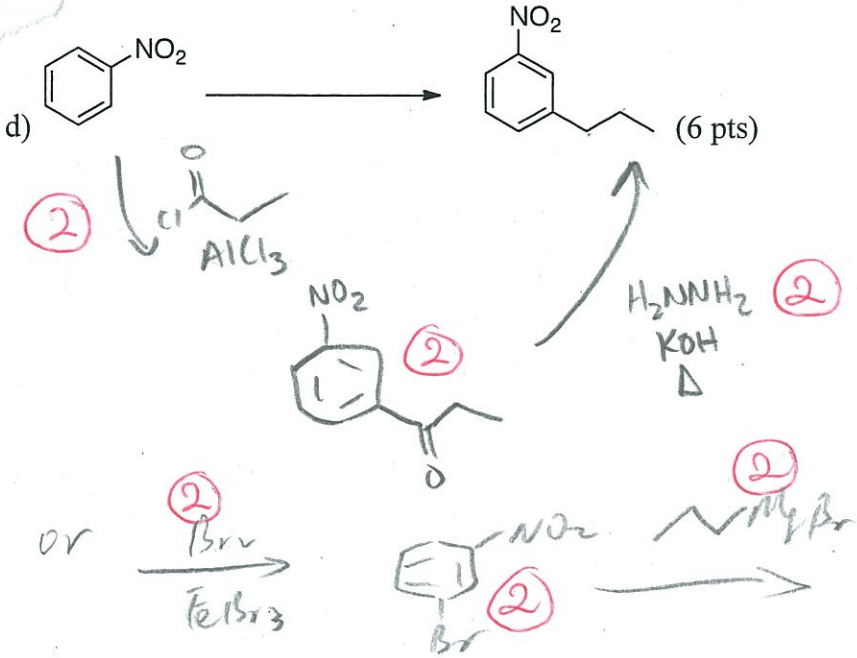
(6 pts)

c) 

(6 pts)

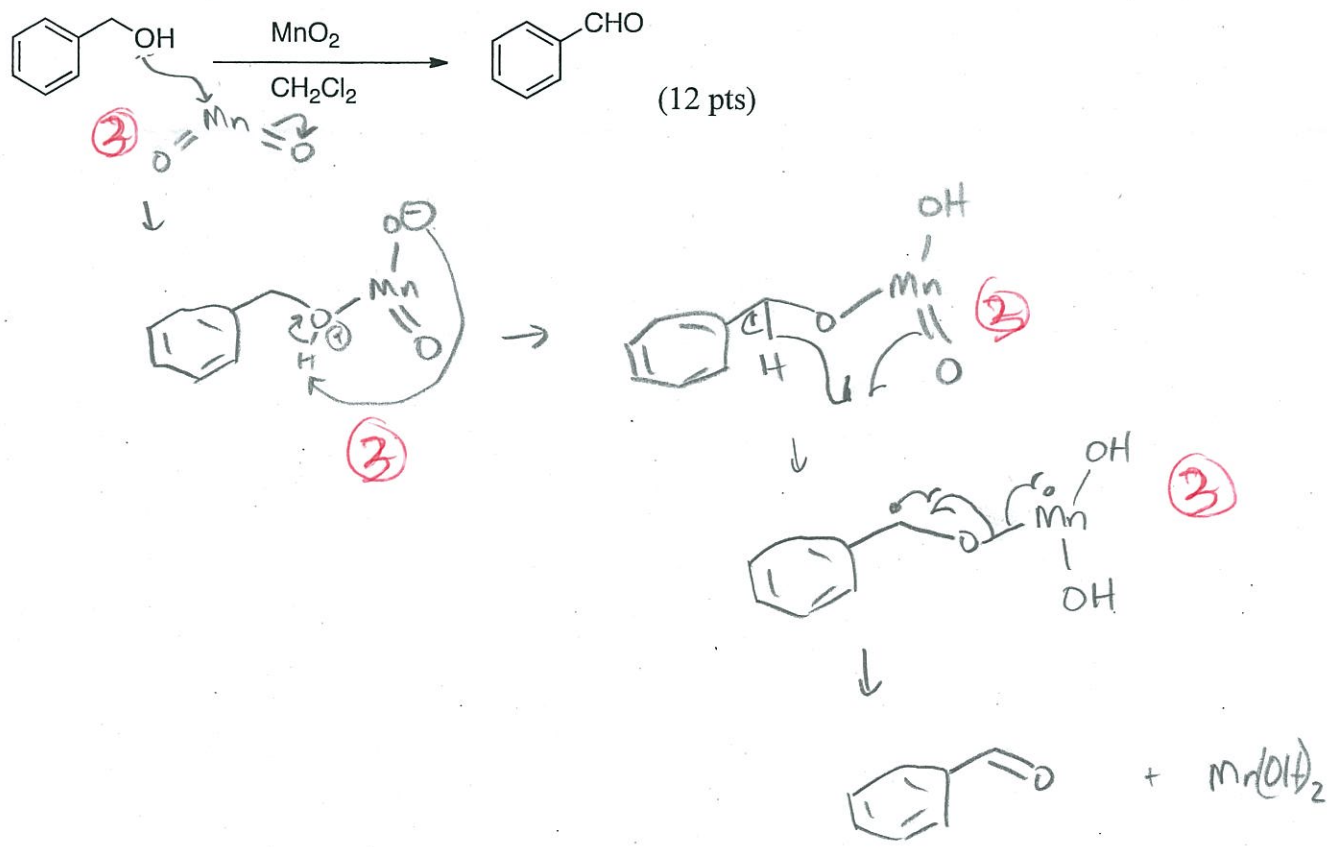
Friedel crafts +0

Ayman

d) 

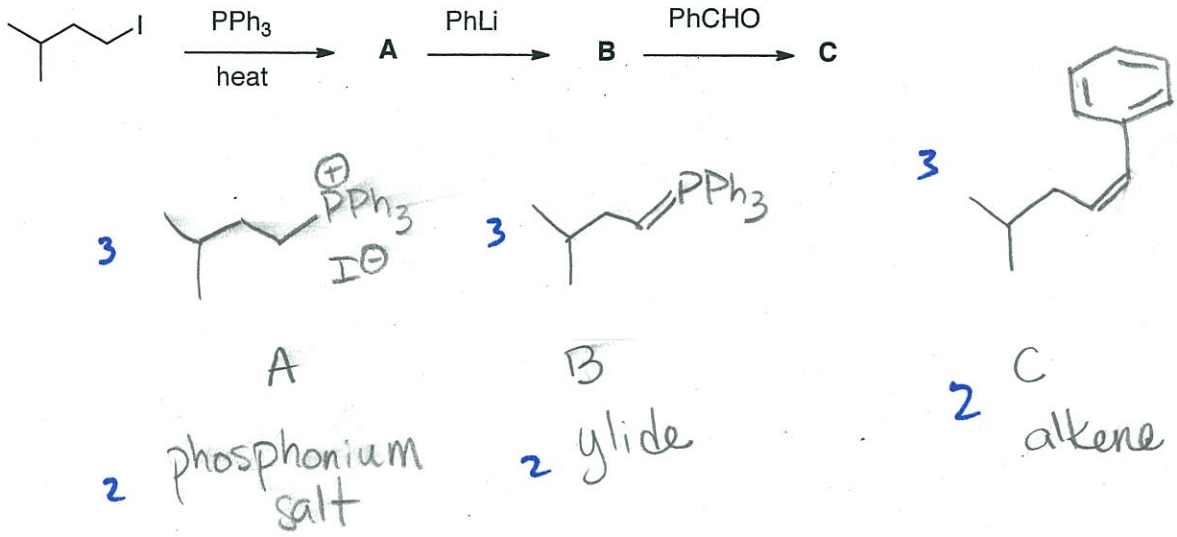
(6 pts)

3) Provide the mechanism for the following reaction. Show every intermediate with the proper charges and all the arrows required for each step of the reaction.

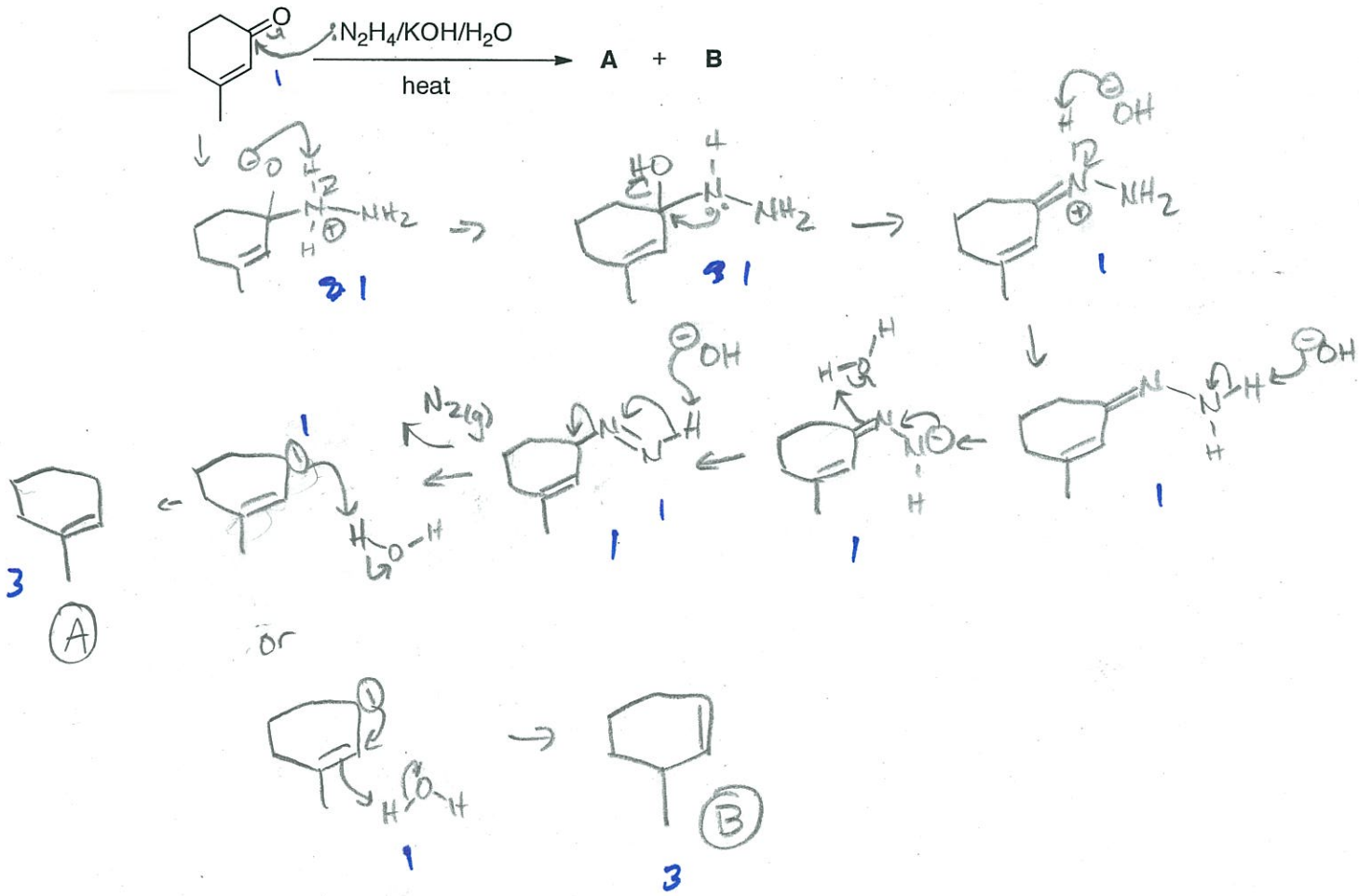


(12 pts)

4) Provide the Lewis structures and names of A, B and C. (3+2 pts each, 15 pts total).



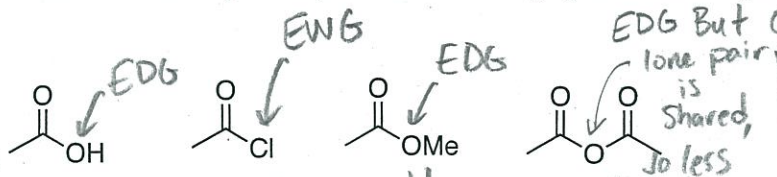
5) Provide the two products and mechanism for the reaction shown below. Show every intermediate with the proper charges and all the arrows required for each step of the reaction (3 pts for each product 10 pts for mechanism, 16 pts total)



2 pts order
3 pts. discussion

6) Rank the electrophilicity of the following species and explain why (5 pts each).

a)

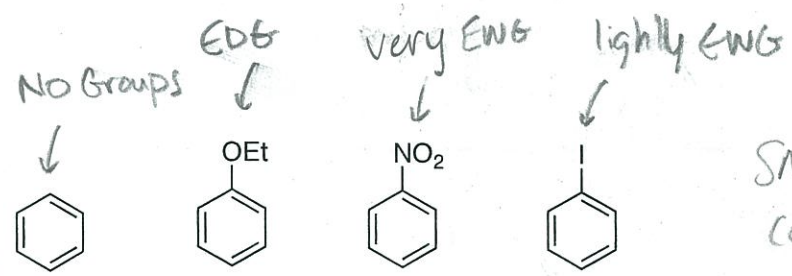


3 1 (most) 4 2

these are close to the same reactivity but the methyl is slightly more donating than H

Addition to the carbonyl is fastest with more $\delta^{\oplus}$ on the Carbon in the carbonyl ∴ most eletrophillic carbonyl is the most $\delta^{\oplus}$ on carbon.

b)



3 4 1 (most) 2

SNAR the Aromatic compound is the Electrophile ∴ least electron density = best electrophile