

**Second Examination
(Closed book, no models)**

Chemistry 118B(A)

March 3, 2006

Name _____ **Key** _____
 (Please print) Last First Middle initial
 Last 4 digits of Students ID Number: _____

Circle the name of the TA whose section you attend.

Section	TA	Sect.	TA	Sect.	TA
1	Aurea Chu	7	Thelma Garcia	13	Nannan Tao
2	Aurea Chu	8	Thelma Garcia	14	Grace Chavis
3	Marci Amii	9	Shengshu Huang	15	Marci Amii
4	Vahid Eskandari	10	Mike Varela	16	Mike Lodewyk
5	Radhika Bachu	11	Vahid Eskandari	17	Grace Chavis
6	Nannan Tao	12	Mike Varela	18	Mike Lodewyk

Repeaters : Please write the name of your designated TA here _____.

- 1) This exam consists of 5 pages (including this page) and 6 questions.
- 2) Do not turn the pages until 11:00 am.
- 3) Turn in your paper to one of the teaching staff by 11:50 am.
- 4) Put your initials in the upper right corner of the next 4 pages. Be sure you have pages 2-5.
- 5) Please answer clearly in the spaces provided. Back of the pages are only for scratch work.
- 6) Any request for regrading should be done according to the TA's instruction.

	1 H								2 He
2	3 Li	4 Be		5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg		13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca		31 Ga	32 Ge	33 As	34 Se	35 Br	35 Kr
5	37 Cs	38 Sr		49 In	50 Sn	51 Sb	52 Te	53 I	53 Xe

Page	Score
2	/26
3	/40
4	/10
5	/24
Total	/100

1. (16 Pts). Multiple choice. Circle one.

a. In electrophilic aromatic substitution reactions, a $-\text{CO}_2\text{H}$ substituent on the aromatic ring is:

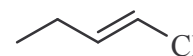
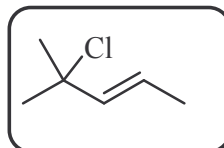
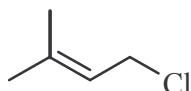
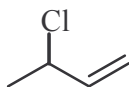
A) a deactivator and a m-director.

B) an activator and a m-director.

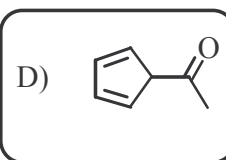
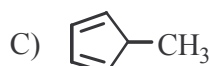
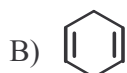
C) an activator and an o,p-director.

D) a deactivator and an o,p-director.

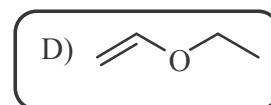
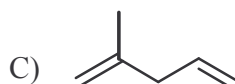
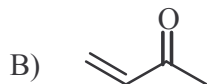
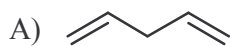
b. The most reactive substrate toward H_2O :



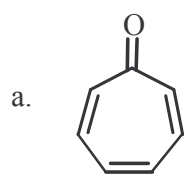
c. The strongest acid:



d. The least reactive dienophile in Diels Alder reaction:



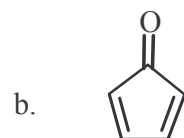
2. (10 Pts) Classify the structures shown below, aromatic, antiaromatic, nonaromatic. Explain your answer. Hint: the carbonyl group is a polar group.



Aromatic 2 pts

The molecule is cyclic planar, and contains $4n+2$ pi electrons, also all members of the ring contain a p orbital for circulating the electrons..

3 pts

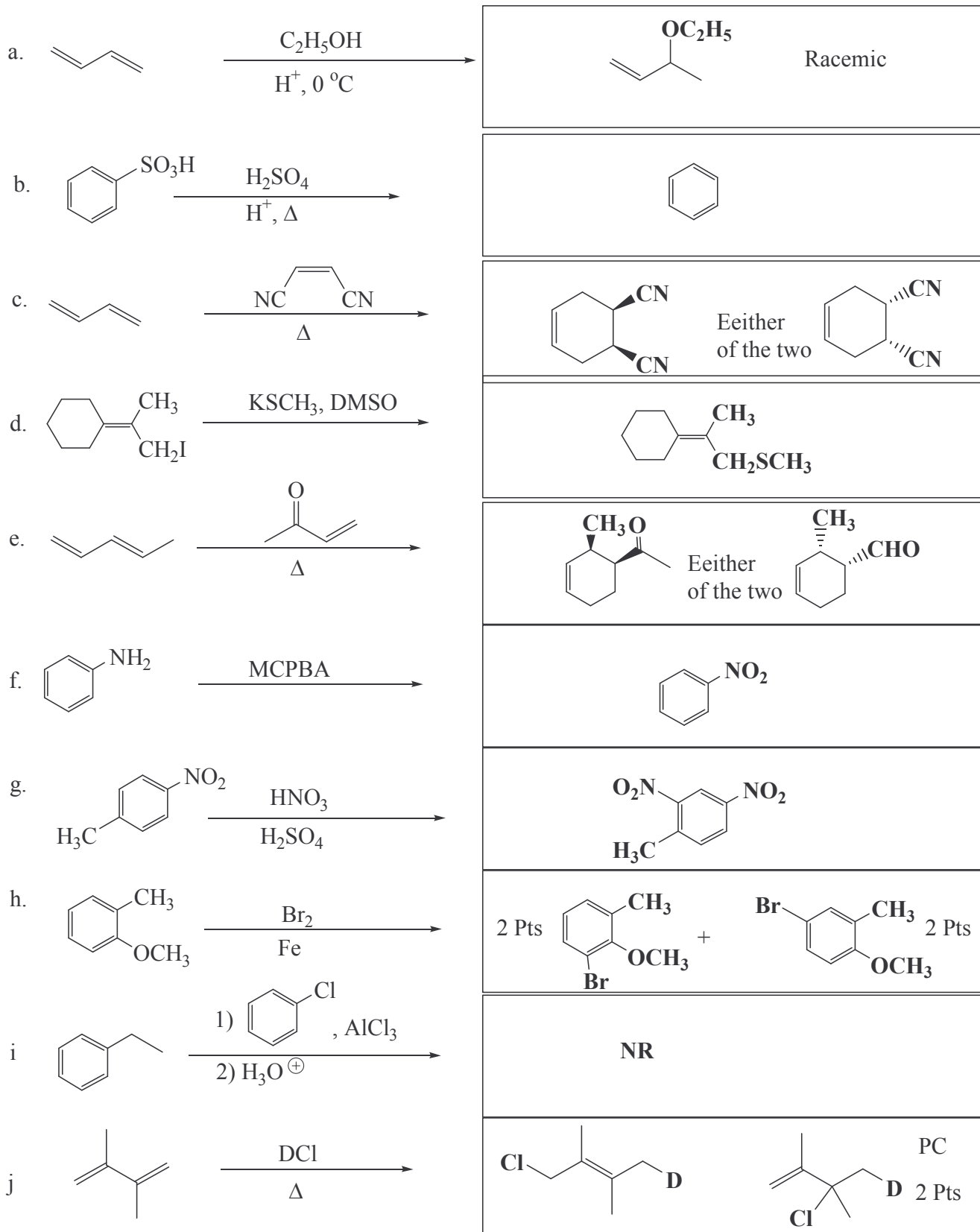


3 pts

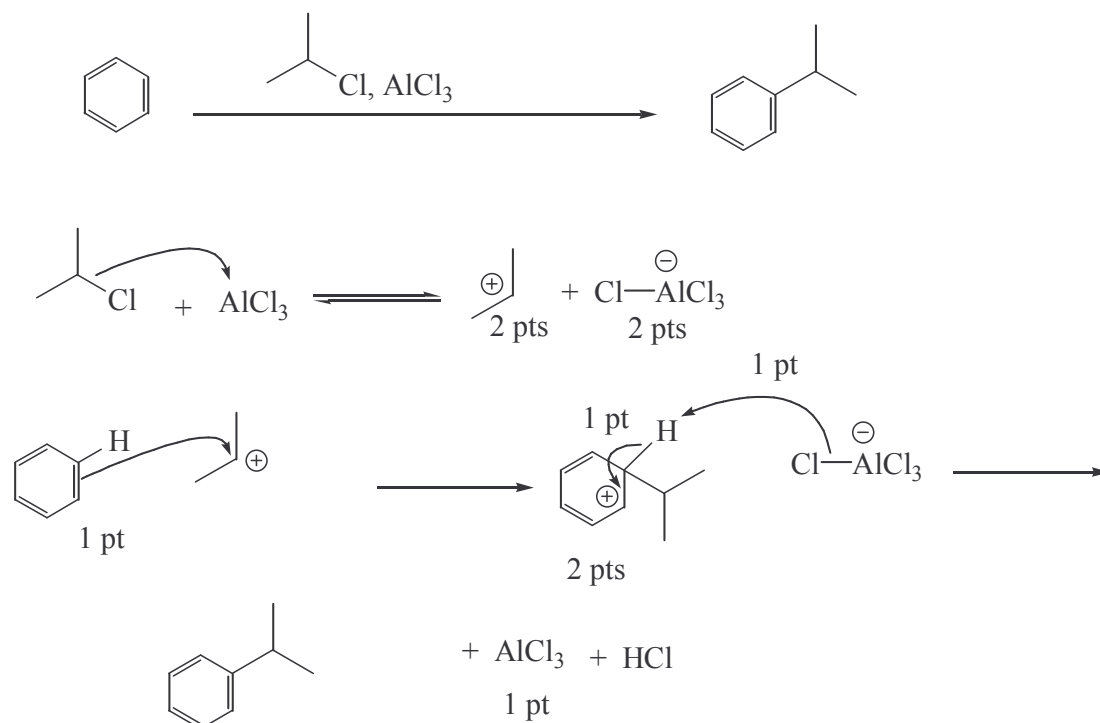
2 pts

Anti-aromatic, cyclic planar molecule with $4n$ pi electrons.

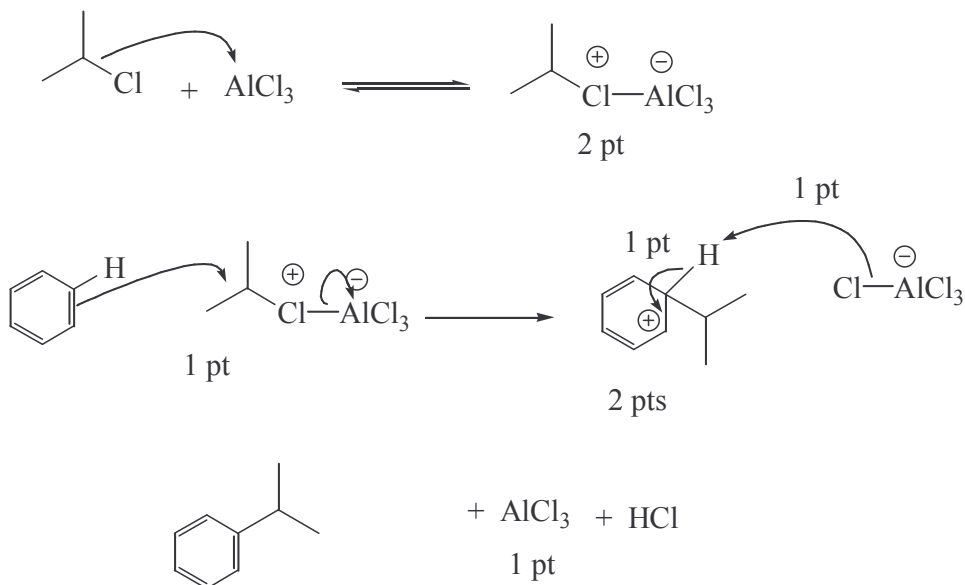
3. (40 Pts) Provide the structure(s) of the expected **major** organic product(s). Unless mentioned otherwise, you can assume that all reagents are present in one mole. **Show stereochemistry where needed and write NR if there is no reaction.**



4. (10 Pts) Write a complete, stepwise, detailed mechanism for the following reaction.

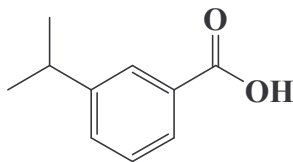


An alternative mechanism

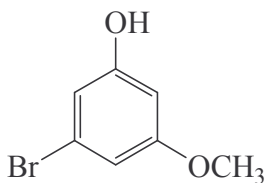


5. (12 Pts) Write an acceptable name, or structure for the following:

a. *m*-isopropylbenzoic acid



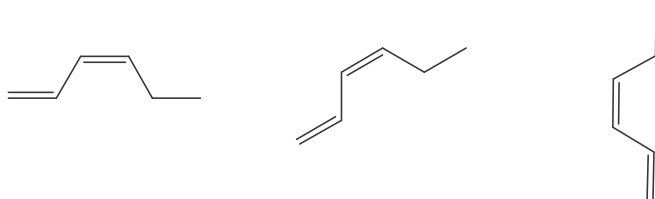
b.



3-Bromo-5-methoxyphenol

-2 for wrong order

c. Draw the bond-line structure for (*Z*)-1,3-hexadiene in its most stable conformer.



Any s-trans

6. (12 Pts) Show how you would carry out the following transformations in high yield. In addition to the reactants, you may use any organic, and inorganic reagents. You don't need to show the mechanism, just write the steps in order you do the reactions.

