Name:

CHEMISTRY 249S
Examination 2
March 29th 2007

Answer all questions in the spaces provided on the examination sheets, indicating clearly what is to be graded.

PRINT YOUR NAME AND STUDENT NUMBER
CLEARLY ON THE FIRST PAGE OF THE EXAM BOOKLET

NAME:

STUDENT NUMBER:

Allowed Aids: Molecular Models

Calculators and other electronic devices are not permitted in this examination

Credit will be given for partial answers

WAIT UNTIL YOU ARE TOLD TO BEGIN

Good Luck!

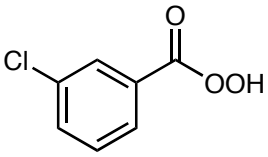
Marking Scheme

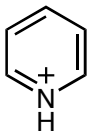
Question 1	**70**	
Question 2	**30**	
Question 3	**40**	
Question 4	**50**	
Total	**190**	

Name:

Abbreviations:

Bu:	butyl (C_4H_9)
cat.:	catalytic
Δ:	heat
equiv:	equivalents
Me:	methyl (CH_3)
Ph:	phenyl (C_6H_5)
TBS:	$Si(CH_3)_2$*t*-Bu

*m*CPBA: 

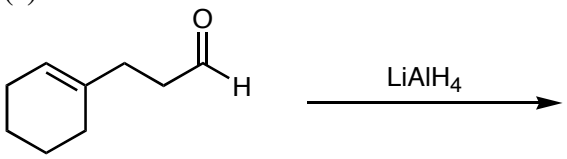
PCC: 

$ClCrO_3^-$

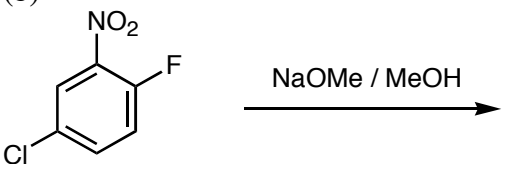
Questions:

1. Draw the **final product** of the following reactions. You may assume standard aqueous work-up steps are used as required. (**70 Points**)

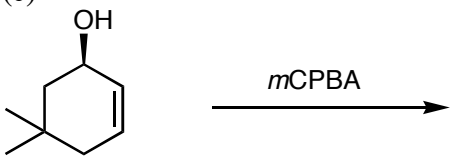
(a)



(b)

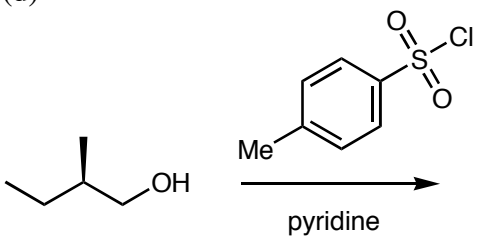


(c)

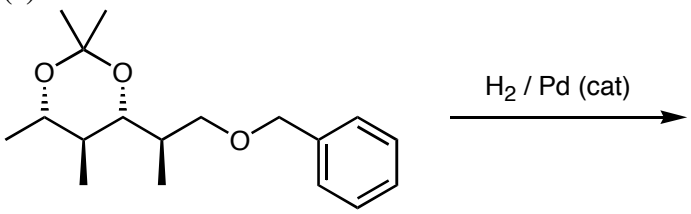


Name:

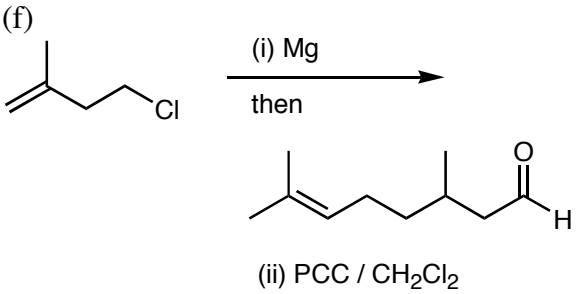
(d)


O
Cl
S
O
Me
OH
pyridine

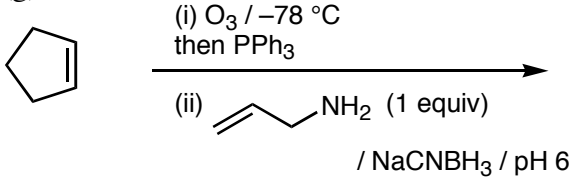
(e)


O
O
O
H2 / Pd (cat)

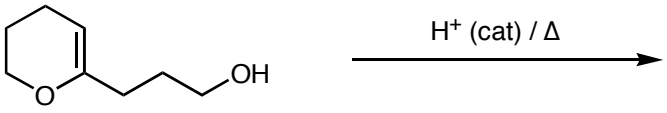
(f)


Cl
(i) Mg
then
O
H
(ii) PCC / CH2Cl2

(g)

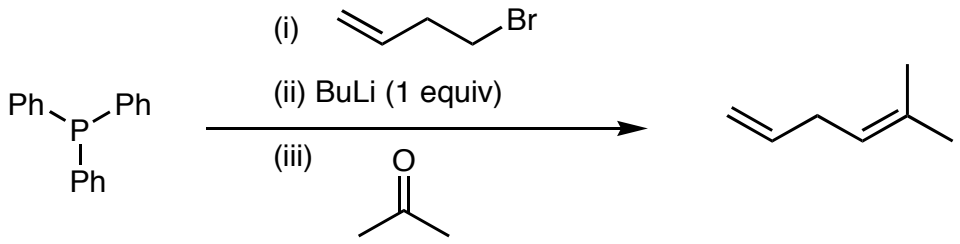

(i) O3 / –78 °C
then PPh3
(ii)
NH2 (1 equiv)
/ NaCNBH3 / pH 6

(h)


O
OH
H+ (cat) / Δ

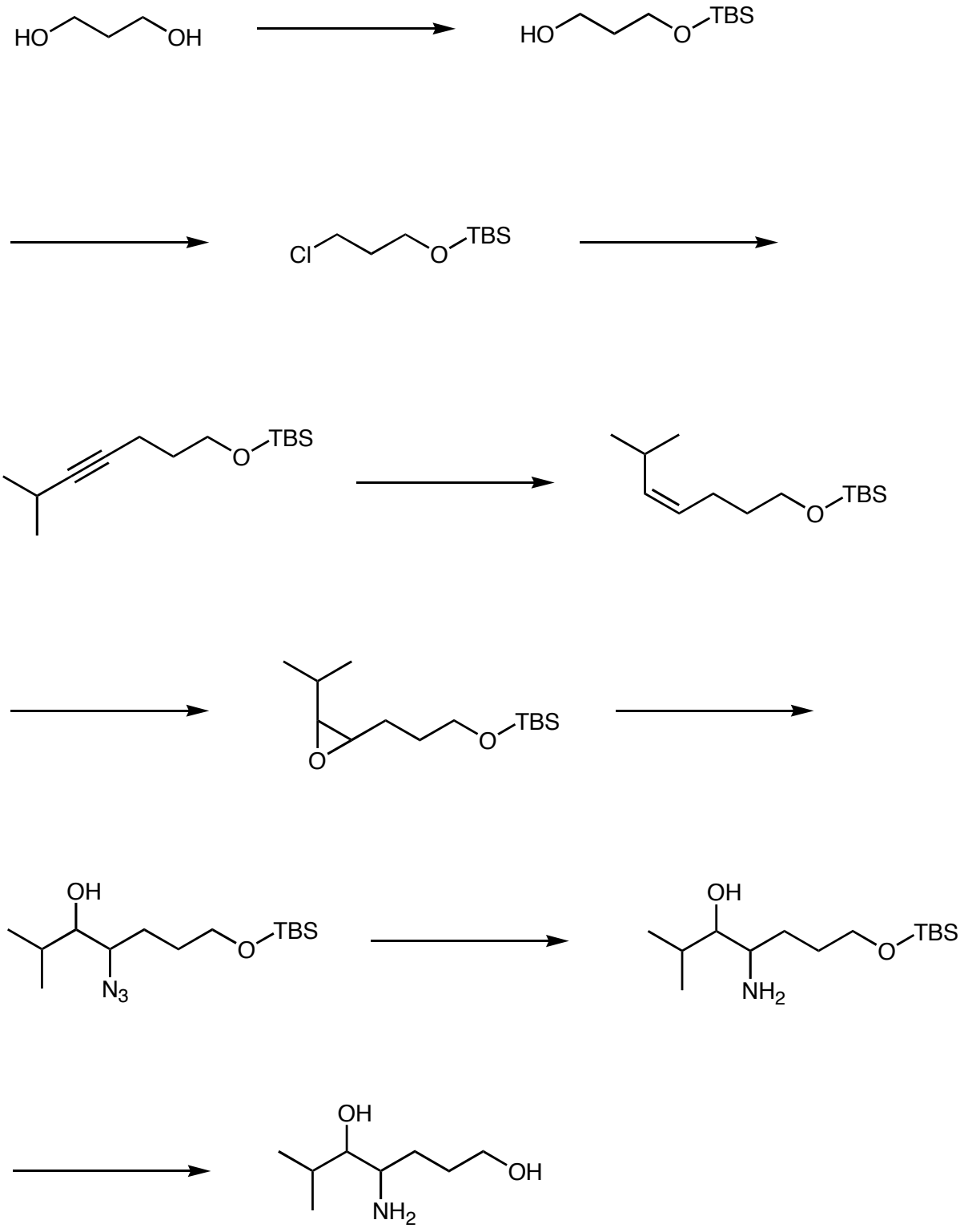
Name:

2. Draw mechanisms for each step of the following synthetic sequence. Your answer should clearly indicate electron pair-movement using "arrow-pushing" and show all intermediates on the pathway to the alkene product. (**30 Points**)



Name:

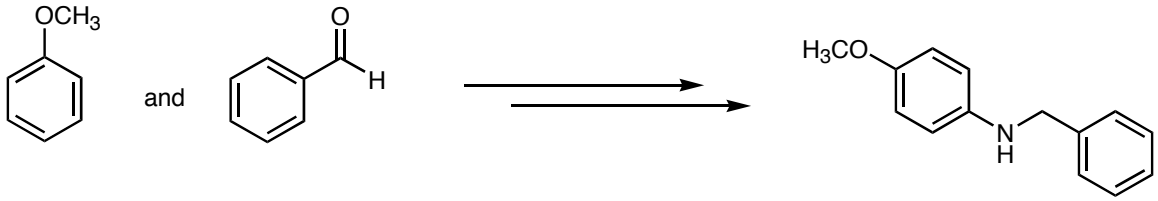
3. Suggest appropriate reagents to accomplish the following transformations. It is not necessary to draw mechanisms for your transformations. Clearly show the *relative stereochemistry* of the last four products. (**40 Points**)



Name:

4. Suggest concise syntheses of the following products using the precursor materials indicated, and any other precursor molecules that contain 5 carbon atoms or less. In each case draw the reagents that you would use **and** the products obtained after each synthetic step. No more than four reactions are required for each synthesis. It is NOT necessary to write mechanisms for the reactions. (**50 Points**)

(a)



(b)