CHEM 330

Midterm Exam
October 26, 2009

Your name: _____

This a closed-notes, closed-book exam

The use of molecular models is allowed

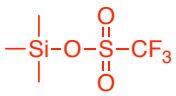
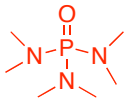
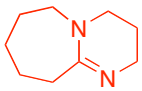
Time: 60 min

this document contains 5 pages

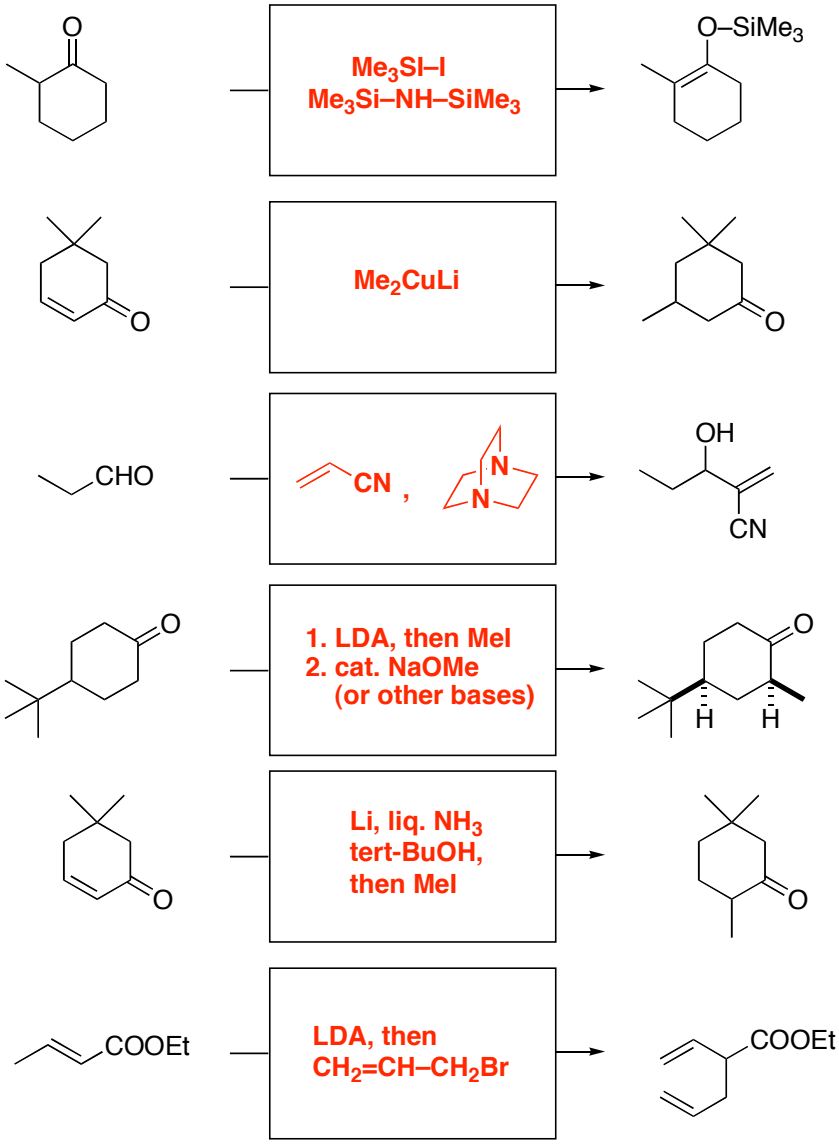
1.	_____	/ 12
2.	_____	/ 18
3.	_____	/ 20
4.	_____	/ 25
5.	_____	/ 25
TOTAL	_____	/100

This exam counts for 25% of your CHEM 330 final grade

1. (12 pts) Draw a clear structure of the following reagents and indicate in few words what they are used for / as (write your answers in the appropriate boxes):

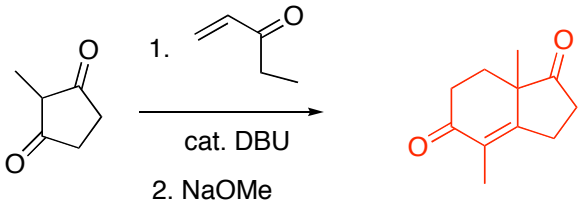
	structure	used for / as
DABCO		catalyst in the Baylis-Hillman reaction
TMSOTf		preparation of kinetic silyl enol ethers by "soft" enolization
HMPA		solvent to break down enolate aggregates into monomers
DBU		catalyst in the Michael reaction of stabilized enolates

2. (18 pts.) Provide the reagents that are required to induce the following transformations (write your answers in the appropriate boxes. **It is understood that each reaction is subject to a final aqueous workup**):

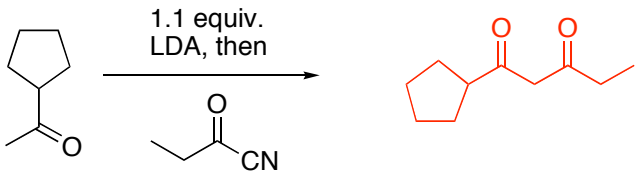


3. (20 pts.) Predict the structure of the major product expected from the following reactions. **It is understood that each reaction is subject to a final aqueous workup**.

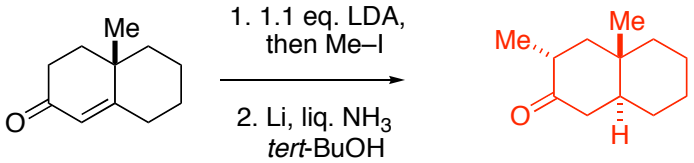
a.



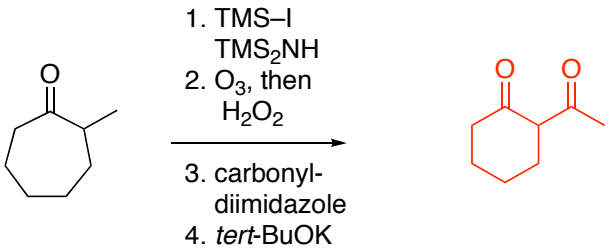
b.



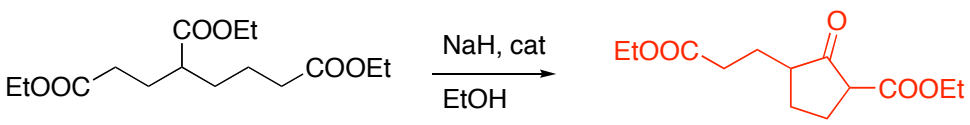
c.



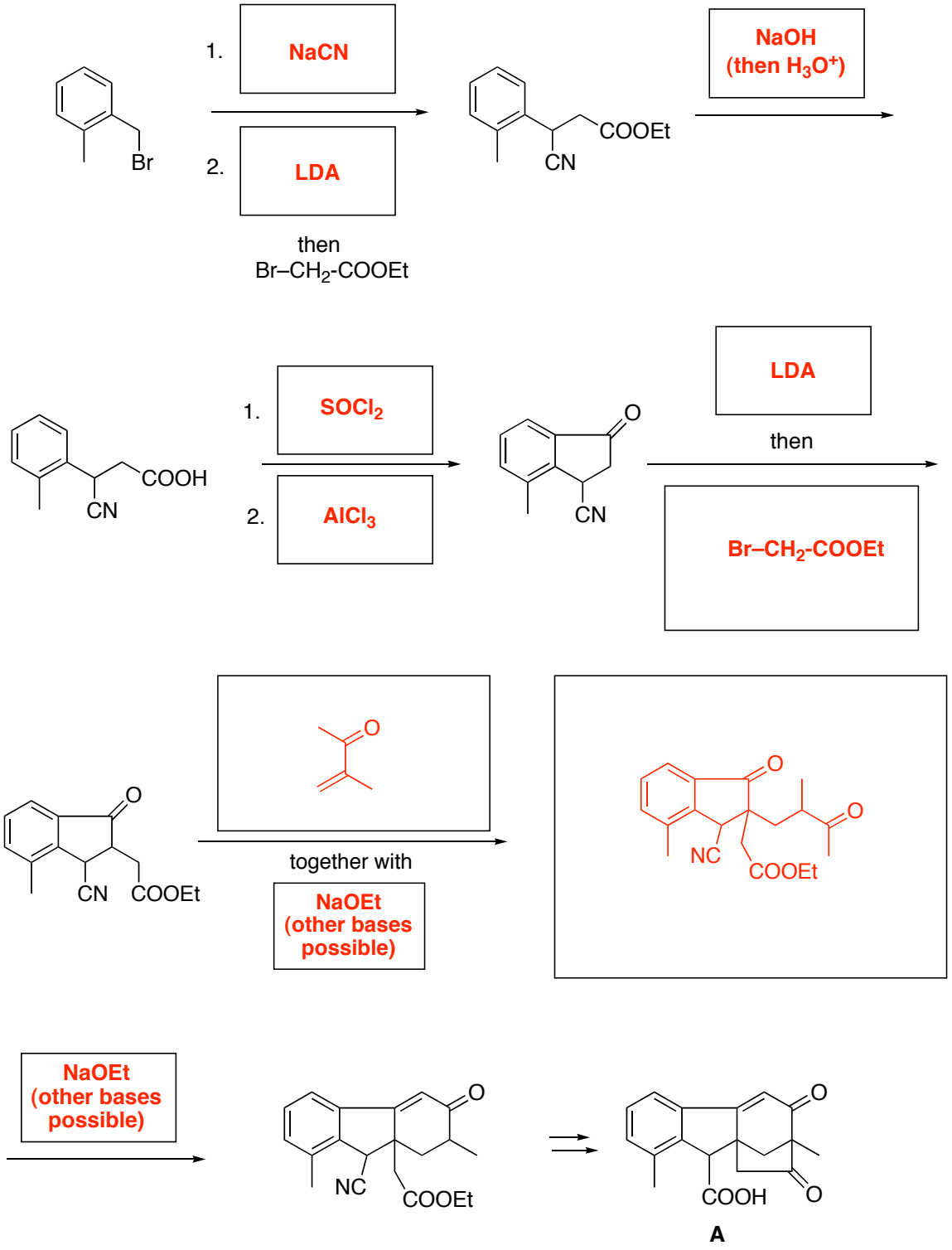
d.



e.



4. (25 pts.) Gibberellins are plant hormones that stimulate vertical growth. A synthesis of gibberellins by Mori, *et al.* proceeded via **A**, which was prepared as shown below. Complete this diagram by writing in all missing intermediates and reagents. **It is understood that each reaction is subject to a final aqueous workup**.

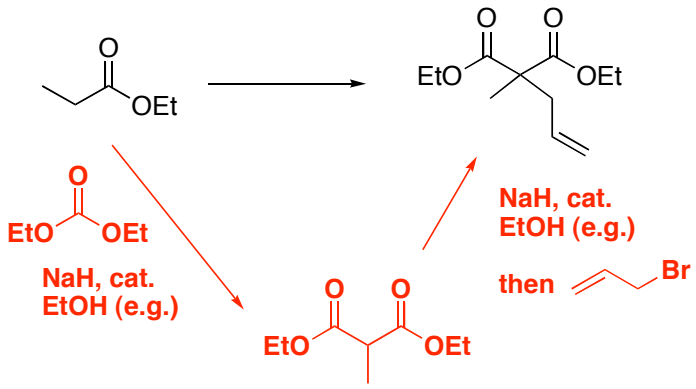


(Cf. *Tetrahedron* **1969**, 1293)

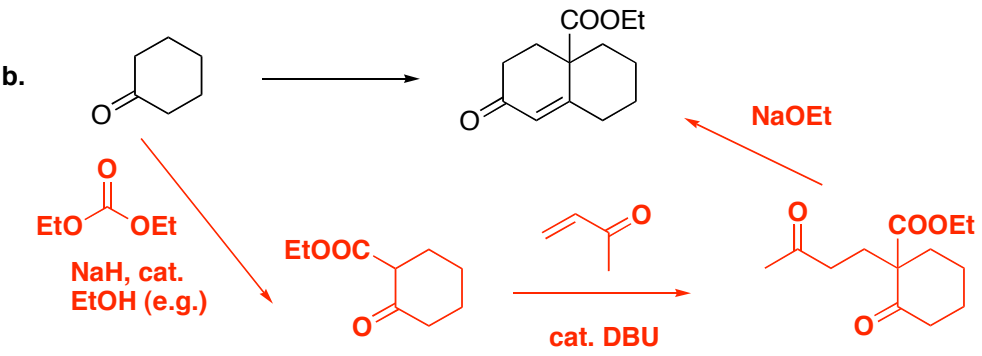
5. (25 pts.) Propose a method to accomplish the transformations shown below. In each case, a multistep sequence (= not just one reaction, but several) may be required. Assume the availability of all reagents needed to convert the starting material into the product (e.g, bases, alkyl halides, etc.). Present your answer as a flowchart.

- **It is not necessary to draw mechanisms**.
- **Aqueous workups at the end of each reaction are understood**

a



b.



c