

UNIVERSITY OF WINDSOR
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Chemistry 59-331/333
Final Examination

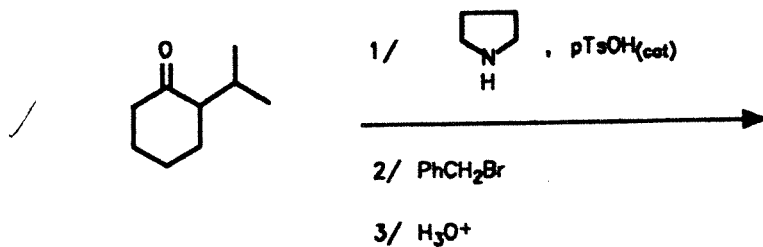
1992
Time: 3 hours

Answer all questions in the exam booklet

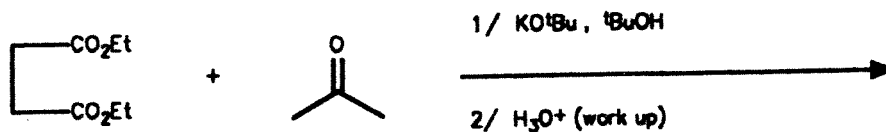
1. Do any ten (10)

Indicate the structure of the expected major product from each of the following reactions. Mechanisms are not necessary, but showing your work is likely to be a help. Include product stereochemistry where it applies (Total 30 marks).

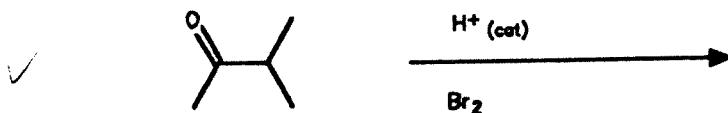
a)



b)



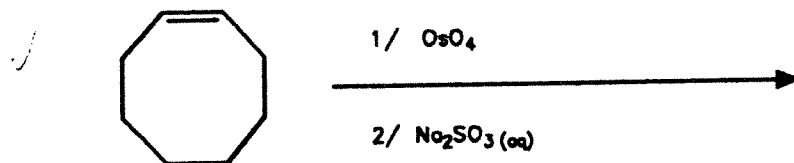
c)



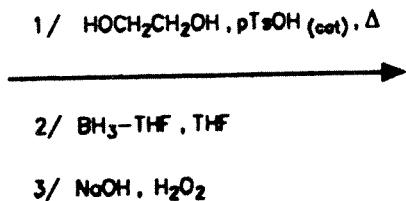
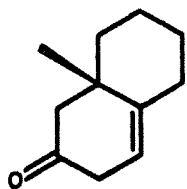
d)



e)

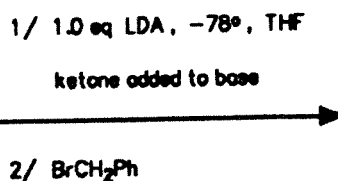
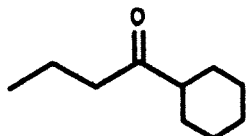


f)

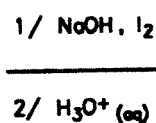
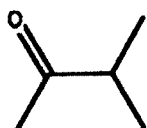


Note: The underside of the starting material is less hindered.

g)

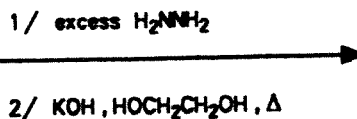
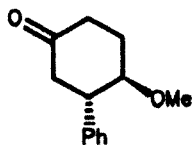


h)

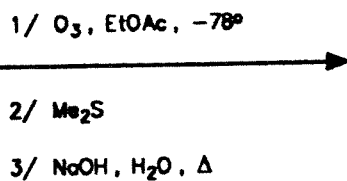
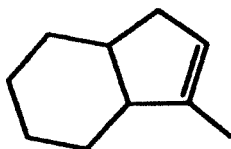


+ *acetone* 3:

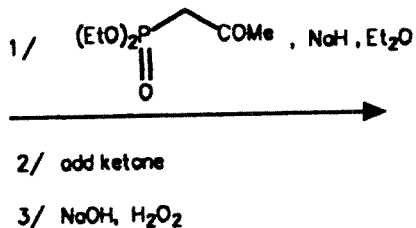
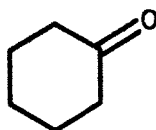
i)



j)



k)



l)



+

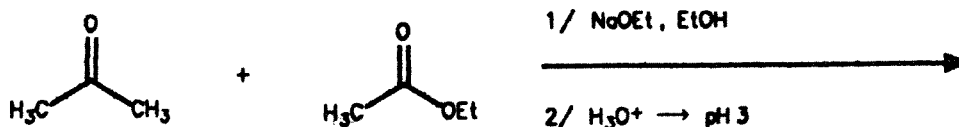


1/ benzene, Δ

2/ H₂, RanNi

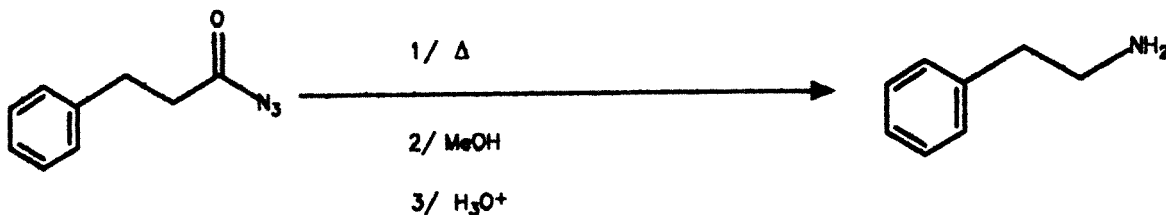
2.

a) Draw the complete mechanism for the Claisen condensation between acetone and ethyl acetate.



b) Do i) or ii), but not both

i) Draw a mechanism for the following Curtius rearrangement. Your answer must contain a drawing of at least one of the resonance forms of the azide starting material (rather than just N_3).



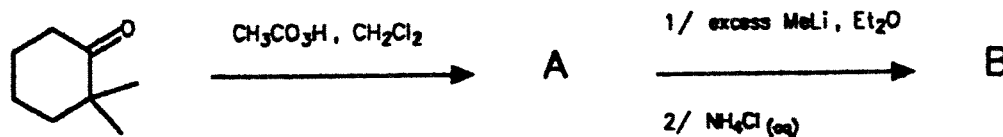
ii) Draw a mechanism for the Birch reduction of ethyl benzoate.



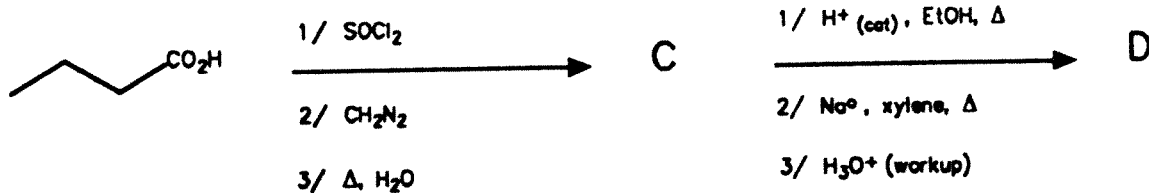
3. Do any 8 (eight) of the letter compounds

Give the expected compounds corresponding to the letters below. Include any stereochemistry where it applies. (Total 40 marks)

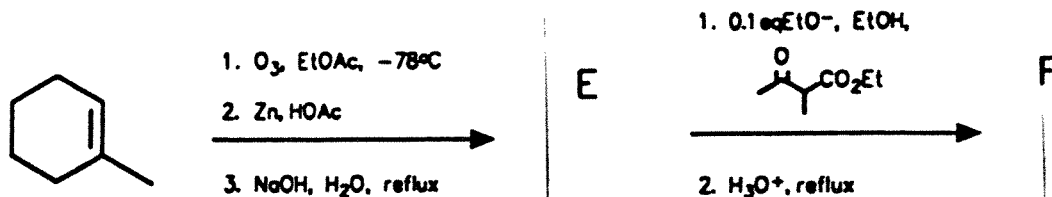
a)



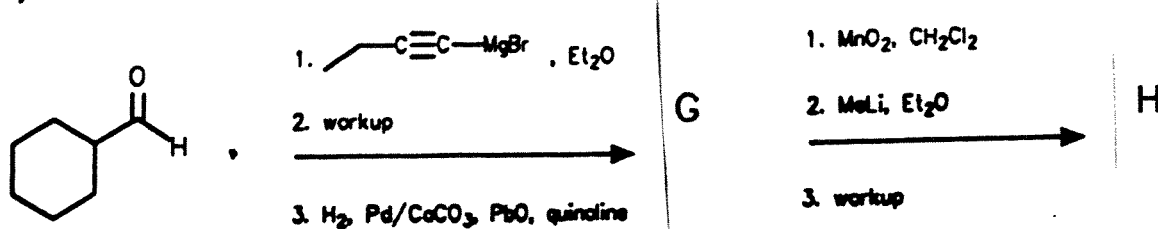
b)



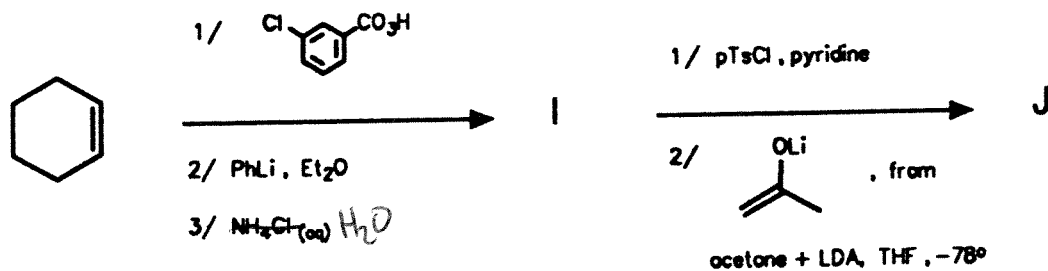
c)



d)



e)

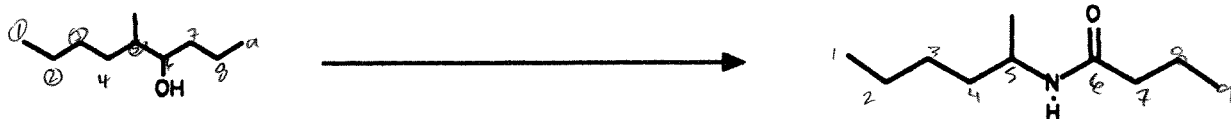


4. Show by equation how you could prepare the products illustrated below from the given starting material. You may use any other reagents you deem fit. Show all reagents, conditions, and isolable intermediates. Mechanisms are not necessary, but may be a help. (Total 70 marks) Do any seven (7)

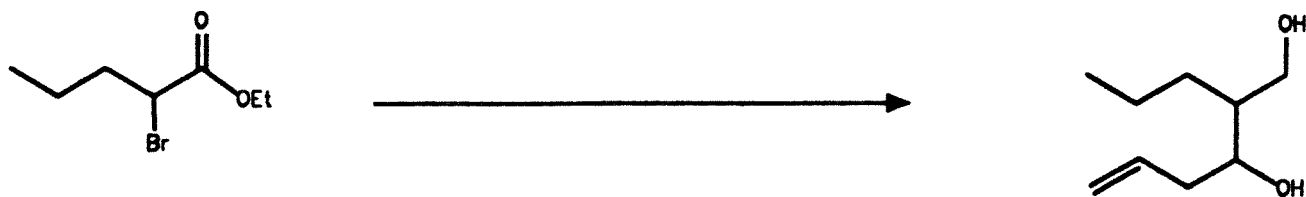
a)



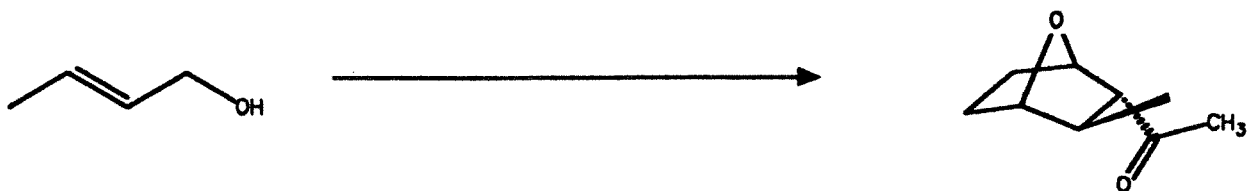
b)



c)



d)



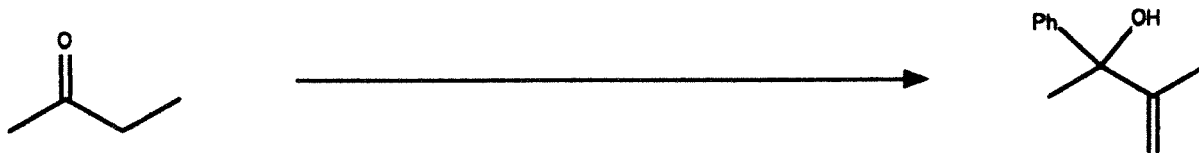
e)



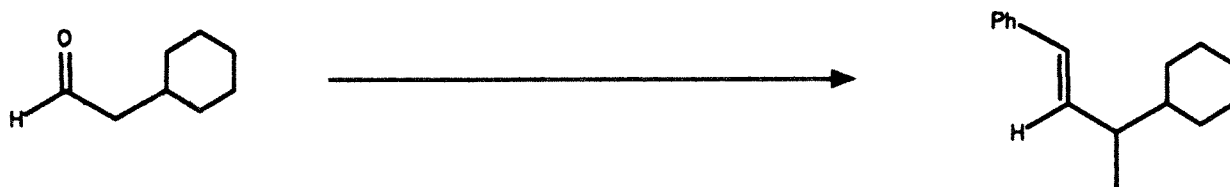
f)



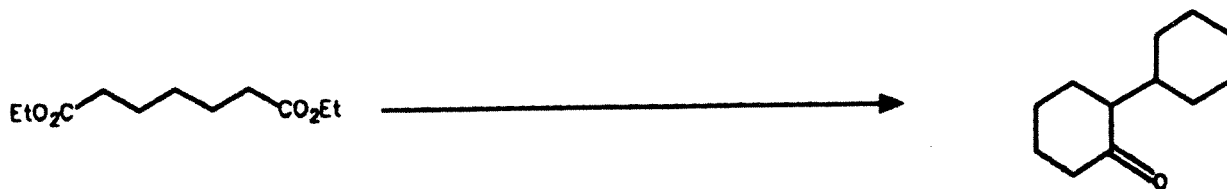
g)



h)



i)



Bonus (up to 10 marks):

a) Treatment of the following chloroketone, did not give an aldol condensation product, but rather the indicated ester. The reaction is called the Favorskii rearrangement. What is going on?



b) Sulphur ylides are very closely related to phosphorus ylides. Like phosphorus ylides, they react with carbonyl compounds; unlike phosphorus ylides, the product of such a reaction is not an alkene, but rather another functional group with which you have dealt in this course. Keeping in mind that the reactivity of sulphur ylides is somewhat like those of phosphorus, predict the product of...

