

UNIVERSITY OF WINDSOR  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Chemistry 59-331/333  
Final Examination

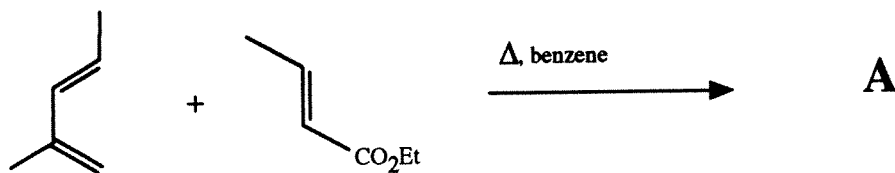
April 26, 1994  
Time: 3 hours

Answer all questions in the exam booklet

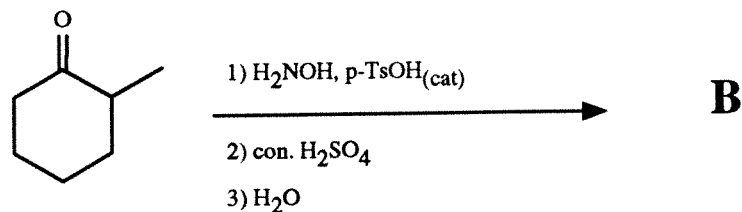
1. **Do any eight (8)**

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 32 marks).

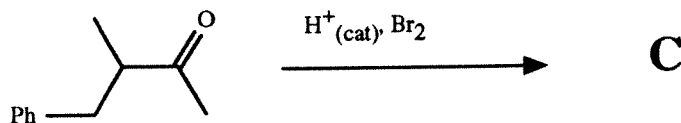
a)



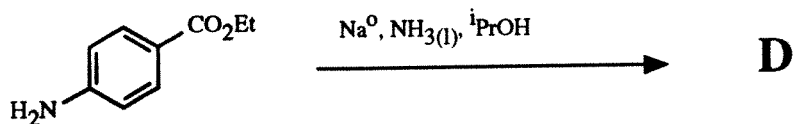
b)



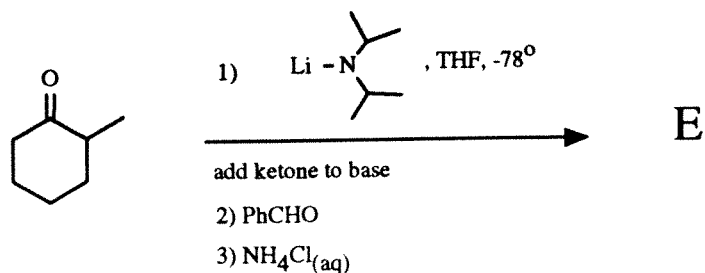
c)



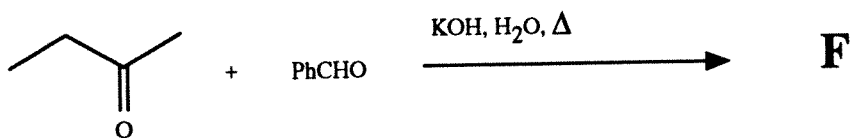
d)



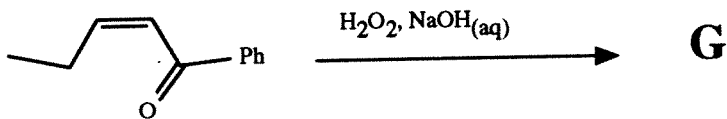
e)



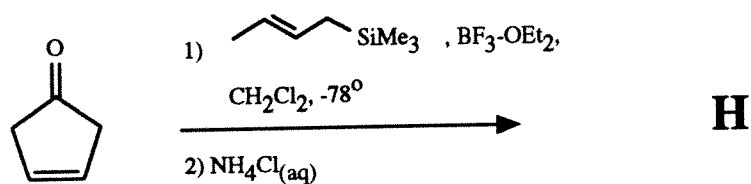
f)



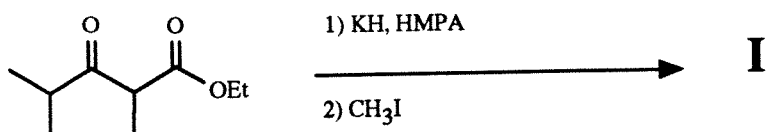
g)



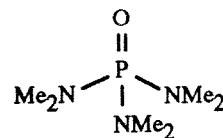
h)



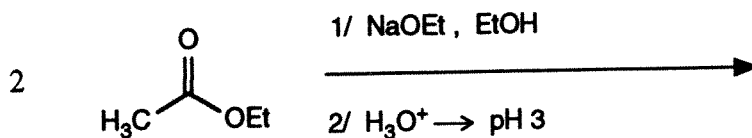
i)



Note: HMPA =

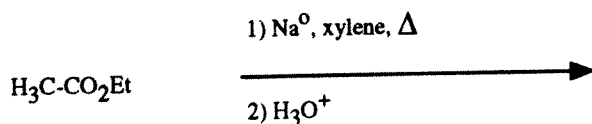
**2. (Total 20 marks)**

a) Draw the complete mechanism for the Claisen condensation between two molecules of ethyl acetate. Be sure to indicate why the reaction goes to completion.

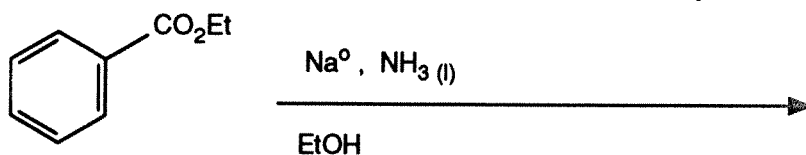


b) Do i) or ii), but not both

i) Draw a mechanism for the following acyloin condensation.



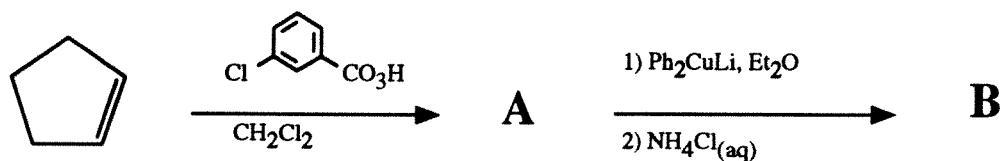
ii) Draw a mechanism for the Birch reduction of ethyl benzoate.



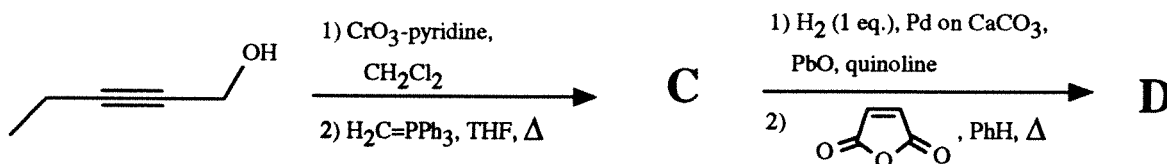
3. Do any 10 (ten) of the letter compounds

Give the expected compounds corresponding to the letters below. Include any stereochemistry where it applies. (Total 50 marks)

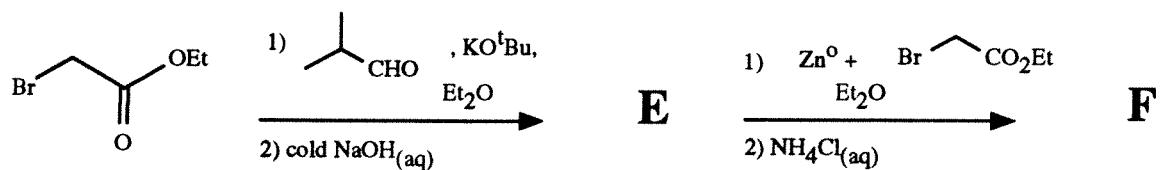
a)



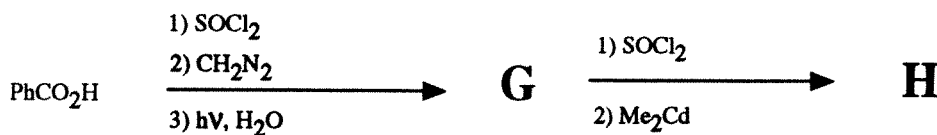
b)



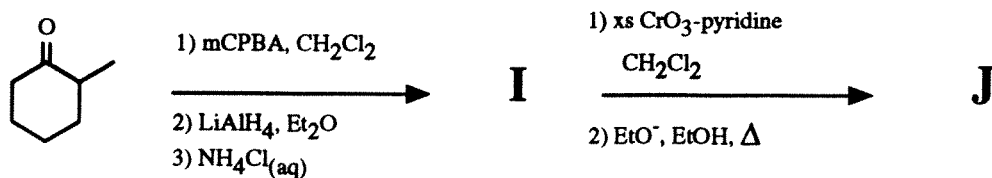
c)



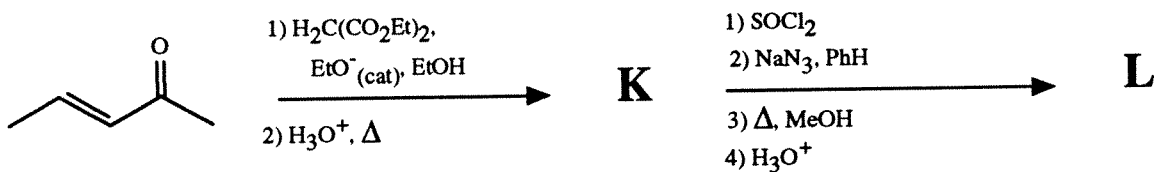
d)



e)

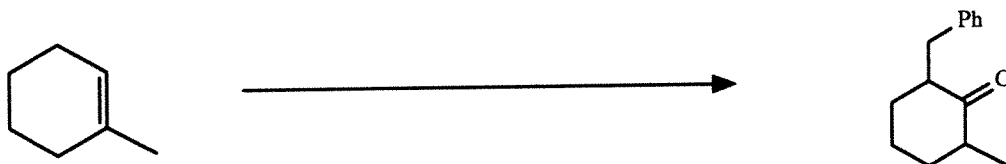


f)

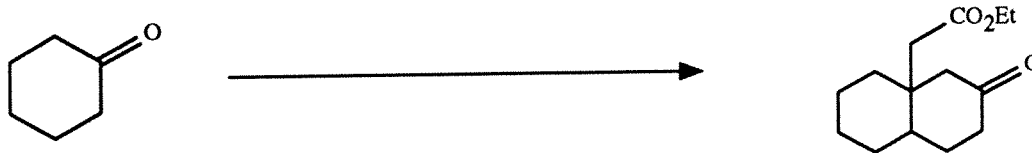


4. Show by equation how you could prepare the products illustrated below from the given starting material. You may use any other reagents you deem fit. Show all reagents, conditions, and isolable intermediates. Mechanisms are not necessary, but may be a help. (Total 70 marks)  
Do any seven (7)

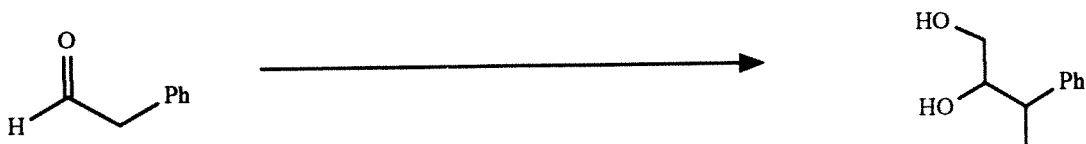
a)



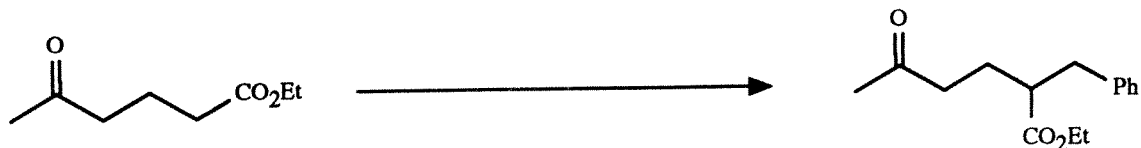
b)



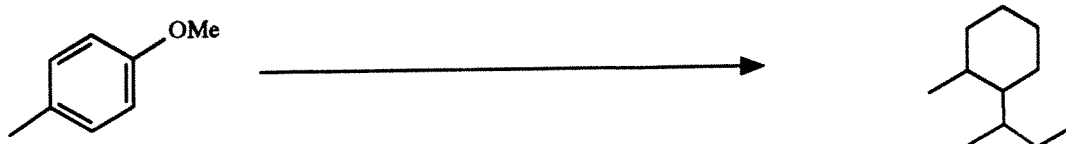
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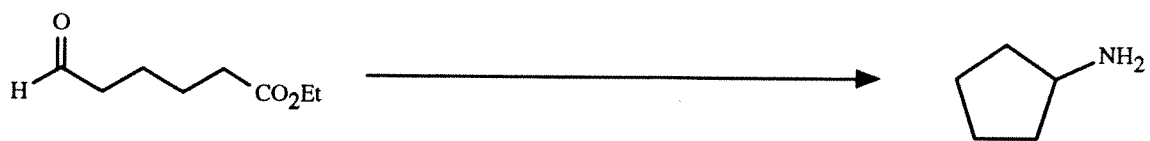
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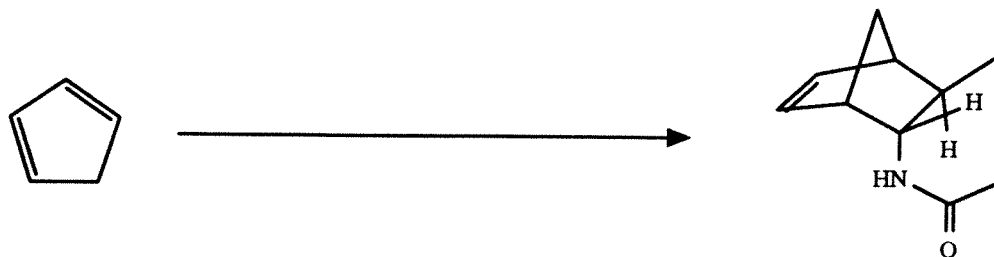
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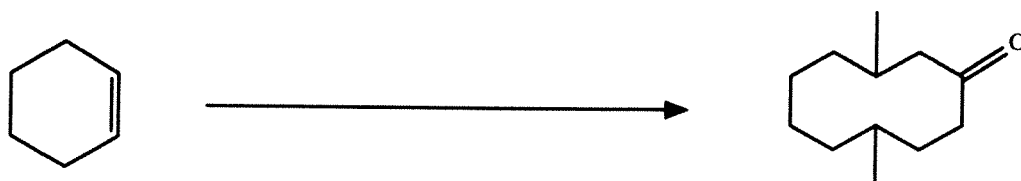
f)



g)



h)



i)

