



THE OPEN UNIVERSITY OF SRI LANKA

B. Sc DEGREE PROGRAMME / STAND ALONE COURSE 2008 / 2009

LEVEL 5 - FINAL EXAMINATION

CHU 3126 / CHE 5126 - ORGANIC CHEMISTRY

DURATION: 2 1/2 HOURS

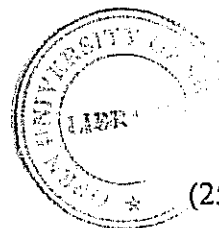
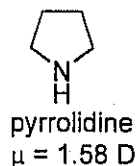
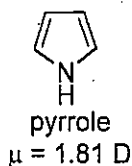
Monday 29th June 2009

10.00 - 12.30 a.m.

Answer any FOUR (04) questions only.

If you have answered more than four questions, only the first four answers will be marked.

1. (a) The dipole moment (μ) of pyrrole and its saturated analogue pyrrolidine are comparable in magnitude but are in opposite directions. Indicate the directions of the dipole moment in each compound and account for your answer.

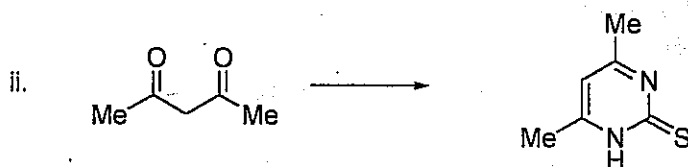
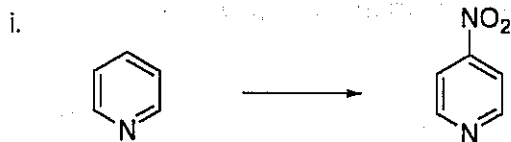


(25 marks)

- (b) Pyridine reacts with methyl iodide to give N-methyl pyridinium iodide while pyrrole does not react with this reagent. Explain.

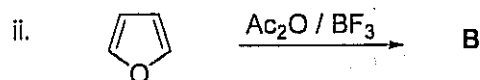
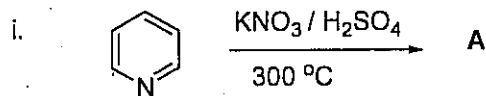
(25 marks)

- (c) How would you effect the following transformations? Give the necessary reagents and essential experimental conditions.



(30 Marks)

(d) Predict the products of the following reactions.

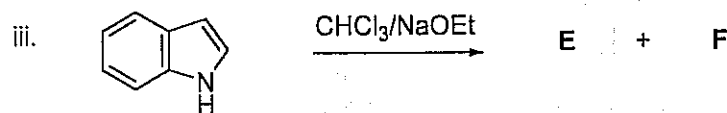


(20 Marks)

2. (a) Pyridine undergoes electrophilic substitution very slowly while nucleophilic substitution occurs readily at C-2 and C-4 positions. Explain.

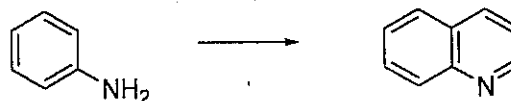
(40 marks)

(b) Predict the products of the following reactions.



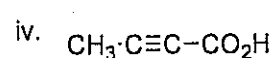
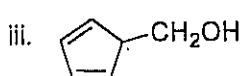
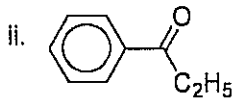
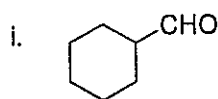
(30 Marks)

(c) How would you effect the following transformation? Give the necessary reagents and write the mechanism for the reaction.

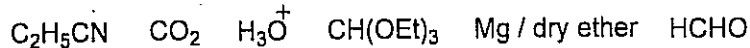
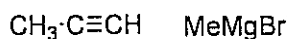
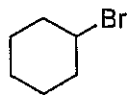
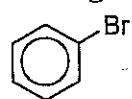


(30 marks)

3. (a) Using the reagents and starting materials given below show how you could synthesize each of the following compounds utilizing Grignard reagents.

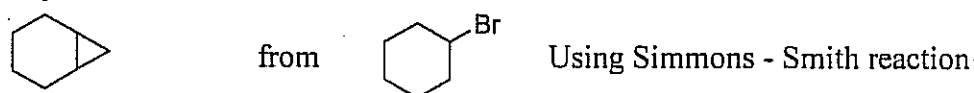
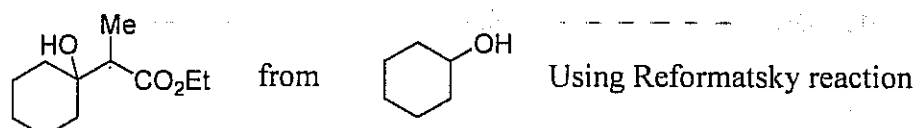


Starting materials and reagents



(60 Marks)

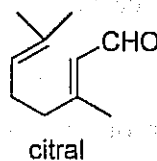
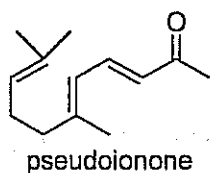
(b) Show how you would synthesize:



(40 Marks)

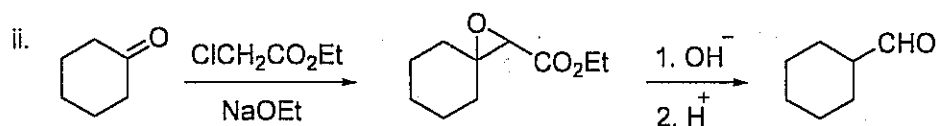
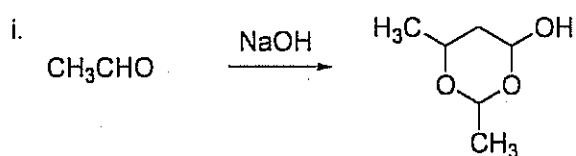
4. (a) Pseudoionone is an industrially important raw material.

- Propose a method to prepare pseudoionone from citral.
- Give the structures of the products, when pseudoionone is treated with acids.
- What are the main uses of the products obtained in ii?



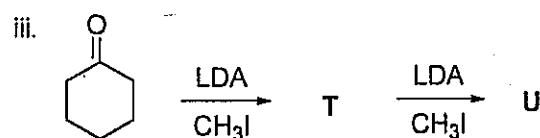
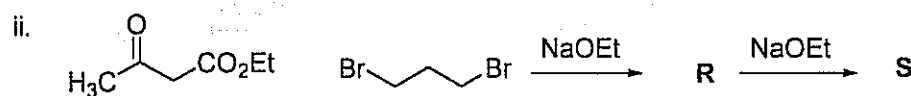
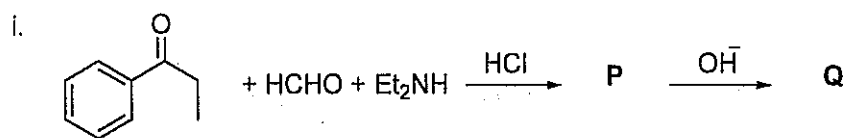
(30 Marks)

(b) Give the mechanisms of the following reactions.



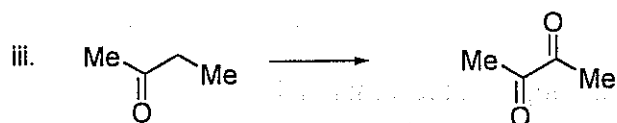
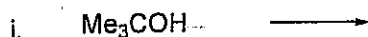
(40 Marks)

(c) Give the structures of the products **P** – **U** of the following reactions.



(30 Marks)

5. (a) Show how you would carry out the following conversions/syntheses.

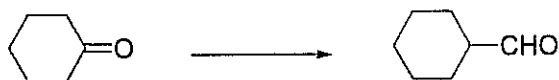


(30 Marks)

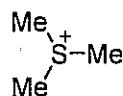
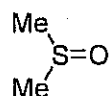
(b) Give a brief account of preparation and synthetic uses of organoboranes considering **one** example in each case.

(25 Marks)

(c) How would you carry out the following synthesis using the reagents given below?



Reagents:

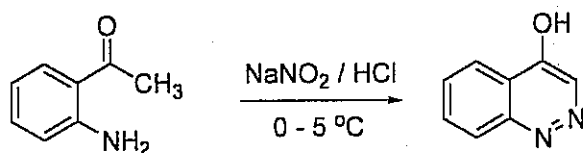


NaH

BF_3

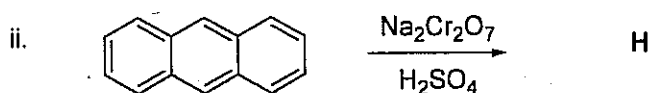
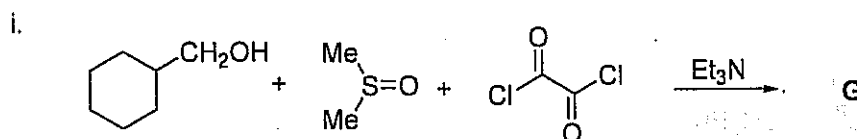
(30 Marks)

(d) Give the mechanism of the following reaction.



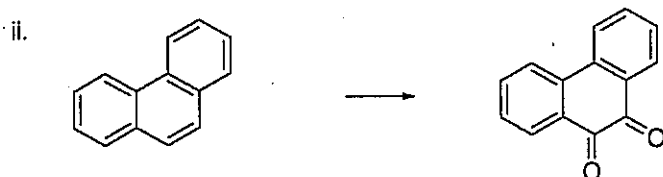
(15 Marks)

6. (a) Predict the products **G** and **H** of the following reactions.



(20 marks)

(b) Give the reagents that can be used to carry out the following reactions.

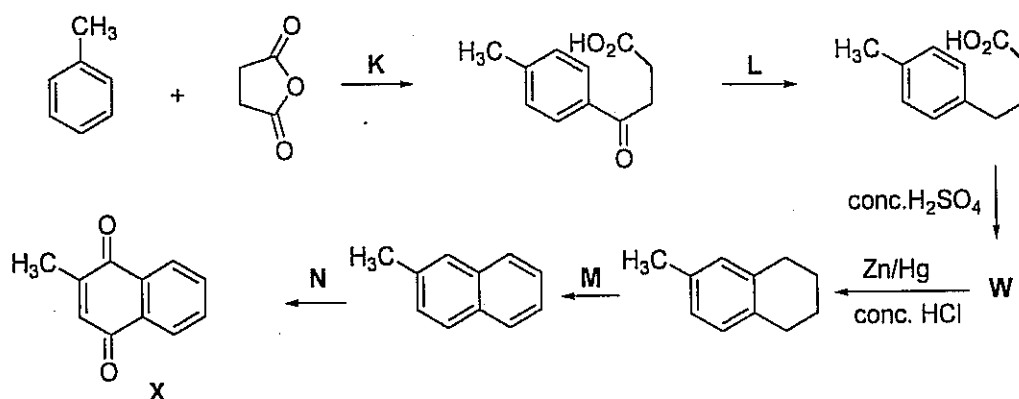


(20 marks)

(c) Although all the C-C bonds in benzene are equal, it is not so with naphthalene which has two fused benzene rings. Explain why

(10 marks)

(d) Given below is the Haworth synthetic route to synthesize a Vitamin K analogue (X). Give the missing reagents K – N and draw the structure of the missing intermediate W.



(50 Marks)

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