



THE OPEN UNIVERSITY OF SRI LANKA
B. Sc. DEGREE PROGRAMME / STAND ALONE COURSE 2014 / 2015
LEVEL 5 - FINAL EXAMINATION
CHU3126 / CHE5126 - ORGANIC CHEMISTRY

DURATION: 02 HOURS

Saturday 25th April 2015

1.00 – 3.00 p.m.

Answer any FOUR (04) questions only.

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

1. Answer all parts.

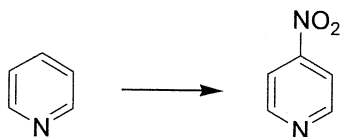
- (a) Explain why electrophilic substitution takes place at the 2-position in pyrrole and 3-position in pyridine.

(25 marks)

- (b) Explain why pyridine is a much stronger base than pyrrole.

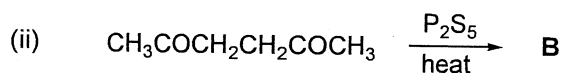
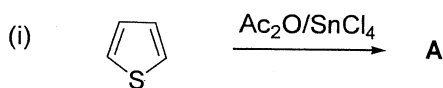
(25 marks)

- (c) Giving the necessary reagents and essential conditions show how you would effect the following transformation.



(25 marks)

- (d) Give the structures of major products A and B of the following reactions.

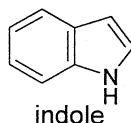


(25 marks)

2. (a) Explain why pyridine undergoes nucleophilic substitution readily at positions 2 and 4.

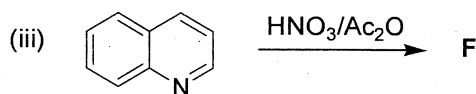
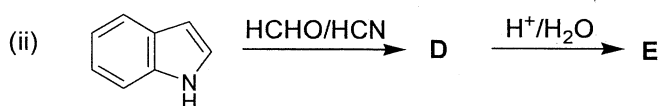
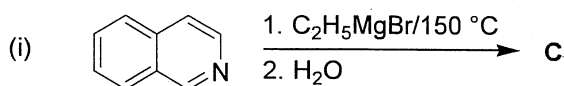
(30 marks)

- (b) Explain why electrophilic substitution in indole occurs mainly at the C-3 position rather than at the C-2 position.



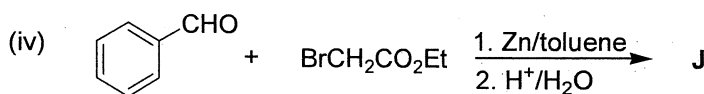
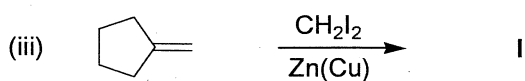
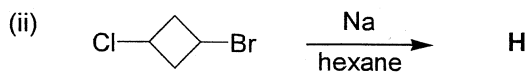
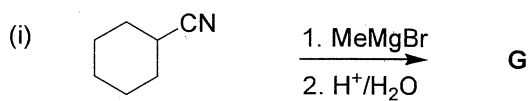
(30 marks)

- (c) Predict the products of the following reactions.



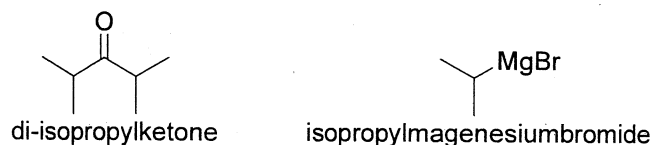
(40 marks)

3. (a) Give the structures of the products G – J of the following reactions.



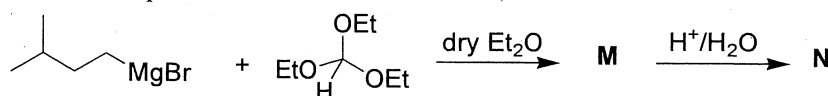
(40 Marks)

- (b) Reaction between di-isopropyl ketone and isopropylmagnesium bromide followed by acidification does not yield the desired alcohol. Giving appropriate mechanisms, explain what side reactions occur when this reaction is attempted.



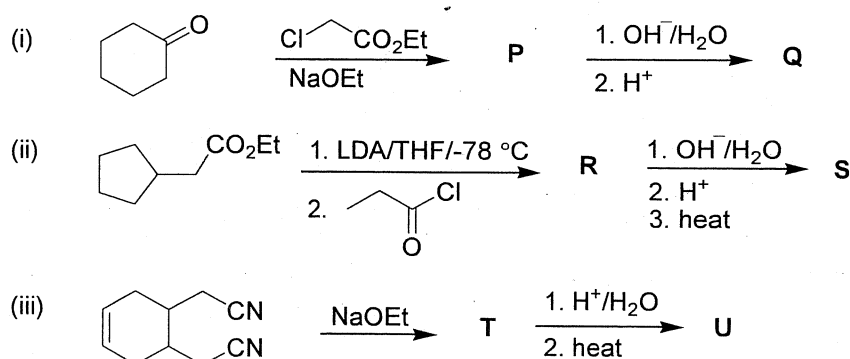
(40 Marks)

- (c) Giving appropriate mechanisms predict the structures of (M) and (N) of the following reaction sequence.



(20 Marks)

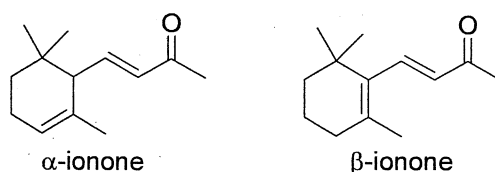
4. (a) Give the structures of the compounds P – U of the following reaction schemes.



(30 Marks)

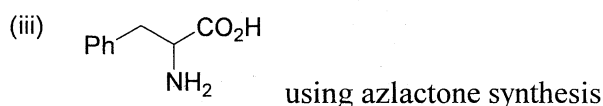
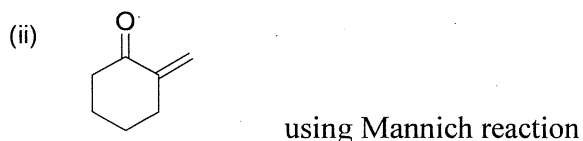
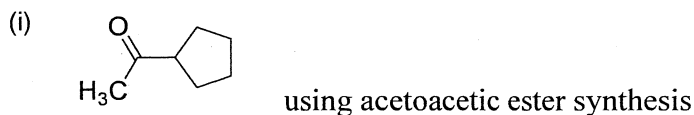
- (b) Show how you would synthesize a mixture of α - and β -ionones using acetone as one of the starting material.

Giving reasons indicate the steps taken to increase the yield of the desired products during the synthesis.



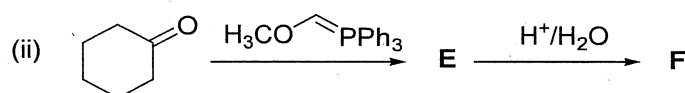
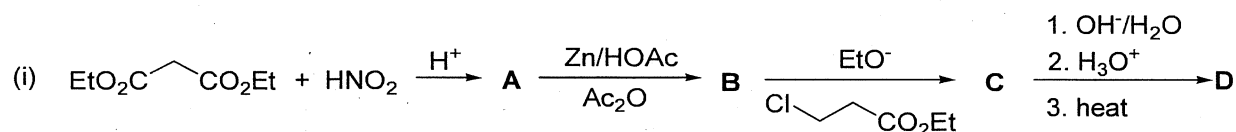
(30 Marks)

(c) Giving necessary starting materials, reagents, and conditions show how you would synthesize any **two** of the following compounds using the method indicated.



(40 Marks)

5. (a) Give structures of the major products (A – F) in the following reaction schemes.



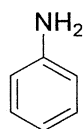
(30 marks)

(b) Show how you would synthesize $\text{PhCH}(\text{NH}_2)\text{COOH}$ via Strecker synthesis.

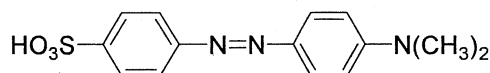
Hint: Use the appropriate aldehyde as one of the starting materials.

(20 marks)

(c) Give the route to synthesize methyl orange using aniline as the only starting material.



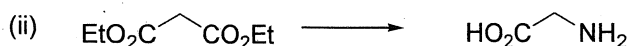
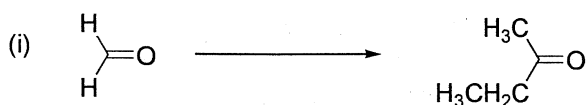
aniline



methyl orange

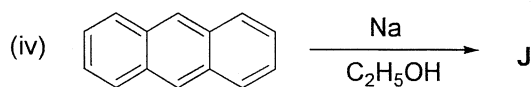
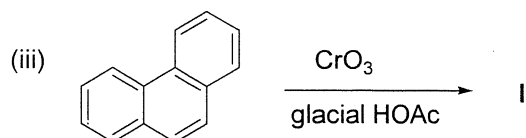
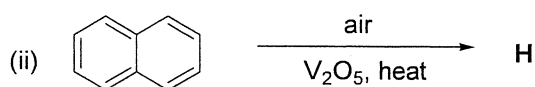
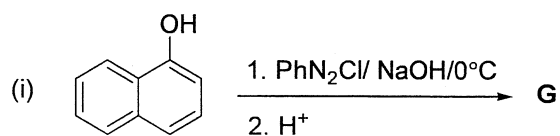
(20 marks)

(d) Show how you would carry out any **ONE** of the following conversions.



(30 marks)

6. (a) Predict the major products of the following reactions.

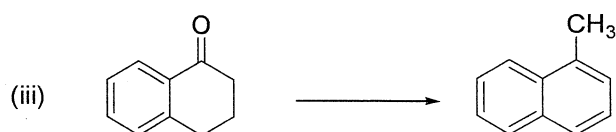
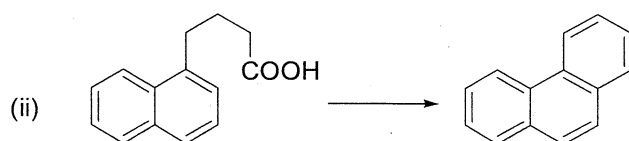
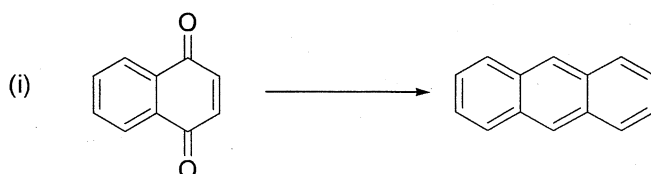


(40 marks)

(b) Show how naphthalene can be synthesized using benzene and succinic anhydride via Haworth synthesis.

(20 marks)

(c) Show how any **TWO (02)** the following conversions could be effected.



(40 marks)

***** Copyrights reserved *****