

RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (Special) Degree in Chemistry
Third Year - Semester II Examination – October / November 2017

CHE 3215 – HETEROCYCLIC AND SYNTHETIC ORGANIC CHEMISTRY

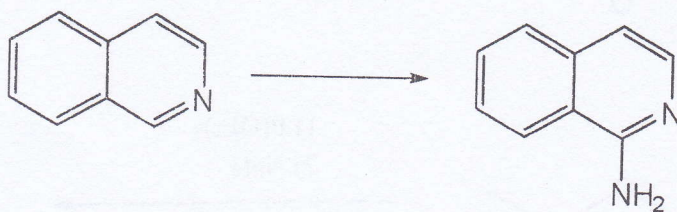
Answer all questions.

Time: Two (02) hours

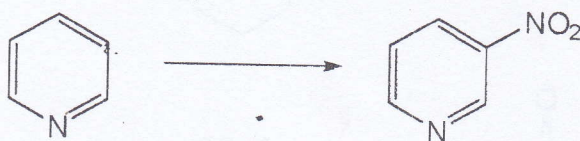
1.

- Explain why nitration occurs predominantly at the α position in pyrrole. (25 marks)
- Would you expect pyrrole to be extremely weak base? Explain your answer. (15 marks)
- Giving necessary reagents and conditions show how you would effect the following conversions.

(i)

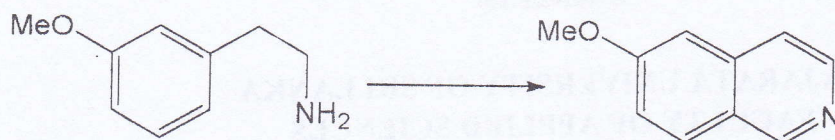


(ii)



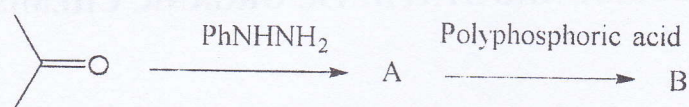
(20 marks)

- d) Giving necessary reagents, conditions and appropriate mechanisms, show how you would carry out the following synthesis using Pictet-Splenger method.



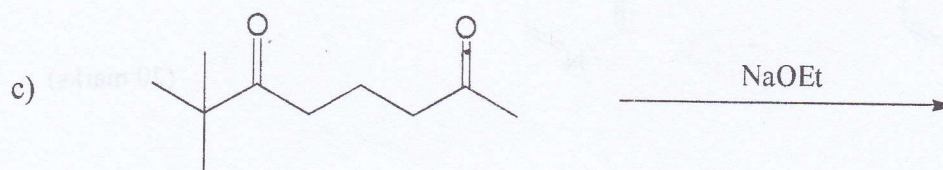
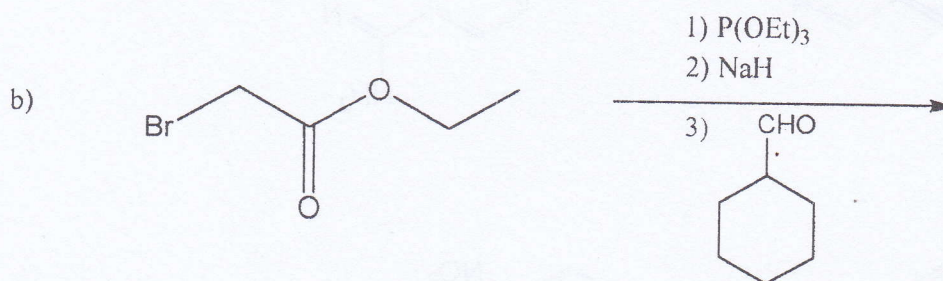
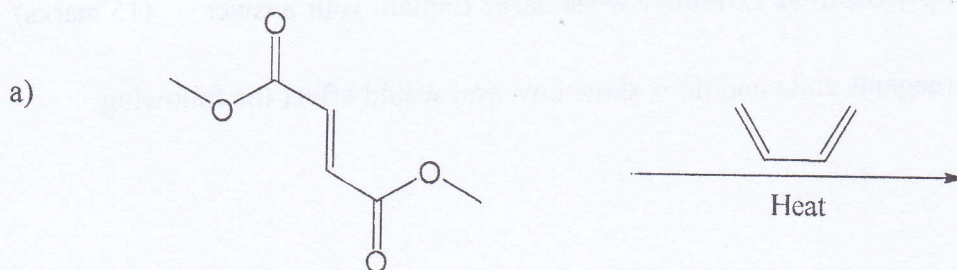
(30 marks)

- e) Give the structures of A and B of the following reaction.

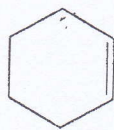
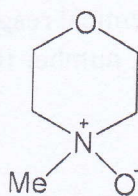


(10 Marks)

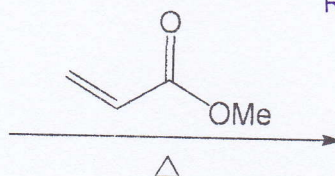
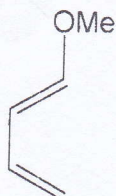
2. Write down the major product in each of the reaction given. Specify the stereochemistry and/or regiochemistry, where relevant.



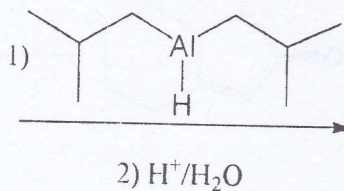
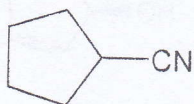
d)

1) OsO_4 ,2) HIO_4

e)



f)

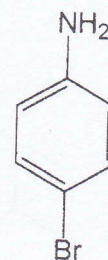
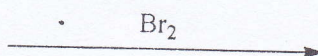
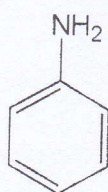


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(100 marks)

3.

a) Consider the monobromination of aniline.

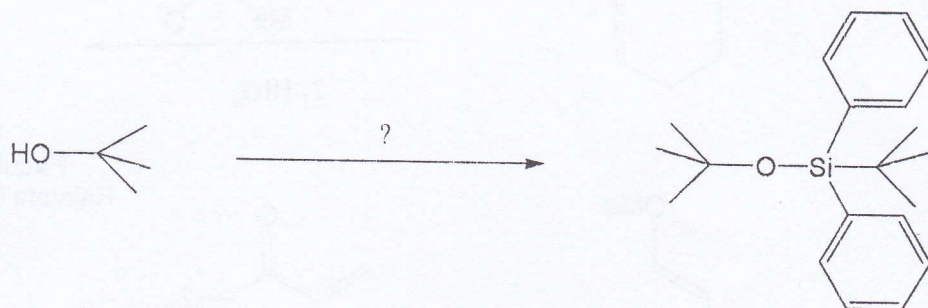


- This reaction is a poor way to obtain the indicated product. Explain why?
- Give a preferred pathway that you can carry out to obtain the interested product.

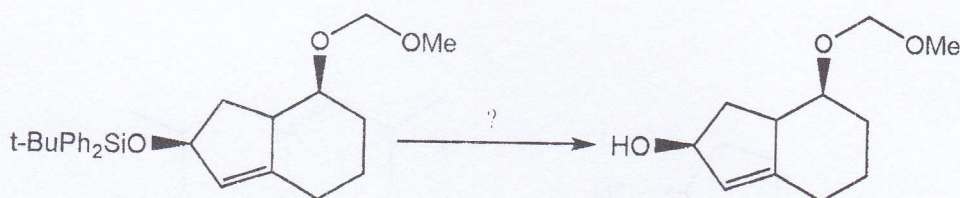
(25 marks)

b) Write down the chemical reagents required to carry out following reactions. If reagents are added stepwise, number them accordingly.

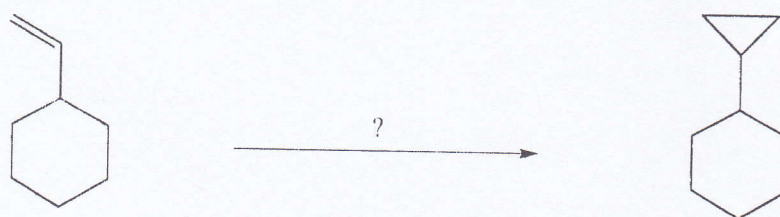
i.



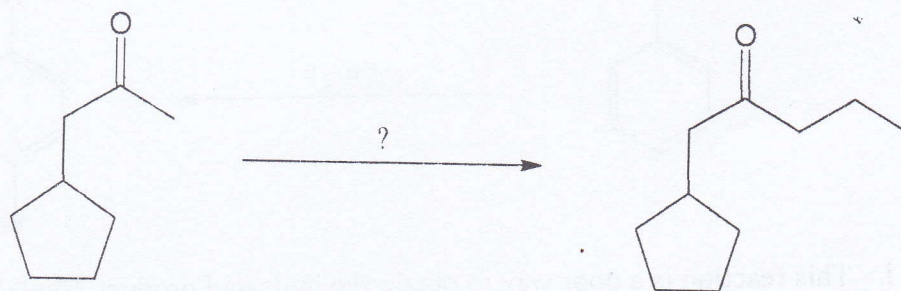
ii.



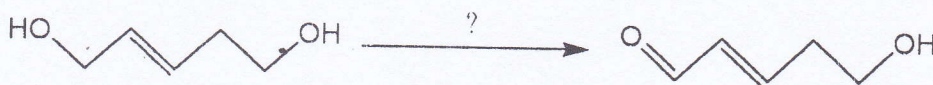
iii.



iv.

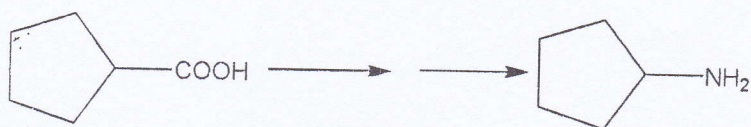


v.



(50 marks)

- c) Show how to carry out following transformation. Several steps will be required.



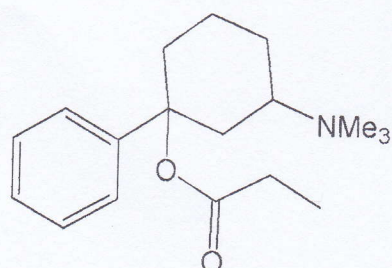
(25 marks)

4.

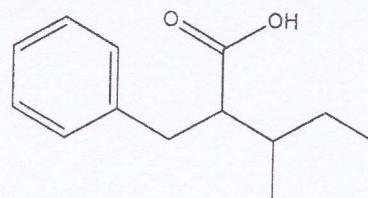
- a) Discuss the term "synthon". Give an example of a synthon and a synthetic equivalent.
(20 marks)

- b) Illustrate how to synthesise any two (02) of following compounds, from commercially available materials. Include both retrosynthetic analysis and the actual synthetic procedure in your answer.

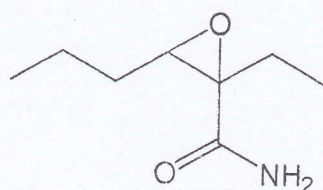
i.



ii.



iii.



(2 x 40 marks)

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