THE OPEN UNIVERSITY OF SRI LANKA

B. Sc. DEGREE PROGRAMME 2017 / 2018

LEVEL 5 - FINAL EXAMINATION

CMU3120 - ORGANIC CHEMISTRY II

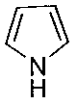
DURATION: 02 HOURS

Wednesday, 12th September 2018 1.30 – 3.30 p.m.

Answer ALL FOUR (04) questions.

1) Answer any **FOUR (04)** parts from parts (a) – (e).

(a) Explain why pyrrole is more reactive than benzene towards electrophilic substitution reactions.



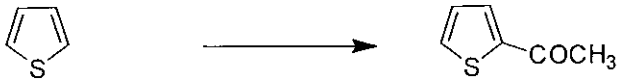
pyrrole

(b) Draw the resonance structures of pyrrole and thiophene and explain why the resonance energy of pyrrole is much less than that of thiophene.

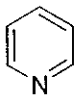
Thiophene

(c) Give the reaction conditions of the following reactions.

(i) 

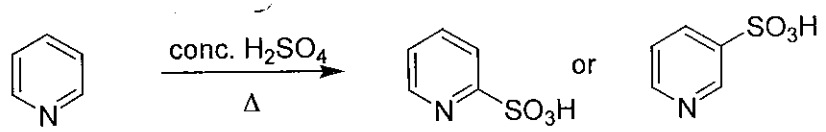
ii) 

(d) The H atoms of methyl groups attached to C-4 of pyridine are acidic. Explain this statement giving the relevant resonance structures.



pyridine

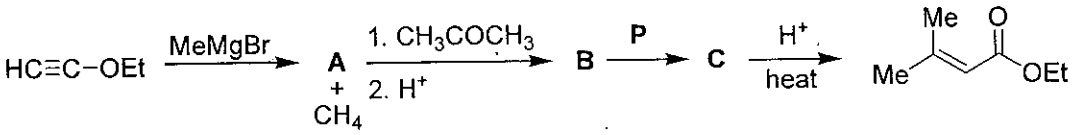
(e) Giving reasons select the most likely product that you expect from the reaction given below.



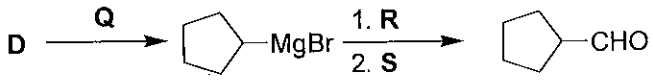
(25 x 4 = 100 Marks)

2) (a) Give the structures of compounds **A** – **D** and the reagents **P** – **S** in the following reaction scheme.

(i)

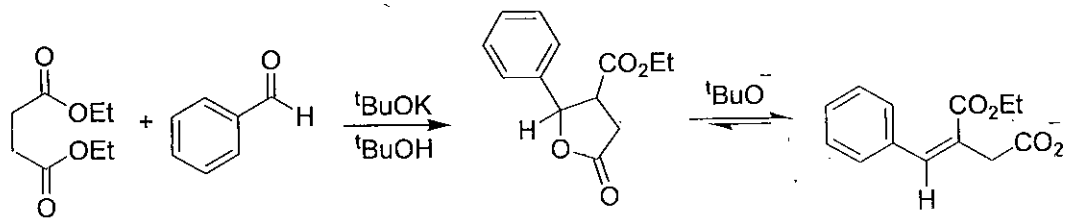


(ii)



(40 Marks)

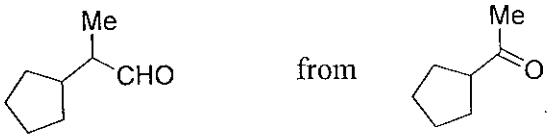
(b) Indicate the mechanism of the following reactions.



(20 Marks)

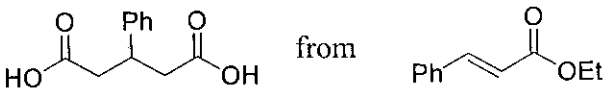
(c) Giving necessary reagents and conditions show how you would carry out any **two (02)** of the following syntheses using the indicated reaction/method.

(i)



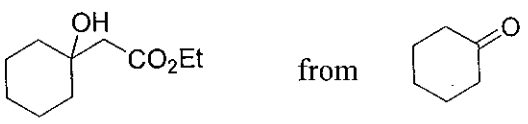
using Darzen reaction

(ii)



using Michael Addition

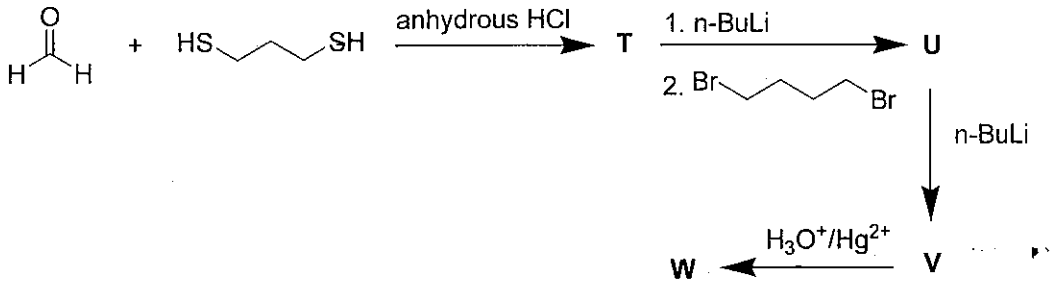
(iii)



using Reformatzky reaction

(40 Marks)

3) (a) Give the structures of the compounds **T** – **U** of the following reaction scheme.

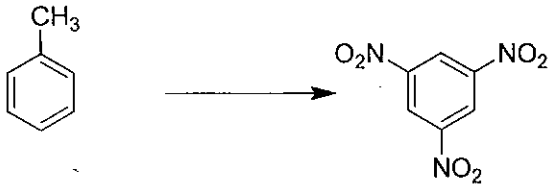


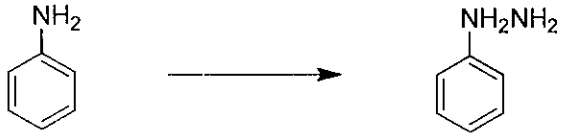
(20 Marks)

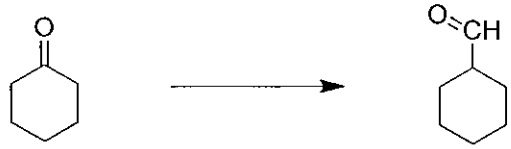
(b) Show how you would use 'Ritter reaction' to synthesize $(CH_3)_3C\text{-}NH_2$ from $(CH_3)_3COH$.

(20 Marks)

(c) Give necessary reagents and conditions show how you would carry out the following multistep reactions.

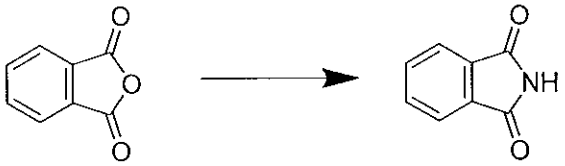
i) 

ii) 

iii) 

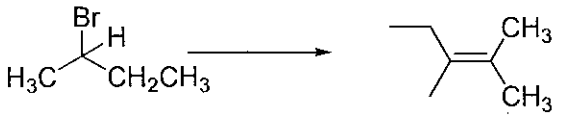
(40 Marks)

(d) Indicate the mechanism involved in the conversion of phthalic anhydride to phthalimide in the presence of aqueous ammonia.

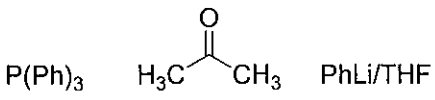


(20 Marks)

4) (a) Indicate how you would carry out the following synthesis using only the reagents given below. Give the mechanism of the reactions involved.

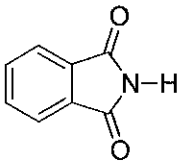


Reagents:



(40 marks)

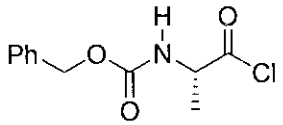
(b) (i) Explain why the H atom attached to the N atom of phthalimide shows significant acidity.



Phthalimide

(ii) 'The activation of the acid group by preparing the acid chloride is not suitable in peptide synthesis when an amino group is protected with benzoyloxycarbonyl group'.

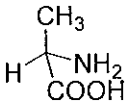
Explain the above statement using the compound **E** given below.



E

(40 marks)

(c) How would you prepare alanine using Strecker synthesis? Give the mechanism for the reaction.



Alanine

(20 marks)