Reg. No: | | | | | | | | |

The Open University of Sri Lanka
B. Sc Degree / Stand Alone Programme 2009/2010
Organic Chemistry - CHU 3126 / CHE 5136
Level 5 - Assignment I – Test
Duration 1½ hours

Q	Marks	
	Max	Awarded
1	30	
2	30	
3	25	
4	25	
Total		

Wednesday 10th February 2009 Time: 4.00 – 5.30 p.m.

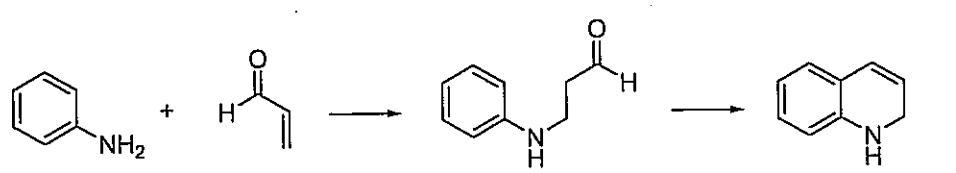
Answer all questions.

Maximum marks allocated to this paper are 110. However a candidate who scores 100 marks or above will be awarded 100% and those scoring less will be awarded the score they make.

1. (a) Explain why furan reacts as a diene during Diels Alder reaction.

furan

(b) During the Skraup synthesis of quinoline, aniline react with acrolein which is formed in situ to form 1,2-dihydroquinoline via compound A.



aniline acrolein (A) 1,2-dihydroquinoline

Propose a possible mechanism for the reaction.

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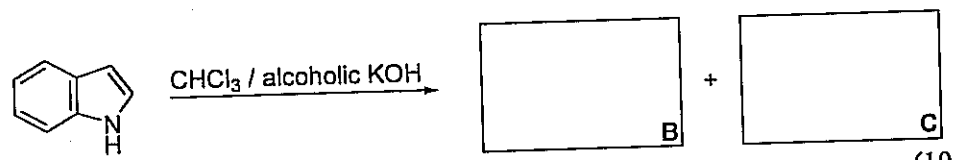
(30 Marks)

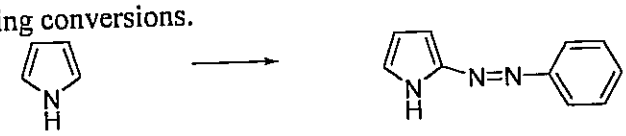
2. (a) Identify the structures of the products **B** and **C** formed in the reaction given below.



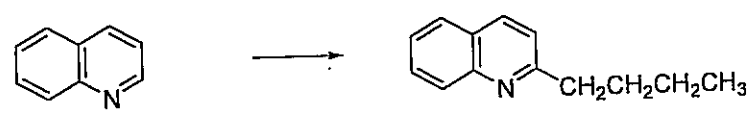
(10 Marks)

(b) Giving necessary reagents and conditions show how you would carry out the following conversions.

(i)



(ii)



(20 Marks)

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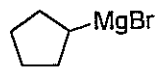
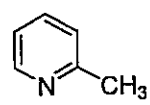
3. Give the structures of products **A**, **B**, **C**, **D** and **E** of the following reactions.

(a) 

$\xrightarrow[2.\ H_3O^+]{1.\ CH_3CN}$ **K**

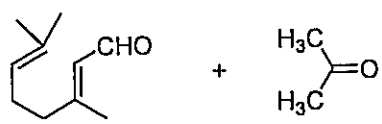
(b)  + MeMgBr ⟶ **L** $\xrightarrow[2.\ H_3O^+]{1.\ HCHO}$ **M**

(c) 

+ PhLi ⟶ **N** $\xrightarrow[2.\ H_3O^+]{1.\ CO_2}$ **O**

(25 Marks)

4. Give the structure of the product of the following reaction sequence.



+

$\xrightarrow[EtOH\ -5\ °C]{NaOEt}$ **P**

P $\xrightarrow{BF_3/HOAc}$ **Q** + **R**

Give the mechanism for the formation of **P**

(25 Marks)

B.Sc. Reg./CC/Stand Alone Programme 2007/2010

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Answer Guide

(1)

(a)

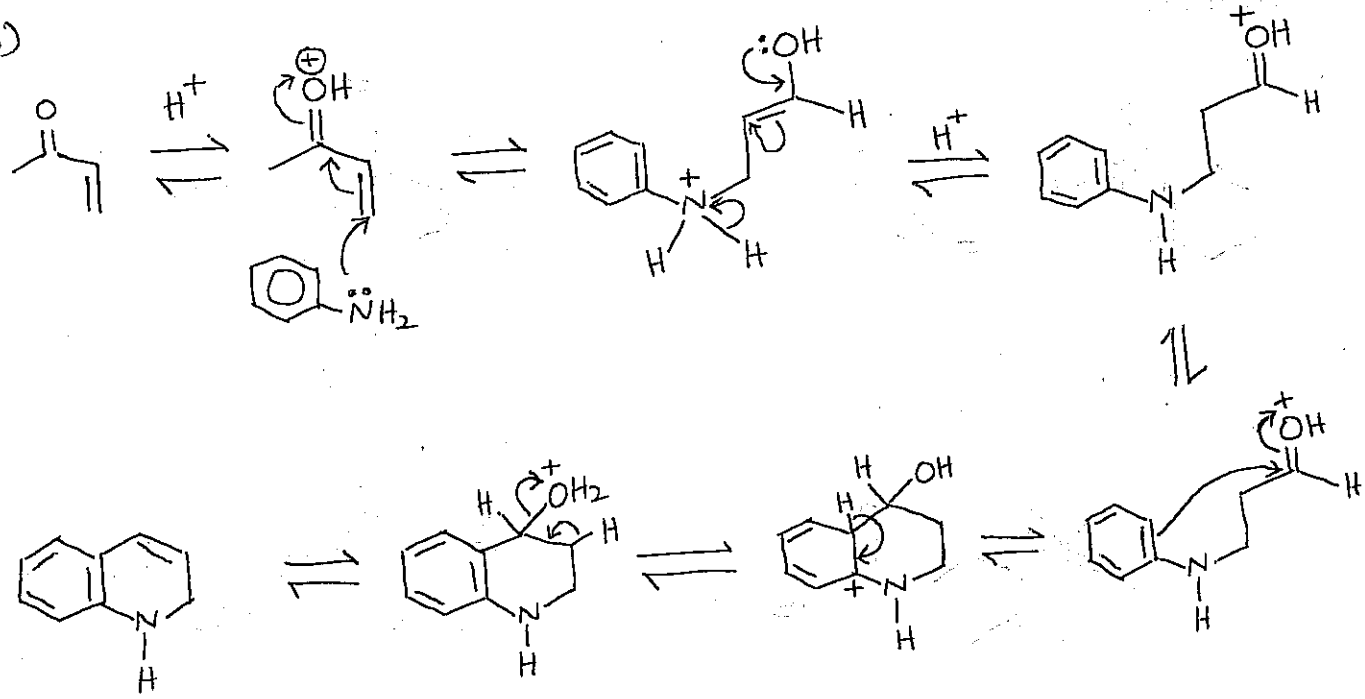
In furan, one of the lone pairs of oxygen is in a p orbital and delocalizes with the ring.

Due to this localization, O atom gets a (+)ve charge which give an unstability to the resonance hybrid. Hence the aromaticity becomes very low.

Therefore the two double bonds can react as a diene component in a Diels Alder reaction.

for the resonance structures refer page 7 unit I

(b)



(2)

(a) Refer page 45, Unit I

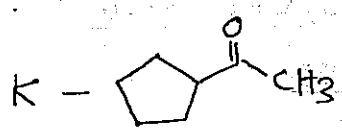
(b)

(i) Refer page 30, Unit I (To prepare PhN_2^+Cl, aniline is reacted with $NaNO_2/HCl$ at 0-5°C)

(ii) Refer Page 41, Unit I

(3)

(a)



(b)

(c) Refer Page 21, Unit II

(4)

P, Q & R - Refer Page 42, Unit II

Mechanism