THE OPEN UNIVERSITY OF SRI LANKA
B. Sc DEGREE PROGRAMME / STAND ALONE COURSE 2009 / 2010
LEVEL 5 - FINAL EXAMINATION
CHU 3126 / CHE 5126 - ORGANIC CHEMISTRY
DURATION: 2 $^1/_2$ HOURS

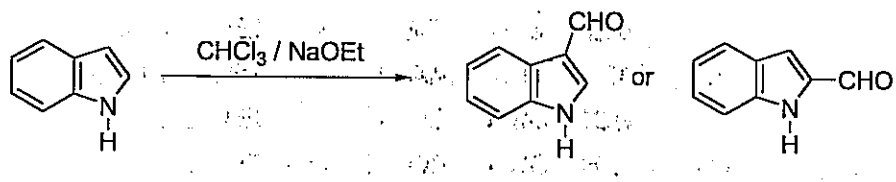
Tuesday, 29th June 2010 — 9.30 a.m. – 12.00 noon

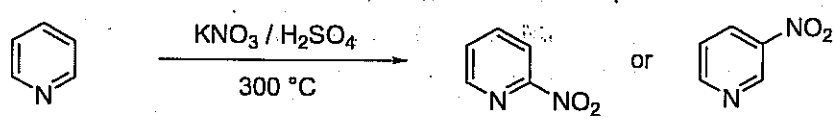
Answer any FOUR (04) questions only.
If you have answered more than four questions, only the first four answers will be marked.

1. (a) Explain the following.
   i. Pyrrole is less basic than pyridine.
   ii. Pyridine is less reactive towards electrophilic substitution than benzene.

(40 marks)

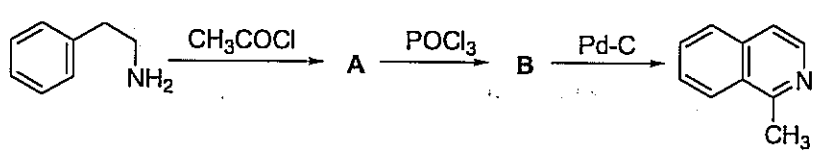
(b) What is the expected product out of the two products in each of the reactions given below? Explain your answer.

i. 

ii. 

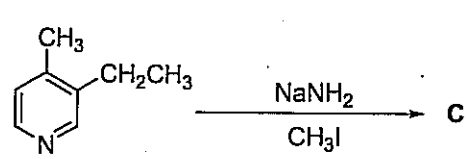
(40 marks)

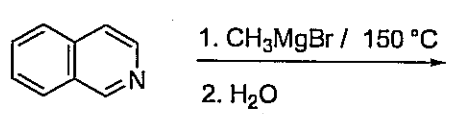
(c) Identify the compounds **A** and **B** in the following synthetic scheme. Give the mechanisms for the formation of **A** and **B**.

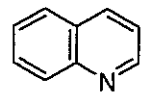


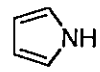
(20 marks)

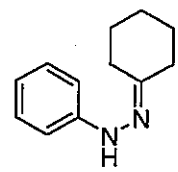
2. (a) Predict the products **C** – **G** of the following reactions.

i. 

ii. 

iii.  alkaline. $KMnO_4$ → **E**

iv.  I_2 / KI → **F**

v.  BF_3, CH_3CO_2H / 65 ^{0}C → **G**

(50marks)

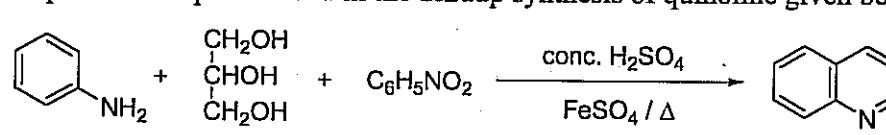
(b) Giving necessary reagents and conditions show how you would effect the following transformations.

i. 

ii. 

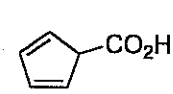
(20 marks)

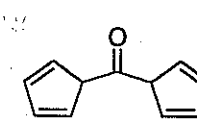
(c) Give probable steps involved in the Skraup synthesis of quinoline given below.



(30 marks)

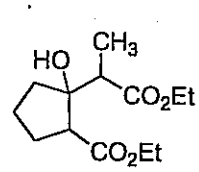
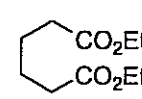
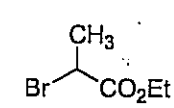
3. (a) Show how you could synthesize the following two compounds utilizing organometallic reagents and appropriate starting materials.

i. 

ii. 

(40 Marks)

(b) How would you propose to synthesize:

 using  And  and any other reagents

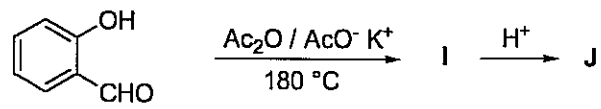
(30 Marks)

(c) Briefly explain limitations of using Grignard reagents in organic synthesis giving different types of examples.

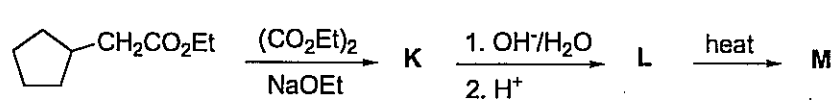
(30 Marks)

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

(i)

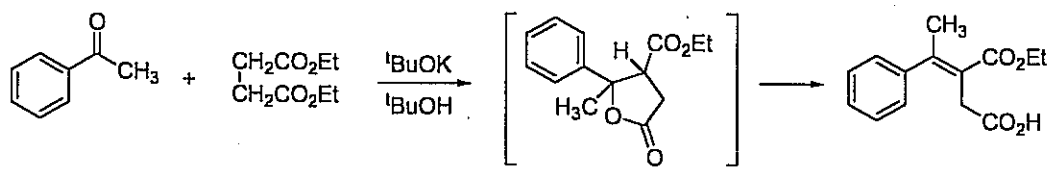


(ii)



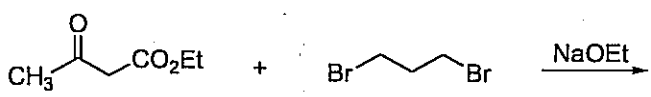
(25 Marks)

(b) Give the mechanism for the following reaction.



(30 Marks)

(c) Predict the product of the following reaction. Give the mechanism for the reaction.



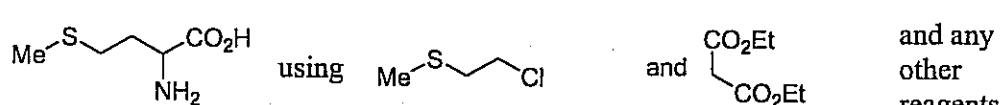
(25 Marks)

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

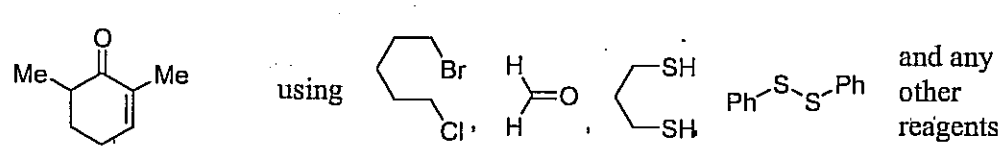
(20 Marks)

5. (a) Propose a suitable synthetic route to synthesize:

(i)



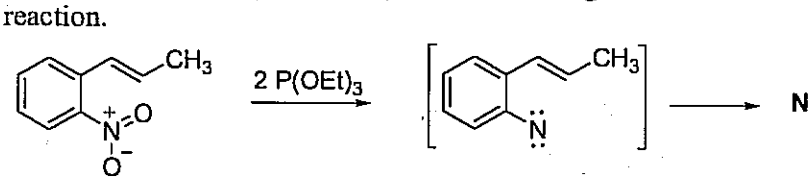
(ii)



Hint: *Initially synthesize the cyclohexanone ring*

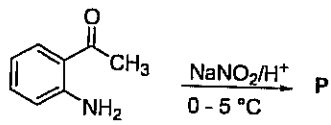
(55 Marks)

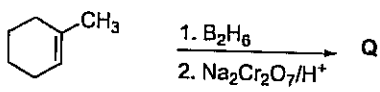
(b) Predict the structure of the product (**N**) of the following reaction. Give the mechanism of the reaction.

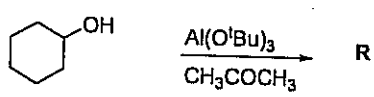


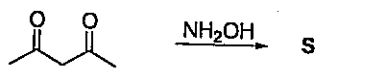
(25 Marks)

(c) Give the structures of compounds **P – S** formed in the following reactions

(i) 

(ii) 

(iii) 

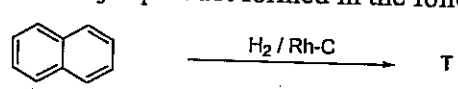
(iv) 

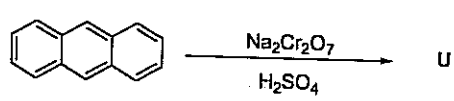
(20 Marks)

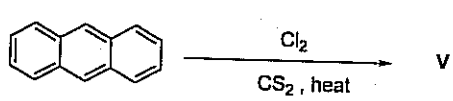
6. (a) Explain why naphthalene gives 2-substituted product with conc. H_2SO_4 on heating while 1-substituted product at 45 °C.

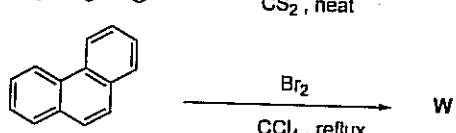
(20 marks)

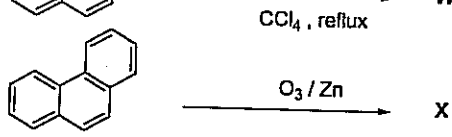
(b) Give the major product formed in the following reactions.

i. 

ii 

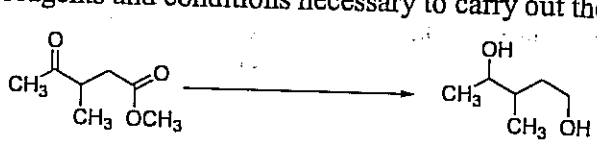
iii. 

iv. 

v. 

(40 marks)

(c) Give reagents and conditions necessary to carry out the following reactions.

i. 

ii. 

iii. 

iv. 

(40 marks)