THE OPEN UNIVERSITY OF SRI LANKA
B.Sc DEGREE PROGRAMME / STAND ALONE COURSE 2012/2013
LEVEL 5 - FINAL EXAMINATION
CMU3120/CME5120 –ORGANIC CHEMISTRY II
DURATION: 2 HOURS

Date: 22nd (Wednesday) May 2013 **Time 1.00 p.m. – 3.00 p.m.**

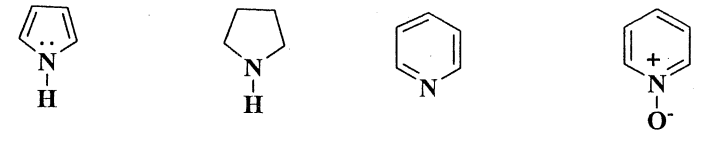
Answer all Questions

1. a) Explain any <u>two</u> (**02**) of the following statements.

   i. Pyrrole is more reactive towards nitration than benzene and electrophilic substitution occurs predominantly at C-2 position.

   ii. Direction of the dipole moment of pyrrole is reversed from its direction in pyrrolidine.

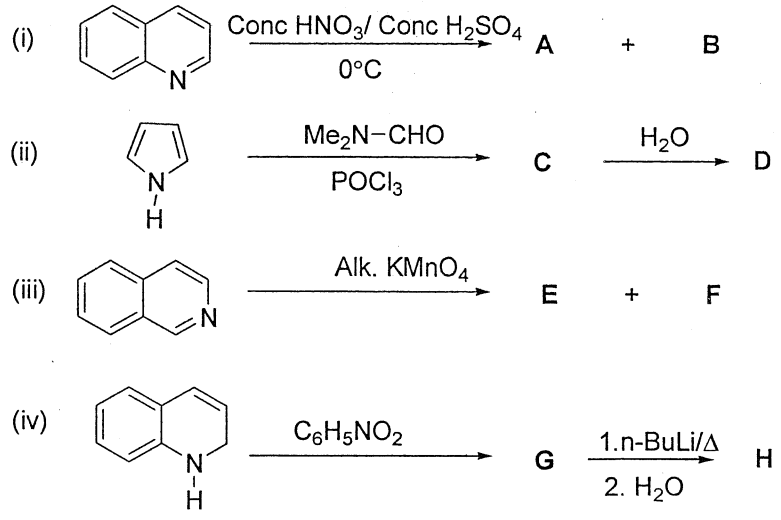
   iii. Pyridine –N-oxide is more reactive towards both electrophilic and nucleophilic reagents than pyridine.



Pyrrole **Pyrrolidine** **Pyridine** **Pyridine-N-Oxide**

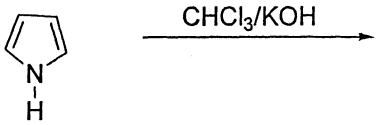
(30 marks)

b) Indicate the products (**A – H**) you expect in any <u>three</u> (**03**) of the following reactions.



(30 marks)

c) Give the mechanisms and the product/s you expect from the following reaction.

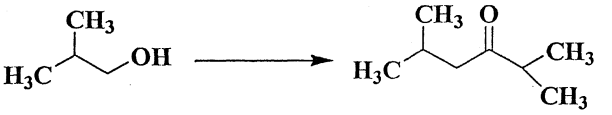


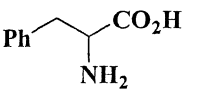
(40 marks)

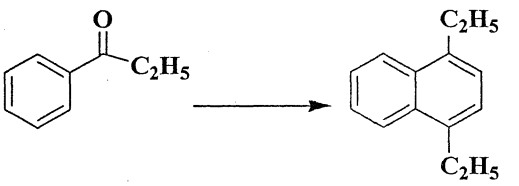
2. (a) Briefly explain why α-haloester of aldehyde is more reactive than that of a ketone.

(20 Marks)

(b) Giving necessary reagents and conditions indicate how you would carry out any <u>two</u> (**02**) of the following reactions.

(i) 

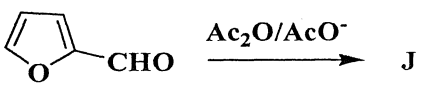
(ii) PhCHO 

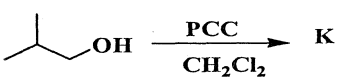
(iii) 

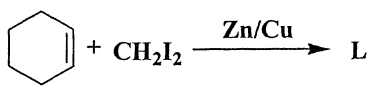
(Hint: Stobbe condensation)

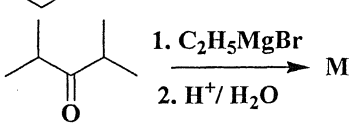
(40 Marks)

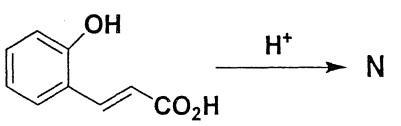
(c) Predict the products (**J –M**) expected from any <u>four</u> (**04**) of the following reactions.

(i) 

(ii) 

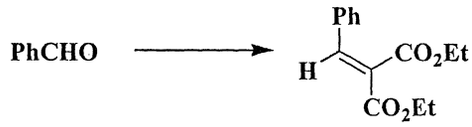
(iii) 

(iv) 

(v) 

(20 Marks)

(d) Indicating the mechanism show how you would carry out the following synthesis.

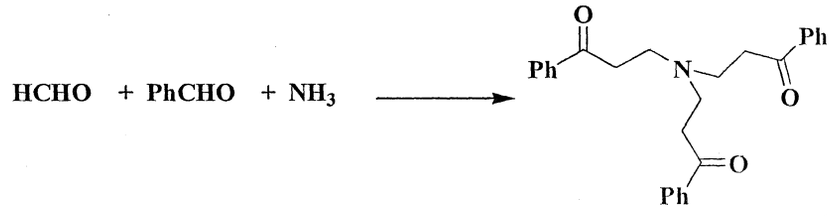


(20 Marks)

3 (a) Briefly explain why mixed claisen condensation can be carried out efficiently with diethyl oxalate **or** with ethyl formate than with ethyl acetate (20 Marks)

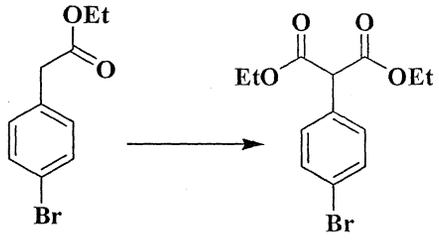
(b) Giving necessary reagents and reaction conditions indicate how you would carry out reaction (**i**) and either (ii) **or** (iii) of the reaction given below.

(i)

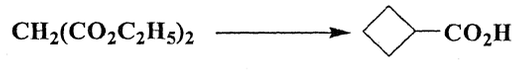


(30 Marks)

(ii)



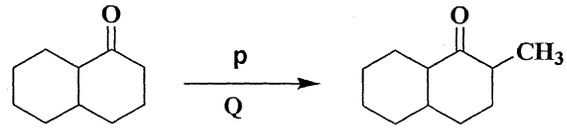
(iii)



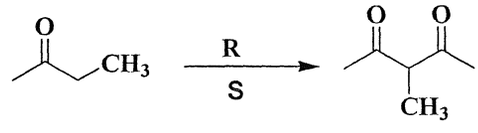
(20 Marks)

(c) Give the reactants (**P – S**) required for the following reactions.

(i)

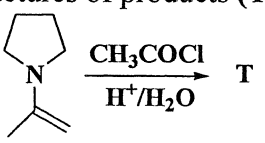


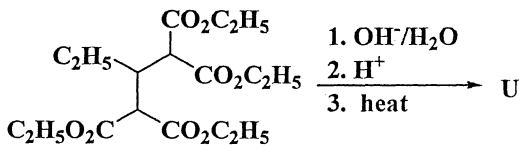
(ii)

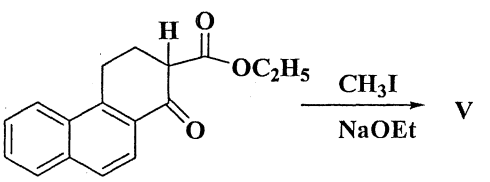


(20 Marks)

(d) Give the structures of products **(T-V)**, of any <u>two</u> **(02)** the following reactions.

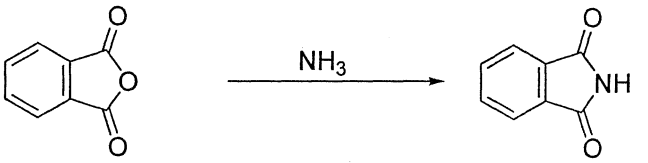
(i) 

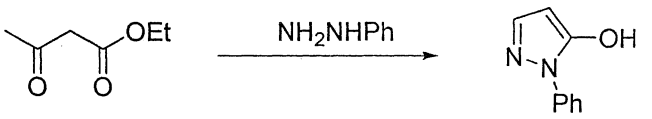
(ii) 

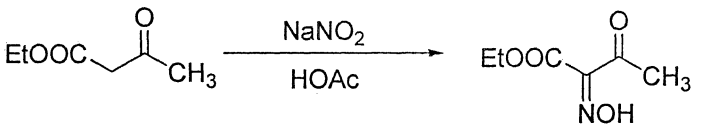
(iii) 

(10 Marks)

4 (a) Write the mechanisms for any <u>two</u> **(02)** of the following conversions.

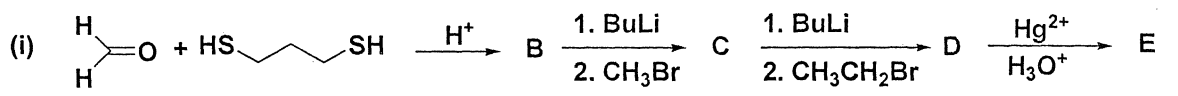
(i) 

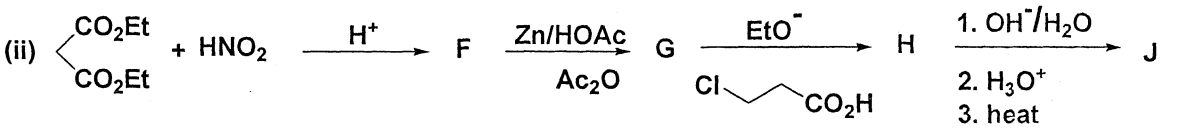
(ii) 

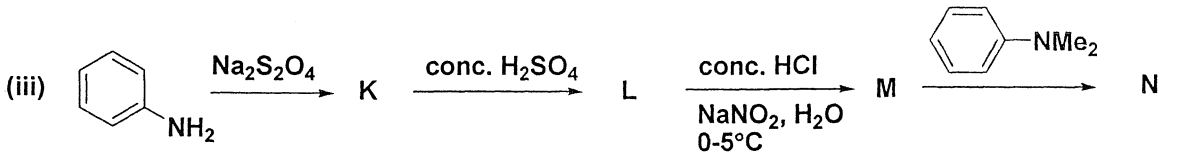
(iii) 

(30 marks)

(b) Complete any <u>two</u> **(02)** of the following reaction schemes.

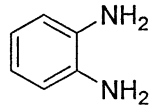
(i) 

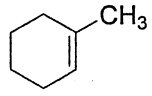
(ii) 

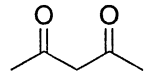
(iii) 

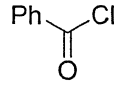
(40 marks)

(c) Predict the products **(W – A)** of the following reactions

(i)  $\xrightarrow[\text{HCl/ 0-5°C}]{NaNO_2}$ **W**

(ii)  $\xrightarrow[\text{2. } Na_2Cr_2O_7/H_2SO_4]{\text{1. } B_2H_6}$ **X**

(iii)  $\xrightarrow{NaNO_2/H^+}$ **Y**

(iv)  $\xrightarrow{NaN_3}$ **Z**

(v)  $\xrightarrow{Me_2NH}$ **A**

(30 marks)

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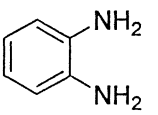
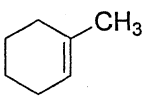
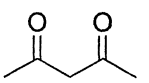
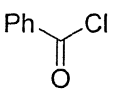
(c) Predict the products **(W – A)** of the following reactions

(i)  $\xrightarrow[HCl/\ 0\text{-}5°C]{NaNO_2}$ **W**

(ii)  $\xrightarrow[2.\ Na_2Cr_2O_7/H_2SO_4]{1.\ B_2H_6}$ **X**

(iii)  $\xrightarrow{NaNO_2/H^+}$ **Y**

(iv)  $\xrightarrow{NaN_3}$ **Z**

(v)  $\xrightarrow{Me_2NH}$ **A**

(30 marks)

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