



Eastern University Sri Lanka

Second Year First Semester Examination in Science

2008/2009 (February 2010)

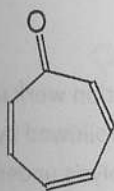
CH 204 Organic Reaction Mechanism and Aromaticity

(Proper & Repeat)

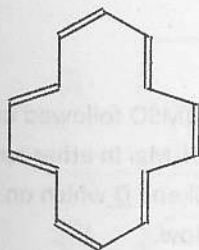
Answer all questions

Time: ONE HOUR

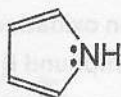
1. (a) State Huckel's rules for aromaticity. Classify the following compounds as aromatic, antiaromatic and non-aromatic and justify your answer.



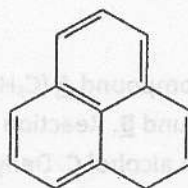
(i)



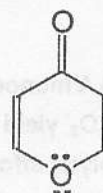
(ii)



(iii)



(iv)

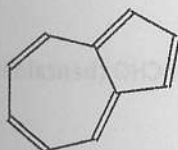


(v)

30 marks

- (b) Explain the following observations

- (i) Dipole moment of Azulene ($C_{10}H_8$; structure shown below) is $\mu = 1.0D$.



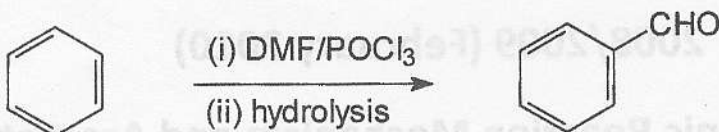
20 marks

Turn Over

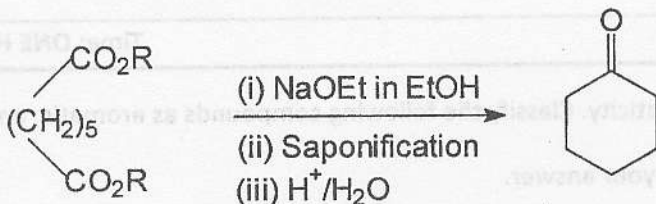
(ii) Planar cyclooctatetraene can be considered as a diradical species (Hint: Draw the Frost-Musulin diagram and explain)

(c) Write down the plausible mechanism for the followings

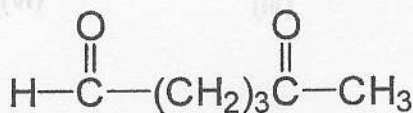
(i)



(ii)



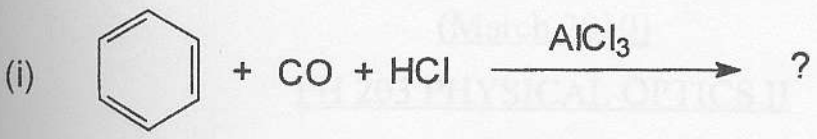
2. (a) A monocyclic compound **A** (C_5H_9Cl) on oxidation with DMSO followed by reaction work up w aq. HCO_3^- yield compound **B**. Reaction of compound **B** with CH_3MgI in ether solvent followed by acid hydrolysis afforded an alcohol **C**. Dehydration of **C** gave an alkene **D** which on ozonolysis under re conditions ended up in a dicarbonyl compound as shown below.



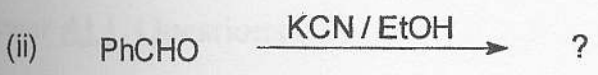
Identify the structures **A**, **B**, **C** and **D** and give a plausible mechanism for the transformation of **A** to **B**.

(b) Explain the term "Umpoled synthesis". How would you convert PhCHO (benzaldehyde) in to deuterium labeled PhCDO using ethane 1,2-dithiol.

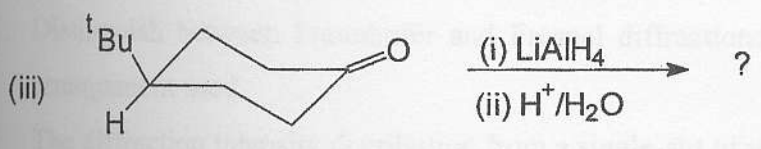
(c) Identify the product (with the correct stereochemistry where possible) in each of the following reaction.



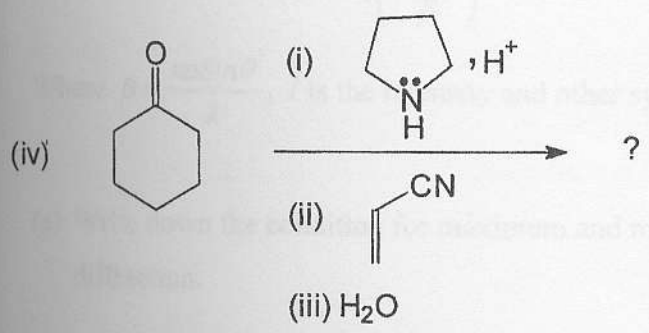
10 marks



10 marks



10 marks



10 marks

End of paper