Organic Chemistry - III
(Common with B.Sc. Biotechnology-Part-III) Paper-B
(Re-appear April-2013)

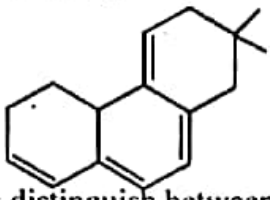
Time Allowed : Three Hours **Maximum Marks : 75**

Note : The candidates are required to attempt at least one question each from Section A, B and C carrying 15 marks each and the entire Section D consisting of 10 short answer type questions carrying 15 marks. Total questions to be attempted should be five.

Section - A

1. (a) What are Chromophores and Auxochromes ? Describe them.

   (b) Compute λ_{max} for the following structure :



   (c) On the basis of IR how will you distinguish between :

   (i) $CH_3CH_2CH_2NH_2$ and $(CH_3)_3N$

   (ii) $CH_3-\overset{\overset{O}{\|}}{C}-CH_3$ and CH_3CH_2OH 5,5,5

2. (a) What is the principle of NMR Spectroscopy ?

   (b) What do you understand by shielding and deshielding of protons?

   (c) A compound having molecular formula $C_{10}H_{13}Cl$ exhibits the following ^{1}H-NMR spectral data :

   (i) 1.57δ (6H, S) (ii) 3.07δ (2H, S) (iii) 7.27δ (5H, S)

   Deduce the structure of the compound. 5,5,5

Section - B

3. (a) What is Grignard's reagent ? How is it prepared ?

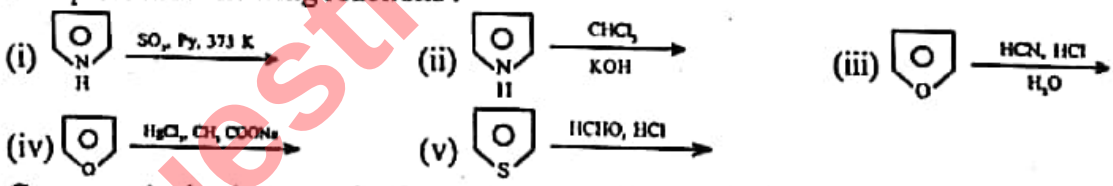
   (b) Describe the reaction of Grignard reagent with α,β – unsaturated carbonyl compounds.

   (c) What are suphonamides ? How are they prepared and what are their uses ? 5,5,5

4. (a) Give the orbital as well are resonating structure of pyrrole.

   (b) Explain about orientation in electrophilic substitution reaction of 5 membered heterocycles.

   (c) Complete the following reactions :



   5,5,5

5. (a) Compare the basic strength of pyrrole, pyridine and piperidine.

   (b) Write a note on Fischer-Indole synthesis alongwith mechanism.

   (c) What are epoxy resins ? Give a method of its preparation. 5,5,5

Section - C

6. (a) What is Claisen-condensation ? Discuss the mechanism of formation of ethyl acetoacetate.

   (b) What is the open chain structure of O(t) Glucose ? Give evidences in its support.

   (c) What is Lobry de Bruyn-van Ekenstein rearrangement ? Give its details. 5,5,5

7. (a) Discuss the Kilani-Fischer synthesis for the conversion of Aldopentose into Aldohenose.

   (b) What are epimers ? Discuss epimerisation of an aldose.

   (c) Draw the ring structure of O(f) Glucose and give evidence in its favour. 5,5,5

8. (a) What do you understand by terminal residue analysis ? Discuss Sanger's method to illustrate it.

   (b) Give various steps of typical peptide syntheses from amino acids.

   (c) Give evidences in favour of dipolar ionic structure of amino acids. 5,5,5

Section - D (Compulsory)

9. Explain the following in brief:

(i) What are hyper and hypochromic effects ?
(ii) Which compound is used as reference compound in N.M. and why ?
(iii) Give reaction of n-Butyl lithium with CO_2.
(iv) Compare the aromatic character of furan, thiophene and pyrrole.
(v) What is natural rubber ? Which type of configuration is observed at double bonds ?
(vi) What is tautomerism ? Explain this phenomenon giving examples.
(vii) What are thiols ? Why are they also called mercaptans ?
(viii) What are anomers ?
(ix) What is Isoelectric point ?
(x) RNA and DNA have four bases each; three are same in both but fourth one is different. Give the structures of these different ones. 1.5×10=15