DCA-530

M.Sc. (Previous) Degree Examination
August 2009
Directorate of Correspondence Course
(Freshers)

APPLIED CHEMISTRY
DEC.APP.CHEM.1.02 : Organic Chemistry

Time : 3 Hours Max. Marks : 85

Note : 1. **Answer any ELEVEN question from Part-A, THREE questions from Part-B and any THREE full questions from Part-C.**
2. **Figures to the right indicate marks.**

PART-A

1. **Answer any ELEVEN of the following.** **11x2=22**

a) Explain stability of carbanions.
b) What are non-classical carbocations?
c) Give two differences between enantiomers and disastereomers.
d) Write the possible optical isomers for tartaric acid.
e) Discuss the mechanism of S_Ni reaction.
f) Explain the aromaticity of tropylium cation.
g) Write the mechanism of sulphonation of benzene.
h) Explain Markownikoff's rule with an example.
i) What is Chugaev reaction?
j) Give one method of synthesis of isoquinoline.
k) Between thiophene and furan which one is more aromatic and why?
l) Arrange the following acids in the increasing order of their acid strength: $ClCH_2COOH$, CH_3COOH, Cl_3CCOOH and $Cl_2C(R)COOH$
m) Outline the azlactone synthesis of amino acids.
n) What is anomeric affect?
o) Name any two carboxylic group blocking agents and used in the peptide synthesis.

PART-B

Answer any THREE of the following questions. **3x8=24**

2. a) Discuss the formation and stability of carbocations.
b) Explain optical isomerism exhibited by biphenyl compounds. **4+4**

3. a) Describe S_N1 reaction with mechanism.
b) What are annulenes? Discuss its aromaticity. **4+4**

4. a) Discuss the mechanism of Friedel-Crafts acylation.
   b) Explain with an example Saytzeff rule of elimination. **4+4**

5. a) Outline Skraup synthesis of quinoline.
   b) Discuss the effect of substituents on the strength of organic bases with appropriate examples. **4+4**

6. a) Outline the synthesis of any one dipeptide.
   b) How the configuration of glucose is established? **4+4**

PART-C

Answer any THREE of the following questions. **3x13=39**

7. a) Discuss the primary and secondary structure of proteins.
   b) Elucidate the structure of sucrose. **7+6**

8. a) Write any two methods each for the synthesis of thiophene and pyrrole.
   b) What is Chichibabin reaction? Write the product obtained in the case of pyridine. **8+5**

9. a) Explain the mechanism of E1 reaction and predict the stereochemistry involved in it.
   b) Discuss the mechanism of nitration of i) Toluene ii) Nitrobenzene. **7+6**

10. a) Write a note on conformational analysis of cyclohexane.
    b) How can be *cis* and *trans* isomers distinguished by physical and chemical methods? **7+6**

11. a) What are carbenes? How are they generated? Discuss any one reaction involving carbenes.
    b) Write a note on effect of solvent and nature of substrate on S_N1 and S_N2 reactions. **7+6**

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