LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION - CHEMISTRY

FIFTH SEMESTER - November 2009

CH 5505 - ORGANIC FUNCTIONAL GROUPS - II

Date & Time: 3/11/2009 / 9:00 - 12:00 Dept. No. Max. : 100 Marks

PART - A

Answer ALL the questions.

 $(10 \times 2 = 20 \text{ marks})$

- 1. Explain why nitration of nitrobenzene is more difficult than that of benzene.
- 2. Give the IUPAC name of (i) CH₃-NH-C₂H₅ (ii) CH₃-N(CH₃) -CH₃.
- 3. What is meant by plane polarised light.
- 4. Assign E and Z configurations to the following compounds
- 5. What are enantiomers? Give any two properties of enantiomers.
- 6. How is diazomethane prepared?
- 7. Give the products of the following transformation and name the reaction involved.
- 8. Give the products obtained when pyridine reacts with sodamide and phenyl lithium.
- 9. Write the molecular formula and structure of nicotine.
- 10. What is isoprene rule? Indicate the isoprene units in the structure of citral.

PART - B

Answer any EIGHT questions

 $(8 \times 5 = 40 \text{ marks})$

11. Predict the products of the following reactions.

i. RNO₂ + 6[H] Metal/acid
$$\longrightarrow$$
 ?

ii. RNO₂ + 4[H]
$$\xrightarrow{\text{Zn/NH}_4^{\text{Cl}}}$$
 ?

iii.
$$C_6H_5NO_2 + [H]$$
 $\xrightarrow{Zn/NaOH}$ \longrightarrow ?

- 12. Describe Hofmann method for separating a mixture of primary, secondary and teritary amines.
- 13. What is diazotisation? How is benzene diazonium chloride prepared in the laboratory?
- 14. What is asymmetric synthesis? Illustrate with an example.
- 15. Distinguish meso and racemic forms using tartaric acid.
- 16. How will you synthesise propionic acid from acetic acid using Arndt-Eistert reaction.

- 17. How will you synthesize 2,3 dimethyl butanoic acid from ethyl acetoacetate.
- 18. How is isoquinoline synthesized using Bischler –Napieralski synthesis method.
- 19. What are alkaloids? How are they isolated from plants. Describe their general properties.
- 20. What are the structural formulas and uses of
 - (a) Menthol (b) α pinene (c) Camphor.
- 21. Explain the mechanism of Cope rearrangement reaction.
- 22. Name thermal rearrangements. Give the mechanism of claisen rearrangement.

PART - C

Answer any FOUR questions.

 $(4 \times 10 = 40 \text{ marks})$

- 23. i. Starting from nitrobenzene how will you get the following compounds. a. Phenol. b. benzoic acid. c. benzene. d. bromobenzene.
 - ii. Name the three isomers of dinitrobenzenes. Give their methods of preparation.
- 24. (i) Discuss the effect of substituents on the basicity of aromatic amines.
 - (ii) Describe the acidic nature of nitro alkanes containing α -hydrogen atom.
- 25. (a) Assign R and S configuration to the following compounds

- (b) Describe the chemical and bio-chemical method for the resolution of racemic mixture.
- 26. Explain the mechanism of the following rearrangement reactions
 - (a) Beckmann rearrangement.
 - (b) Hoffmann rearrangement.
 - (c) Fries rearrangement.
- 27. Write notes on
 - (i) Hofmann exhaustive methyation.
 - (ii) Classification of Terpenoids.
- 28. (a) Explain the mechanism of nitration of pyrrole using acetyl nitrate.
 - (b) Give the products of the following reaction.