

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – NOVEMBER 2019

CH 5510 – ORGANO-NITROGEN COMPOUNDS & STEREOCHEMISTRY

Date: 29-10-2019

Dept. No.

Max. : 100 Marks

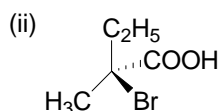
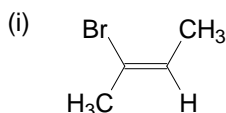
Time: 09:00-12:00

PART-A

Answer **ALL** questions.

(10 x 2 = 20)

1. Why is nitromethane acidic?
2. Write the preparation of trinitrobenzene.
3. Which is more aromatic - furan, pyrrole and thiophene? How?
4. What are the uses of piperine and menthol?
5. Assign the stereochemistry of the following compounds.



6. Define dihedral angle.
7. What are diastereoisomers? Give an example.
8. Draw the structure of following compounds.
(i) R-2-bromoprop-1-ol (ii) erythro-2,3-dibromopentane
9. What is oxy-cope rearrangement?
10. Give an example for anionotropic rearrangement.

PART-B

Answer any **EIGHT** questions.

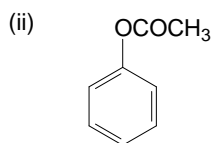
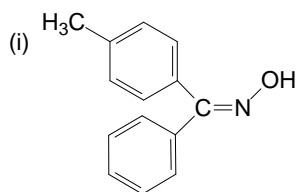
(8 x 5 = 40)

11. How are nitro compounds reduced under (i) acidic and (ii) basic conditions? **(2x2.5)**
12. Discuss the following. **(2x2.5)**
(i) Gatterman reaction (ii) Coupling reaction
13. What are the products formed when pyrrole is subjected to **(1.5+1.5+2)**
(i) nitration (ii) sulphonation (iii) oxidation
14. Discuss the structure and functions of nicotine.
15. What are the general methods of determining the structure of terpenoids?
16. How are cis- and trans-isomers distinguished? Give suitable evidences.
17. Draw the potential energy diagram of the conformational analysis of n-butane.
18. Discuss on the various methods of racemization with examples.
19. Draw fischer, saw horse and newman projections of 2-bromo-3-chloropentane.
20. Explain the optical activity of allenes with suitable example.

21. Write the mechanism of the following rearrangement reactions. (2.5+2.5)

- (a) Claisen rearrangement (ii) Benzil-benzilic acid rearrangement

22. What are the products formed when the following compounds undergo rearrangement. (3+2)



PART-C

Answer any **FOUR** questions. (4 x 10 = 40)

23a. How are the following compounds prepared? (2.5+2.5)

- (i) aniline (ii) diethylamine

b. How is aniline diazotized? Write the conversion of benzenediazonium chloride into phenol and fluorobenzene. (5)

24a. Electrophilic substitution of pyridine occurs at C-3 but the nucleophilic substitution occurs at C-2. Explain with examples. (5)

b. Make the following conversions. (2.5+2.5)

- (i) Furan to 2-Furoic acid (ii) Isoquinoline into 1-aminoquinoline

25. Write short notes on (5+5)

- (a) Skraup synthesis of quinoline (b) Bischler-Napieralski synthesis.

26a. Describe absolute asymmetric synthesis with an example. (5)

b. Discuss the conformers of dimethylcyclohexane with potential energy diagrams. (5)

27a. Explain the structure and functions of camphor. (5)

b. Write notes on chemical and bio chemical methods of resolution of racemic mixture. (5)

28. Write the mechanism of the following rearrangements: (3+4+3)

- (a) Beckmann (ii) pinacol-pinacolone (iii) Curtius
