



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – APRIL 2016

CH 2953 – CHEMISTRY OF HETEROCYCLICS AND NATURAL PRODUCTS

Date: 27-04-2016

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

PART-A

Answer ALL questions.

(10 x 2= 20)

1. How is thiazole synthesized by a ring closure reactions?
2. State whether pyridine undergoes electrophilic or nucleophilic substitution reaction faster. Give reason.
3. How do you establish the functional nature of $-NHCH_3$ group?
4. What is Hofmann exhaustive methylation? Give an example.
5. How is the position of double bond in abietic acid confirmed?
6. Group the following alkaloids according to their occurrence: papavarine, cocaine, atropine, morphine.
7. How are $-OCH_3$ groups in anthocyanin estimated?
8. Give any one method of confirming the presence of lactone ring in gibberellic acid.
9. How is the position of double bond in zinziberene confirmed?
10. How is camphoric acid synthesized from acetoacetic ester?

PART-B

Answer any EIGHT questions.

(8 x 5= 40)

11. How is pyrrole nitrated? Why are protic acids not used for electrophilic substitution reactions of pyrrole?
12. Discuss the orientation of electrophilic substitution in isoquinoline.
13. How are the following compounds synthesized? a) uracil b) imidazole
14. How is the structure of tropinic acid confirmed by Mackenzie & Wood synthesis?
15. How is morphine synthesized?
16. Give the structure of heptapylline. How are the position and skeleton of C_5 side chain confirmed by NMR spectroscopy?
17. Effect the conversion of cadinene to 2,7-dimethylcadalene.
18. How would you synthesis Vitamin A_1 from 2-methylcyclohexanone?
19. Give the synthesis of oestrone from 3-(3-methoxyphenyl)-1-bromopropane.
20. What is Diel's hydrocarbon? How is its constitution established?
21. How is the presence of fluorene nucleus in gibberellic acid confirmed by degradation reaction?
22. Give the Robinson method of synthesizing hirsutidin chloride.

PART-C

Answer any FOUR questions.

(4 x 10= 40)

23. Write the reactions of the following with mechanism:
i) Fischer-indole synthesis ii) Skraup synthesis. (5 + 5)
24. Elucidate the structure of papaverine.
25. a. Give the structure of gibberellic acid. How would you prove the presence of the two types of $-OH$ groups in it? (5)
b. How would you convert α -pinene into camphor? (5)
26. Discuss the structural elucidation of cocaine and write its synthesis.
27. Explain the use of the following reagents in the structural characterization of squalene.
i) H_2 /catalyst ii) Na /amyl alcohol iii) $Ac_2O/1\% H_2SO_4$ iv) CrO_2Cl_2/CCl_4 . (4 x 2.5)
28. Explain the structural determination of cyanidin chloride. How is its structure confirmed by synthesis?

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