

FACULTY OF SCIENCE
M.Sc. IV – Semester Examination, May / June 2018

Subject: Chemistry (Organic Chemistry)

Paper – III
Advanced Heterocyclic Chemistry

Time : 3 Hours

Max. Marks: 80

Note : Answer all questions from Part–A and Part–B. Each question carries 8 marks in Part–A and 12 marks in Part – B.

PART – A (4 x 8 = 32 Marks)
(Short Answer Type)

- (a) How do you convert methyl oxirane to methyl thirane? Give appropriate mechanism.
(b) Give any three differences between aromaticity and antiaromaticity.
- (a) Explain Dimroth rearrangement.
(b) Discuss importance and synthesis of pteridines.
- (a) Describe two methods for the synthesis of thiazoles.
(b) Explain why the usual electrophilic substitutions like nitration, Sulphonation do not occur in case of oxazole.
- (a) Describe any two methods of preparation of azepines.
(b) What are thiepinines? Discuss their stability.

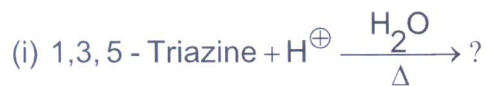
PART – B (4 x 12 = 48 Marks)
(Essay Answer Type)

- (a) Describe two reactions to explain the reactivity of diazirenes.
(b) Give any one method of synthesis of Azetidine and oxaziridine.
OR
(c) What products are formed when 2-phenyl -3-methyl-2H-azirine is reacted with (i) LiAlH_4 and (ii) $\text{C}_2\text{H}_5 \text{Mg Br}$
(d) Discuss the ring opening reactions of oxetanes and thietanes.
- (a) Formulate the products obtained in each of the following reactions when 5-nitro benzimidazole is treated with (i) formaldehyde, dimethyl amine in presence of hydrochloric acid. (ii) $\text{CH}_3\text{-I}/\text{K}_2\text{CO}_3, \Delta$.
(b) Outline any two methods of synthesis of oxazines.
OR
(c) Describe the synthesis of Isoxazole and what happens when 3, 5 – dimethyl isoxazole is treated with benzaldehyde in presence of piperidine formulate the reaction.
(d) Discuss any two methods for the formation of benzoxazoles and complete the following reaction.



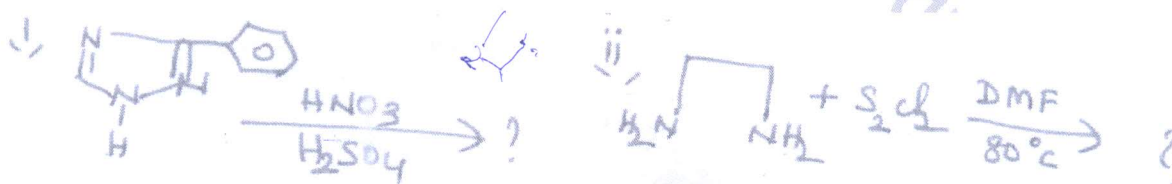
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- 7 (a) Describe the synthesis of theophylline and theobromine.
 (b) Complete the following reactions



OR

- (c) Write tautomeric structures of purine ring and outline the synthesis of caffeine.
 (d) Discuss any two methods of preparation of 1,3,4-oxadiazoles complete the following reactions



- 8 (a) Give a method of synthesis of selenophenes and tellerophenes.
 (b) Discuss any two methods of synthesis of benzodiazepines and explain which diazepine system is important as drug candidate.

OR

- (c) Give any two methods for the synthesis of boroles.
 (d) Discuss the following with suitable example.
 (i) Reactivity of azepines
 (ii) Rearrangement of 1,2-diazepines
