(ii) Classical and non-classical carbocations with their generation and stability

(iii) Generation, stability and reactivity of carbine

(iv) Transition states and intermediates.

6. (a) What are free radicals ? Write short notes on the following : **9**

(i) Stability of α-substituted alkyl free radicals

(ii) Electrophilic free radical

(iii) Nucleophilic free radical.

(b) Explain, why triplet methylene is more stable than singlet ? **3**

(c) Discuss the rearrangement reaction of carbocations and cabanions. **8**

Unit IV

7. (a) Write a complete note on instrumentation and applications Gas Chromatography. **15**

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AA-292

M. Sc. EXAMINATION, May 2018

(First Semester)

(Re-appear Only)

CH503B

CHEMISTRY

Organic Chemistry-I

(Structure and Mechanism in Organic Chemistry-I)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. Explain the following terms with suitable example : **20**

(a) Aromaticity and Anti-aromaticity

(b) Bonding in fullerene

(c) Phase transfer catalyst

(d) Catenin and rotaxanes.

2. (a) What are Rotaxanes ? How can they be synthesised. **5**

(b) Construct molecular orbital diagram of 1, 3, 5-hexatriene by the use of the perturbation theory. **5**

(c) What are Crown Ethers ? Give their methods of preparation. **6**

(d) Discuss the aromaticity of Azulene ($C_{10}H_8$). **4**

Unit II

3. (a) Write short notes on the following : **12**

(i) Ambident nucleophile

(ii) Stereochemistry of biphenyls

(iii) Stereospecific and stereoselective synthesis

(iv) Conformational and configurational isomers.

(b) Explain Cram's rule. Draw the Fisher projection formula of (R)-2-Bromopentane. **8**

4. (a) Discuss the stereochemistry of carbon-nitrogen double bond with particular reference to oxime. **10**

(b) With suitable example, discuss the effect of angle strain, torsional strain, steric strain and intermolecular hydrogen bonding on the stability of conformations. **10**

Unit III

5. (a) Show that Hammett equation represents a linear free relationship. **8**

(b) Write notes on the following : **12**

(i) Hammond's postulate

(b) What are the essential criteria for selection of suitable solvents for paper chromatography. **5**

8. (a) Write short notes on the following : **10**

(i) Electrophoresis

(ii) Counter Current Distribution.

(b) Discuss and differentiate between thin layer and paper chromatography. **10**

(b) What are the essential criteria for selection of suitable solvents for paper chromatography. **5**

8. (a) Write short notes on the following : **10**

(i) Electrophoresis

(ii) Counter Current Distribution.

(b) Discuss and differentiate between thin layer and paper chromatography. **10**