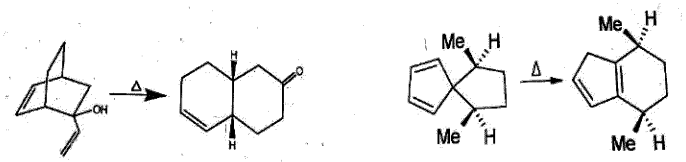
5. (a) What are Electrocyclic Reactions ? Drawing correlation diagram discuss disrotatory and conrotatory interconversion of cyclobutene and butadiene. Support the results of correlation diagram by FMO Theory. **10**

(b) Explain mechanism of Claisen rearrangement and give its synthetic importance. **5**

(c) Explain the mechanism of the following reactions : **5**



6. (a) 5-Methyl-1,3-cyclopentadiene rearranges to give a mixture of 5-methyl-1,3-cyclo-pentadiene, 1-methyl-1,3-cyclopenta-diene, and 2-methyl-1,3-cyclo-pentadiene. Show how these products are formed. **5**

DD297

M. Sc. EXAMINATION, May 2019

(Fourth Semester)

(B Scheme) (Main & Re-appear)

CHEMISTRY

CH614B

Organic Chemistry Special–IV

(Photochemistry and Pericyclic Reactions)

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. (a) State Grotthus-Draper's law of Photochemistry. Give three examples of naturally occurring photochemical reaction. **5**

(b) Explain the following : **15**

(i) Quantum yield and their determination

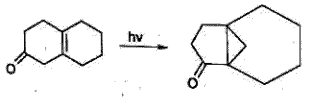
(ii) Jablonski Diagram

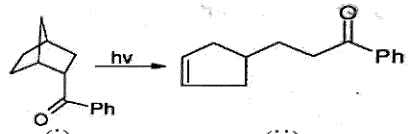
(iii) Norrish Type-II process with example.

2. (a) Explain the photo chemical reactions of saturated ketones by Norrish Type-I reaction. **5**

(b) Discuss the photochemistry of rearrangement of 1, 4- and 1, 5-dienes with suitable examples. **10**

(c) Suggest mechanism for the following reactions : **5**

(i) 

(ii) 

(i) (ii)

Unit II

3. (a) Describe the photochemistry of aromatic compounds in isomerisation addition and substitutions. **12**

(b) Explain the generation, detection and stability of free radicals. Give mechanism of hunsdiecker reaction. **8**

4. Write notes on the following : **20**

(a) Photo-fries Rearrangement

(b) Singlet Molecular Oxygen Reaction

(c) Barton Reaction

(d) Paterno-Buchi reaction or Oxetane Formation.

Unit IV

7. (a) Write short notes on the following : **15**

(i) Conformational analysis of cyclohexanone

(ii) Ring inversion and pyramidal inversion

(iii) Transannular reaction.

(b) Discuss conformational analysis of medium ring compounds and compare with normal ring compounds. **5**

8. (a) Explain the following terms : **10**

(i) Annomeric effect

(ii) 1, 3-diaxial interaction

(iii) Reflex effect

(iv) 2-alkyl ketone and 3-alkyl ketone effects in cyclohexanone.

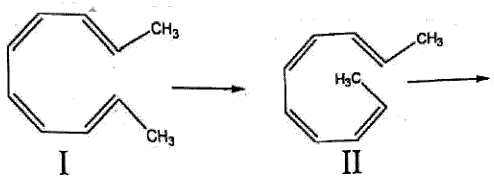
(b) Write an explanatory note on conformation of cyclodecane. **10**

(b) Will thermal 1,3-migrations of carbon occur with retention or inversion of configuration ? **5**

(c) Give the product formed when each of the following compounds undergoes an electrocyclic reaction : **6**

(i) under thermal conditions

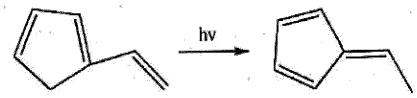
(ii) under photochemical conditions.



I II

(d) Explain the mechanism of the following reactions : **4**

(i)



(ii)