

FACULTY OF SCIENCE

M.Sc. II-Semester Examination, May / June 2018

Subject : Chemistry

Paper - II
Organic Chemistry

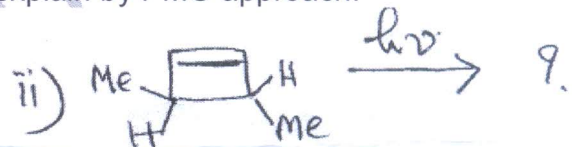
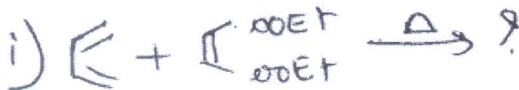
Time : 3 hours

Max. Marks : 80

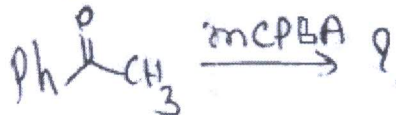
Note : Answer all questions from Part-A and Part-B. Each question carries 8 marks in Part-A and 12 marks in Part-B.

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

- 1 a) Define the ambident nucleophile and explain with two examples.
b) How do you prove that the cyclic intermediates containing oxygen and sulphur are involved in NGP reactions.
- 2 a) Predict the product of the following and explain by PMO approach.



- b) Draw and write the symmetry properties of HOMO and LUMO in the ground state and excited state the following systems.
i) 1, 3-butadiene ii) 2, 4-pentadienyl radical
- 3 a) What are the products obtained from ethylmethylketone under photochemical conditions?
b) Explain the mechanism of di-pi methane rearrangement with suitable example.
- 4 a) Discuss on stability of carbanions and structure of free radical.
b) Predict the product and explain mechanism.



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

- 5 a) Explain the mechanism for aromatic nucleophilic substitution $\text{S}_{\text{N}}2(\text{Ar})$ with suitable example and discuss the evidences for it.
b) Discuss in detail of S_{Ei} mechanism with suitable example.

OR

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- c) Predict the product of the following and explain the mechanism.
- Threo-3-bromo-2-butanol $\xrightarrow{\text{HBr}}$?
 - Trans-2-iodo-cyclohexyl acetate $\xrightarrow{\text{AcOH}}$?
- d) Explain in detail the SET mechanism.
- 6 a) Write the Woodward-Hoffmann selection rules for electrocyclic and cycloaddition and cycloreverse reactions by Frontier Molecular Orbital approach.
- b) Draw the correlation diagram of electrocyclic reaction of 1,3-cyclohexadiene to 1,3,5-hexatriene and explain.
- OR**
- c) (2E, 4E)-2,4-hexadiene under goes electrocyclisation under thermal condition. Explain the stereochemistry of this reaction by FMO method.
- d) Discuss with suitable examples the supra facial and antara facial migration of 1,3 and 1,5-hydrogen shift based on PMO approach.
- 7 a) Paterno-Buchi reactions are stereospecific in the case of aliphatic carbonyl compounds but not in aromatic carbonyl compounds. Explain.
- b) Define and explain Norrish type-II reaction with pent-2-enone.
- OR**
- c) Discuss in detail about photochemical cis-trans isomerisation of alkenes.
- d) Discuss the effect of structure of substrate and hydrogen donor on photoreduction.
- 8 a) Define the reaction and discuss the mechanism for Curtius and Lossen rearrangement.
- b) How do you explain the retention of configuration of migrating group in Hofmann reaction?
- OR**
- Write the reaction and mechanism for the following :
- Sommet-Hauser and Favorskii Rearrangement
 - Isoborneol in presence of acid
