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SB-3434

M. Sc. (Part - I) Examination

April / May – 2011

Organic Chemistry : Paper - IV

(Old Course)

Time : **3** Hours] [Total Marks : 54

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **M.Sc. (Part - I)**

Name of the Subject :

☛ **Organic Chemistry : Paper - 4 (Old)**

☛ Subject Code No. : **3 4 3 4** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

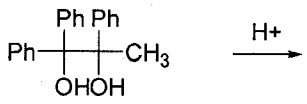
(2) Answer to the **two** sections should be written in separate answer books.

(3) Figures to the **right** indicate **full** marks of the questions.

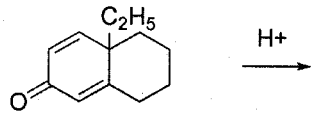
SECTION-I

1 Give the name of the rearrangement, end products and offer suitable mechanism with relevant supporting explanation of the following : **9**

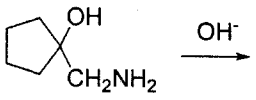
a.



b.



c.



OR

1 Give mechanism, migratory aptitude and two synthetic application of the following rearrangement : **9**

(a) Wagner-Meerwein

(b) Dienone-Phenol

(c) Demjanov.

2 (a) Explain with suitable example SN^i mechanisms. **9**

(b) What do you mean by neighboring group participation ? Explain neighboring group participation by - NH_2 and - COO^-.

(c) Explain by giving suitable mechanism of the folllowing : $\beta\beta'$ dichlorodiethyl sulfide is hydrolysed much faster than $\beta\beta'$ dichlorodiethyl ether.

OR

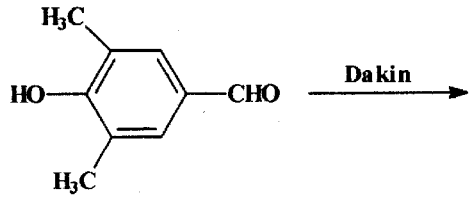
2 (a) Discuss mechanism of Von Richter rearrangement. **9**

(b) Discuss reactions of allylic halides.

(c) Explain by giving suitable mechanism of the following : 1-t butyl allychloride on treatment with nucleophiles yields rearranged product exclusively.

3 (a) Give nature of the reaction, mechanism and two synthetic applications of Arndt-Estert synthesis. **9**

(b) Give end product(s), suitable reagents and mechanism of :



(c) Give mechanism and two synthetic application of Leukart reaction.

OR

3 (a) With suitable example and mechanism explain Knoevenagel reaction. **9**

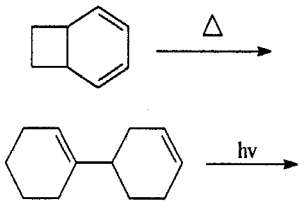
(b) Using Willgeroldt reaction, show how you will prepare p-dimethylamino phenyl acetic acid.

(c) Discuss the mechanism and two synthetic applications of Darzen's glycidic ester synthesis.

SECTION-II

4 (a) Construct correlation diagram for cycloaddition and the reverse reaction of ethylene-cyclobutane system and show that they are thermally forbidden but photochemically allowed process. **9**

(b) Give mechanism and the product of following reaction :



(c) Explain [1, 3] and [1, 5] sigmatropic rearrangement with respect to Claisen rearrangement.

OR

4 (a) Construct correlation diagram for disrotatory interconversion of 1, 3, 5-hexatriene and allyl system. **9**

(b) Using PMO method, discuss selection rules for the electrocyclic reaction.

(c) Draw molecule orbitals for butadiene and hexatriene and comment upon their symmentry properties.

5 (a) Predict which of the following may have aromatic character : **9**

(i) [8] annulene

(ii) [14] annulene

(b) Construct the orbital energy diagram for cyclobutadiene and benzene using Frost circle method and calculate the delocalization energy(DE) of the two compounds. Discuss their character.

(c) Discuss NMR spectra of aromatic compound emphasizing benzene.

OR

5 (a) Explain homoaromaticity giving illustration.

(b) State Huckel rule of aromaticity. Explain the term; aromaticity, antiaromaticity and non aromaticity.

(c) Discuss the geometry and structure of cyclobutadiene.

6 (a) Explain kinetic and thermodynamic control for chemical reaction by using Hammonds postulates. **9**

(b) Discuss partial energy diagram and explain transition state and intermediate.

(c) Explain Hemmet equation in terms of linear free energy.

OR

6 (a) Enlist the types of reactions with one example of each. **9**

(b) Discuss Curtain-Hammet principle with example.

(c) Derive Taft equation and explain steric effect on reactivity of structure.