2103N1683

Candidate's Seat No :_____

M.Sc. Semester-3 Examination

502

Chemistry (O)

March-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions: All questions carry equal marks.

All questions are Compulsory

Q.1 **[i] Answer the following questions** 7

A) Discuss the conformation analysis of 1,4-dimethylcyclohexane with their stability and optical activity

B) Discuss the conformations of trans-decaline with its stability

[ii] Answer the following question

Discuss [4+2] cycloaddition reaction. Discuss the role of FMO to predict the course of cycloaddition 7

OR

Q.1 **[i] Answer the following questions** 7

A) Discuss conformational analysis of 1,3-dimethylcyclohexane with their stability and optical activity

B)Discuss conformations of cis-decaline with its stability

[ii] Answer the following questions 7

Discuss sigmatropic rearrangement. Discuss the use of PMO to predict the course of sigmatropic reaction

Q.2 **[i] Answer the following questions** 7

A) Discuss the uses of ethers as protecting group

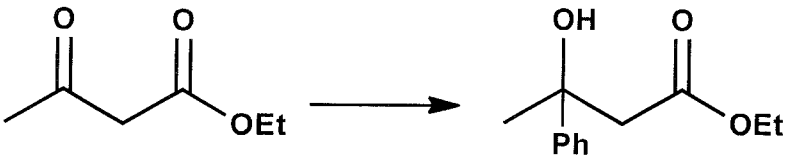
B) Complete the following reaction using suitable protecting group

[ii] Answer the following questions 7

A) Discuss the use of esters as protecting group

P.T.O

B) Complete the following reaction using suitable protecting group

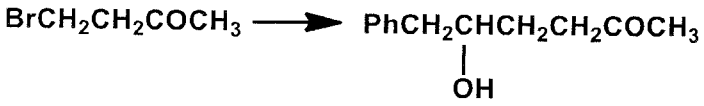


OR

Q.2 **[i] Answer the following questions** 7

A) Discuss the use of carbamates as protecting group

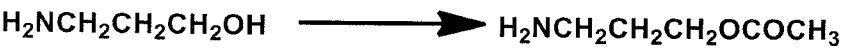
B) Complete the following reaction using suitable proecting group and Grignard reaction



[ii] Answer the following questions 7

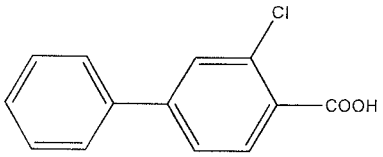
A) Discuss any three uses of cyclic acetals and ketals as protecting group

B) Complete the following reaction using suitable protecting group



Q.3 **[i] Write resrosynthesis of the following compounds** 7

1



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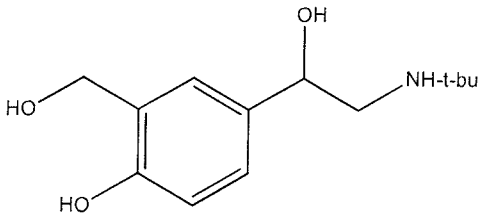
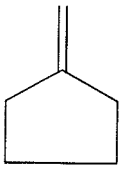


ii] Answer the following questions 7

A) Complete the retrosynthesis of the following compound

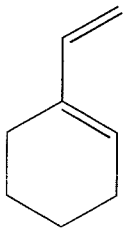


B) Discuss the use of nitro compounds in retro synthesis

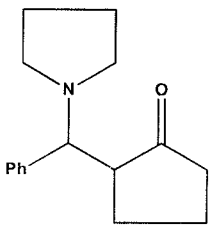
OR

Q.3 **[i] Write resrosynthesis of the following compounds** 7

1



2



[ii] Answer the following questions 7

A) Discuss 1,4-addition in α, ß -unsaturated ketones

B) Discuss the use of nitriles and epoxides as umpolung reagents in retrosynthesis

Q.4 **[i] Answer the following questions** 7

Enlist methods for the reduction of carbonyl compounds. Discuss reduction of amides to aldehyde and alcohols

[ii] Answer the following questions 7

A) Give applications of chromic acid as an oxidizing agent with mechanism

B) Discuss epoxydation of cyclohexene

OR

Q.4 **[i] Answer the following question** 7

Enlist oxidizing agents for oxidation of alkenes. Giving reaction mechanism discuss oxidation of alkene to corresponding diols and carbonyl compounds

[ii] Answer the following questions 7

A) Discuss reduction of aromatic compounds

B) Discuss the reduction of anhydride to lactone and diols

Q 5 **Answer in short (any seven)** 14

1 Draw the structures of main four conformers of n-butane and give their stability order.

2 Define disrotatory and conrotatory terms in photochemistry with suitable example

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3 Choose the correct option for the most stable conforer of 1,2-dimethylcyclohexane

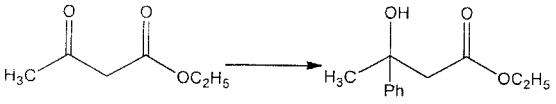
A Cis-1,2-ea

B Cis-1,2-ae

C Trans-1,2-aa

D Trans-1,2-ee

4 Complete the following reaction using suitable protecting group



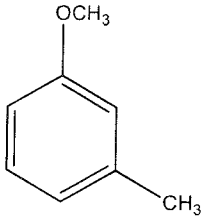
5 Give the use of acyclic acetals as protecting group for two different functional groups

6 Give the use of protection and deprotection

7 Define chemoselectivity with suitable example

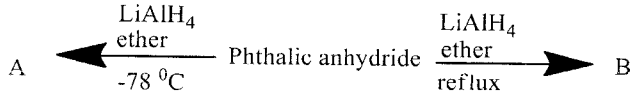
8 Give two applications of acetylene in retrosynthesis

9 Carry out retro synthesis of following compound



10 Give one application each for DMSO and MnO_2 as oxidizing agents

11 Complete the following reaction and draw the structure for A & B



12 Give chemical reaction for oxidation of activated –CH- adjacent to carbonyl group