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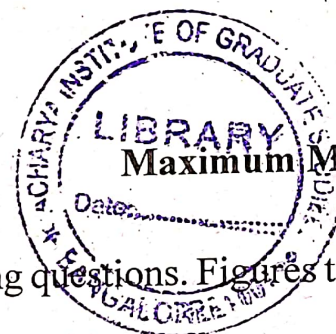
III Semester M.Sc. Degree Examination, April/May - 2022

## CHEMISTRY

Organic Reaction Mechanisms

(CBCS : 2019-20 onwards Scheme)

Paper : CH - 301 OC



Time : 3 Hours

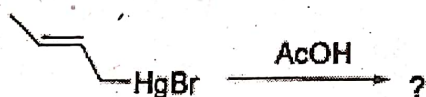
## Instructions:

Answer question No. 1 and any **five** of the remaining questions. Figures to the right indicate marks.

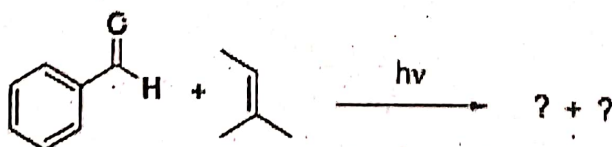
1. Answer any **Ten** of the following.

(10×2=20)

- The conversion of chiral alcohols to halides in presence of  $\text{SOCl}_2$  proceeds with stereoretention. Sketch the mechanism for this reaction.
- Indicate the effect of doubling the concentration of  $\text{Nu}^-$  and doubling the concentration of substrate on the rate of  $\text{SN}^1$  and  $\text{SN}^2$  reactions.
- Predict the product and mention the reaction type.



- What is photo sensitization? Give an example.
- Complete the reaction. Which one of the product gives acetaldehyde upon acidolysis?

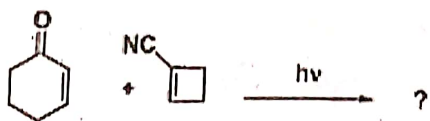


f. Write the FMOs of 1,3 - butadiene.

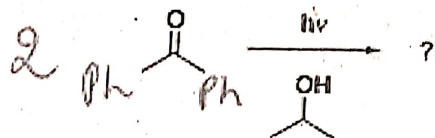
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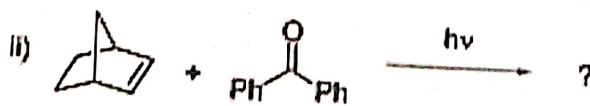
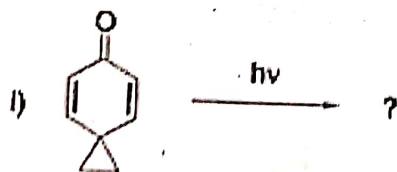
g. What is the major product of the following reaction?



- h. Illustrate Claisen rearrangement with an example.
- i. Write an example for endo - selective Diels - Alder reaction.
- j. Give the mechanism for allylic bromination with NBS.
- k. What is transamination? Mention the enzyme and coenzyme involved in this.
- l. Write the structure of lipoic acid. Mention its role in biochemical reactions.
2. a. Discuss the B<sub>AC</sub>2 mechanism of ester hydrolysis. How is the mechanism supported by <sup>18</sup>O labeling studies?
- b. Describe any two synthetic applications of diazo - transfer reaction. (5+5=10)
3. a. Sketch the basic and modified Jablonski diagrams. Highlight their significance.
- b. Complete the following reaction and provide the mechanism. (6+4=10)



4. a. Discuss photodimerization of cyclopentenone.
- b. What are the products of the following reactions? Outline the mechanism of their formation. (5+5=10)

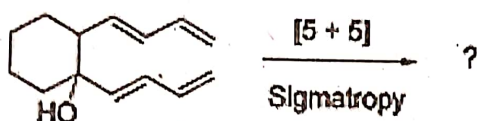




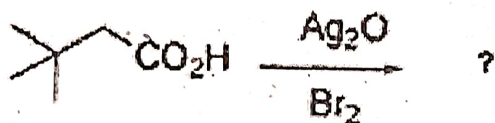
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5. a. Describe the preparation of singlet molecular oxygen. Highlight the difference between triplet and singlet states. Write a note on cycloadditions involving singlet molecular oxygen.
- b. Account for the stereospecificity of conrotatory and disrotatory electrocyclic reactions by using Woodward - Hoffmann correlation diagrams. (5+5=10)
6. a. Mention the rules for thermally and photochemically allowed sigmatropic shifts.
- b. Explain why Walk rearrangement are termed as (1,n) sigmatropic shift?
- c. Write the structure of the product. (4+3+3=10)



7. a. Complete the reaction, furnish the mechanism and give name reaction



- b. Discuss the synthetic utility of Fenton's reagent.
- c. Write examples for Sandmeyer reaction and Meerwin arylation reaction. (4+3+3=10)
8. a. What is 'one - carbon pool'? Explain the synthesis of methionine using N<sup>5</sup> - methyl - THF.
- b. Illustrate the mechanistic role of TPP in decarboxylation of  $\alpha$  - ketoacids. (5+5=10)

