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**CHH/ACH/OCH/CAH 452**

Second Semester M.Sc. Degree Examination, September/October 2022
CHEMISTRY/APPLIED CHEMISTRY/ORGANIC CHEMISTRY/ANALYTICAL
CHEMISTRY
Advanced Organic Chemistry
(CBCS : 2016-17 Syllabus)
(Freshers and Repeaters)

Time : 3 Hours

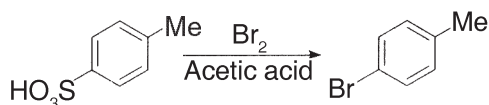
Max. Marks : 70

- Note :** i) Answer **all** sub-questions from Part – **A** and **any four** questions from Part – **B**.
 ii) Figures to the **right** indicate marks.

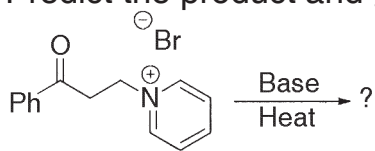
PART – A

Answer **all** the following sub-questions.**(2×9=18)**

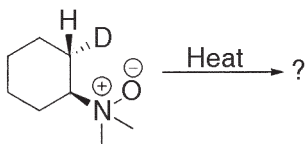
- The $-\text{NH}_2$ group is o, p-directing group but it gives meta-substitution during nitration. Comment on this.
 - What is $\text{S}_{\text{E}}\text{i}$ reaction ? Outline the mechanism taking suitable example.
 - Outline the mechanism with comment.



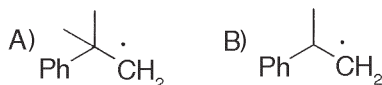
- Predict the product and give reasons for its formation.



- Complete the following reaction with necessary comments.



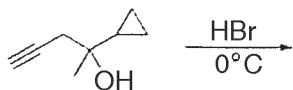
- The migration of phenyl group in radical A is faster than in B. Offer explanations.



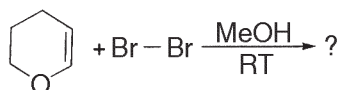
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- g) Outline the mechanism of acid catalyzed transesterification of methyl acetate with ethanol.
- h) Predict the major product formed in the following.

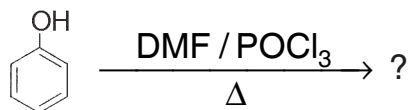


- i) Predict the product(s) and indicate the stereochemistry for the following reaction.



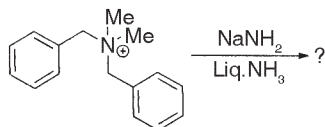
PART – B

2. a) Explain aromatic electrophilic substitution reaction taking suitable example.
- b) Predict the products and offer an explanation for their formation.

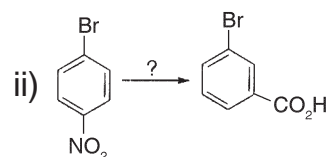
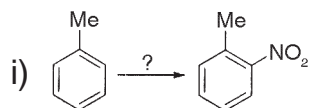


- c) Discuss the mechanisms for the following rearrangements. **(4+3+6)**
- Fries Rearrangement
 - Smiles Rearrangement.

3. a) Discuss the mechanisms of S_E1 and S_E2 reactions taking suitable examples.
- b) Predict the product for the following and outline its mechanism.

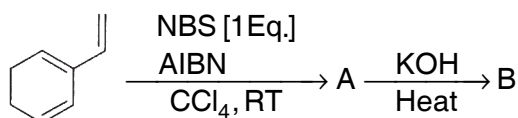


- c) Identify the reagents, conditions and discuss the following conversions. **(4+3+6)**

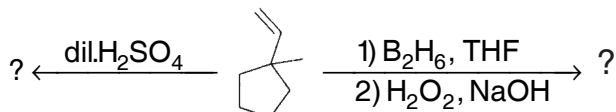




4. a) Explain the xanthate pyrolysis with suitable examples.
b) What are the experimental evidences in support of existence of free radicals in organic reactions ? Give an account of free radical reactions.
c) When treated with EtOK/EtOH, the threo isomer of MeCHDCH(Br)Me loses HBr but the erythro isomer loses DBr on similar treatment. Explain this observation. **(3+6+4)**
5. a) Discuss the factors which affect the rate of elimination reactions.
b) Write a note on Hofmann degradations.
c) Predict the structures of A and B and outline the mechanism for the following : **(6+4+3)**



6. a) Outline the mechanisms for $A_{AC}2$ and $A_{AL}1$ ester hydrolysis. Discuss the evidences to support these mechanisms.
b) Predict the products and explain their formation for the following reactions.



- c) Explain the preparation of the following from cyclopentene.
i) *cis*-Cyclopentane-1, 2-diol
ii) *trans*-Cyclopentane-1, 2-diol. **(5+4+4)**
7. a) Discuss the mechanisms for the following reactions.
i) Knoevenagel condensations
ii) Perkin reaction.
b) Suggest the suitable products in the following reactions and propose the mechanisms.
- 1) BrCCCC(=O)C $\xrightarrow[\text{ii) aq. NH}_4\text{Cl}]{\text{i) Mg, THF}}$?
- 2) N#CCCC#N $\xrightarrow{\text{NH}_3}$?
- c) Write a note on Michael addition reactions. **(6+4+3)**