SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
M.Sc.Chemistry - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - II

22PCHCT2004 - Organic Reaction Intermediates and its Mechanism

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain any two factors responsible for the stability of carbocation.
2. Illustrate the role of chloroform and alkali in Reimer-Tiemann reaction.
3. Predict the products and provide the mechanism with stereo chemistry.
   $\mathrm{CH_3\,CHBr\,CHBr\,CH_3} \xrightarrow[\text{Acetone}]{\text{Zn}} ?$
4. Discuss Sharpless asymmetric epoxidation with suitable examples.
5. Predict the product, give the mechanism and account for the stereo chemical course of the reaction. $\mathrm{PhCHBrCH_3} \xrightarrow[\mathrm{CH_3COOH}]{\mathrm{CH_3COOAg}} ?$
6. Apply the orientation effect and explain why the nitration of toluene gives o- and p-nitrotoluene readily and predominantly?
7. Discuss the mechanism of Michael reaction.
8. Examine the hydroxylation reactions of alkene with OsO_4 and $KMnO_4$.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. What are free radicals? How are they classified? Give any two methods for the generation of free radicals.
10. Explain the following conversions with mechanism.
    (i) 2 - aminopyridine from pyridine.
    (ii) 2 - carbethoxy cyclopentanone from ethyl adipate.
11. (i) Justify the fact that the electrophilic aromatic substitution reactions occur by a stepwise mechanism.
    (ii) Differentiate aromatic electrophilic substitution from aromatic nucleophilic substitution.

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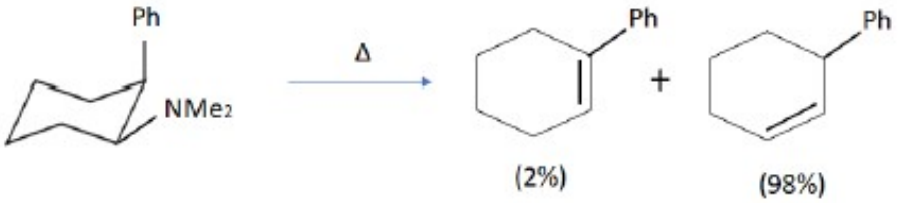
12. (i) Distinguish the factors controlling the competing reactions of substitution and elimination in alkyl halides.

    (ii) Justify the following observation.



II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Discuss the synthetic applications of the following.

    (i) LTA (ii) SeO_2 (iii) Birch reduction.

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