Roll.No. | 25PCHCT1001

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 - NOVEMBER 2025
SEMESTER - I

**25PCHCT1001 - Basic Principles of Organic Chemistry**

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

## Section B

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

1. Using Frost circle, determine the energy levels and stability of cyclobutadiene and cyclooctatetraene.
2. Explain how kinetic isotope effect can be used to study reaction mechanisms.
3. Assign R/S configurations to 2,3-dibromobutane and 2-chloro-3-methylpentane. Identify its possible stereoisomers.
4. Explain with an example how topicity of ligands influences stereochemical outcomes in reactions.
5. Draw and discuss the most stable conformation of cis-1,3-dimethyl cyclohexane.
6. Explain how steric and electronic factors affect the conformational preference in substituted ethanes.
7. Illustrate the mechanism of Beckmann rearrangement.
8. Predict the product formed in the Baeyer–Villiger oxidation of cyclohexanone and justify.

## Section C

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

9. Compare and contrast aromatic, antiaromatic, and non-aromatic systems with examples and explain their chemical consequences.
10. Examine the role of isotopic labeling and crossover experiments in determining organic reaction mechanisms.
11. Discuss how chirality arises in allenes and biphenyl systems and analyze their optical activity.
12. Analyze the conformations and stereochemistry of cis- and trans-decalin and explain their differences in stability.

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

13. Analyze the mechanistic similarities and differences between the Favorskii and Stevens rearrangements.

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