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. - END SEMESTER EXAMINATIONS NOVEMBER - 2022
SEMESTER - I
22PCHCT1001 - Basic Principles of Organic Chemistry

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

Section A

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

1. Explain the following
   (i) Furan reacts vigorously reacts with bromine and chlorine, but does not react with iodine. (2 marks)
   (ii) Ionic cyclic systems obeying Huckel's rule, also exhibit aromaticity (2 marks)
   (iii) Cyclobutadiene is highly unstable among annulenes (1 mark)
2. Describe substituent and reaction constants in detail as put forth by Hammett.
3. Relate that reactive conformation is the least energy conformation in which the chemical reaction takes place, to Cram's rule with illustrations
4. Explain the interconversion of projection formulae for ethane.
5. State the principles for examining possible structures of substituted cyclohexanes and sketch out conformational structures of any three disubstituted cyclohexanes.
6. Relate the cis and trans stereoisomers of 1,2 and 1,3 - dimethylcyclohexanes.
7. Show the variation involved in Demjanov rearrangement as predicted by Tiffeneau-Demjanov rearrangement with proper mechanism.
8. Examine the mechanism and applications of dienone-phenol rearrangement.

Section B

Part A

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

9. (i) Interpret the structures of cyclobutadiene, benzene and cycloocta tetraene with the help of Frost circle diagram (6 marks)
   (ii) Rephrase the one-electron oxidation of ferrocene with a neat sketch (4 marks)
10. Classify the various sensitivity factors and also relate the substituent constants as proposed by Taft.

Contd...

11. Recommend the study of cis – trans isomerism in alkenes and cyclic alkenes with specific examples.
12. (i) Compare the stereochemical realatioship between trans and cisdecalins marks)
    (ii) Appraise the interconversion of axial and equatorial isomers of cyclohexanol. Also, assess cyclohexanol's energy as a function of conformation (1 marks)

Part B

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

13. Predict the rearrangements pertaining to the following products and associate their detailed mechanisms
    (i) N- dialkyl benzyl amine (3 marks)
    (ii) carboxylic acid derivatives (4 marks)
    (iii) hepta-1,5-diene (3 marks)

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