

M-64/2110

10827/N

Total No. of Sheet used : 2

Total No. of Questions: 9

Subject: Chemistry

Paper: 102

Title of the Paper : ORGANIC CHEMISTRY

Time allowed: 3 Hours

Maximum Marks: 55

Minimum Pass Marks:

Note: Attempt five questions only selecting two questions from each of Sections A and B. Section C is compulsory.

SECTION-A

- | | | | |
|-----|-----|--|---|
| I | (a) | Discuss the formation and structure of carbene. | 4 |
| | (b) | Write the product(s) and mechanism of reaction of (i) allylbenzene with HBr and (ii) propenylbenzene with HBr. | 4 |
| II | (a) | Discuss structure of free radical having sp ³ , sp ² hybridized carbon with one reaction each involving stereochemistry. | 4 |
| | (b) | Explain auto-oxidation of n-hexane and give an example of rearrangement involving free radical. | 4 |
| III | (a) | Discuss the bonding in inclusion compounds. | 4 |
| | (b) | Discuss aromaticity in benzenoid compounds by taking different examples. | 4 |
| IV | (a) | Discuss the crossover experiment technique for determination of reaction mechanism. | 4 |
| | (b) | How isotopic labeling helps in the determination of reaction mechanism ? | 4 |

SECTION-B

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|------|-----|--|----|
| V | (a) | Discuss the factors that govern E1 and E2 mechanism. | 4 |
| | (b) | How to prove involvement of benzyne in a reaction ? | 4½ |
| VI | (a) | Discuss the formation of triple bond by elimination reaction. | 4 |
| | (b) | Explain the effect of solvent and nature of base in elimination reaction. | 4½ |
| VII | (a) | Explain [2+2]cycloaddition reaction using Woodward-Hoffmann correlation diagram. | 4 |
| | (b) | Write the product(s) in the electrocyclic reaction of 2E,4Z,6E-octatriene under thermal and photochemical conditions and explain using FMO approach. | 4½ |
| VIII | (a) | Explain [4+2]cycloaddition reaction using PMO approach. | 4 |
| | (b) | Discuss the migration of hydrogen and carbon moiety in [1,3]sigmatropic rearrangement. | 4½ |

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SECTION-C

- IX
- (a) Discuss the insertion reaction involving triplet nitrene.
 - (b) Outline the mechanism of free radical polymerization.
 - (c) What are fullerenes ?
 - (d) Compare the stability of allylic and benzylic carbocation.
 - (e) Discuss reactions of nitrene with nucleophiles.
 - (f) Define and explain homo-aromaticity
 - (g) What is Saytzeff rule ?
 - (h) Discuss dehalogenation by zinc in elimination reaction.
 - (i) Write the product of photochemical reaction between bicyclo[2.2.1]hepta-2,5-diene.
 - (j) Discuss [5,5]sigmatropic rearrangement.
 - (k) What is Cope rearrangement ?

2x11= 22