

**RAN-1803080201020001****M.Sc. (Sem. I) Examination November - 2025****Chemistry****Organic Chemistry (Paper - II)****Time: 3 Hours]****[Total Marks: 70**

સૂચના : / Instructions (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fill up strictly the above details on your answer book (2) Sketch neat and labelled diagram wherever necessary. (3) Figures to the right indicate full marks of the questions. (4) All questions are compulsory.	Seat No.: <table border="1"> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> Student's Signature						

Q-1. Answer any three of the following [18]

- What are carbocation? Explain classical and non-classical carbocation with suitable examples. Discuss Shapiro reaction with mechanism.
- Discuss stability parameters of carbanion.
- What are triplet carbenes? Give preparation of cyclohexene from cyclohexanone through Bamford-stein's rearrangement.
- Explain the following name reactions along with its suitable mechanism.
 - Mannich reaction,
 - Hunsdiecker reaction

Q-2. Answer any three of the following [18]

- What is co-relation diagram? Give co-relation diagram for the conversion of butadiene to cyclobutene through con-rotatory pathway.
- What is FMO method? Derive selection rule for electrocyclic reactions of 4q and 6q electron system using FMO method.
- What are cycloaddition reactions? Explain cycloaddition reaction of butadiene and ethylene to form cyclohexene by FMO method.
- By using PMO method, Justify that, (i) Ring opening of Cyclobutene to butadiene through disrotatory pathway is photo-chemically allowed process, & (ii) Cycloaddition reaction between ethylene and butadiene is thermally allowed via suprafacial orbital overlapping.

Q-3. Answer any three of the following [18]

- What is SN1 mechanism? Explain with an example.
- Discuss ArSN1 aromatic nucleophilic substitution reaction mechanism.
- Discuss the effects of neighbouring group participation by -NH₂ & -RS group on the reactivity in aliphatic nucleophilic substitution reaction.
- Pyridine is aminated with NaNH₂ in liquid ammonia to give 2 or 6-amino pyridine. Justify the products giving mechanism.

Q-4. **Answer any three of the following** **[16]**

1. What are racemic mixtures? Explain the mechanical separation method diastereoisomeric method for the separation of racemates.
 2. Explain dynamic stereochemistry and prochirality giving suitable examples.
 3. What is an enantiomer? Give examples. Explain optical activity in absence of chiral carbon in biphenyl and allenes.
 4. What is prochirality? Discuss the prochirality in 1,3-propane diol and prochiral relationship between ethanol and acetaldehyde.
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