K25P 3531

Reg. No. : .....

Name : .....

I Semester M.Sc. Degree (C.B.C.S.S. – O.B.E. – Reg./Supple./Imp.) Examination, October 2025
(2023 Admission Onwards)
CHEMISTRY/CHEMISTRY WITH DRUG CHEMISTRY SPECIALIZATION
MSCHD01C03/MSCHE01C03 : Organic Chemistry – I

Time : 3 Hours Max. Marks : 60

SECTION – A

Short answer questions. Answer **any five** questions. **Each** question carries **three** marks. **(5×3=15)**

1. Azulene exhibits an unusual deep blue color and a significant dipole moment despite being a hydrocarbon. Analyze its structural and electronic factors responsible for these properties.
2. Explain Chugaev elimination.
3. How will you convert cyclohexanone oxime into caprolactam ? Explain.
4. Why is substitution more common at an allylic carbon than at vinylic carbon ? Explain.
5. Explain benzyne mechanism.
6. What is the Paternò-Büchi reaction? Illustrate with an example.

SECTION – B

Paragraph questions. Answer **any three** questions. **Each** question carries **six** marks. **(3×6=18)**

7. Discuss the radiative and non-radiative processes undergone by excited molecules using Jablonski diagram.

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8. Explain the mechanism of the following aromatic rearrangements :

   i) Benzidine rearrangement

   ii) Sommlet-Hauser rearrangement.

9. Analyze the mechanisms of the following photochemical rearrangements :

   i) Lumi ketone rearrangement and

   ii) di-π Methane rearrangement.

10. Explain the mechanism of the following reactions :

   i) Pinacol rearrangement

   ii) Lossen rearrangement

11. Evaluate the characteristics that distinguish aromatic, non-aromatic, and anti-aromatic compounds. Illustrate with suitable examples.

SECTION – C

Essay type questions. Answer **any three** questions. **Each** question carries **nine** marks. **(3×9=27)**

12. Analyze the elimination reactions of menthyl chloride and neomenthyl chloride. Discuss how their stereochemistry influences the reaction mechanism and product distribution.

13. Write an essay on carbenes, discussing their structure, methods of formation and chemical properties.

14. Explain the mechanistic aspects of aliphatic nucleophilic substitution reactions with special reference to S_N1, S_N2, and S_Ni mechanisms. Discuss the factors influencing each pathway and provide suitable examples to illustrate the differences.

15. Discuss the concept of aromaticity in annulenes and heteroannulenes.

16. Discuss the factors affecting the selectivity and outcome of photochemical Norrish Type-I and Norrish Type-II reactions in ketones. Analyze how these factors vary between cyclic and acyclic systems with suitable examples.

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