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B.M.S. COLLEGE FOR WOMEN
BENGALURU – 560004

I SEMESTER END EXAMINATION-APRIL – 2024

M.Sc. CHEMISTRY-ORGANIC CHEMISTRY-I
(CBCS Scheme-F+R)

Course code: MCH102T

Time: 3 Hour

QP Code: 11008

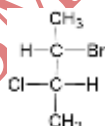
Max.Marks:70

Instruction: Answer Question No.1 and any FIVE of the remaining.

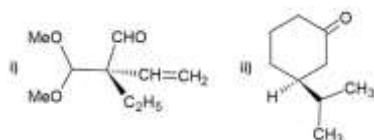
1. Answer any TEN questions

(2×10 =20)

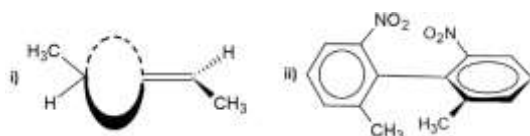
- What is resonance? How the resonance energy of benzene is determined.
- Draw the structure of [10]-annulene and comment on its aromaticity
- What are rotaxanes? Give their potential applications.
- Arrange the carbocations in the order of their enhancing stability with justification for tertiary butyl carbocation, allyl carbocation, isopropyl carbocation and benzyl carbocation
- Write the mathematical expression for Taft equation and elaborate the terms
- Which of the following is stronger acid? Give reason
3-bromopropionic acid and 2-bromopropionic acid
- Convert the following projection into Newman and Sawhorse projections



- Assign the configuration (R or S) for the following molecules:



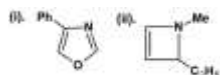
- Indicate the following as M or P with justification:



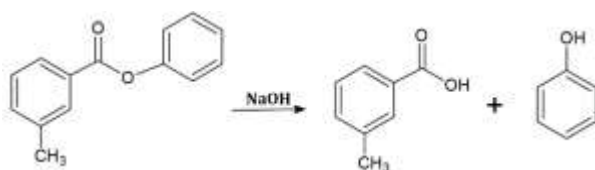
- Give the stable conformations for the following sugars:

- α -D-Galactopyranose
- α -D-Fructose

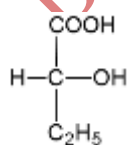
- Name the following by IUPAC system:



- 1) Give any one synthesis of coumarin
2. a) How crown ethers and metal ions are complexed? Give the structure of 18-crown-6 ether containing potassium ion.
- b) Write the structure of the suitable receptor which incorporated glyceraldehyde dimer as guest.
- c) Mention the importance of cyclodextrins. (4+3+3=10)
3. a) Justify: how isotopic labelling is used to determine the mechanism of the following reaction.

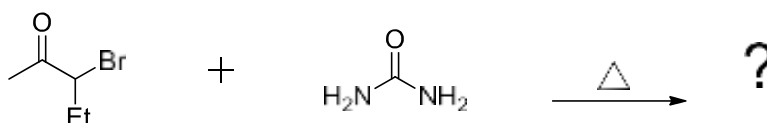


- b) How the presence of intermediates is useful in establishing the mechanism of a reaction explain with suitable examples.
- c) Discuss the effect of substrate, attacking nucleophile and leaving group on the mechanism of SN1 and SN2 reactions. (4+3+3=10)
4. a) Draw the stable conformation of
 - i) Bicyclo[2.2.2]octane
 - ii) 3-Methyl bicyclo[3.1.1]heptane
- b) Explain the terms enantiotopic and diastereotopic groups and faces with suitable examples
- c) What are CIP rules? Discuss how these rules are used to determine the R/S configuration of following:



(4+3+3=10)

5. a) Propose any two method for the synthesis of benzisoxazole.
- b) Write any two reactions of benzimidazole.
- c) Predict the product with suitable mechanism for the following reaction and name the product

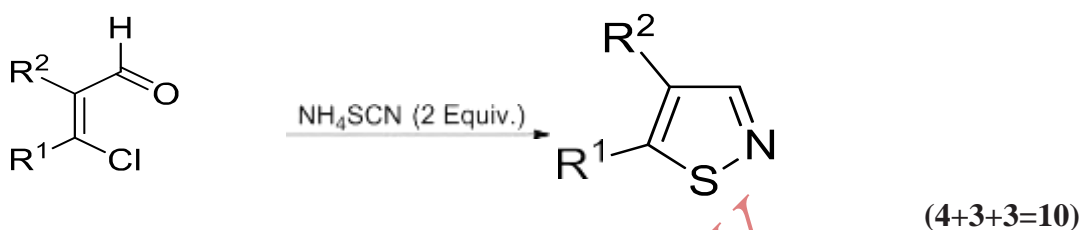


(4+3+3=10)

6. a) Outline any one method for the synthesis of indole.

- b) Write a short note on Cram's and Prelog's rules of asymmetric induction.
c) What are potential energy diagrams? Illustrate with examples for different types of reactions. (4+3+3=10)

7. a) Define molecular recognition? Describe molecular cleft structure and functions as receptors.
b) Write a note on optical activity of alkylidene cycloalkanes
c) Sketch the mechanism for the following reaction:



8. a) Explain the concept of thermodynamic and kinetic control of a reaction using the example of the reaction of an unsymmetrical ketone with a base.
b) Discuss briefly the conformation of cyclohexane
c) Write a note on classical and non-classical carbocations (4+3+3=10)
