UUCMS. No. | | | | | | | | | | | |

B.M.S. COLLEGE FOR WOMEN, AUTONOMOUS
BENGALURU-560004
SEMESTER END EXAMINATION-SEPT/OCT-2023

M.Sc. in Chemistry-4th Semester

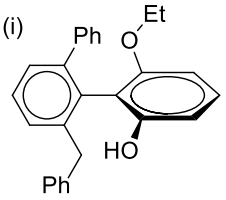
STEREOCHEMISTRY AND RETROSYNTHETIC ANALYSIS

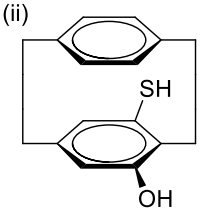
Course code: MCH201T **QP Code: 12007**
Duration: 3 Hours **Max.Marks:70**

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

1. Answer any TEN questions **(2X10=20)**

a) Assign R/S configuration to the following compounds.

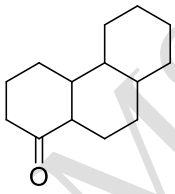
(i) 

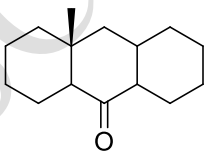
(ii) 

b) Draw the structures of catenanes and s-trans-cyclooctane

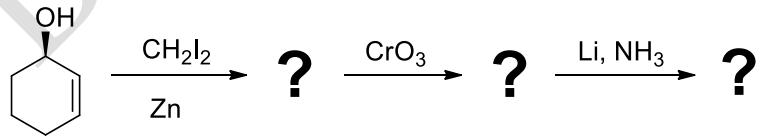
c) What is Umbrella effect? Give an example.

d) Describe the application of octant rule in determining the configuration of following compounds:

(i) 

(ii) 

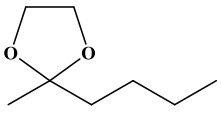
e) Predict the product/s with stereochemistry.



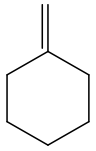
R-(+)-Cyclohexenol

f) What is α-axial haloketone rule? Explain with an example.

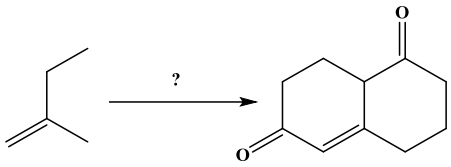
g) Suggest suitable reagent/s and mechanism for the deprotection of the following molecule:



h) Write the use of Wittig reaction in the synthesis of the following compound.



i) How do you achieve the following conversion?



j) Outline the logical retrosynthesis of Prelog-Djerassi lactone.

k) Write the stereo chemical structure of reserpine.

l) Predict the suitable target material by using limonene as the starting material.

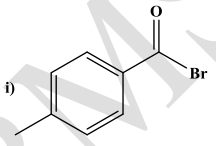
2. a) Describe the chirality in ansa and helicenes with an example.

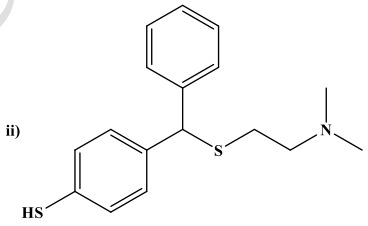
b) Discuss the optical activity of arsenic and Sulphur compounds **(5+5=10)**

3. a) Explain with suitable examples how the anomalous X-ray scattering technique is useful to determine the absolute configuration.

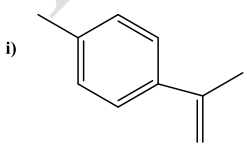
b) Discuss the chemical correlation method without involving the chiral center to determine the absolute configuration. **(5+5=10)**

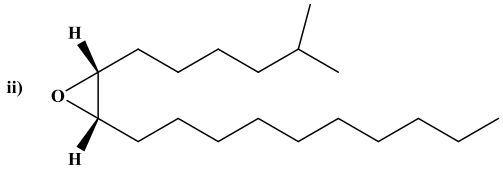
4. a) Suggest suitable synthesis for the following compounds:





b) Write retrosynthetic analysis of the following compounds:





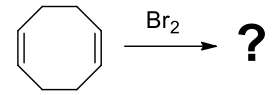
(5+5=10)

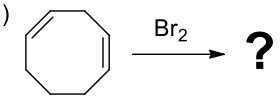
5. a) Give the steps involved in the synthesis of juvabione

b) Sketch the retro synthetic analysis of longifloene and outline its synthesis **(5+5=10)**

6. a) What are intra annular, extra annular hydrogens and trans annular strain? Predict the

product/s with suitable mechanism for the following trans annular reactions.

(i) 

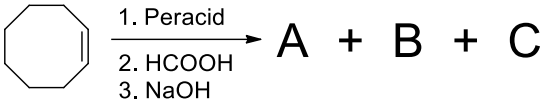
(ii) 

b) Illustrate rule of shift to determine the absolute configuration.

c) What is reversal of polarity? Explain how this technique is used in the construction of C-C bond. **(4+3+3=10)**

7. a) Suggest a logical retrosynthesis of aromadendrene.

b) Predict the product/s with suitable mechanism for the following transannular reactions.



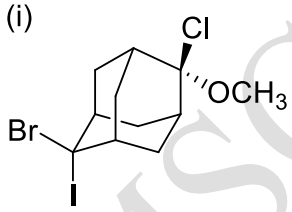
c) How Mill's rule was useful in determining the absolute configuration of cholestan-β-3-ol.

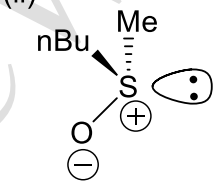
(4+3+3=10)

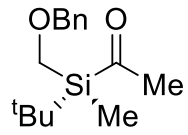
8. a) Discuss the various types of protecting groups employed for the protection of alcohols

b) Suggest the retrosynthetic analysis for the synthesis of cortisone

c) Assign R/S configuration to the following compounds.

(i) 

(ii) 

(iii) 

(4+3+3=10)

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