



IV Semester M.Sc. Examination, June 2017
(Semester Scheme) (CBCS)
CHEMISTRY

C – 402 – OC : Stereochemistry and Retrosynthetic Analysis

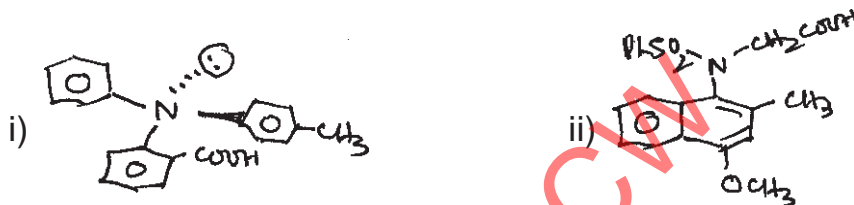
Time : 3 Hours

Max. Marks : 70

Instruction : Answer question no. 1 and **any five** of the remaining.

1. Answer **any ten** of the following : (10×2=20)

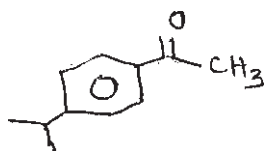
- a) While cis-cyclooctene is optically inactive, trans-cyclooctene exhibits optical activity. Explain why ?
- b) Which one of the following is optically stable and why ?



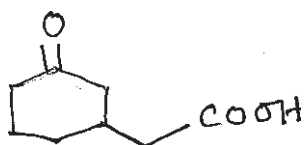
c) Use R and S descriptors and describe the absolute configuration of the following :



- d) What is “buttressing effect” ? Explain with an example.
- e) Write briefly on optical activity due to phosphorus in suitably substituted phosphines.
- f) Give a suitable synthesis for the following TM.

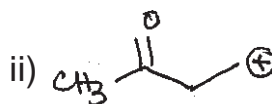
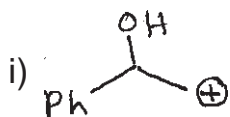


g) Sketch a retrosynthetic scheme for the following TM.

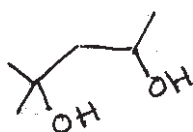




- h) Give an example for a C-O 1, 1-disconnection.
 i) What is a synthon ? Suggest suitable synthetic equivalents for the following synthons.



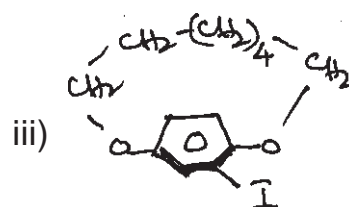
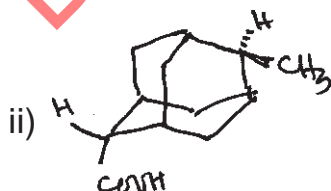
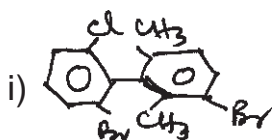
- j) Give any one method of preparation of 2-phenyloxetane.
 k) Based on disconnection approach give a convenient synthesis for the following TM.



- l) Use two group C-C disconnection and give the retrosynthetic analysis and design a synthesis for the following compound.



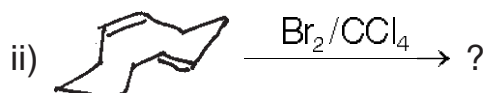
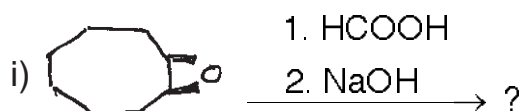
- m) What is chemoselectivity ? Explain with a suitable example.
 2. a) Use CIP rules and assign R/S configuration to the following :



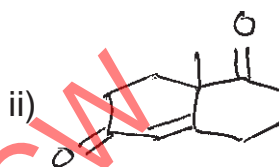
- b) Give an account of optical activity of [2]-catenanes and organosilanes. (6+4)
 3. a) Explain how the absolute configuration of (–) – lactic acid is determined w.r.t. (+) – tartaric acid by chemical correlation method.
 b) What is α -axialhaloketone rule ? Explain how this rule is used to determine the absolute configuration of (–) – 1-transdecalone which exhibited a positive cotton effect on bromination.
 c) What is Mills rule ? Explain with a suitable example. (4+3+3)



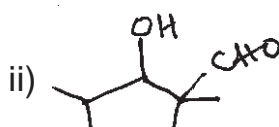
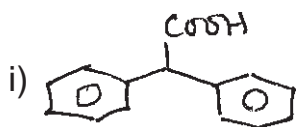
4. a) With suitable examples explain how the study of quasiracemates is useful in the determination of absolute configuration of chiral molecules.
b) What is distance rule ? Explain with suitable examples.
c) Predict the products of the following reactions and propose mechanisms. **(3+3+4)**



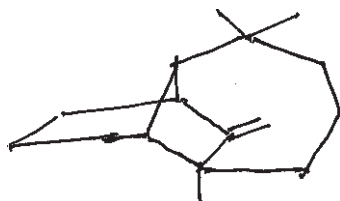
5. a) Sketch the retrosynthetic schemes and outline the synthesis of the following TMs.



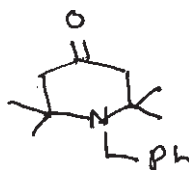
- b) Give a brief account of the use of acetylenes in organic synthesis. **(6+4)**
6. a) Write briefly on the use of aliphatic nitro compounds in organic synthesis.
b) Use C-C disconnections and synthesize the following TMs. **(4+6)**



7. a) Give the retrosynthetic analysis and synthesis of the following :



- b) Give a retrosynthetic scheme and sketch a synthesis of the following :





- c) Devise a route to convert the given starting material into the product. Comment on the route devised by you. **(4+3+3)**



8. a) Give a brief account of the following in organic synthesis :
- Reversal of polarity
 - Two group C-O disconnections
- b) Outline reasonable disconnections of Juvabione leading to simple starting materials and sketch a synthesis of it from 4-methoxyacetophenone. **(6+4)**

BMSCW