



IV Semester M.Sc. Examination, June 2016  
(CBCS)  
CHEMISTRY

C – 402 : OC : STEREOCHEMISTRY AND RETROSYNTHETIC ANALYSIS

Time : 3 Hours

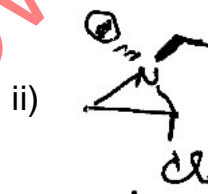
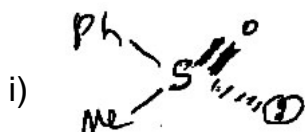
Max. Marks : 70

**Instruction :** Answer question number 1 and **any five** of the **remaining** questions.

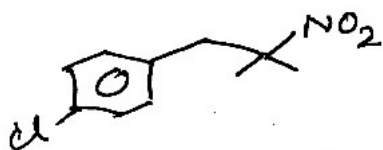
1. Answer **any ten** of the following :

(10×2=20)

a) Name the following as R or S.

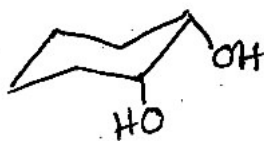


b) Give a retrosynthetic scheme for the following compounds :



c) Explain the Chirality of organic compound, which contain Silicon.

d) Suggest a suitable reagent for the protection of the following molecule.

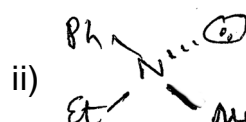
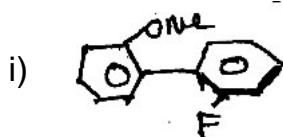




e) Give a suitable synthesis for the following.



f) Which one of the following is optically stable if any and why ?



g) What is "Distance rule" ? Explain with an example.

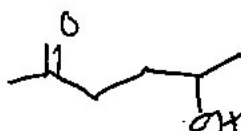
h) Write suitable synthetic equivalents for the following synthons.

i) Methyl anion;      ii) Allyl cation.

i) Explain how the method of quasisracemates is useful in the determination of absolute configuration of chiral molecules.

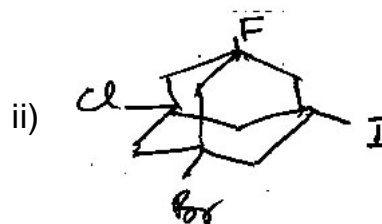
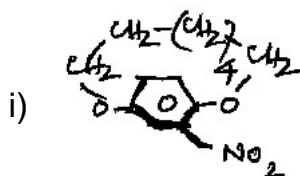
j) Give any one method of synthesis of a four-membered carbocyclic compounds.

k) Sketch a retrosynthetic analysis and give a synthesis for the following molecule.



l) What is C-X, 1, 2-diX ? Explain with an example.

2. a) Use CIP rules and assign R/S configuration to the following :

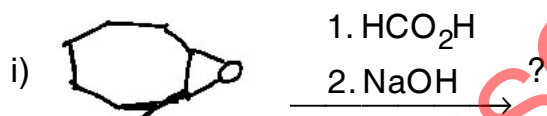


b) Give an account of optical activity of [2]-catenanes and organosilanes. (6+4=10)

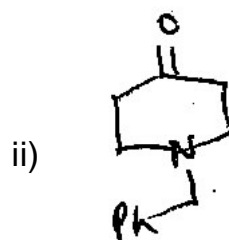
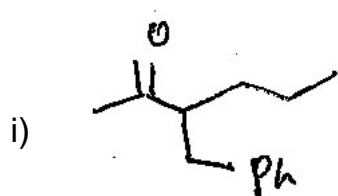


3. a) Explain how the absolute configuration of the following is determined by chemical correlation method.
- i) (+)-Malic acid with respect to (+)-tartaric acid.
  - ii) (+)-aspartic acid with respect to (–)-serine.
- b) What is  $\alpha$  - axial haloketone rule ? Explain how this rule is used to determine the absolute configuration of (–)-trans-1-decalone which exhibited a positive cotton effect on bromination. **(6+4=10)**

4. a) What is the rule of superposition ? Explain the application of this rule in the determination of absolute configuration of chiral molecules.
- b) Predict the products of the following reactions and propose mechanisms.



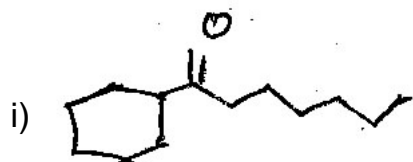
5. a) Sketch the retrosynthetic schemes and outline the synthesis of the following compounds :



- b) Write briefly on the following :
- i) Use of Reversal of polarity in planning a synthesis;
  - ii) Use of acetylides in organic synthesis. **(4+6=10)**



6. a) Give an account of use of basic principles and terminologies in disconnection approach.  
b) Use C-C disconnections and synthesize the following TMs.



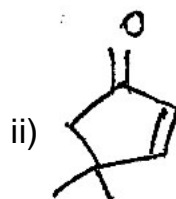
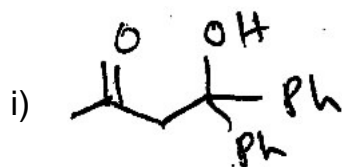
(4+6=10)

7. a) Give the retrosynthetic analysis and synthesis of lycorane.  
b) Sketch the synthesis of each of the following using simple and readily available starting materials.



(6+4=10)

8. a) Give the retrosynthetic analysis and synthesis of the following compounds.



- b) Use the disconnection approach and sketch a synthesis of Aromadendrene.

(6+4=10)

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