



IV Semester M.Sc. Degree Examination, June 2017
(NS) (2010-11 Scheme) (Repeaters)
CHEMISTRY

C 402 – OC : Stereochemistry and Retrosynthetic Analysis

Time : 3 Hours

Max. Marks : 80

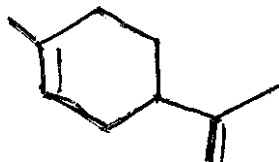
Instruction: Answer question 1 and **any five** of the remaining.

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

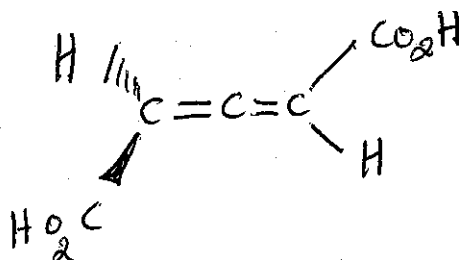
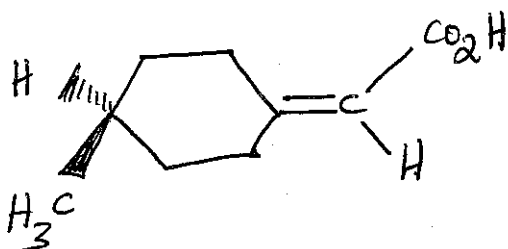
a) Sketch a retrosynthetic scheme for the following :



b) Outline the retrosynthetic route involving Wittig and Diels-Alders reactions for the following :

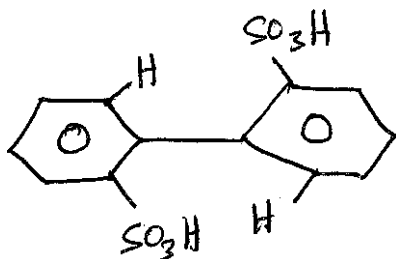


c) Identify the optically active isomers in the following pair and assign R/S configuration :

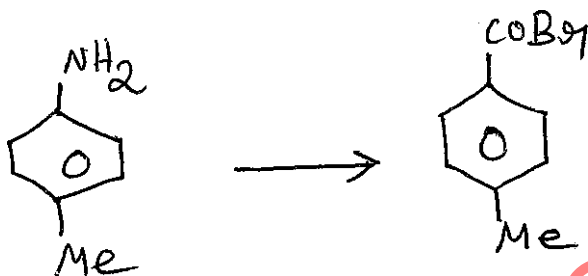




d) Explain whether the following compound can be resolved or not ?

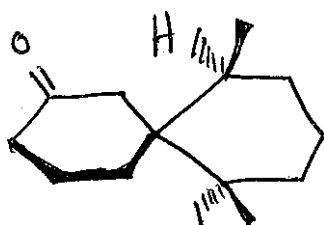


e) Suggest a method for the following conversion :



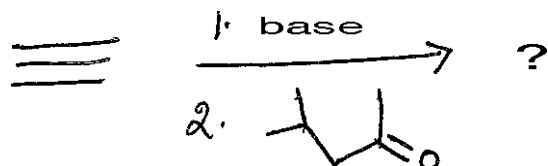
f) What are helical enantiomers ? Illustrate their configurational nomenclature.

g) Assign with explanation, configurations of the chiral carbons of the following compound :



h) Give any two examples of chemoselective reactions with equations.

i) Write the structure of the product formed in the following reaction :





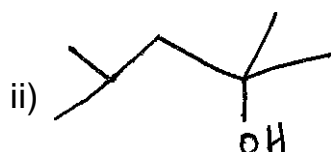
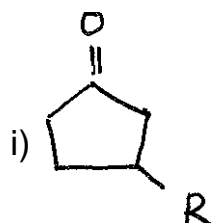
- j) Give a method for the synthesis of the following ring compound through a cycloaddition reaction :



- k) Demonstrate, with equation, the use of the following compound for the protection of a functional group :



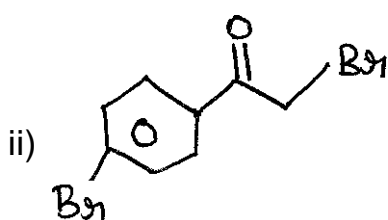
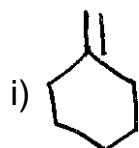
- l) Give an example for 1, 3-diX disconnection.
2. a) What is the rule of optical superposition ? Explain the use of Mill's rule in the determination of configuration with relevant examples.
b) Explain the strain in the conformation of bicyclo[3.3.1] nonane. How is it related to adamantane ?
c) Write neatly and clearly identify all the four stereoisomers of hepta-2, 3, 5-triene (with proper stereochemical notations such as R, S, E, Z etc.) **(4+4+4=12)**
3. a) Discuss the optical activity of arsenic and sulphur compounds.
b) Give the total synthesis of fredericamycin A. **(6+6=12)**
4. a) Explain the use of octant rule in the determination of absolute configuration of decalones.
b) Outline the retrosynthetic analysis and the corresponding synthesis of the following compounds :



(5+7=12)



5. a) Give any two methods for the generation of anion of acetylene and their reactions with RX and epoxide with suitable equations.
- b) Explain the use of aliphatic nitro compounds in organic synthesis. **(6+6=12)**
6. a) Give a suitable synthesis for the following :



- b) Illustrate the use of the following as protecting groups in organic synthesis :
- i) MEM group
- ii) FMOC group. **(6+6=12)**
7. a) Give the retrosynthetic analysis of Vitamin D.
- b) Write a note on the following :
- i) Hydrolysis of medium sized ring epoxides.
- ii) FGI. **(5+7=12)**
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