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IV Semester M.Sc. Degree Examination, September /October - 2022

CHEMISTRY

Advanced Stereochemistry and Retrosynthetic analysis

(CBCS Scheme 2019-20)

Paper : CH - 401-OC

Time : 3 Hours

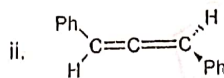
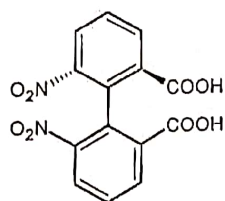
Maximum Marks : 70

Instructions to Candidates:

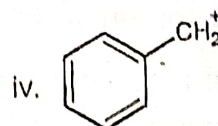
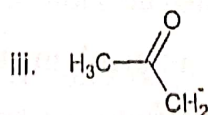
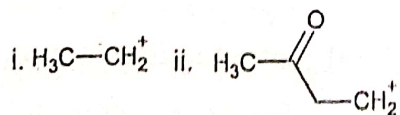
Answer question No.1 and any five of the remaining.

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

a) Assign the absolute configuration R or S to the following compounds:



- b) Write all the conformations of cyclononane and state which one is more stable and why?
- c) State the distance rule. Mention its applications.
- d) What is Mills rule? Give any one application of it.
- e) Write the synthetic equivalents for the following synthons:



[P.T.O.]

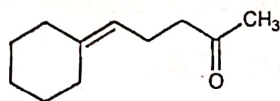




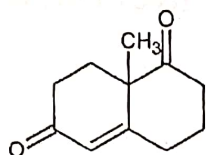
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- f) Propose synthesis of the following TM using disconnection approach. Justify your choice of reagents:



- g) What is a protecting group? Highlight its salient features.
h) Write any two protecting groups each for amines and carboxylic acids.
i) Sketch the retrosynthetic analysis followed by synthesis for the following TM:



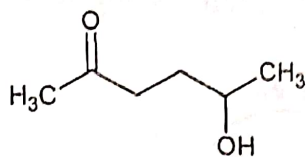
- j) Using disconnection approach suggest a synthesis for the following compound:



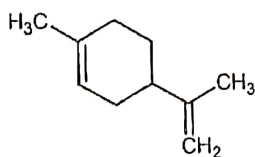
- k) Write the principal of chemical correlation involving diastereomers method to know the relative configuration of a compound.
l) Mention the limitation of the method of quasi-racemates.
2. a) Discuss the optical activity of catenanes and helicenes citing suitable examples.
b) Give an account on conformational analysis of medium size rings.
c) Write briefly on chirality of compounds in presence of phosphorus, and arsenic atoms or suitable examples. (3+3+4=10)
3. a) State α -axial haloketone rule. Illustrate its applications in determining the absolute configuration of substituted decalones.
b) Explain the method without involving the chiral centre for determining the absolute configuration of a molecule. (6+4=10)
4. a) Discuss the guidelines for choosing suitable disconnections.
b) Explain two-group C-X disconnections with the help of appropriate examples.



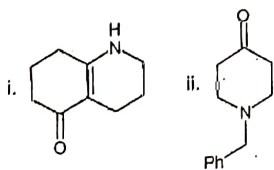
- c) Indicate the umpolung synthon and reagent, give the retrosynthetic analysis and corresponding synthesis of the following TM: (3+3+4=10)



5. a) What are the requirements of the protecting groups? Illustrate the use of the following as protecting groups in organic synthesis:
- Triptyl group,
 - Boc-group
 - Cbz group.
- b) Discuss the two-group C-C disconnections with respect to Diels-Alder reaction. Outline the retrosynthetic analysis and the designed synthesis of the following compound: (3+3+4=10)



6. a) Applying the disconnection approach, suggest a synthesis for each of the following:



- b) Illustrate the steps of the retrosynthetic analysis of longifolene and outline the corresponding synthesis. (5+5=10)
7. a) Explain with suitable examples CIP rules of determining the R/s configuration of compounds containing sulphur, nitrogen, phosphorus and silicon atoms.
- b) Discuss any two methods to control chemoselectivity and regioselectivity problems in carbonyl condensation reactions. (5+5=10)

[P.T.O.]