LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

SIXTH SEMESTER – **APRIL 2015**

CH 6615 - SYNTHETIC ORGANIC CHEMISTRY

Date : 22/04/2015 Dept. No. Max. : 100 Marks

Time : 09:00-12:00

PART-A

Answer **ALL** Questions: (10x2=20 marks)

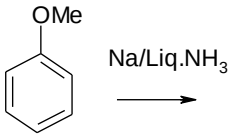
1. Define the term retro synthesis.
2. What are 'Synthons? Give two examples.
3. What is DIBAL? Give its uses.
4. What is Jone's reagent? Mention its significances.
5. What are pericyclic reactions? Give an example.
6. Give the two possible products that could result from the thermal self cycloaddition of $F_2C=CCl_2$.
7. Why is the methylene carbon active in ethylaceto acetate.
8. What is keto-enol tautomerism? Give an example.
9. What are designer solvents? Give an example.
10. What is solvent free synthesis? Mention any two advantages.

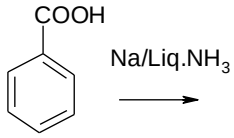
PART-B

Answer any **EIGHT** Questions : (8x5=40 marks)

11. What is Convergent synthesis? Why is it advantages over linear synthesis?
12. What are protecting groups? Highlight the use of protecting groups in organic synthesis with an example.
13. Explain the mechanism of Wolf –Kishner reduction with an example.

14. Formulate the product(s) in the following reaction and suggest a suitable mechanism for any one reaction.

a) 

b) 

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15. Discuss the mechanism of reduction by sodium borohydride. Predict the product obtained by the reduction of an N-alkylpyridinium salt with $NaBD_4$.

16. Starting from malonic ester how are the following compounds are prepared?

a) Adipic acid b) n-butyric acid

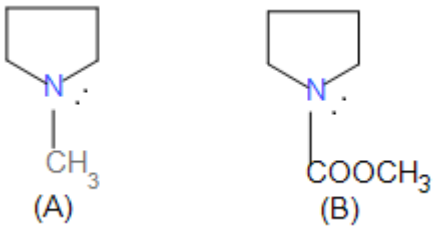
17. Predict the product in the following reaction and write its mechanism.

$C_6H_5CHO + C_6H_5CHO \xrightarrow{OH^-}$

18. Write the mechanism of aldol condensation with an example.

19. Explain the FMO approach for electro cyclic reactions with an example.

20. Compound A does not give a Diels-Alder adduct with acetylene dicarboxylic esters but compound B does-Why?



21. Write the advantages of microwave assisted organic synthesis.

22. What are 'Task specific ionic liquids'? Explain the advantages and disadvantages of ionic liquids.

PART-C

Answer any **FOUR** Questions (4x10=40 marks)

23. a) State and explain the guiding principles in choosing alternate synthetic routes.

    b) Discuss the retro synthesis of acetylacetone.

24. a) Explain umpolung synthesis with suitable example.

    b) Write a note on solid state synthesis.

25. Write the mechanism of the following reactions with appropriate examples.

    a) Clemmenson's reduction b) Hydroboration

26. a) Can pericyclic reactions be described in terms of electrophilic –nucleophilic interactions? Give reasons for your answer.

    b) Explain sigmatropic rearrangement reactions with an example.

27. How are the following compounds synthesized from aceto acetic ester?

    i) Antipyrine ii) Isobutyric acid iii) Acetyl acetone iv) Crotonic acid.

28. Explain the twelve principles of green chemistry.

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