LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – NOVEMBER 2010

# CH 3808 - PHOTOCHEMISTRY AND ORGANIC SYNTHESIS

Date : 29-10-10 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**Part-A**

Answer **ALL** questions. (10 × 2 = 20)

01 What are the merits of FGI? Give suitable examples.

02 How is mercuric acetate oxidation done?

03 How is Birch reduction regioselective? Give suitable examples.

04 What are cheletropic reactions? Give examples.

05 Write a short note on degenerate sigmatropic rearrangement reactions.

06. What are the advantages of using phosphoryl esters instead of phosphanes in Wittig reactions?

07. 30 g of toluene after various conversions forms 25 g of benzamide. What is the percentage yield of the reaction?

08 What is Alder’s endo rule? What is its effect on the stability of the products?

09. Represent various photophysical reactions using Jablonskii diagram.

10. What are hot ground state reactions? Give an example.

**Part-B**

Answer any **EIGHT** questions. (8 × 5 = 40)

11. How are primary and secondary amines prepared by Mannich reaction?

12. How regioselective compounds can be converted to regiospecific? Explain with suitable examples.

13. What are the various methods of C-C disconnections made during retrosynthetic analysis? Discuss any five in detail.

14. Perform retrosynthesis and subsequently report the synthesis of the given compound.



15. How is cubane synthesized?.

16. Explain the mechanism of catalytic reduction using metals?

17. Explain the mechanism of hydroboration and oxidation reaction

18. How are 5 and 7 membered heterocyclic compounds prepared by cycloaddition reactions?

19. Predict the products formed by the following reactions.



20. Draw correlation diagram for the electrocyclization reaction of 1,3-butadiene by dis-rotation. Predict whether the reaction is thermally or photochemically allowed.

21. What is Barton reaction? Predict the product from the following compound undergoing above reaction.



22. Predict the products in the following reactions.





**Part-C**

Answer any **FOUR** questions. (4 × 10 = 40)

23. Explain the mechanism of following reactions.

a) Benzoin condensation

b) Stobbe reaction

c) Perkin reaction

24. a) What are Boc and Bn protecting groups? How are they involved in the protection of various functional groups?

b) Explain the retrosynthesis of the following compound.



25. a) How are unnatural synthons useful in the synthesis of difunctional compounds? Explain with examples.

b) How is longifolene synthesized?

26 a) Compare Wolf Kishner and LiAlH4 reductions with examples.

b) How are active methylene compounds play significant role in organic synthesis? Explain the mechanism of Knoevenagal reaction.

27. a) Predict the stereochemistry of the products of the following reactions.





b) How cycloaddition is regioselective? Explain with any two examples.

28. a) Derive Stern-Volmer expression.

b) How does 4,4-diphenylcyclohex-2-en-1-one undergo photochemical rearrangement reactions? Write the complete reaction.

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