



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – CHEMISTRY**

**FOURTH SEMESTER – NOVEMBER 2016**

**CH 4813 - ORGANIC SYNTHESIS & PHOTO CHEMISTRY**

Date: 02-11-2016  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

**Part-A**

**Answer ALL questions.**

**(10 × 2 = 20)**

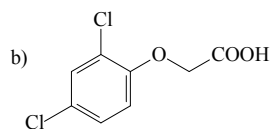
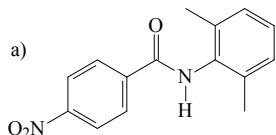
1. Write short note on the stereochemistry of Wittig reaction.
2. How positive charge at the  $\beta$ -carbon is stabilized in an organosilicon compounds?
3. Give any two methods of preparation of dicyclohexylcarbodiimide (DCC).
4. Predict suitable synthon and synthetic equivalents for  $C_6H_5CH(OH)COC_6H_5$ .
5. How convergent synthesis is superior over linear synthesis?
6. What is reductive amination?
7. Draw the HOMO of 1,3,5-hexatriene and excited state LUMO of 1,3-butadiene.
8. Write the group transfer reaction between ethylene and propene.
9. Discuss the geometry of excited state ethylene molecule.
10. Describe the Norrish type-I reaction in ethylpropyl ketone.

**Part-B**

**Answer any EIGHT questions.**

**(8 × 5 = 40)**

11. Predict the synthons and synthetic equivalents for the following compounds.



12. Illustrate with an example in the use of protection and deprotection of alcohols and amine functional groups in the organic synthesis.
13. Explain the use of dithianes in the conversion of propargyl ketone into 1-phenyl acetyl acetone.
14. What are stereospecific and stereoselective reactions? Give suitable examples.
15. Give two synthetic applications each of LDA and DCC.
16. Discuss the applications of trimethylsilyl halide in the organic synthesis.
17. Describe the following reactions with examples.  
(a) MPV reduction      (b) Birch reduction
18. Explain Suzuki coupling reaction of aromatic compounds with a specific example.
19. Write the mechanism of following reactions.  
(a) 3,3-sigmatropic benzidine rearrangement.  
(b) Electrocyclization of 1,3,5-hexatriene.
20. Draw the correlation diagram for the electrocyclicization of 1,3-butadiene by *con* rotation. Predict whether the reaction is feasible thermally or photochemically.
21. What are the products formed when 4,4-diphenylcyclohexa-2,5-dienone undergoes photochemical rearrangement reaction? Write its mechanism.
22. Write the mechanism of photoreduction of benzophenone using 2-propanol.

### Part-C

Answer any **FOUR** questions.

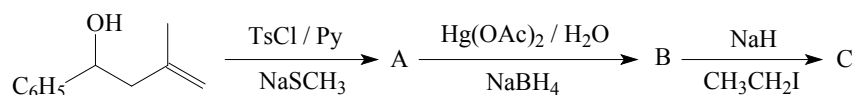
(4 × 10 = 40)

23 a. Explain the use of FGI in retrosynthetic analysis of (i) 1-phenylpropene and (ii) N-ethylethanamine.

b. Give the mechanism for the DCC and DMAP (cat.) mediated esterification reaction.

24 a. Explain the Starks extraction mechanism of phase transfer catalysis.

b. Identify A, B, & C.



25 a. Discuss the stereochemical aspect of the mechanism of Ziegler-Natta polymerization.

b. Give the applications of propan-1,3-dithiol as protecting group.

26 a. How is an imine reduced using NaBH<sub>4</sub>? (5)

b. Explain the electro-organic synthesis of bicyclic compounds with any two examples. (5)

27 a. Discuss the mechanism of 1,3-dipolar cycloaddition reactions. (5)

b. Explain the 1,5-sigmatropic rearrangement reactions with suitable examples. (5)

28 a. Explain di- $\pi$ -methane rearrangement reaction involving both aliphatic and aromatic substituents. (5)

b. Describe the photochemistry of  $\alpha,\beta$ -unsaturated compounds. (5)

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