



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

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

**FOURTH SEMESTER – APRIL 2016**

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

Date: 15-04-2016  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

**Part-A**

*Answer ALL questions.*

**(10 x 2= 20)**

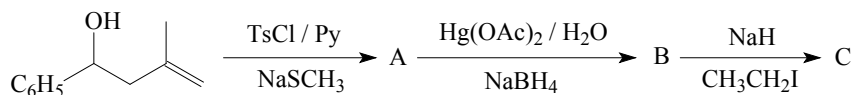
1. HBr addition to propene is a regiospecific reaction-Justify.
2. How is positive charge at the  $\beta$ -carbon stabilized in organosilicon compounds?
3. Write the mechanism for the reduction reaction of 2-butyne with Na/liq.  $\text{NH}_3$ .
4. Give any two methods of preparation of dicyclohexylcarbodiimide (DCC).
5. How is convergent synthesis superior over linear synthesis?
6. Write the mechanism of  $\text{SeO}_2$  oxidation of toluene.
7. What are group transfer reactions? Give an example.
8. Draw FMO picture of two molecules of 1,3-butadiene undergoing photochemical cycloaddition reaction.
9. What is photoisomerization reaction? Mention the factors affecting it.
10. What is a hot ground state reaction? Mention its salient features.

**Part-B**

*Answer any EIGHT questions.*

**(8 x 5= 40)**

11. Explain the use of FGI in retrosynthetic analysis of (a) 1-phenylpropene and (b) N-ethylethanamine.
12. Give the applications of propan-1,3-dithiol as a protecting group.
13. Explain the use of silyl reagent as protecting group for alcohols.
14. Give the mechanism for the DCC and DMAP (cat.) mediated esterification reaction.
15. Explain the Starks extraction mechanism of phase transfer catalysis.
16. Identify A, B, & C in the following reaction.



17. Write the complete mechanism of electroreduction of nitrobenzene.
18. (a) How is an aldehyde converted into an acid by Cr(VI) oxidation? Write the mechanism of the same.  
(b) What is reductive amination reaction?
19. Draw the correlation diagram for the electrocycloaddition of 1,3,5-hexatriene by disrotation. Predict whether the reaction is thermally or photochemically allowed.
20. Explain cationic and anionic cycloaddition reactions with suitable example.
21. Write the mechanism of photochemical rearrangement of 2,4,6-octatrienone.
22. (a) Explain the photochemistry of  $\alpha,\beta$ -unsaturated compounds with an example.  
(b) Write the Paterno-Buchi reaction for alkyne derivative.

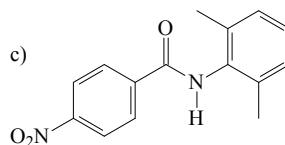
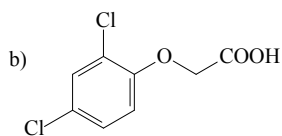
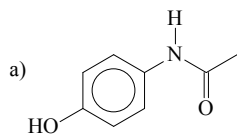
## Part-C

Answer any **FOUR** questions.

(4 x 10= 40)

23 a. What are stereospecific and stereoselective reactions? Give suitable examples.

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



24 a. Explain the use of dithianes in the conversion of propargyl ketone into 1-phenyl acetyl acetone.

b. Give the reaction of diazomethane with (a) cyclopropylacetic acid and (b)  $\text{CH}_3\text{COCl}$ .

25 a. Write a note on the stereochemistry of Wittig reaction.

b. Illustrate with an example, the use of protection and deprotection of aldehydes and amine functional groups in organic synthesis.

26 a. Write the mechanism of lead tetraacetate oxidization of a vicinal diol and a geminal-dicarboxylic acid.

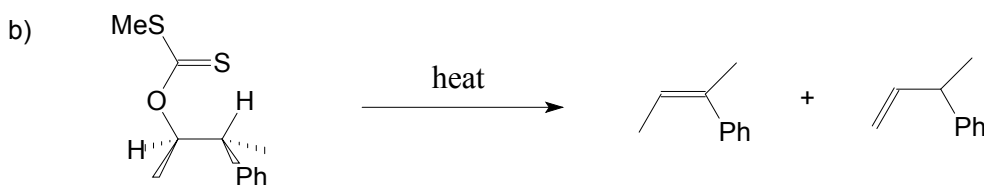
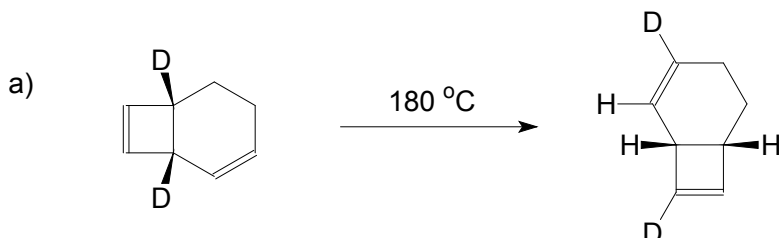
(3+3)

b. Explain the  $\text{LiAlH}_4$  reduction of propionamide.

(4)

27 a. Establish a suitable mechanism for the following reactions.

(3+3)



b. Explain degenerate sigmatropic rearrangement reaction using bullvalene. (4)

28 a. Explain the photoreduction of benzophenone using 2-propanol. What is the quantum yield of this reaction? (5)

b. Explain the Barton reaction in aliphatic compounds with an example. (5)

\*\*\*\*\*