



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

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

**THIRD SEMESTER – NOVEMBER 2017**

**CH 3808 - PHOTOCHEMISTRY AND ORGANIC SYNTHESIS**

Date: 02-11-2017  
Time: 09:00-12:00

Dept. No.

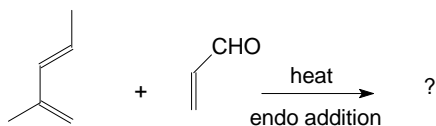
Max. : 100 Marks

### Part-A

Answer **ALL** questions:

(10 × 2 = 20)

1. How is the diborane addition of an alkene is regiospecific?
2. Why is Wittig Horner reaction better than Wittig reaction?
3. Write the difference between natural and unnatural synthons. Give an example for each.
4. What is functional group addition? Give an example.
5. What is crossed aldol condensation?
6. How is tetraethyl lead synthesized electrochemically?
7. What is Alder-ene reaction? Give an example.
8. Predict the stereochemistry of the product.



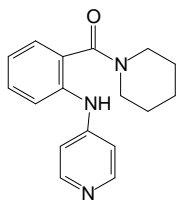
9. Write the mechanism of Fries photochemical rearrangement reaction.
10. What is Norrish type I reaction? Give an example.

### Part-B

Answer any **EIGHT** questions:

(8 × 5 = 40)

11. Explain the mechanism of 1,3-dipolar addition reaction with suitable examples.
12. How are the following difunctionalised compounds synthesized?
  - a) 1,3-propanediamine
  - b) ethyl acetoacetate
13. How is the stereochemistry controlled by functional group transposition? Explain with suitable example.
14. Perform retrosynthetic analysis and suggest a suitable synthetic method for the following compound.



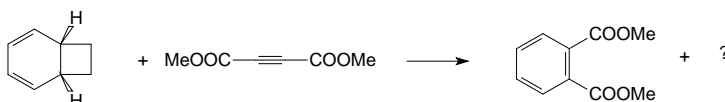
15. Compare Wolff Kishner and Clemmensen reductions with suitable example.
16. Write the complete mechanism of electroreduction of nitrobenzene.
17. Describe the synthesis of cubane.
18. Draw correlation diagram for the electrocyclization of 1,3-butadiene by dis rotation. Predict whether the reaction is thermally or photochemically allowed.
19. How is the stereochemistry of the products varied by 1,3- and 1,5-sigmatropic rearrangement reactions? Write the mechanism of reaction.
20. Explain Barton reaction in steroids.
21. How does 4,4-diphenylcyclohex-2-en-1-one undergo photochemical rearrangement reaction?
22. What is a hot ground state reaction? How does it yield unusual products under thermal conditions?

### Part-C

Answer any **FOUR** questions:

(4 × 10 = 40)

23. a) Write the mechanism of Mannich reaction.  
 b) Explain 1,2- and 1,4-Michael addition reactions with examples. (5+5)
24. a) Discuss the C-C disconnections with any three guidelines.  
 b) Explain the mechanism of protection and deprotection of an alcohol. (6+4)
25. a) Discuss the importance of functional group interchange in organic synthesis with suitable example. (4)  
 b) Explain the mechanism of the following reactions with suitable examples. (3+3)  
 i)  $\text{SeO}_2$  oxidation      ii) Peracid oxidation
26. a) Discuss the electroreduction reactions involving alkyl halides.  
 b) How is cycloaddition reaction regioselective? Give suitable example. (5+5)
27. a) Predict the product and suggest a suitable reaction mechanism.



- b) Explain the stereochemistry of chelotropic reactions with any two examples. (4+6)
28. a) What is Paterno Buchi reaction? How does it take place in alkynes?  
 b) Explain the di- $\pi$ -methane rearrangement reaction with an example. (5+5)