

## Chemistry (P.G.)

[CBCS]

M.Sc. Third Semester End Examination-2023

(Regular &amp; Supplementary Paper)

PAPER-CEM-302

Organic Special

Full Marks: 40

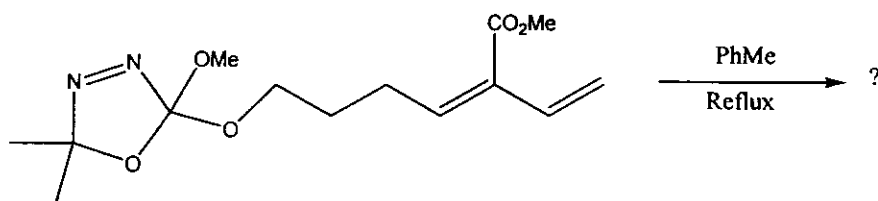
Time: 02 Hrs

*The figures in the right hand margin indicate marks**Candidates are required to give their answers in their own words as far as practicable**Illustrate the answers wherever necessary*

## Group - A

A. Answer any four questions of the following: 4x2= 8

1. Find the product of the following considering cheletropic reaction.

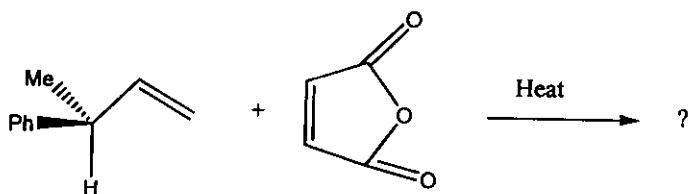


2. What is oxidative reaction? Give example.
3. A linear Hammett plot is obtained in the alkaline hydrolysis of p- and m-substituted benzoic acid esters while the Hammett plot of

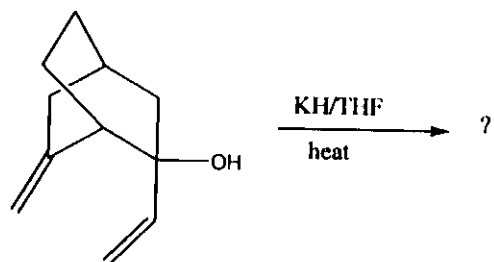
(2)

similar esters in 99.9 %  $\text{H}_2\text{SO}_4$  consists of two straight lines of positives and negative slopes meeting at zero. Explain.

4. What is ene reaction? Give example
5. Predict the product and explain.



6. Write down the structure of the expected product with mechanism.

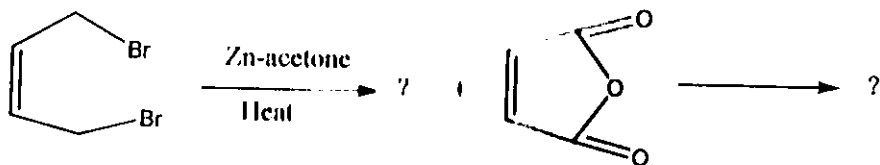


### Group - B

B. Answer any four questions of the following:

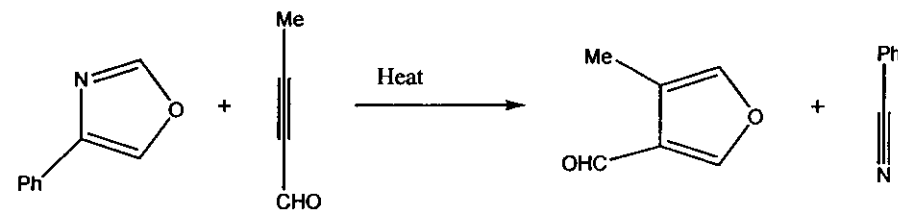
4x8= 32

7. a). Fill the blank with proper stereochemistry

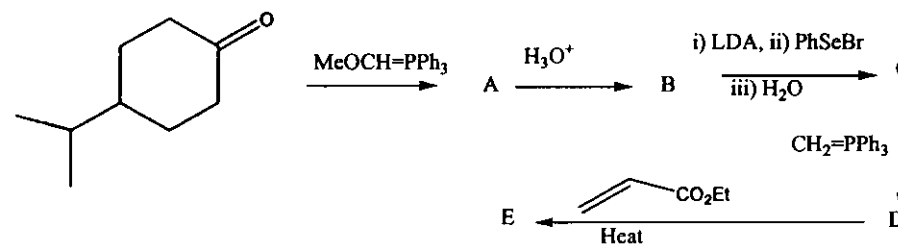


(3)

- b). Identify the kind of pericyclic reaction and explain how the products are formed.

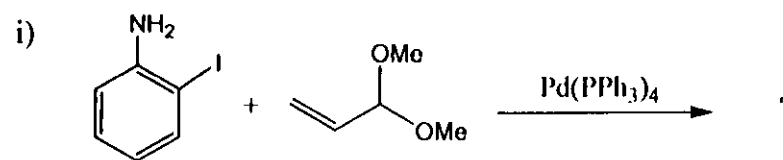


- c). Fill in the blank with proper stereochemistry.

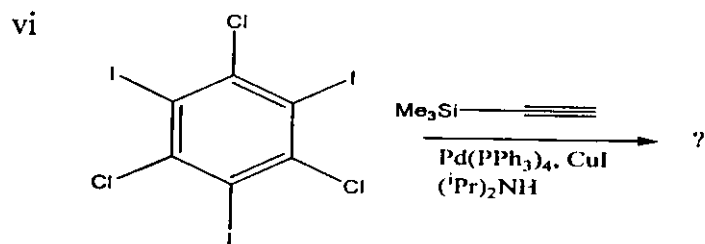
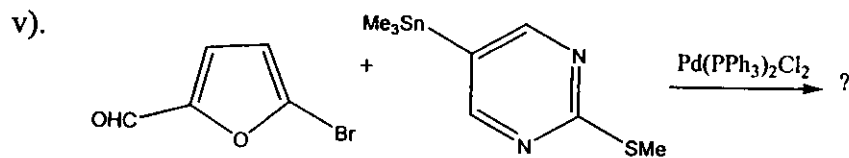
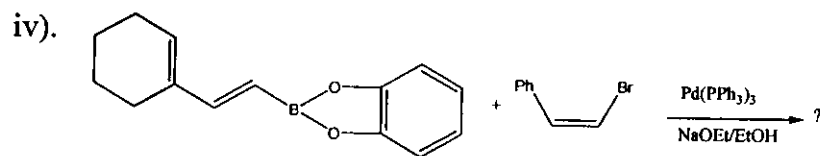
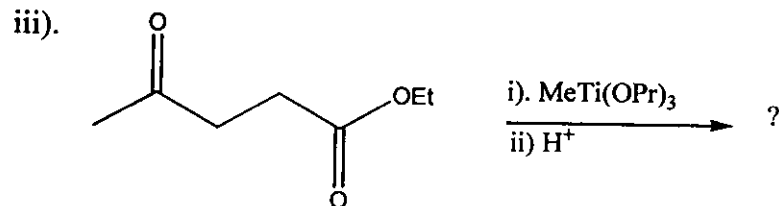


2+2+4 = 8

8. a) What is Ziegler Natta Catalyst? Show the mechanism of long chain hydrocarbon formation using Ziegler Natta Catalyst.
- b) What is Tebbe's reagent?
- c). Write down the structure of the product in the following reactions (any four)



(4)



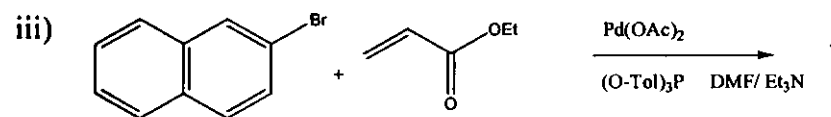
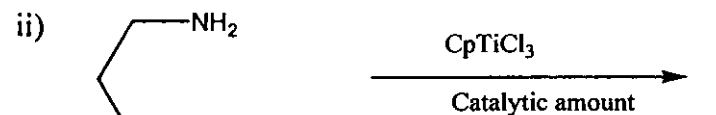
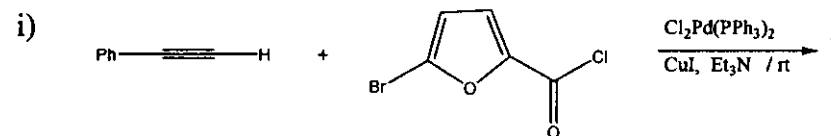
(1+2)+1+4=8

9. a). How Hammett equation was derived with reference to ionisation of benzoic acid as standard.  
 b). The saponification of methyl benzoate has  $\rho = 2.229$ . What would be the effect of introducing electron withdrawing group on the rate of the reaction? Show the rate determining step and transition state of the reaction. Do you expect a good linear

(5)

Hammett plot or its deviation in presence of electron donating group? Explain with reasoning. 4+4 = 8

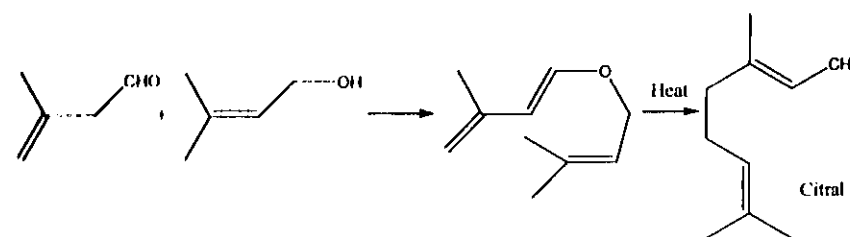
10. a) Predict the product of the following reaction with mechanism



b). Transition metal based organometallic compound differ from main group metal based organometallic compound – Explain.

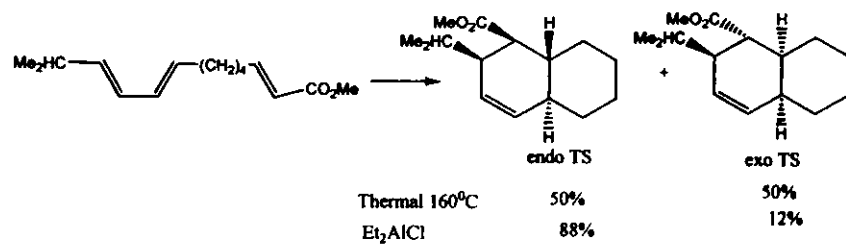
2\*3+2=8

11. a). Explain the formation of citral through the following reaction sequence via sigmatropic shifts:



(6)

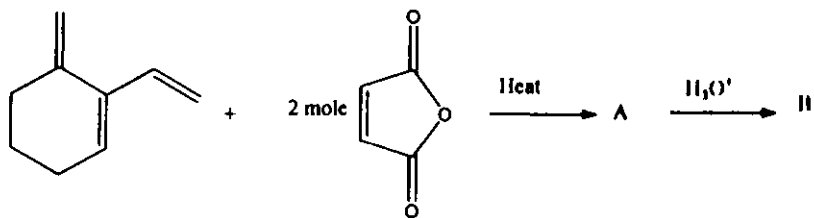
b). Explain the role of  $\text{Et}_2\text{AlCl}$  in the following reaction



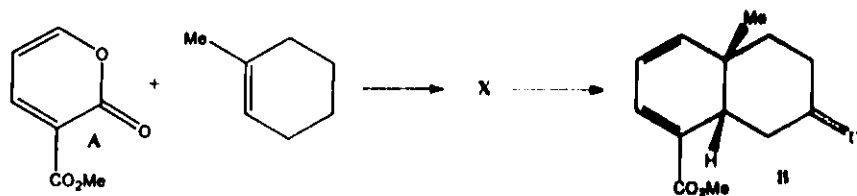
c). What is linear and nonlinear approach in cheletropic reaction?

$$2+3+3=8$$

12. a). Find the products in the following reaction

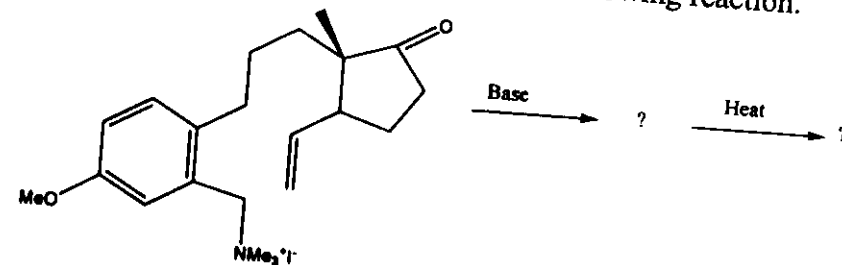


b). Identify the structure of X and show how A is transformed into B.



(7)

c). Identify the missing structures of the following reaction.



$$3+3+2=8$$

