Chemistry (P.G.)

[CBCS]

M.Sc. Third Semester End Examination-2024

(Regular & Supplementary Paper)

PAPER-CEM-302

[Organic Special]

Full Marks: 40 ***Time: 02 Hrs.***

The figures in the right hand margin indicate marks.

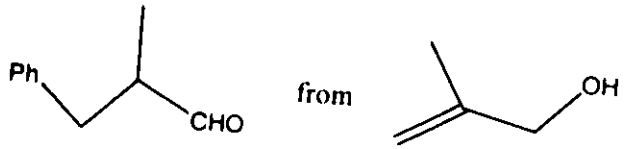
Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

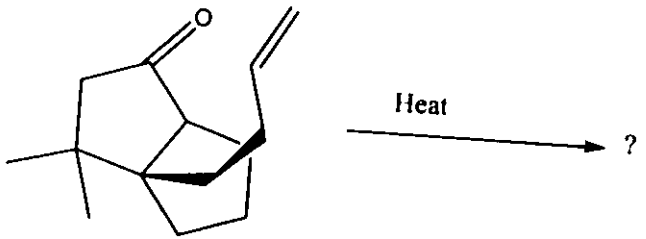
Group – A

A. Answer any four of the following question **4x2=8**

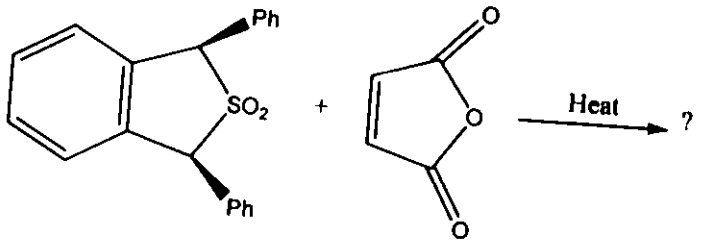
1. How Hammett equation was derived with reference to ionisation of benzoic acid as standard?
2. Give example where hydropalladation-dehydropalladation can lead to alkene somerisation.
3. Show the mechanism of long chain hydrocarbon formation using Ziegler Natta catalyst?
4. How would you employ organo transition metal compounds in the synthesis of the following?



5. Find the product of the following reaction.



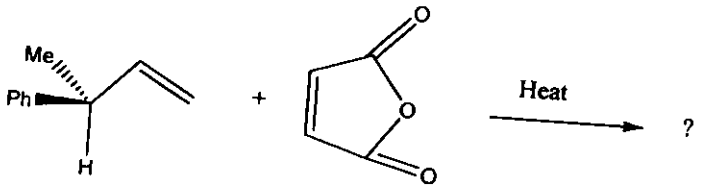
6. Find the product of the following with proper stereochemistry.



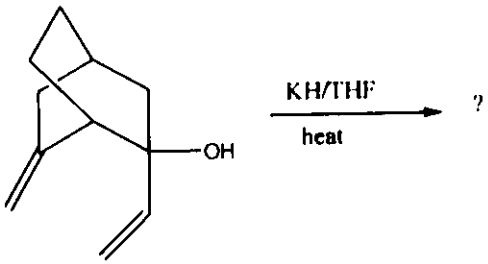
Group-B

B. Answer any four of the following question **4x8 = 32**

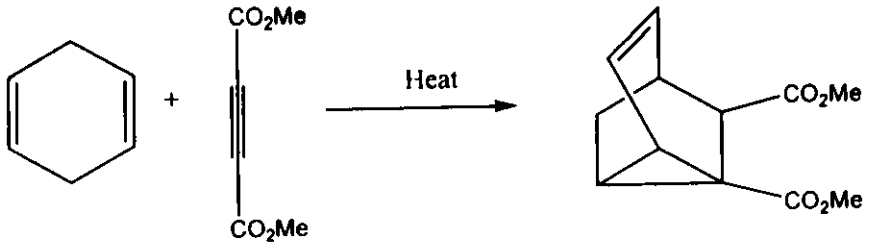
7. a). Predict the product and explain.



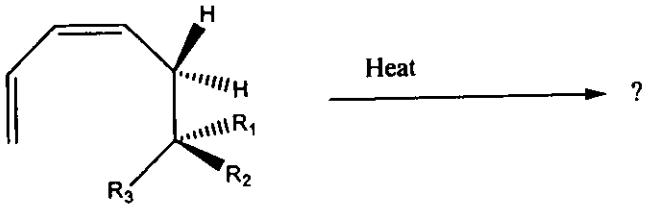
b). Write down the structure of the expected product with mechanism.



c). Write down mechanism of the following reaction



d). Find the product of the following sigmatropic reaction with FOI



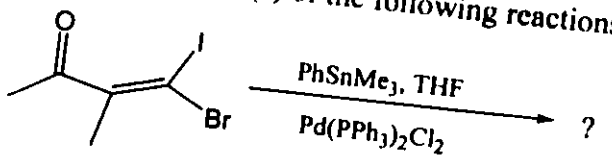
2+2+2+2 = 8

8. a) What is Petasis reagent? Give one special application of Petasis reagent.

b) What is migratory insertion? Give an example.

c). Predict the product(s) of the following reactions.

i)



ii

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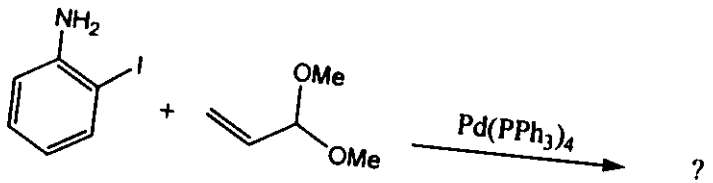
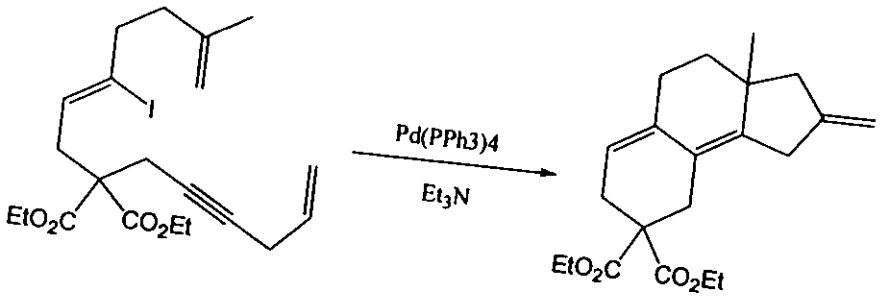


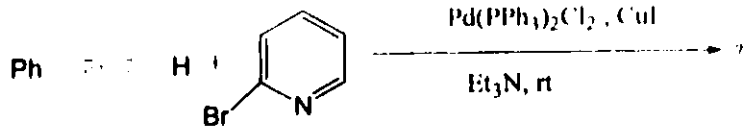
9. a). A linear Hammett plot is obtained in the alkaline hydrolysis of p- and m-substituted benzoic acid esters while the Hammett plot of similar esters in 99.9 % H_2SO_4 consists of two straight lines of positives and negative slopes meeting at zero. Explain. 3+3+2

b). Rationalize the following reactions.

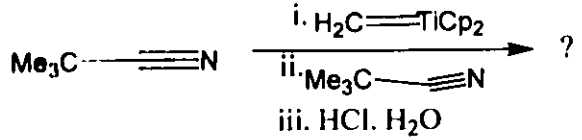


10. a) Write down the product of the reaction with mechanism (any one) 5+3 = 8

i)

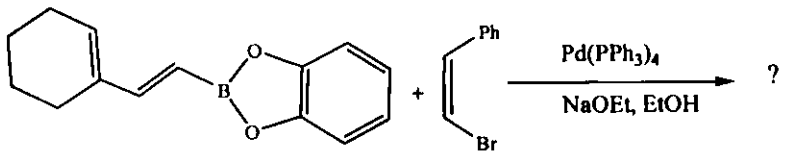


ii)

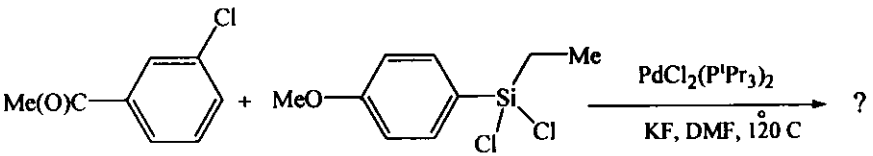


b). Write down the structure of the product in the following reactions

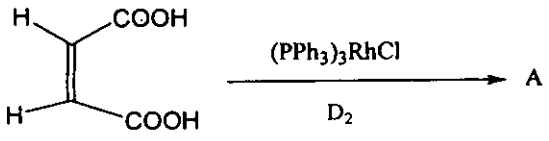
i).



ii).

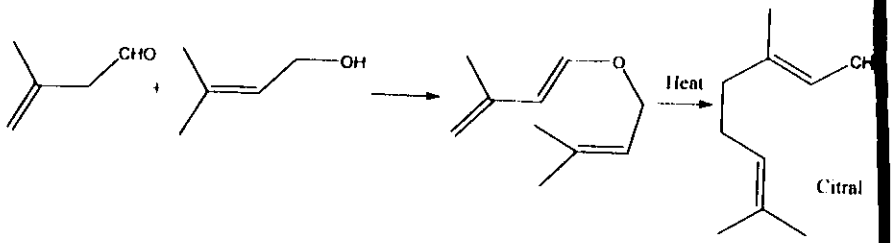


iii).



c). What is Tebbe's reagent? 3+3+2 = 8

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



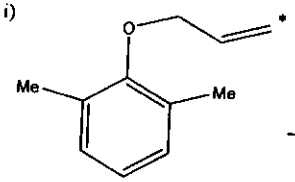
b). Explain why concerted [1,3]-H shift thermally forbidden while [1,3]-carbon migration occurs with inversion of configuration at migrating centre?

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

2+3+3=8

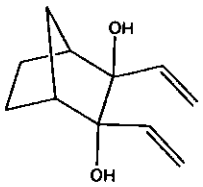
12. a). Write the product with proper stereochemistry and mechanism.

i)



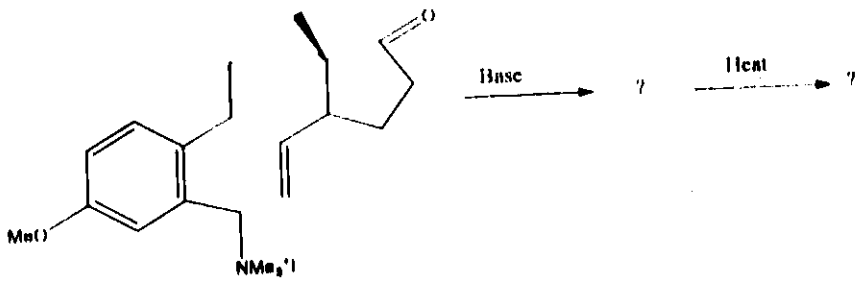
Heat → ?

ii)



Heat → ?

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



3+2+3 = 8

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