

Chemistry (P.G.)

[CBCS]

M.Sc. First Semester End Examination-2023

(Regular & Supplementary Paper)

PAPER-CEM-102

Full Marks: 40

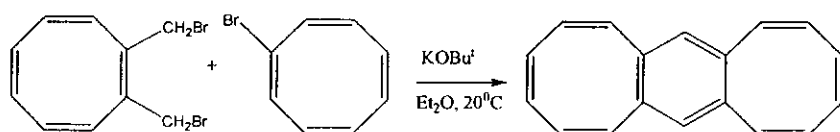
Time: 02 Hrs

*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.*

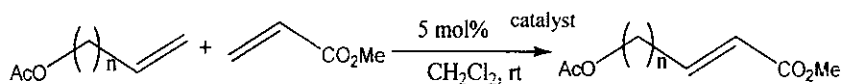
A. Answer any four from the following

4x2 = 8

1. Illustrate the significance of order of events in organic synthesis by citing appropriate example.
2. Suggest a mechanism to explain the following conversation

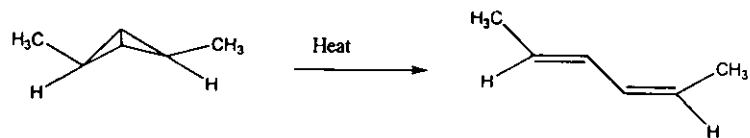


3. What is biomimetic reaction? Give one example.
4. Explain the product formation

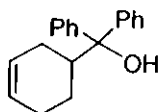


5. What is isoprene rule? What is "biogenetic isoprene rule"?
6. Suggest a mechanism to explain the following conversation

(2)



7. Using disconnection approach, design a suitable synthesis for the following compound.

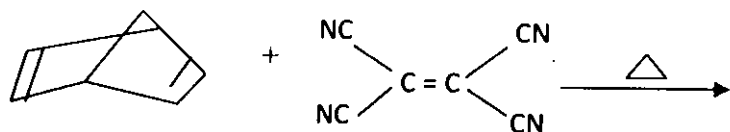


B. Answer any four from the following

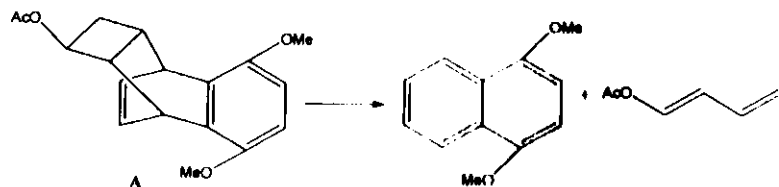
4x8 = 32

8 a) Draw the correlation diagram for cycloaddition reaction of butadiene and ethylene having supra-supra approach.

b) Predict the product(s) with F.M.I. of the following reaction :



c). On being heated to 320-340°C the following compound (A) produces 1,4-dimethoxy-naphthalene and acetoxy-butadiene- Explain mechanistically

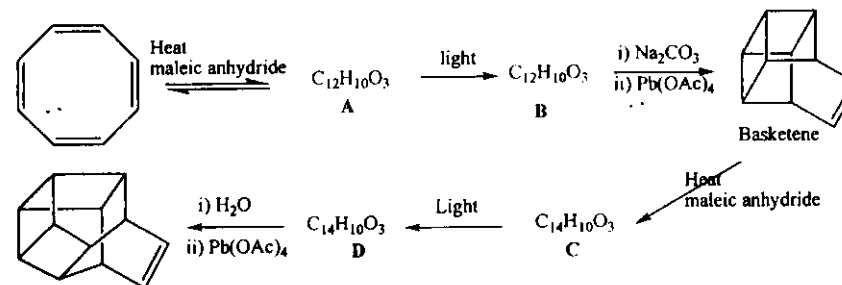


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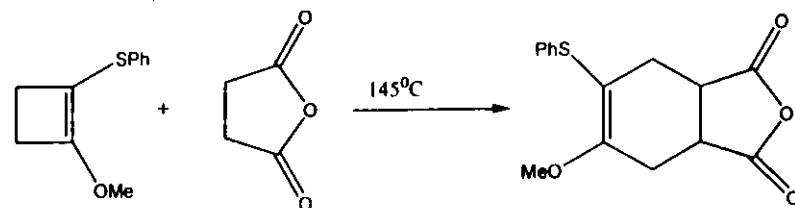
(3)

9. a). Develop an orbital symmetry correlation diagram for cyclobutene-butadiene inter conversion in conrotatory pathway. Indicate the symmetry allowed pathway.

b) Draw the structures of A to D

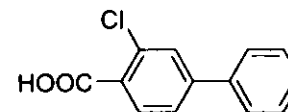


c) Propose a mechanism for the following transformation and show the TS using FOI diagram



2+4+2=8

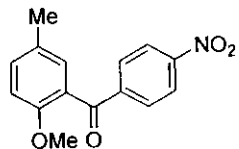
10. (a) Give retrosynthetic analysis and an efficient synthesis of the following compound.



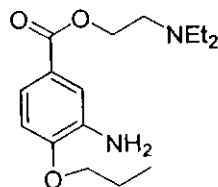
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(4)

- b.) Give two different retrosynthetic pathways for the following compound and explain which pathway is better for the synthesis of the target molecule.



- c.) Outline only the retrosynthetic pathway of the following compound



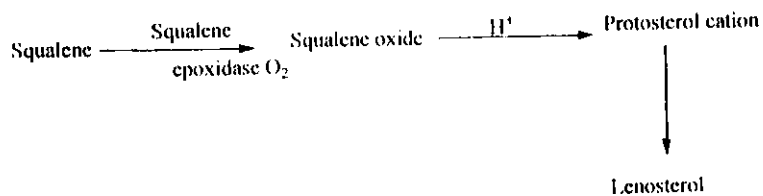
3+3+2=8

11. Explain the formation of the following from squalene epoxide by applying the "biogenetic isoprene rule" with at least three examples each (answer **any two**):

- monocyclic triterpenoids
- bicyclic triterpenoids
- tricyclic triterpenoids

4 x 2 = 8

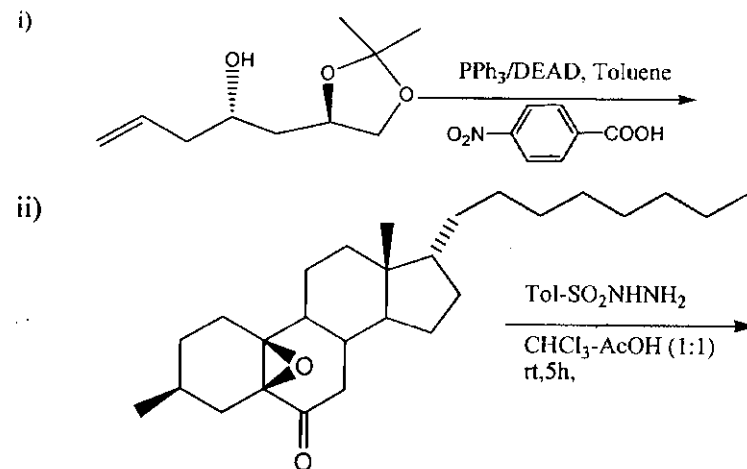
12. a.) Explain the product formation with mechanism



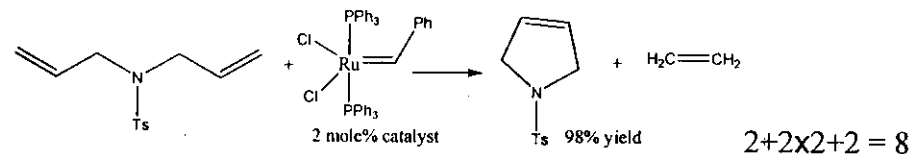
- b.) Write down the product of the following reactions with mechanism.

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(5)

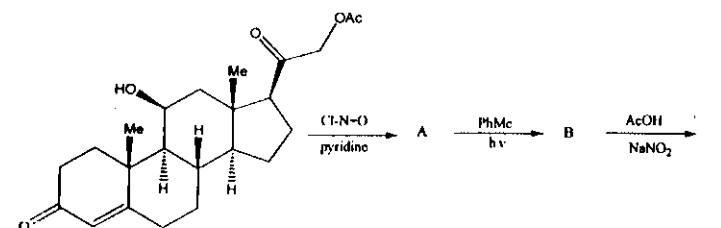


- c.) Explain the following observations.

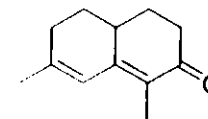


2+2x2+2 = 8

13. a.) Identify the product A, B and C



- b.) Utilization of plant metabolites as raw materials instead of petroleum products will lead to a sustainable society. – Explain.
- c.) Outline the retro and forward synthetic pathway of the following compound.



3+2+3 = 8