

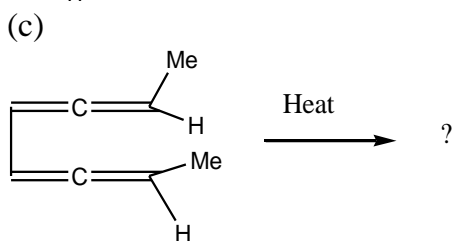
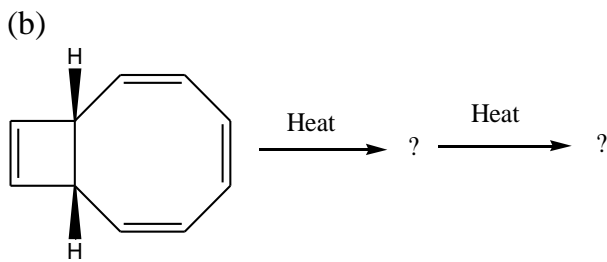
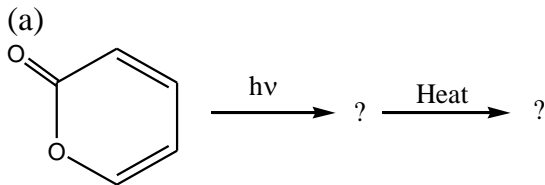
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PG CBCS
M.Sc. Semester-I Examination, 2021
CHEMISTRY
PAPER: CEM 102

Full Marks: 40**Time: 2 Hours****Answer any FOUR questions from the following:****4X10=40**

1. Predict the structure of the products indicating the FOI in each case.

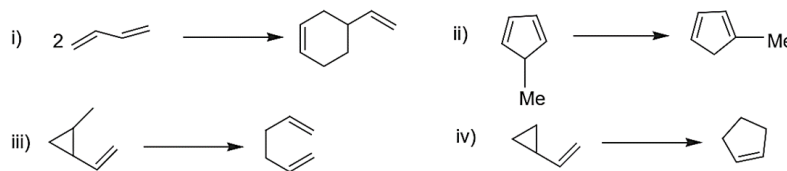
4+4+2



2. a) Develop an orbital symmetry correlation diagram for cyclobutene-butadiene interconversions in conrotatory pathway. Indicate the symmetry allowed pathway.

b) Drawing interaction diagram show that the disrotatory path is allowed thermally and conrotatory path is allowed photochemically for cyclobutene-butadiene interconversion.

c) Identify each of the following pericyclic reactions.



3+3+4

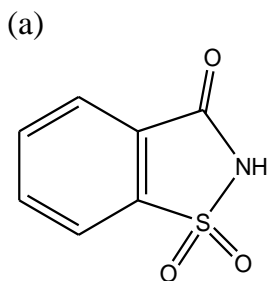
3. Write short notes on the following with examples:

(2x5)

(a) Synthon (b) Synthetic equivalent (c) FGI (d) FGA (e) Protection of functional group

4. Write the retrosynthesis of the following compounds:

2.5x4

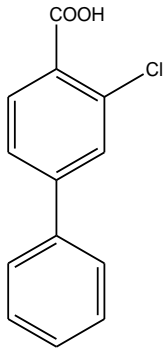


Saccharine

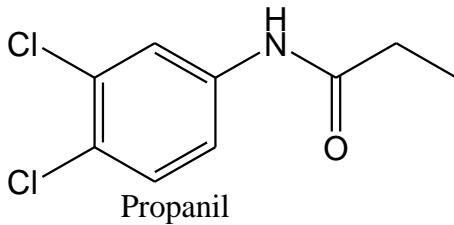
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(2)

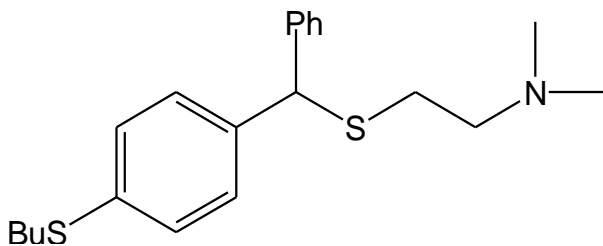
(b)



(c)



(d)



5. a) What are alkaloids? Write four natural sources of alkaloids. 2+2

b) How would you convert 2-propenylpyridine to (\pm) Coniline? 3

c) Ephedrine is slightly weaker base than Ψ -Ephedrine Explain. 3

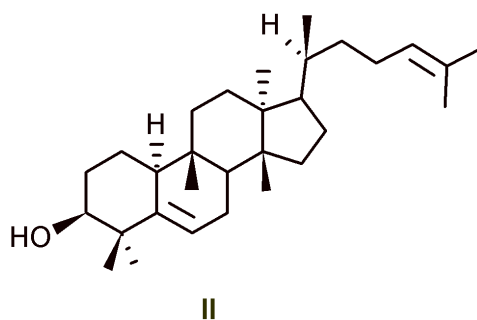
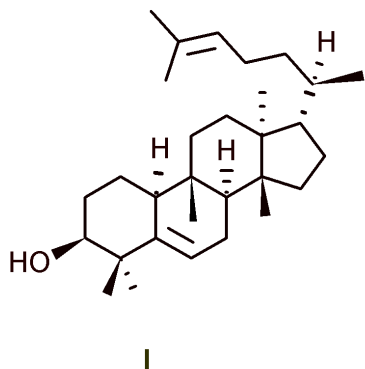
6. (a) What is ricinine? How do you synthesise ricinine? 5

(b) What is piperine? Give synthesis of piperine? 5

7. (a) Explain the formation of the following from squalene epoxide by applying the 'biogenetic isoprene rule' (at least three examples for each): 2.5X2

(i) bicyclic triterpenoids (ii) tricyclic triterpenoids

(b) Synthesize the following 6-6-6-5 tetracyclic triterpenoids from squalene by applying biogenetic isoprene rule: 2.5X2



(P.T.O.)

(3)

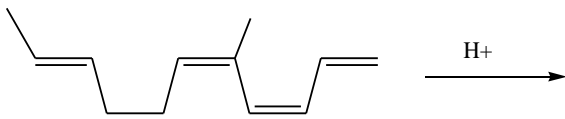
8. a) How do you establish the position of the two double bonds in Citral by ozonolysis?
 b) When Limenone is heated strongly it yields 2 moles of isoprene. What kind of reaction is involved here?
 c) The boiling point of geraniol is somewhat higher than that of Uerol-Why?
 d) Nerol undergoes acid catalysed cyclisation to α -terpinol nine times faster than Geraniol – explain.

2.5x4

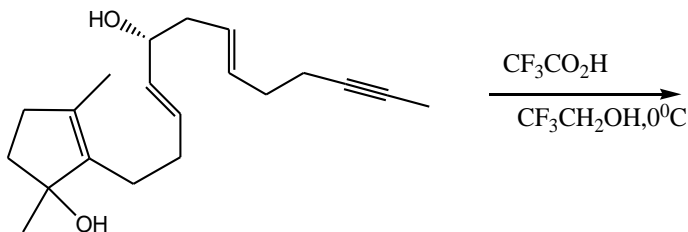
9. Write the mechanism of following reactions and draw the structure of the products (including stereochemistry) in each case (*Attempt any four*)

4x2.5=10

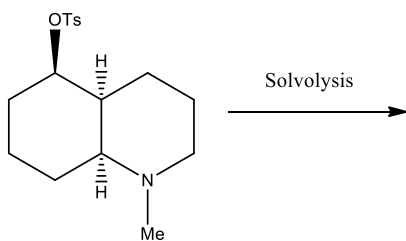
(a)



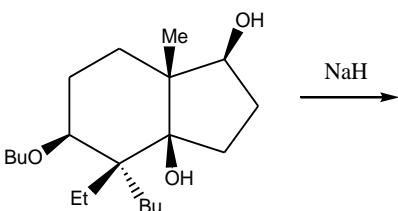
(b)



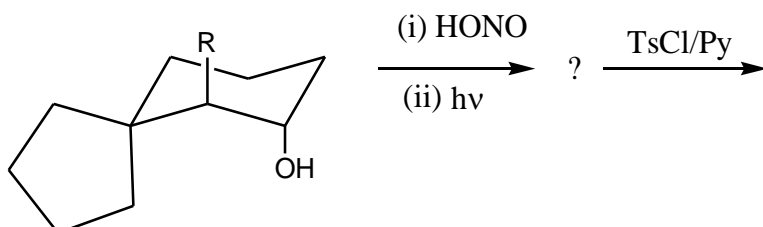
(c)



(d)



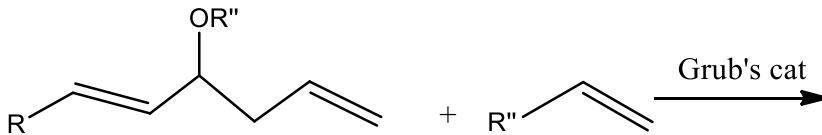
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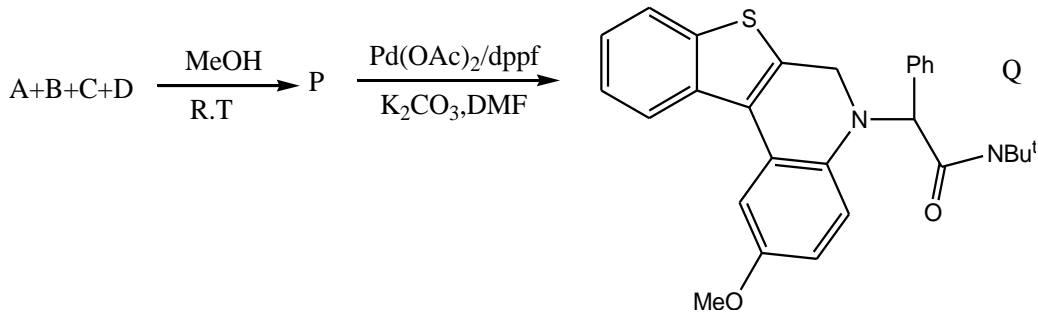
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(4)

(f)

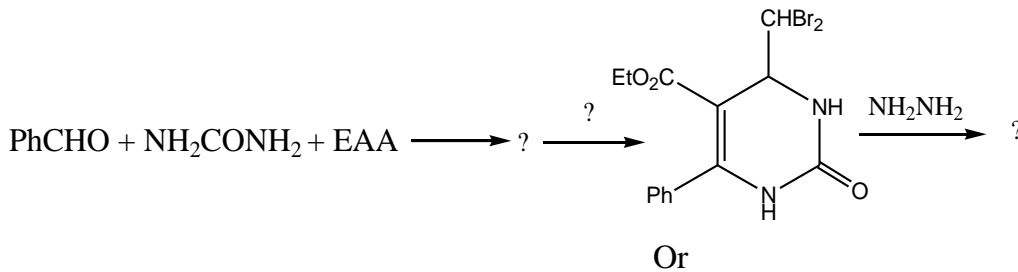


10. (a) work backwards to find the four components (A,B,C,D) of the Ugi reaction and the product 'P', that on Heck coupling yields product 'Q'. 4



(b) Give the mechanism of either Biginelli condensation (Kappe mechanism) *or* olefin metathesis (Chauvin mechanism). 3

(c) (i) Write the structure of missing reagent/product (marked by ?) in the following transformation: 3



(ii) Using a benzophenone compound (E) transform $\text{CH}_3(\text{CH}_2)_{14}\text{CH}_2\text{OH}$ into $\text{CH}_3\text{CH}_2\text{C}(=\text{O})(\text{CH}_2)_{12}\text{CH}_2\text{OH}$ following Breslow's strategy.

