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M.Sc. RNLKWC-/CEM-102/22

2022

ORGANIC CHEMISTRY

M.Sc. First Semester End Examination - 2022

PAPER - CEM-102

Full Marks : 40

Time : 2 hours

*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

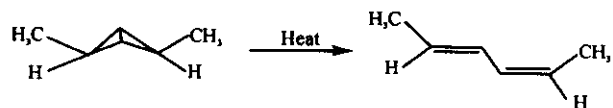
Answer any four from the following

4×2=8

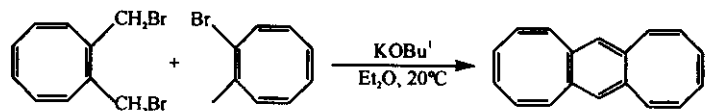
1. What is meant by 'illogical electrophile' and 'illogical nucleophile'? Give suitable example of each of them.
2. Suggest a mechanism to explain the following conversation.

(Turn Over)

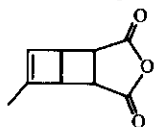
(2)



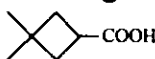
3. Suggest a mechanism to explain the following conversion.



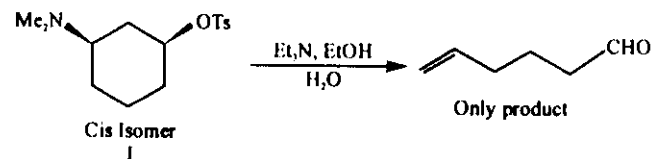
4. (a) What are terpenoids?
 (b) How many isoprene units are present in a triterpene?
 5. Give retrosynthetic analysis and an efficient synthesis of the following compound.



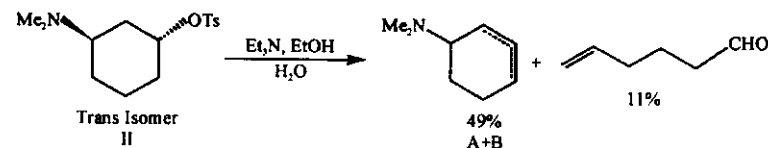
6. Give retrosynthetic analysis and an efficient synthesis of the following compound.



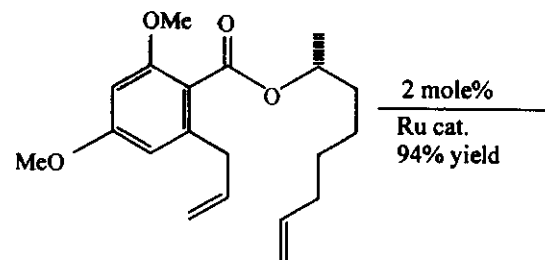
7. Explain the following observations.



(3)



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

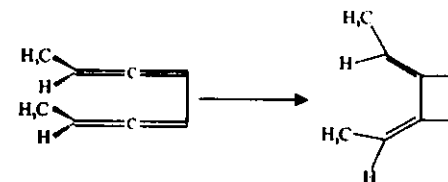


Group - B

Answer any four from the following

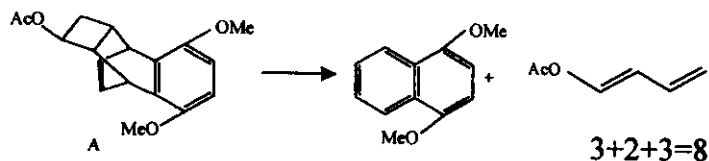
4×8=32

9. a) Draw the correlation diagram for electrocyclic ring closer reaction of butadiene meeting symmetry selection rule.
 b) Have the following reaction proceeds with controtory or disrotatory manner? Show its FMO approach also.

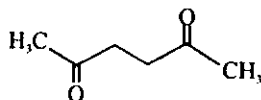


(4)

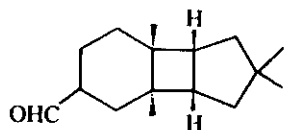
- c) On being heated to 320-340°C the following compound (A) produces 1,4-dimethoxy-naphthalene and acetoxy-butadiene- Explain mechanistically.



10. a) Show two possible disconnections of the following target molecule. Obtain a pair of suitable synthones from each disconnection and indicate the synthon, if any. Give a synthetic equivalent for synthon.



- b) Give retrosynthetic analysis and an efficient synthesis of the following compound.



- c) Give retrosynthetic analysis and an efficient forward synthesis of the following compound.



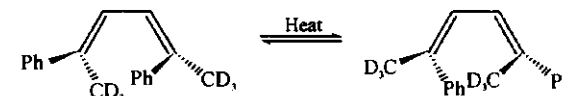
3+2+3=8

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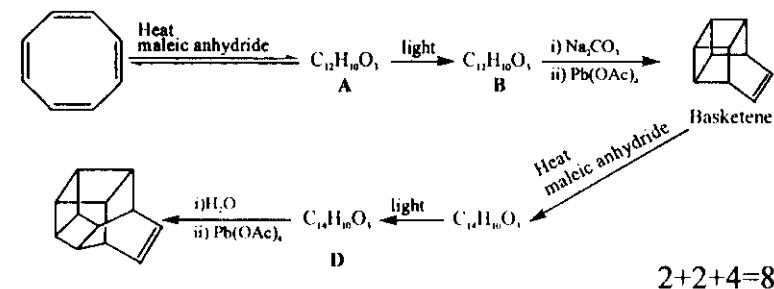
(5)

11. a) Explain the product formation.



- b) What product will be formed when cis-5, 6-di-methyl-1, 3-cyclohexadiene is heated and trans-5, 6-di-methyl-1, 3-cyclohexadiene is irradiated with light? Explain with FMO approach.

- c) Draw the structure of A to D



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

- (i) monocyclic triterpenoids
- (ii) bicyclic triterpenoids
- (iii) tricyclic triterpenoids

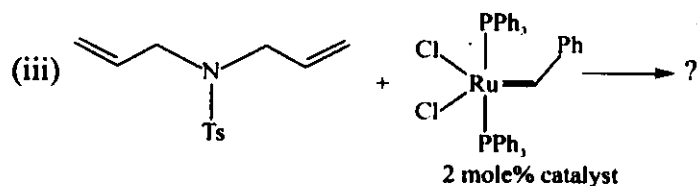
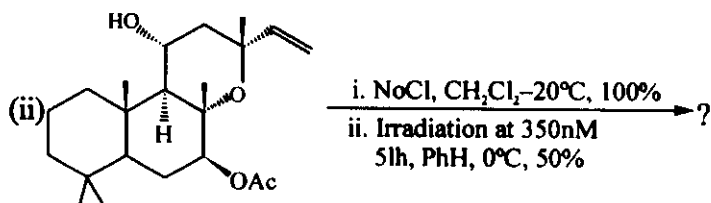
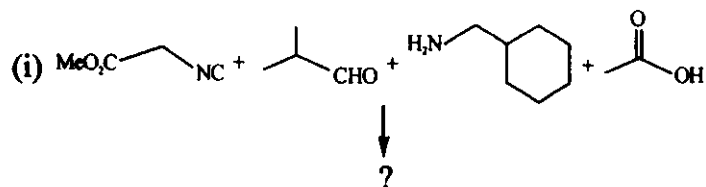
4×2=8

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(6)

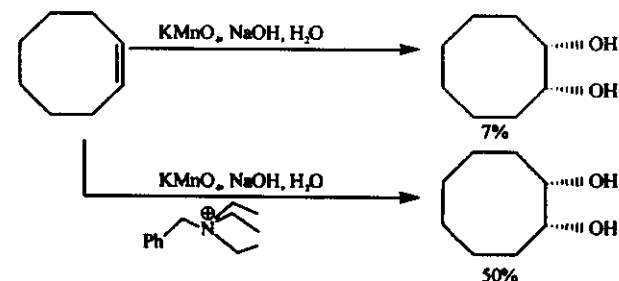
13. a) Predict the product(s) of the following reactions with mechanism (any one)



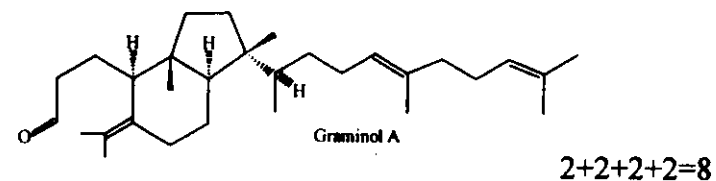
- b) What is template effect?

(7)

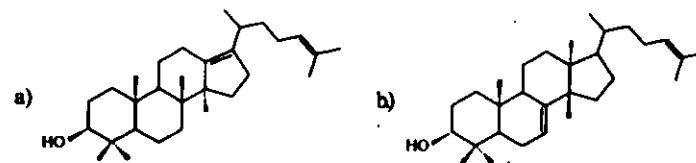
- c) Explain the product formation



- d) Synthesize the following compounds (with plausible mechanism)

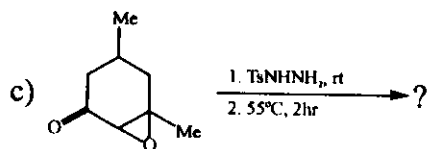
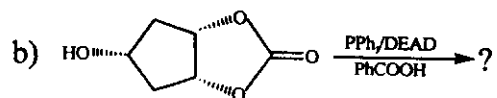
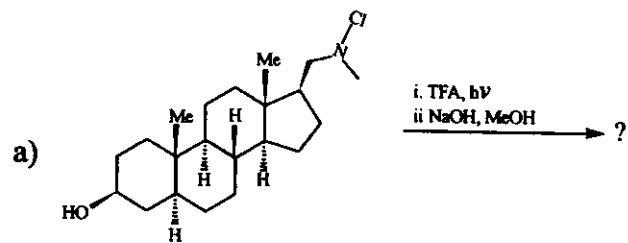


14. (i) Synthesize the following 6-6-6-5 tetracyclic triterpenoids from squalene following biogenetic Isoprene rule.



(8)

(ii) Write down the product of the following reactions with mechanism (any two)



4+2+2