

Total Pages – 8

M.Sc. RNLKWC-/CEM-202/22

2022

CHEMISTRY

M.Sc. Second Semester End Examination - 2022

PAPER - CEM-202

Full Marks : 50

Time : 6 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.*

Write the answer in your own word.

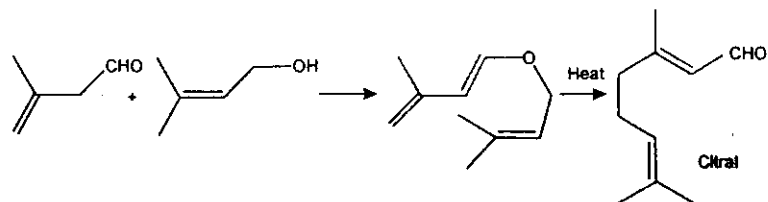
Group - A

1. Answer any four from the following. 4×2=8
 - a) 5-methyl 1,3-cyclopentadiene, when heated with diethyl maleate, gives a mixture of three isometric products – explain mechanistically.

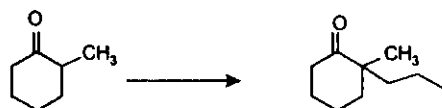
(Turn Over)

(2)

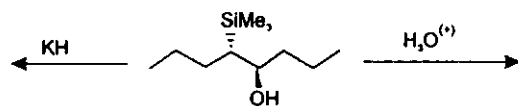
- b) Explain the formation of citral through the following reaction sequence via sigmatropic shifts:



- c) What is P-helicity? Give a proper example.
d) Carry out the following conversion with plausible mechanism.



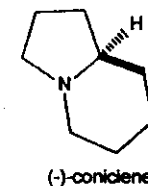
- e) Write down the product(s) of the following reaction with mechanism (if any).



- f) What are logical and illogical synthons?
g) Propose a synthesis of (-) coniceine using a ring-closing metathesis (RCM) procedure as a key step. Show (i) your retrosynthetic analysis and (ii) all reagents and reaction

(3)

- conditions required to transform a commercially available starting material into the target molecule.

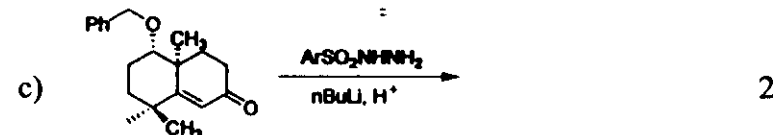
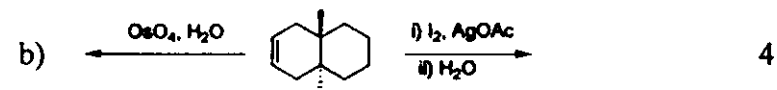
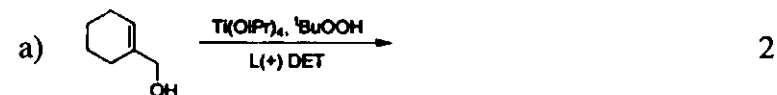


Group -B

Answer any four from the following :

4×8=32

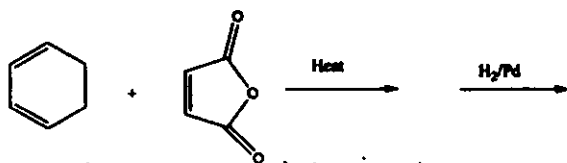
2. Predict the product with plausible mechanism of the following.



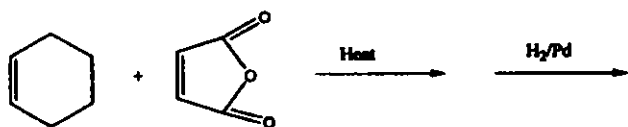
(4)

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

b) (i) In principal following Diels-Alder reaction could give two products– Explain.



(ii) Write the product(s) with plausible mechanism.



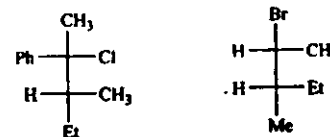
c) Synthesize the following compound using sigmatropic reaction.



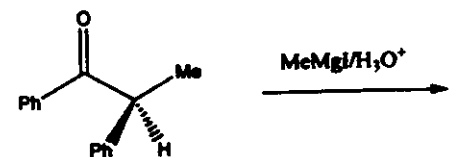
4. a) Define the term Atropisomerism with proper example. Correlate Atropisomerism of molecule with Molecular axial dissymmetry and Centro-dissymmetry.

(5)

b) Determine the (Pref-Parf) nomenclature of the following compounds :

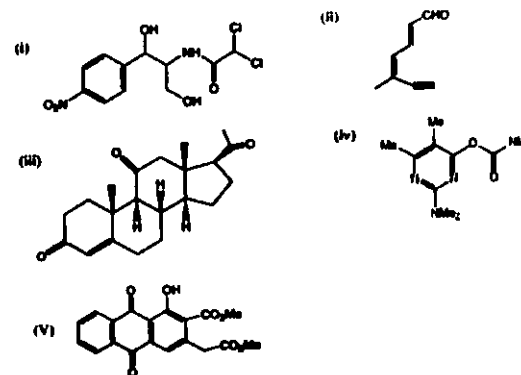


c) Write down the major product using Cram's Rule and Re/Si name of the following carbonyl in the reactant.



(2+2)+2+2=8

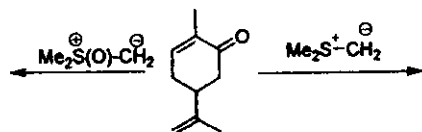
5. Give the retrosynthetic approach and their synthesis strategies of the following compound (any two).



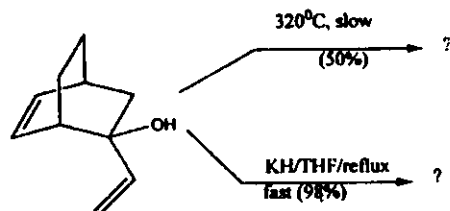
(6)

4+4=8

6. a) Write down the product(s) of the following reaction with plausible mechanism.

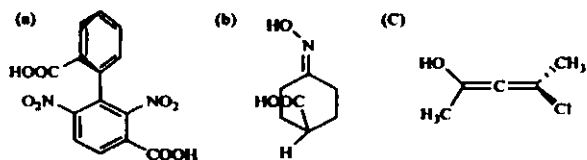


- b) Write down the structure of the product and explain its formation. Why the yield is more and the rate is faster in one case.



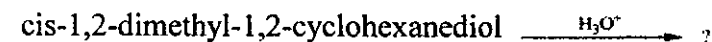
4+4=8

7. (i) Determine (R,S) configurational nomenclature of the following compounds with proper explanation (any two)

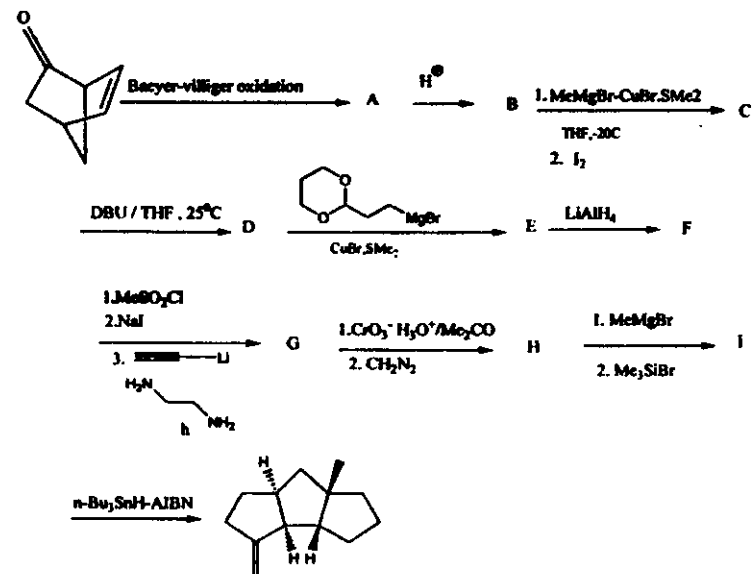


(7)

- (ii) Predict the product of the following reaction



- (iii) Identify the product A to I



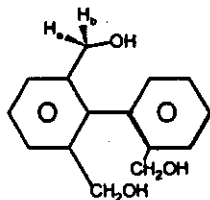
2+2+4=8

(8)

8. a) Write brief notes on

(i) 2Alkyl ketone effect (ii) Pseudoasymmetry

b) Comment on the chairality of the following molecule and the topic relation between H_a and H_b . Also comment on the expected multiplicity of 1H NMR signals of this mythylene protons.



$$(2+2)+4=8$$