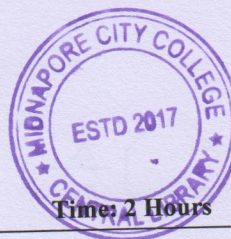


PG (NEW) CBCS
M.Sc. Semester-I Examination, 2019
CHEMISTRY
PAPER: CEM-102
(Organic)



Full Marks: 40

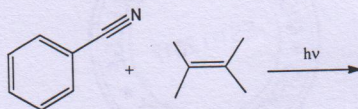
Time: 2 Hours

Group- A

Answer any four questions of the following:

2×4=8

- 1) Write Woodward-Hoffmann rule for electrocyclic ring closing reaction.
- 2) Predict the product of the following reaction.



- 3) What is meant by sigmatropic shift of [i,g] order?
- 4) What is "biogenetic isoprene" rule?
- 5) What do you mean by a multicomponent reaction? Write its advantages over step-wise reaction.
- 6) What is a phase transfer catalyst? Give an example and explain the principle.
- 7) What do you mean by retrosynthetic analysis? Illustrate with an example.
- 8) What are 'synthon' and 'synthetic equivalent'? Explain with examples.

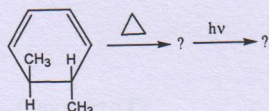
Group-B

Answer any four questions of the following:

4×4=16

- 9) Define 'site selectivity' and 'periselectivity' with specific examples and explain indicating Frontier Orbital interaction. 2+2
- 10) Predict the product of the following reactions indicating F.O.I. (Attempt any two) 2+2

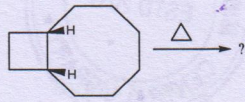
i)



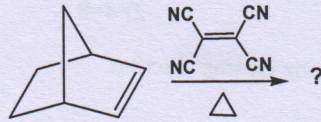
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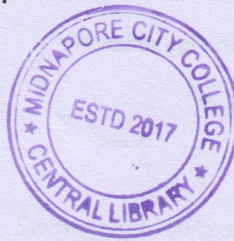
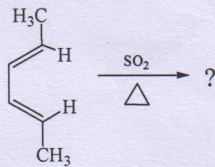
ii)



iii)



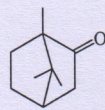
iv)



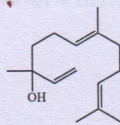
11) What are 'Suprafacial' and 'Antarafacial' cycloadditions? Illustrate with examples. Write Woodward-Hoffmann selection rules for cycloaddition reaction. 2+2

12) Synthesize the following natural products (answer *any two*) 2+2

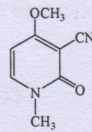
i) Camphor



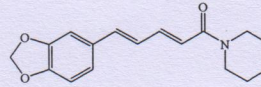
ii) Nerolidol



iii) Ricinine



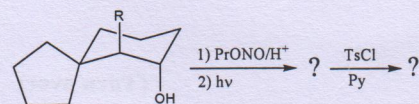
iv) Piperine



13) Write and explain Breslow's strategy of remote functionalization using a benzophenone derivative. 4

14) Write the structures of the products in the reaction / reaction sequences (answer *any two*): 2+2

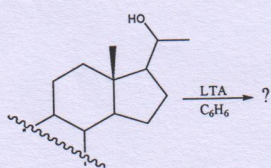
i)



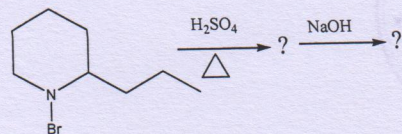
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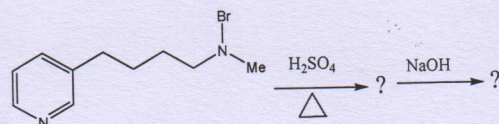
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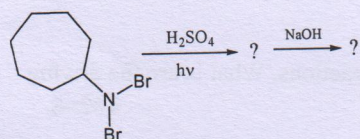
iii)



iv)



v)



15) Why functional group protection is required in a synthesis? Illustrate with an example. What is polarity inversion (umpolung)? Describe with an example. 2+2

16) How do you protect the following functional groups: (a) aldehyde, (b) acid (c) alcohol, and (d) amine? Under what condition(s) the protecting groups survive and how these are de-protected?

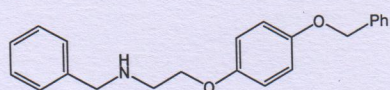
Group-C

Answer any two questions of the following:

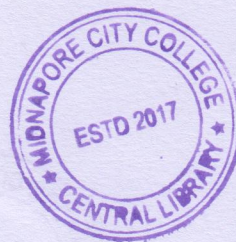
8×2=16

17) Synthesize the following compounds using retro synthetic approach. 4×2=8

i)

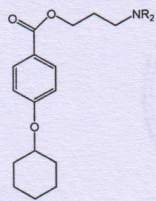


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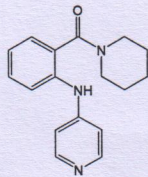


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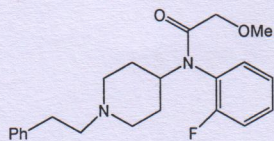
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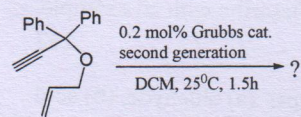


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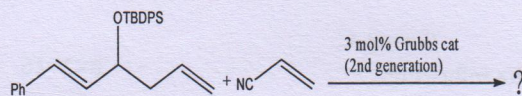


18) Write the product of following metathesis reactions. What is/are the driving force(s) for the forward reaction? 4×2=8

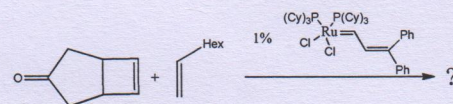
i)



ii)



iii)



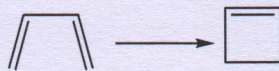
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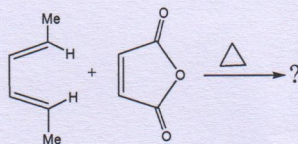
iv)



19) a) Draw the correlation diagram of the following conversions in thermal condition. 4



b) Discuss briefly regarding the kinetically controlled and thermodynamically controlled product of the following reaction using F.M.O approach. 4



20) a) What are alkaloids? What are the sources of alkaloids? Discuss general properties of alkaloids. Write down the classification of alkaloid on the basis of the nucleus present in alkaloid. 1+1+1.5+2.5

b) Synthesize Santene from camphene. 2

