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ACH 502

Third Semester M.Sc. Degree Examination, December 2018
APPLIED CHEMISTRY
Synthetic Reagents and Heterocyclic Chemistry
(CBCS : 2016 – 17 Syllabus)

Time : 3 Hours

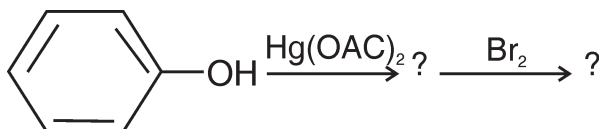
Max. Marks : 70

- Note :** i) Answer from Part – A and **any four** full questions from Part – B.
 ii) Figures to the **right** indicate marks.

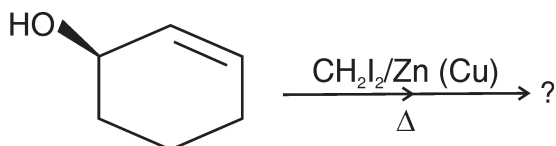
PART – A

1. Answer **all** the following sub-divisions. **(9×2=18)**

a) Write the products in the following reactions and propose suitable mechanisms :

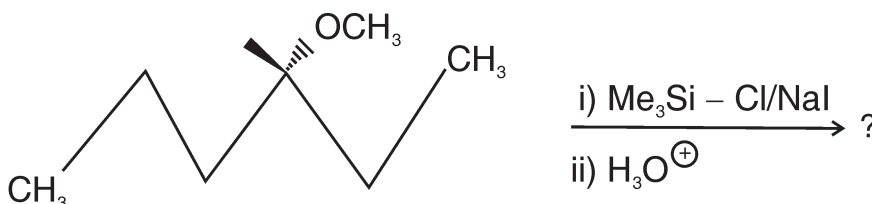


b) Draw the structure of the product(s) and outline its mechanism.



c) What is Heck reaction ? Illustrate with an example.

d) Predict the product in the following reaction and give reason.



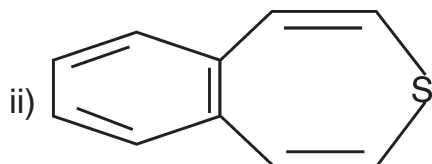
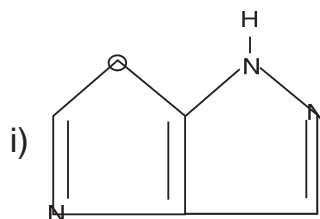
e) Formulate the reaction of Gilman's reagent with an α, β -unsaturated carbonyl compound.

f) Illustrate the synthetic utility of LDA with a suitable example.

P.T.O.

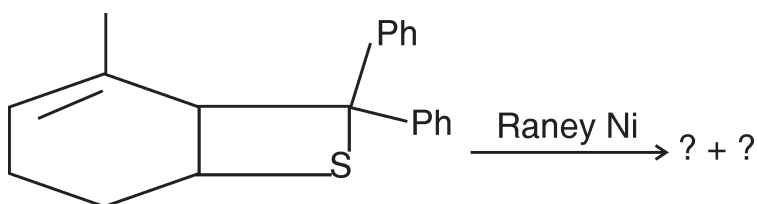


g) Using Hantzsch-Widman system, name the following compounds :



h) Outline any one synthesis of oxepines.

i) Predict the products formed in the following reaction :



PART – B

Answer **any four** full questions :

(4×13=52)

2. a) Explain the methods of preparation and reactions of organolithium compounds.

b) Discuss the reactions of Grignard reagents with

i) amides

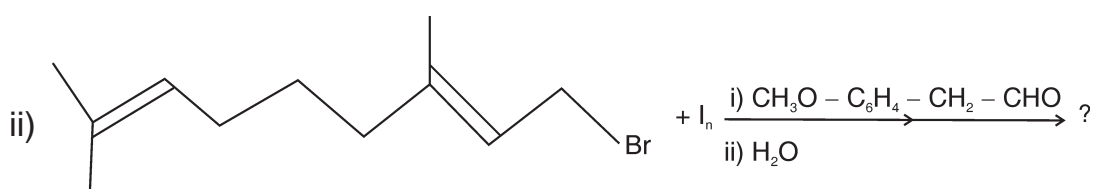
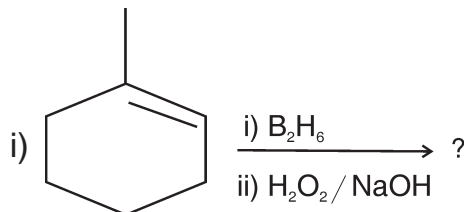
ii) α, β – unsaturated carbonyl compounds.

c) Explain the synthetic utility of organostannanes in C – C bond forming reactions with any two examples.

(5+4+4=13)



3. a) What is Peterson reaction ? Explain its application in organic synthesis.
b) Predict the product/s in the following reactions and outline their mechanisms.



- c) Describe the application of carbonylation reaction of organoboranes.

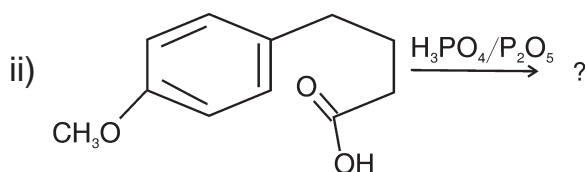
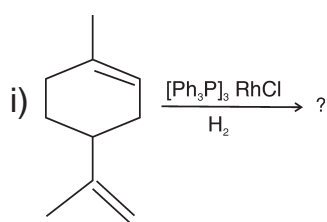
(3+4+6=13)

4. Discuss the synthetic utility of the following reagents in organic synthesis

- a) DCC
b) Crown ethers
c) SeO_2 .

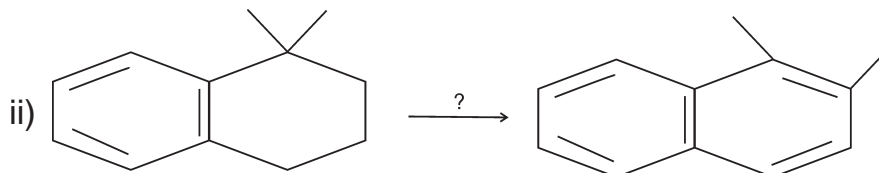
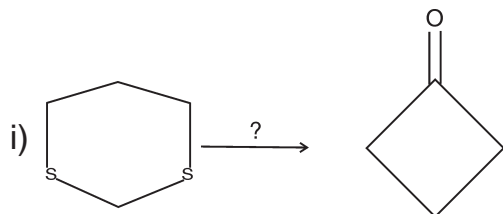
(4+5+4=13)

5. a) Predict the products in the following reactions and suggest suitable mechanisms :





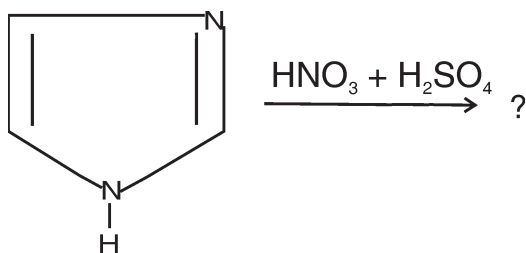
b) How do you bring out the following transformations ?



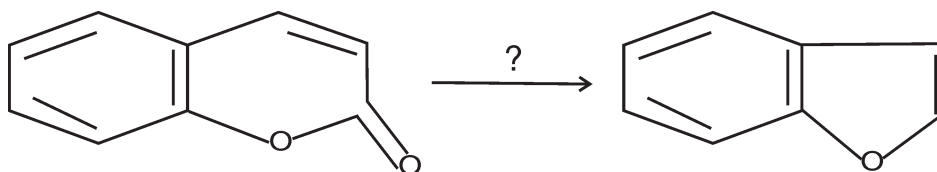
c) What are phase transfer catalysts ? Explain their use in organic synthesis with a suitable example. **(4+6+3=13)**

6. a) Describe Knorr synthesis of pyrrole. Explain its electrophilic substitution reactions.

b) Predict the major product and propose the mechanism for the following reaction :



c) How do you bring out the following conversion ? **(6+3+4=13)**



7. a) Explain the mechanism of Fischer indole synthesis by taking suitable example.

b) Discuss the electrophilic and nucleophilic substitution reactions in pyridine.

c) Outline any one synthesis and two reactions of the following heterocycles :

i) Isoquinoline

ii) α -pyrone.

(3+4+6=13)
