



Third Semester M.Sc. Degree Examination, December 2018
(CBCS Scheme) (Old Syllabus)
CHEMISTRY (Repeater) (2015 Batch)
Reaction Mechanisms and Heterocyclic Chemistry

Time : 3 Hours

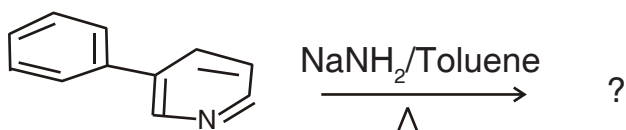
Max. Marks : 70

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

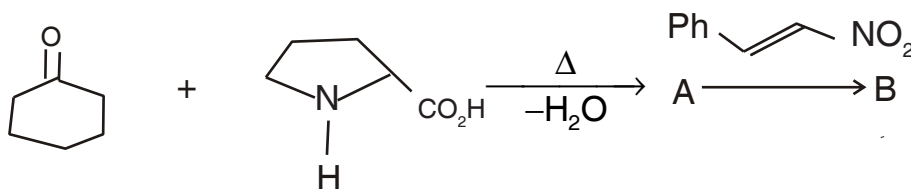
PART – A

1. Answer **any ten** subdivisions : (10×2=20)

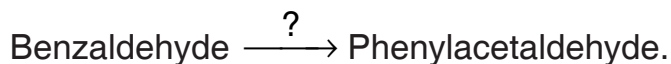
a) Predict the product in the following reaction and outline its mechanism :



b) Write the products A and B in the following reaction :



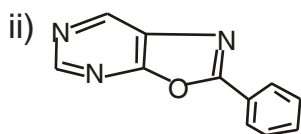
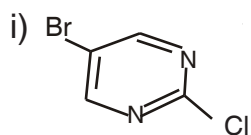
c) How do you achieve the following transformation ?



- d) Predict the stereochemical structure of an oxime of acetophenone which undergoes rearrangement to give acetanilide.
 e) Give evidence to show that Favorskii rearrangement involves a cyclopropanone intermediate.
 f) What is Demaynov rearrangement ? Illustrate with an example.



g) Write the systematic name for the following :



h) Outline a method for the synthesis of an azepine derivative.

i) Illustrate how Skraup's reaction can be applied for the synthesis of 7-methoxy quinoline.

j) What is oxy-cope rearrangement ? Give an example.

k) What are pericyclic reactions ? How are they classified ?

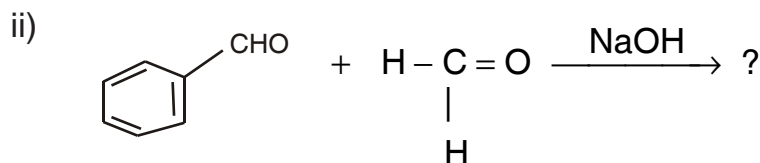
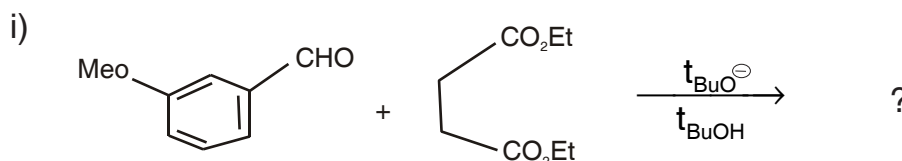
l) During electrocyclic reactions, which orbital symmetry is preserved in conrotatory motion ? Give an example.

PART – B

Answer **any five** of the following :

(5×10=50)

2. a) Predict the product/s and propose the mechanism for the following :



b) Explain Woodward – Prevost hydroxylation.

(6+4=10)



3. a) Explain the following reactions with reaction mechanism.

- i) Suzuki coupling
- ii) Benzoin condensation.

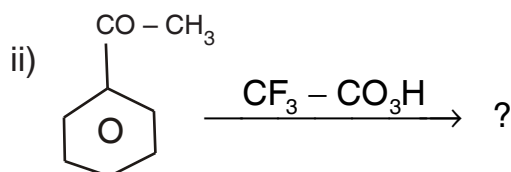
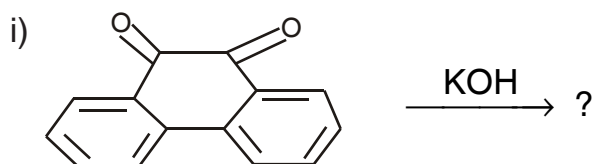
b) Give an account of Wittig reaction. (6+4=10)

4. a) With suitable examples, explain the aptitude of migrating groups in Pinacol-Pinacolone rearrangement.

b) Explain briefly the mechanism of Wagner-Meerwein rearrangement.

c) Discuss the mechanism and synthetic applications of Benzidine rearrangement. (3+3+4=10)

5. a) Predict the products in the following reactions and propose mechanism :

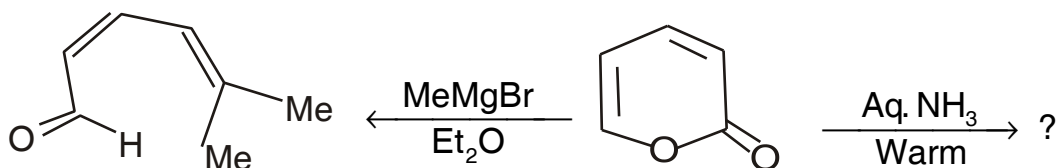


b) Give a comparative account of Curtius and Lossen reaction. (6+4=10)

6. a) How do you bring about the following conversions ?

- i) β - Phenylethylamine $\xrightarrow{?}$ Isoquinoline.
- ii) Uric acid $\xrightarrow{?}$ purine.

b) Propose a reasonable mechanism for the following conversions : (6+4=10)





7. a) Outline a method for the synthesis of Naphthyridine.
- b) Give the mechanism of the rearrangement involved when 3-fluoropyrazine is treated with sodium azide.
- c) Discuss the reactions of quinolines. **(3+3+4=10)**
8. a) Deduce Woodward-Hoffmann rules for electrocyclic reaction of $4n\pi$ electron system under thermal and photochemical conditions.
- b) Using correlation diagram show that addition of butadiene and ethylene is thermally allowed and photochemically forbidden process. **(5+5=10)**
9. a) With the help of FMO method predict whether the thermal $4\pi + 2\pi$ cycloaddition is suprafacial or antarafacial.
- b) Analyze a [1, 5] – sigmatropic rearrangement.
- c) Give a brief account of 1, 3 – dipolar cyclo addition reactions. **(4+3+3=10)**
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