MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Reg. No.										

DEPARTMENT OF SCIENCES, III SEMESTER M.Sc. (CHEMISTRY)
END SEMESTER EXAMINATIONS, DECEMBER 2018

SUBJECT: Advanced Organic Chemistry [CHM - 5103]
(REVISED CREDIT SYSTEM-2017)

Time: 3 Hours Date: 22-12-2018 MAX. MARKS: 50

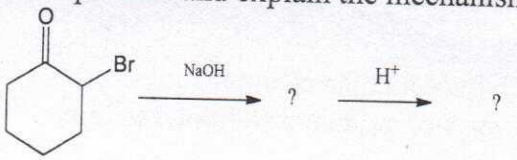
Note: (i) Answer **ALL** questions

(ii) Draw diagrams, and write equations wherever necessary

1. A. i. Describe the mechanism of Pinacol-Pinacolone rearrangement.

ii. Explain the factors that influence the migratory aptitude of different substituents in rearrangement reactions.

B. i. Predict the product and explain the mechanism for the following reaction.

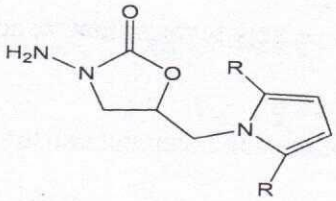


ii. Give reason: Hoffmann rearrangement proceeds with the retention of configuration.

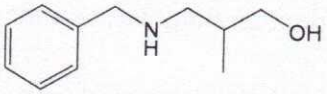
C. Explain the conversion of malonic ester into glycine using Curtius rearrangement.

[4+4+2]

2. A. Propose a disconnection strategy and suggest a suitable synthetic method for the following heterocyclic compound.



B. i. Explain the retrosynthetic strategy for the following compound using this 1,3-diX disconnection.

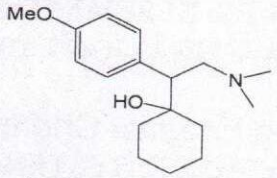


ii. Explain one group C-X disconnection and two groups C-X disconnection strategies used in retrosynthetic analysis with suitable examples.

C. Suggest suitable retrosynthetic strategy in case of 1,5-difunctional compounds.

[4+4+2]

3. **A. i.** Propose a retrosynthetic analysis of the following drug Vanlafaxine.

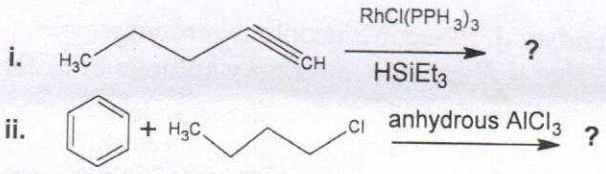


ii. Explain any one method of amine synthesis.

B. i. Explain the general methods for the protection and deprotection of alcohols.

ii. Describe the structure and stability of carbanion in detail.

C. Predict the product and write the mechanism of the following reactions.



[4+4+2]

4. **A. i.** Describe 18 electron rule with a suitable example.

ii. Discuss the different pathways of oxidative addition reaction.

B. Explain the following:

i. Zeigler-Natta polymerization

ii. Fischer-Tropsch reaction

iii. Hydrosilation

iv. Fluxionality in organometallic compounds

C. Give reasons for the following;

i. Ligand substitution reaction takes place in the complex $[Pt(Cl)_2(PPh_3)]$ via dissociative interchange.

ii. Electron rich metal centers favor oxidative addition.

[4+4+2]

5. **A.** i. Explain the mechanism and stereochemistry involved in the aldol condensation reaction.

ii. Discuss the applications of organometallics as drugs and radiopharmaceuticals.

B. i. Describe the mechanism of Riemer-Tiemann reaction.

ii. What is Diels-Alder reaction? Explain the effect of substituents on the rate of the reaction

C. Explain the mechanism of Oppenauer oxidation.

[4+4+2]

***