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, NOVEMBER 2018

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

Time: 3 Hours Date:22nd Nov 2018 MAX. MARKS: 50

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

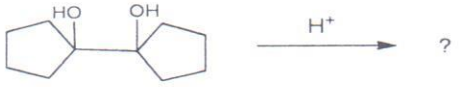
(ii) Draw diagrams, and write equations wherever necessary

1. **A. i.** Write Curtis rearrangement in case of α-hydroxy acyl azides. Explain the mechanism.

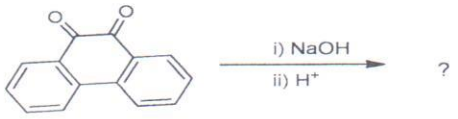
ii. Distinguish thermal and photo-Fries rearrangement reactions.

B. Predict the product and describe the mechanism of the following reactions

i.



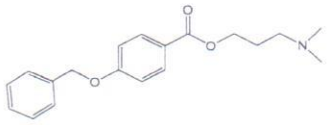
ii.



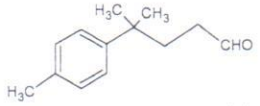
C. Give an account of benzidine rearrangement and its synthetic utility.

[4+4+2]

2. **A.** What is chemoselectivity? Predict the disconnection strategy and suggest a synthetic scheme for the following compound.



B. i. Give a reasonable retrosynthetic strategy for the following compound.

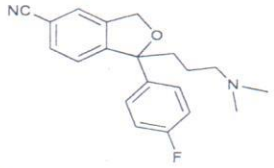


ii. Explain donar and acceptor synthons with illustrative examples.

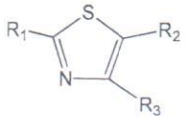
C. Why are protecting groups used in organic synthesis? Explain the qualities of a good protecting group.

[4+4+2]

3. **A.** Propose the retrosynthetic analysis for the following drug Citalopram.



B. i. Provide a general disconnection strategy for the following heterocyclic compound.



ii. Describe the mechanism of Wolf-Kishner reduction. Give merits of this reaction.

C. Predict the product in the following reaction. Explain your reasoning.

[4+4+2]

4. **A. i.** Describe the hydroformylation catalytic cycle using $HCo(CO)_4$.
ii. Explain the mechanism of Monsanto acetic acid process.

B. i. Differentiate between 1, 1 and 1, 2 migratory insertion reactions with suitable examples.
ii. Explain the mechanism of Birch reduction.

C. Determine the value of "n", assuming that the 18 electron rule is obeyed by the following complexes.
i. $[Mo_2(CO)_n]^{2-}$ **ii.** $Fe(CO)_nCl_2$ **iii.** $Cr(C_5H_5)(CO)_n^{-1}$ **iv.** $Ni(C_nH_n)_2$

[4+4+2]

5. **A. i.** Describe the mechanism of Baeyer-Villiger reaction. Discuss the migratory aptitude of migrating groups.
ii. Discuss the factors affecting the ligand substitution reactions.

B. i. Explain structure and stability of carbocations.
ii. What is Michael addition reaction? Give a general mechanism.

C. Describe the mechanism of Mannich reaction.

[4+4+2]

***