MANIPAL UNIVERSITY

Reg. No.

Deemed- to -be -University under Section 3 of the UGC Act, 1956

DEPARTMENT OF SCIENCES, M.Sc (Chemistry)

I SEMESTER END SEMESTER EXAMINATIONS, November 2017

SUBJECT: Organic Chemistry-I [CHM-4103]

REVISED CREDIT SYSTEM

Time: 3 Hours | Date: 18-11-2017 | MAX. MARKS: 50

Note: **a) Answer all questions b) Write diagrams and equations wherever necessary.**

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1. **A.** Write the products formed in the following reactions. Account for the major products formed during the reaction

   i) p-Chloro toluene + nitrating mixture ⟶ ?

   ii) Benzyl bromide + CH_3CH_2OH ⟶ ?

   B. Discuss the following;

   i) Antiaromaticity

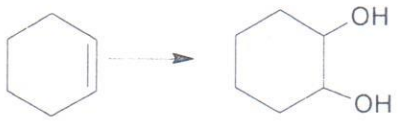
   ii) Stereochemistry of substitution and elimination reaction

   C. Explain the concept of electroreduction using appropriate examples

[4+4+2]

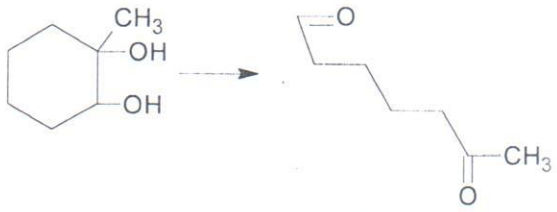
2. **A.** Describe the methods for the following synthetic conversions.

i)

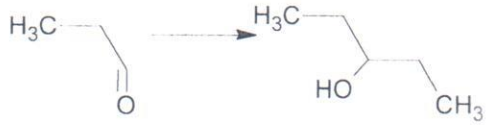


ii) $CH_3CH_2COOCH_2CH_2CH_3 \longrightarrow CH_3CH_2CHO$

iii)



iv)



B. i) Explain the structure and bonding of acetylene and methyl radical.

ii) Describe the mechanism of Baeyer-Villiger Oxidation reaction. Write the advantage of this reaction over the oxidation reaction using Tollen's reagent.

C. Give reasons for the following;

i) Tertiary butoxide ion a stronger base but a poor nucleophile than ethoxide ion

ii) Friedel Crafts alkylation of benzene with propyl chloride result into isopropyl benzene as the major product.

[4+4+2]

3. A. i) Explain the basicities of heterocyclic compounds.
ii) Differentiate between SN1 and SN2 reactions by taking appropriate examples.

B. Derive Curtin-Hammett equation. Explain its applicability for an elimination reaction.
C. Differentiate the following;
i) Singlet and triplet states.
ii) Fluorescence and phosphorescence.

[4+4+2]

4. A. i) Explain chirality of compounds having sulphur and phosphorus atoms. Why chiral carbon containing compounds are abundant when compared with other heteroatoms?
ii) Explain the term 'buttressing effect' in the context of atropisomerism.
B. i) Distinguish E & Z isomers. Comment on their chemical reactivity and polarity using illustrative examples.
ii) Describe threo and erythro nomenclature system.
C. Explain the mechanism of Barton reaction using an example.

[4+4+2]

5. A. Describe how Cram's model gives mechanistic insights for 1,2-asymmetric induction reaction.
B. Write the mechanism of Paterno-Buchi reaction. Describe the available evidences to suggest its stereochemical aspects.
C. Write the mechanism of di-pi-methane rearrangement reaction. Why a sensitizer is added for such reaction to carried out.

[4+4+2]

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