

Roll No.

Exam Code : M-24

Subject Code—61388

B. Sc. EXAMINATION

(Batch 2019 Onwards)

(Main/Re-appear)

(Second Semester)

CHEMISTRY

CCL-205

Organic Chemistry—II

(Functional Group Organic Chemistry)

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) In Friedel-Crafts reaction, nitrobenzene is often used as solvent. Why does it not compete with the reaction ?

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- (b) Explain electrophilic substitution reaction with example.
- (c) Explain Kharascheffect with example.
- (d) Why racemisation is not 100% in case of SN^1 reaction ?
- (e) Explain the role of $ZnCl_2$ in conversion of primary alcohol to alkyl halide.
- (f) What is Malaprade reaction ?
- (g) Explain why dialkylcadmium is considered superior to Grignard reagent for the prepration of ketone from acid chloride ?
- (h) Explain why α -hydrogen atoms of carbonyl compounds are acidic in nature ? $2 \times 8 = 16$

Unit I

2. (a) How will you convert benzene into acetophenone ? Name the reaction and explain the mechanism of the reaction. 6

- (b) By taking suitable examples, explain the side chain oxidation reaction of alkylbenzenes ? Also explain uses of this reaction ? 4+2
- (c) Write the method of preparation of benzene from : 2+2
- (i) Sodium benzoate
- (ii) Acetylene.
3. (a) Define electrophiles. Write the step for generation of electrophile in case of :
- (i) Nitration of benzene
- (ii) Sulphonation of benzene. 2+2+2
- (b) Write a short note on σ and π complexes in aromatic electrophilic substitution reaction. 4
- (c) Write the step for generation of electrophile in Friedel-Crafts alkylation and explain the limitations of Friedel-Crafts alkylation. 2+6

Unit II

4. (a) Explain the product formed when ethyl bromide reacts separately with :
- (i) Aqueous KOH and Alcoholic KOH
 - (ii) KCN and AgCN 4+4
- (b) Explain the elimination addition mechanism of conversion of chlorobenzene to aniline. Also give evidence in support of this mechanism. 6+2
5. (a) Allyl halides are more reactive while vinyl halides are less reactive than alkyl halides towards nucleophilic substitution reaction. Explain ? 6
- (b) Explain the effect of solvent, nature and conc. of nucleophilic reagent on SN^1 and SN^2 reactions ? 6
- (c) Write short note on Sandmeyer reaction. 4

Unit III

6. (a) What is Lucas reagent ? How Lucas reagent is used to distinguish between primary, secondary and tertiary alcohol ? 1+3
- (b) Discuss the cleavage of benzyl methyl ether with HI. 4
- (c) Explain the product formed when phenol is treated with bromine in : 4
- (i) aqueous medium
- (ii) non-aqueous medium
- (d) What is migratory aptitude ? Explain the migratory aptitude of different groups in pinacol-pinacolone rearrangement ? 4
7. (a) How will you prepare ethyl alcohol, isopropyl alcohol and *tert* - butyl alcohol using Grignard reagent ? 6
- (b) Discuss the use of periodic acid in structure determination of isomeric diols with molecular formula $C_4H_{10}O_2$? 6
- (c) Preparation of phenol from cumene. 4

Unit IV

8. (a) What happens when : 2+2
- (i) Acetophenone is reduced with Zn-Hg/Cl
 - (ii) Benzaldehyde reacts with acetaldehyde in presence of NaOH
- (b) What is iodoform test ? Explain the chemistry behind iodoform test ? 2+4
- (c) Explain, why aldehydes undergo nucleophilic addition reactions more readily than ketones ? 6
9. (a) Explain with mechanism of :
- (i) Benzoin Condensation
 - (ii) Wolf-Kishner Reduction. 6+6
- (b) Explain, why nucleophilic addition reactions of ammonia and its derivatives are carried out in weakly acidic medium ($\text{pH} \sim 5.6$) ? 4