

- N.B. : (1) All questions are compulsory.
(2) Attempt all subquestions together.

1. (a) Discuss the difference in acidity of benzoic acid and phenol and account for the same. 2
(b) Among ethylamine and ethanol, the former is considered basic while the latter is called neutral, even though both Nitrogen and Oxygen atoms have lone pair of electrons. Explain. 2
(c) Aldehydes are considered to be more reactive than ketones, account for the same. 2
(d) Account for the fact that oxidation of ketones with strong oxidising agents is not an important method to synthesize carboxylic acids. 2
(e) Using a mild oxidising agent convert an aldehyde to a carboxylic acid and write the reaction involved. 1
(f) Answer the following (**any three**) and write the complete reaction : 6
(i) Butanone $\xrightarrow[\text{H}_3\text{O}^+]{\text{KOCl}, \Delta}$.
(ii) Formaldehyde + sec.butyl Magnesium bromide $\xrightarrow[\text{H}_3\text{O}^+]{\text{ether}}$.
(iii) diethylester of hexanedioic acid $\xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{C}_2\text{H}_5\text{O}^-}$.
(iv) Bromobenzene $\xrightarrow[\text{H}_3\text{O}^+]{\text{Mg, THF}} \text{CO}_2$.
2. (a) Discuss the mechanism of the following : 4
(i) Benzoin condensation.
(ii) Benzaldehyde + ethyl 2-bromopropionate $\xrightarrow[\text{H}_3\text{O}^+]{\text{Zn, ether}}$
(b) Write the steps involved in the following conversions : 4
(i) diethyl malonate to 2,2-dimethylethanoic acid.
(ii) Salicylaldehyde to catechol.
(c) Discuss two different methods of synthesis of ethers and write the reactions involved. 3

TURN OVER

Q.P. Code : 527500

2

3. (a) Give the mechanism for the following using suitable examples. 4
(i) Alkaline hydrolysis of an ester and account for the retention of configuration of alcohol formed.
(ii) Beckmann rearrangement and show the stereochemistry involved. 4
(b) Answer the following and write reactions involved.
(i) Using Gabriel synthesis prepare n-propylamine.
(ii) Using Cannizzaro reaction prepare a mixture of formic acid and benzyl alcohol in good yields.
(c) Bring about following conversions and write the reactions involved. 3
(i) Aniline to Chlorobenzene.
(ii) Ethyl benzoate to n-propyl benzoate.
(iii) Benzoic acid to benzamide.
4. (a) Complete the reactions and write the mechanism involved : 4
(i) 1,1 - Diphenyl 2-methyl propan - 1,2 - diol $\underline{H^+}$.
(ii) p-nitrobenzamide \underline{NaOBr} .
(b) Discuss the conformational stability of 1-methyl 4-phenyl cyclohexane 4
and 1-methyl 2-phenyl cyclohexane separately and comment on resolvability.
(c) Write the reaction and the product formed in **any three** of the following 3
:
(i) Propiophenone + $\text{Ph}_3\text{P} = \text{CHCH}_3 \rightarrow$.
(ii) Acetone + diethyl succinate $\underline{t\text{-BuOK}}$.
(iii) Phenyl propionate $\underline{\text{AlCl}_3}$, high temp..
(iv) 2, 4 - dinitro chlorobenzene $\underline{\text{aq. NaOH, } \Delta}$.
5. (a) Give the mechanism involved in the following : 4
(i) Reimer - Tiemann reaction.
(ii) Reaction involved when benzyltrimethylammonium bromide is treated with sodamide.

TURN OVER

- (b) Write the reactions involved in the following conversions. 4
- (i) o-toluidine to o-cresol.
 - (ii) ethyl pentanoate to pentanol.
 - (iii) cyclohexanol to 1-methyl cyclohexanol.
 - (iv) benzaldehyde to cinnamic acid.
- (c) Discuss Haworth synthesis of naphthalene. Also write the resonance structures of naphthalene. 3
6. (a) Write the mechanism in the following conversions : 4
- (i) Acetophenone to ethylbenzene using selective reducing agent.
 - (ii) Phenol to salicylic acid.
- (b) Write the product at the end of the reaction and name the reaction involved. 4
- (i) $\text{C}_6\text{H}_5\text{C}(=\text{O})\text{NHOH} \xrightarrow[\text{H}_2\text{O}]{\text{acetic anhydride, } \text{OH}^-}$
 - (ii) p-toluidine $\xrightarrow[\text{Na}_2\text{CO}_3 \text{ soln.}]{\text{HNO}_2, \text{C}_6\text{H}_5\text{OH}}$
- (c) Write a note on **two** or **three** reducing agents and choose proper examples 3 to explain their use.