(c) What happens when phenyl acetate is treated with $AlCl_3$ in presence of aq. HCl? Name the reaction and give mechanistic details. (5×3=15)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4113 **H**

Unique Paper Code : 2172011202

Name of the Paper : Haloalkanes, Arenes, Haloarenes, Alcohols, Phenols, Ethers and Epoxides

Name of the Course : **B.Sc. (Hons) Chemistry**

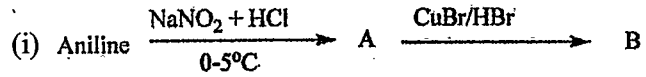
Semester : II

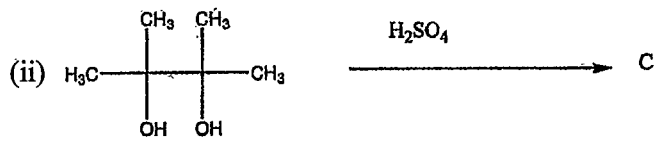
Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

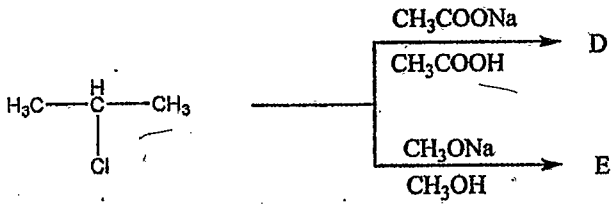
1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt all parts of a question together.
3. Attempt any **four** questions in all.
4. Question no. **1** is compulsory.
5. Each question carries **15** marks.

1. (a) Complete the following reaction as indicated, identify and write their names-





(b) Write products of the following reactions and identify the mechanism involved-



(c) Write various steps in the reaction of given epoxide in the given conditions :

(b) Out of $C_6H_5CH_2Cl$ and $(C_6H_5)_2CHCl$ which is more easily hydrolyzed by aqueous sodium hydroxide under S_N1 and S_N2 conditions and why?

(c) What are the limitations of reaction of benzene with CH_3Cl? Why these limitations are not there in reaction of benzene and CH_3COCl?

(5×3=15)

6. (a) Explain why Halogens in haloarenes are (i) weakly deactivating (ii) ortho/para directing.

(b) Taking Nitrobenzene as an example explain how a Nitro group deactivates the benzene ring towards electrophilic substitution reaction but at the same time it activates the ring towards Nucleophilic substitution reaction

(a) Cumene is oxidized in air and the resulting compound undergoes rearrangement in presence of an acid catalyst. Why is this method an industrial method of preparation?

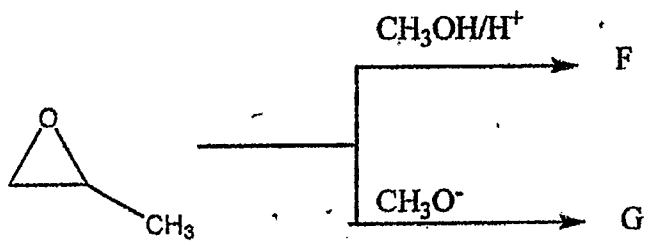
(b) Esterification of ethyl alcohol with acetic acid in acidic medium.

(c) Reaction of ortho-bromotoluene with $NaNH_2$ in liq. NH_3.

(d) A compound 'A' reacts with CH_3MgBr to give Ethanol which upon oxidation with PCC gets converted to 'B'. Identify A and B. Write all the steps involved in the given reaction.

(5×3=15)

5. (a) What happens when 2-Butanol is treated with Thionyl chloride in presence and in absence of Pyridine?



(5×3=15)

2. Justify the given statements **(any three)**

(a) Ethyl bromide reacts differently with KNO_2 and $AgNO_2$.

(b) Aryl halides have very low reactivity towards Nucleophilic substitution reaction as compared to Alkyl halides and Benzyl halides.

(c) Di-tertiary Butyl ether cannot be prepared by Williamson's ether synthesis.

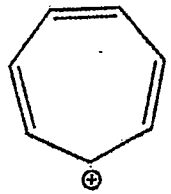
(d) Cleavage of phenyl alkyl ether with HI gives phenol and alkyl iodide. (5×3=15)

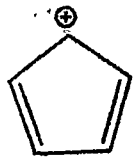
3. (a) Giving reasons arrange the following compounds as mentioned in parentheses

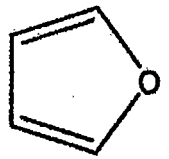
(i) t-butanol, n-butanol and isopropanol (towards lucas test)

(ii) o-methyl phenol, p-methyl phenol and m-methyl phenol (increasing order of acidity)

(b) Define aromaticity. Classify the following as aromatic or antiaromatic giving suitable explanation –

(i) 

(ii) 

(iii) 

(iv) 

(c) Carry out the following conversions (Give complete chemical equations)

(i) Benzene to m-Dinitrobenzene

(ii) Methyl chloride to Ethanoic acid

(5×3=15)

4. Write reaction mechanism for the given reactions **(any three)**