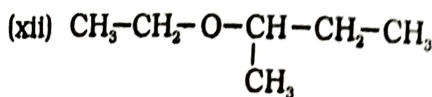
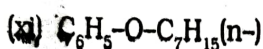
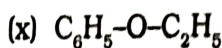
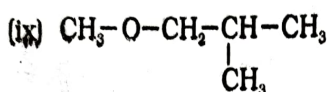
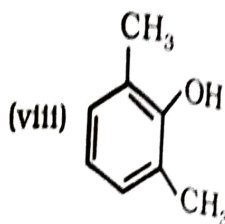
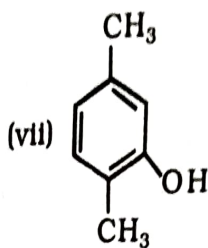
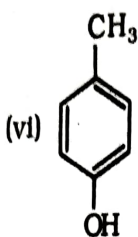
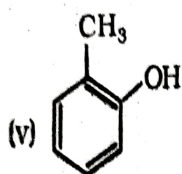
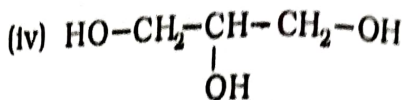
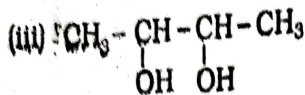
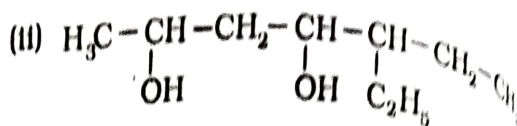
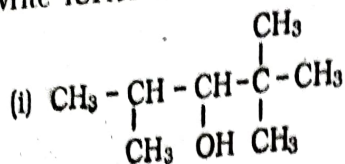


Assignment-I Exercises (ONLY the ~~marked~~ questions)

11.1 Write IUPAC names of the following compounds:



11.2 Write structures of the compounds whose IUPAC names are as follows:

(i) 2-Methylbutan-2-ol

(ii) 1-Phenylpropan-2-ol

(iii) 3,5-Dimethylhexane -1, 3, 5-triol

(iv) 2,3 - Diethylphenol

(v) 1 - Ethoxypropane

(vi) 2-Ethoxy-3-methylpentane

(vii) Cyclohexylmethanol

(viii) 3-Cyclohexylpentan-3-ol

(ix) Cyclopent-3-en-1-ol

(x) 4-Chloro-3-ethylbutan-1-ol.

11.3 (i) Draw the structures of all isomeric alcohols of molecular formula $\text{C}_5\text{H}_{12}\text{O}$ and give their IUPAC names.

(ii) Classify the isomers of alcohols in question 11.3 (i) as primary, secondary and tertiary alcohols.

11.4 Explain why propanol has higher boiling point than that of the hydrocarbon, butane?

11.5 Alcohols are comparatively more soluble in water than hydrocarbons of comparable molecular masses. Explain this fact.

11.6 What is meant by hydroboration-oxidation reaction? Illustrate it with an example.

11.7 Give the structures and IUPAC names of monohydric phenols of molecular formula, $\text{C}_7\text{H}_8\text{O}$.

11.8 While separating a mixture of *ortho* and *para* nitrophenols by steam distillation, name the isomer which will be steam volatile. Give reason.

11.9 Give the equations of reactions for the preparation of phenol from cumene.

11.10 Write chemical reaction for the preparation of phenol from chlorobenzene.

11.11 Write the mechanism of hydration of ethene to yield ethanol.

11.12 You are given benzene, conc. H_2SO_4 , and NaOH . Write the equations for the preparation of phenol using these reagents.

11.13 Show how will you synthesise:

(i) 1-phenylethanol from a suitable alkene.

(ii) cyclohexylmethanol using an alkyl halide by an S_N2 reaction.

(iii) pentan-1-ol using a suitable alkyl halide?

11.14 Give two reactions that show the acidic nature of phenol. Compare acidity of phenol with that of ethanol.

11.15 Explain why is *ortho* nitrophenol more acidic than *ortho* methoxyphenol ?

11.16 Explain how does the -OH group attached to a carbon of benzene ring activate it towards electrophilic substitution?

11.17 Give equations of the following reactions:

(i) Oxidation of propan-1-ol with alkaline $KMnO_4$ solution.

(ii) Bromine in CS_2 with phenol.

(iii) Dilute HNO_3 with phenol.

(iv) Treating phenol with chloroform in presence of aqueous NaOH.

11.18 Explain the following with an example.

(i) Kolbe's reaction.

(ii) Reimer-Tiemann reaction.

(iii) Williamson ether synthesis.

(iv) Unsymmetrical ether.

11.19 Write the mechanism of acid dehydration of ethanol to yield ethene.

11.20 How are the following conversions carried out?

(i) Propene \rightarrow Propan-2-ol.

(ii) Benzyl chloride \rightarrow Benzyl alcohol.

(iii) Ethyl magnesium chloride \rightarrow Propan-1-ol.

(iv) Methyl magnesium bromide \rightarrow 2-Methylpropan-2-ol.

11.21 Name the reagents used in the following reactions:

(i) Oxidation of a primary alcohol to carboxylic acid.

(ii) Oxidation of a primary alcohol to aldehyde.

(iii) Bromination of phenol to 2,4,6-tribromophenol.

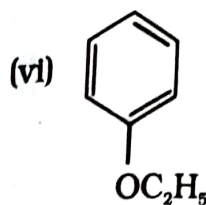
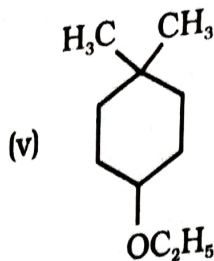
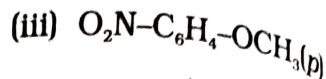
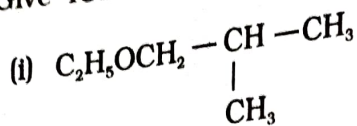
(iv) Benzyl alcohol to benzoic acid.

(v) Dehydration of propan-2-ol to propene.

(vi) Butan-2-one to butan-2-ol.

11.22 Give reason for the higher boiling point of ethanol in comparison to methoxymethane.

11.23 Give IUPAC names of the following ethers.



11.24 Write the names of reagents and equations for the preparation of the following ethers by Williamson's synthesis:

(i) 1-Propoxypropane

(ii) Ethoxybenzene

(iii) 2-Methoxy-2-methylpropane

(iv) 1-Methoxyethane

11.25 Illustrate with examples the limitations of Williamson synthesis for the preparation of certain types of ethers.

11.26 How is 1-propoxypropane synthesised from propan-1-ol? Write mechanism of this reaction.

11.27 Preparation of ethers by acid dehydration of secondary or tertiary alcohols is not a suitable method. Give reason.

11.28 Write the equation of the reaction of hydrogen iodide with:

(i) 1-propoxypropane (ii) methoxybenzene and (iii) benzyl ethyl ether.

11.29 Explain the fact that in aryl alkyl ethers (i) the alkoxy group activates the benzene ring towards electrophilic substitution and (ii) it directs the incoming substituents to ortho and para positions in benzene ring.

11.30 Write the mechanism of the reaction of HI with methoxymethane.

11.31 Write equations of the following reactions:

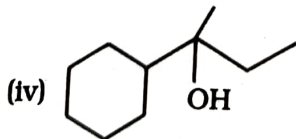
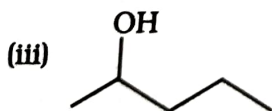
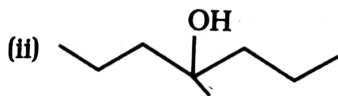
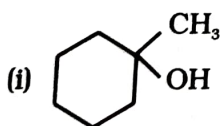
(i) Friedel-Crafts reaction - alkylation of anisole.

(ii) Nitration of anisole.

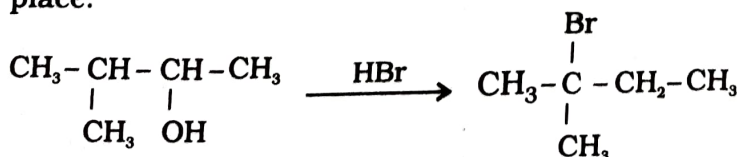
(iii) Bromination of anisole in ethanoic acid medium.

(iv) Friedel-Craft's acetylation of anisole.

11.32 Show how would you synthesise the following alcohols from appropriate alkenes?



11.33 When 3-methylbutan-2-ol is treated with HBr, the following reaction takes place:



Give a mechanism for this reaction.

(Hint : The secondary carbocation formed in step II rearranges to a more stable tertiary carbocation by a hydride ion shift from 3rd carbon atom.