Oxygen Containing Organic Compounds-I

Date Planned : __ / __ / __	CBSE Pattern	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-0	Exact Duration :_____

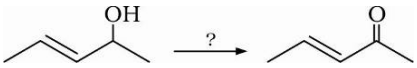
Very Short Answer Type **(1 Mark)**

1. Draw the structure of phenyl isopentyl ether.

2. Name the products obtained when benzyl phenyl ether is heated with HI.

3. You are given benzene, oleum (SO_3 and H_2SO_4) and NaOH. Write the equations for the preparation of phenol using these reagents.

4. Suggest a reagent for the following conversion.



5. Why diethyl ether does not react with sodium ?

Short Answer Type-I **(2 Marks)**

6. Lower alcohols are water soluble whereas higher alcohols are water insoluble, Give reason ?

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

8. Although phenol is an acid, yet it does not react with sodium bicarbonate solution. Why ?

Short Answer Type-II **(3 Marks)**

9. Ortho and para-nitrophenol are more acidic than phenol. Draw the resonance structures of the corresponding phenoxide ions.

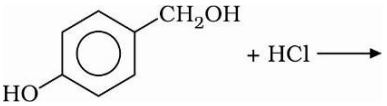
10 **(a)** Name the reagents and write the chemical equation for the preparation of the following compounds by Williamson's synthesis.

(i) Ethoxy benzene **(ii)** 2-Methyl-2-methoxypropane

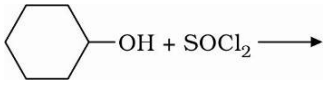
(b) Why do phenols not give the protonation reaction readily ?

11. Complete the following reaction equations :

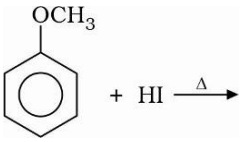
(a)



(b)



(c)



12 Illustrate the following reactions by giving a chemical equation for each :

(i) Williamson's Synthesis **(ii)** Fischer esterification

(iii) Kolbe's Reaction

13. Name the reagents which are used in the following conversions :

(i) A primary alcohol to an aldehyde **(ii)** Butan-2-one to butan-2-ol

(iii) Phenol to 2, 4, 6-Tribromophenol.

14. Give explanation for each of the following :

(i) The relative ease of dehydration of alcohols is : tertiary > secondary > primary

(ii) Grignard reagent should be prepared under anhydrous conditions.

(iii) Phenol is less acidic than acetic acid.

(iv) Alcohols are more Bronsted basic than phenol.

(v) Reactivity of alcohol towards sodium is: 1° > 2° > 3°.

(vi) o-nitrophenol is steam volatile but not p-nitrophenol.

15. How are the following conversions carried out?

(a) Methyl magnesium bromide to 2-Methylpropan-2-ol

(b) Phenol to Benzoquinone

(c) Propene to Propan-2-ol

(d) Cyclohexanol to Cyclohexanone

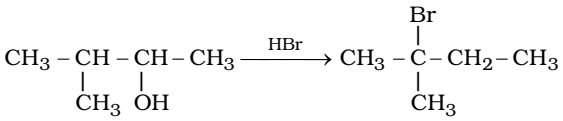
16. Explain the fact that in aryl alkyl ethers, the alkoxy group :

(i) Activates the benzene ring towards electrophilic substitution and

(ii) Directs the incoming substituents to ortho and para-positions in benzene ring.

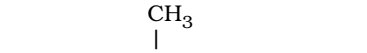
17 Write the reaction of Williamson's synthesis of 2-Ethoxy-3-methylpentane starting from Ethanol and 3-Methyl pentan-2-ol.

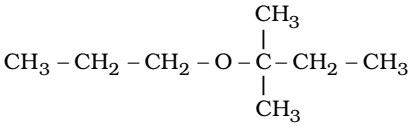
18. When 3-Methylbutan-2-ol is treated with HBr, the following reaction takes place

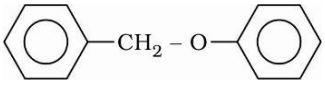


Give a mechanism for this reaction.

19. Write the major products that are formed by heating each of the following ethers with HI.

(i) 

(ii) 

(iii) 

Long Answer Type **(5 Mark)**

20. A compound 'A' having molecular formula $C_4H_{10}O$ is found to be soluble in concentrated H_2SO_4. It does not react with sodium metal or permanganate. On heating with excess of HI, it gives a single alkyl halide. Deduce the structure of compound A and explain all the reactions.

21. **(a)** Name the starting material used in the industrial preparation of phenol.

(b) Write complete reaction for the bromination of phenol in aqueous and non-aqueous medium.

(c) Explain why Lewis acid is not required in bromination of phenol?

22. **(A)** How will you distinguish between the following pairs by using chemical reagent ?

(i) 1-Butanol and 2-Butanol **(ii)** Phenol and Methanol

(iii) Ethanol and Phenol

(B) How is phenol obtained from :

(i) Aniline **(ii)** Benzene sulphonic acid ?

(C) How can phenol be converted into :

(i) Salicylaldehyde **(ii)** Phenolphthalein

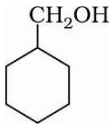
(iii) Toluene

23. **(A)** Write the reagents and equations for preparation of the following ethers ?

(i) 1-Propoxypropane **(ii)** Ethoxybenzene

(iii) 2-Methoxy-2-methylpropane **(iv)** 1-Methoxyethane

(B) Show how are the following alcohols prepared by the reactions of a suitable Grignard reagent on methanal ?

(i) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2OH$ **(ii)** 

(C) Predict the major product of acid catalysed dehydration of :

(i) 1-Methylcyclohexanol **(ii)** Butan-l-ol

24. 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

25. **(i)** How will you convert phenol to benzoic acid ?

(ii) An organic compound A having molecular formula C_6H_6O gives a characteristic colour with aqueous $FeCl_3$ solution. A on treatment with CO_2 and NaOH at 400 K under pressure gives B which on acidification gives a compound C. The compound C reacts with acetyl chloride to give D which is a popular pain killer. Deduce the structure of A, B, C and D.