CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

ETHERS

Example

1. What all the acylic structural isomers with the molecular formula $C_4H_{10}O$. Give their IUPAC names also.

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2. The following is not an appropriate reaction for the preparation of t-butylethyl ethers.

$$C_2H_5ONa + CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - Cl \rightarrow CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - OC_2H_5$$

(i) What would be the major product of this reaction ?

(ii) Write a suitable reaction for the preparation of tert-butylethyl ether.

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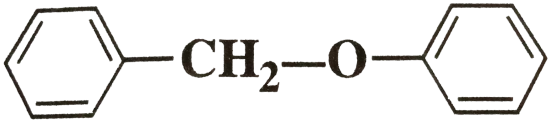
3. Give the major products that are formed by heating each of the following ethers with HI

(i) $CH_3 - CH_2 - \overset{CH_3}{\overset{|}{C}}H - CH_2 - O - CH_2 - CH_3$ (ii)

$$CH_3 - CH_2 - CH_2 - O - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - CH_2 - CH_3$$

(iii) 

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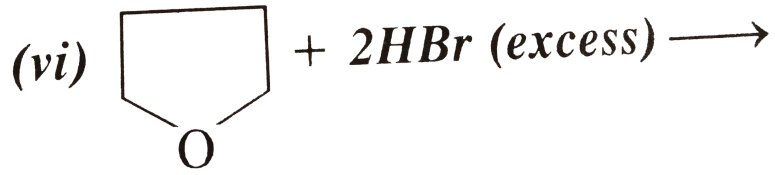
4. Complete the following reactions :

$(i) C_2H_5 - O - C_2H_5 + HCI \xrightarrow{\text{Cold}}$ $(ii) C_2H_5 - O - C_2H_5 + HI \xrightarrow{\text{Excess}}$

$(ii) C_2H_5 - O - C_2H_5 + CI_2 \xrightarrow{\text{Sunlight}}$ $(iv) CH_2 = CHCH_2ONa + ICH$

(v) $(CH_3)_2C = CH_2 + C_2H_5OH \xrightarrow{H_2SO_4}$

(vi) 

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5. How will you bring about the following conversions :

(i) Methyl iodide to methyl ethyl ether (ii)n Ethylene to divinyl ehter

(iii) Dimethyl ether to diethyl ether (iv) Ethyl iodide to diethy ether

(v) Propan-1- ol to -1- propoxypropane.

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6. Write the question of the reaction of hydrogen iodide with

(i) 1-Propoxypropane (ii) Methoxybenzene (iii) Benzyl ethyl ether

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7. complete the missing links in the folloiwng :

$(i) C_2H_5 \xrightarrow{Na} [X] \xrightarrow[\text{Heat}]{C_2H_5I} [Y] \xrightarrow{Cl_2(hv)} [Z]$

(ii) $C_2H_5ONa \xrightarrow{C_2H_5I} [X] \xrightarrow[(373K)]{\text{Excess of HBr}} [Y] \xrightarrow{KOH(alc.)} [Z]$

(iii) $CH_3CHBrCH_3 \xrightarrow{\text{KOH(alc.)}} [X] \xrightarrow[(\text{Preoxde})]{\text{HBr}} [Y] \xrightarrow{CH_3ONa} [Z]$

(v) $(v)\ CH_3MgBr + \underset{O}{\diagdown\!\!\!\!\diagup} \xrightarrow{H_3O^+} [A] \xrightarrow{HBr} [B] \xrightarrow{Mg/ether} [C] \xrightarrow[H_3O^+]{HCHO} [D]$

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8. An ether, (A) having molecular formula, $C_6H_{14}O$, when treated with excess of HI produced two alkyl iodides which on hydrolysis yield compounds (B) and (C). Oxidation of (B) gives an acid (D), whereas

oxidation of (C) results in the formation of a mixed ketone, (E) . Give graphic representation of (A) to (E).

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N C E R T In Text Questions

1. Write the reactions of Williamosn's sybthesis of f 2- ethoxy-3-methoxypentane starting from ethanol and 3-methylpentan-2-ol.

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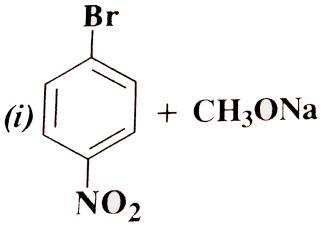
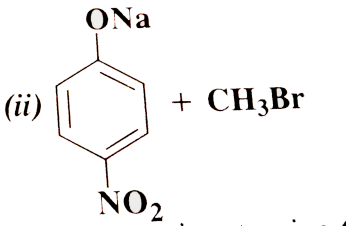
2. Which of the following is an appropriate set of reacnts for the preparation of 1-methoxy-4 nitrobenzne and why ?





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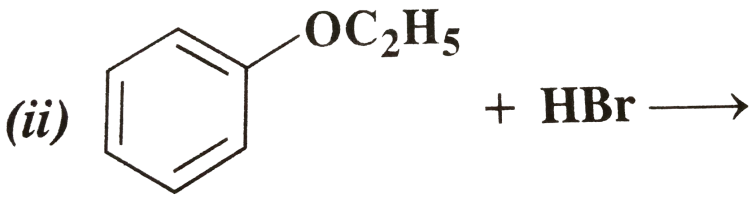
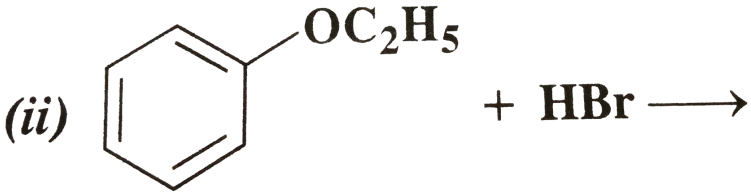
3. Predict the products of the following reactions :

(i) $CH_3 - CH_2 - CH_2 - O - CH_3 + HBr \rightarrow$

(ii) 

(iii) 

(iv) $(CH_3)_3C - OC_2H_5 + HI \rightarrow$

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N C E R T Exercise

1. Explain the following with examples :

(i) Williamson ether synthesis (ii) Unsymmetrical ethers

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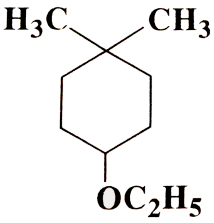
2. Give the IUPAC names of the following ethers :

(i) $CH_3OCH_2 - \underset{\underset{CH_3}{|}}{CH}CH_3$ $(ii)CH_3OCH_2CH_2CI$

(iii) $O_2N.\,C_6H_4 - OCH_3(p)$ $(iv)CH_3CH_2CH_2OCH_3$

(v)



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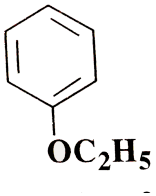

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3. Write the names of the reagents and equations for the preparation of the following ethers by Williamson's synthesis :

(i) 1- Propoxypropan (ii) 2-Methoxy-2-methylpropane (iii) Ethoxybenzene (iv) Methoxyethane.

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4. Illustrate with examples the limitations of Williamson's synthesis for the preparation of certain types of ethers.

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5. How is 1-propoxypropane synthesised from propan-1-ol ? Write mechanism of the reaction.

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6. Write the equation for the reaction of HI with :

(i) 1-Propoxypropane (ii) Methoxybenzene (iii) Benzl ethyl ether.

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

(i) activates the benzene ring towards electrons subsitution.

(ii) directs the incoming substitudents word ortho and para positions in the ring.

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8. Write the equations of the following reactions:

i. Friedel-Crafts reaction - alkylation of anisole.

ii. Nitration of anisole.

iii. Brominatation of anisole in ethanoic acid medium.

iv. Fridel-Crafts acetylation of anisole.

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Short Answer Type Questions

1. What is the structure and IUPAC name of glycerol?

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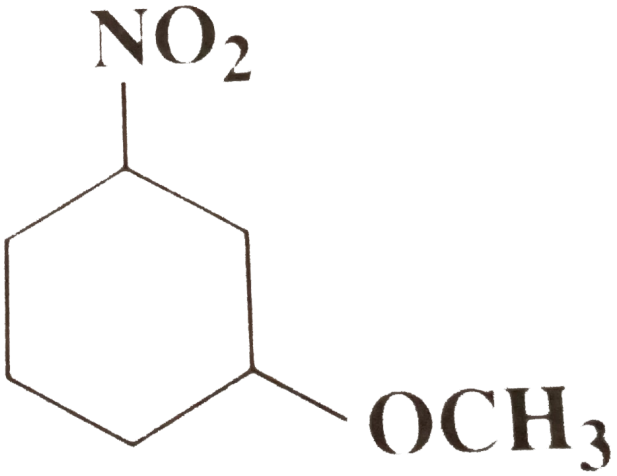
2. Write the IUPAC name of the following compounds.

(A) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{OH}{|}}{CH} - \underset{\underset{C_2H_5}{|}}{CH} - \underset{\underset{OH}{|}}{CH} - CH_3$ (B)

(B)



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3. Write the IUPAC name of the compound given below.

$CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{C} = \underset{\underset{CH_2OH}{|}}{C} - OH$

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4. Name the factors responsible for the solubility of alcohols in water .

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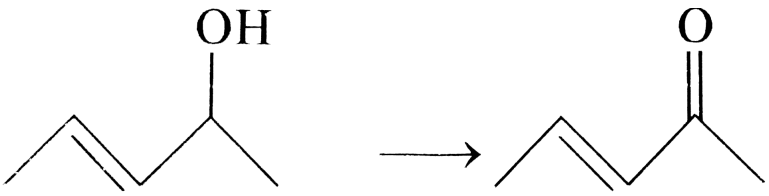
5. Suggest a reagent for the following conversion



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6. What is denatured alcohol ?

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7. Out of 2-chloroethanol and ethanol which is more acidic and why ?

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8. suggest a reagent for the conversion of ehanol to ethanal.

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9. Suggest a reagent for conversion of ethanol to ethanoic acid.

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10. Out of o-nitrophenol and p-nitrophenol, which is more volatile ? Explain?

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11. Out of o-nitrophenol and o-cresol which is more acidic ?

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12. When phenol is treated with bromine water, white precipitate is obtained. Give the structure and the name of the compound formed.

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13. Arrange the given compouns in decreasing order of acidity and give a suitable explanation, Phenol, o-nitrophenol, o-cresol

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14. Alcohols react with active metals e.g., Na, K etc., to give corresponding alkoxides. Write down the decreasing order of reactivity of sodium metal towards primary, secondary and tertiary alcohols.

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15. What happens when benzene diazonium chloride is heated with water ?

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16. Arrange the following compounds in decreasing order of acidity.

$H_2O, ROH, HC \equiv CH$

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17. Name the enzymes and write the reactions involved in the preparation of ethanol from sucrose by fermentation.

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18. How can propan-2-one be converted into tert-butyl alcohol ?

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19. Write the structures of the isomers of alcohols with molecular formula $C_4H_{10}O$ Which of these exhibits optical acitvity ?

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20. Explain why is OH group in phenols more strongly held as compared to OH group in alcohols ?

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21. Explain why nucleophilic substitution reactions rae not very common in phenols.

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22. Preparation of alcohols from alkenes involves the electrophilic attack on alkene carbon atom. Explain its mechanism.

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23. Explain why is O=C=O non polar while R-O-R is polar ?

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24. Why is the reactivity of all the three classes of alcohols with conc. HCl and $ZnCl_2$ (Lucas reagent) different ?

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25. Write steps to carry out the conversion of phenol to aspirin.

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26. Nitration is an example of aromatic electrophilic substitution and its rate depends upon the group already present in the benzene ring. Out of benzene and phenol, which one is more easily nitrated and why ?

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27. In Kolbe's reactio insteaded of phenol, phenoxide ion is treated with carbon dioxide. Why ?

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28. Dipole moment of phenol is smaller than that of methanol. Why ?

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29. Ethers can be prepared by Williamson synthesis in which an alkyl halide is reacted with sodium alkoxide. Di-tert-buty ether can't be

prepared by this method. Explain

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30. Why is the $C-O-H$ bond angle in alcohols slightly less than the tetrahedral angle whereas the C-O-C bond angle in ether is slightly greater?

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31. Explain why low molecular mass alcohols are soluble in water ?

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32. Explain why p-nitrophenol is more acidic than phenol ?

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33. Explain why alcohols and ethers of comparable molecular mass have different boiling points?

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34. The carbon-oxygen bond in phenol is slightly stronger than that in methanol. Why ?

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35. Arrange water, ethanol and phenol in increasing order of acidity and give reason for your answer.

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Long Answer Type Questions

1. Write the mechanism of the reaction of HI with methoxybenzene.

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2. (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 ?

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3. How can phenol be converted to aspirin ?

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4. Explain a process in which a biocatalyst is used industrial preparation of a compound known to you.

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Additional Important Questions

1. Ethers have less dipole moments than alcohols. Justify.

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2. Sodium metal can be used to dry diethyl ether and not ethyl alcoho. Why?

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3. Why are ethers highly inflammale substances ?

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4. An ether possesses dipole moment even if the alkyl groups present in it are idenitcal . Explain.

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5. Dimethyl ether is completely soluble in water but diethyl ehter is soluble isn water to small extent. Discuss.

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6. Ethers are relatively inert. Justify.

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7. why is it not possible to prepare ditertiary butyl ether by Williamson's synthesis ?

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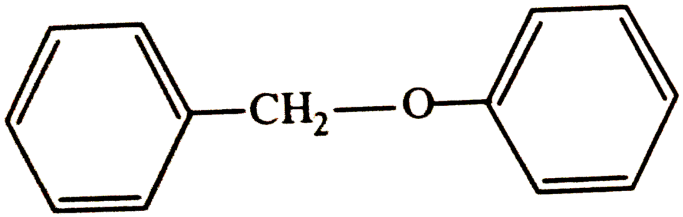
8. With the help of Williamson's synthesis, prepare the following ethers.

(a) 

(b) $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - OCH_3$

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9. Why are secondary and tertiary alcohols not suitable for praparing ethers by dehydration with conc. H_2SO_4 ?

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10. Methyl phenyl ether cannot be prepared from bromoenzene. Discuss.

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11. Phenyl methyl ether (on anisole) reacts with HI to give phenol and methyl iodide and not iodobenzene and methyl alcohol. Justify .

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12. Ethers have low solubility in water but high solubility in conc. H_2S_4. Explain.

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13. Why is diethyl ether used as solvent in the prparation of Grignard reagents ?

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14. Sometimes explosionn occurs durring the distilliation of an ether Explain.

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15. Ethers are cleaved by acids and not by bases. Explain.

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16. 2,2-Dimethyloxirane can be cleaved by acid $\left(H^{\oplus}\right)$. Write the mechanism.

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17. Which of the following is the correct method for synthesising methyl-t-butyl ether and why ?

i. $(CH_3)_3CBr + NaOMe \rightarrow$

ii. $CH_3Br + NaO - t - Bu \rightarrow$

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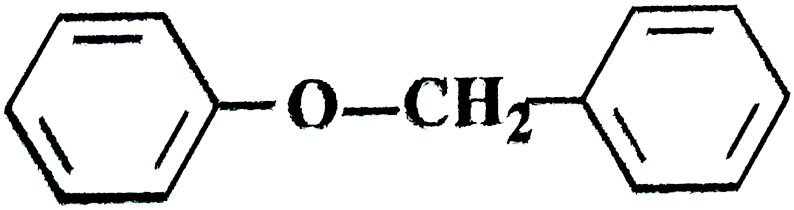
18. Which product is formed when



is reacted with HI ?

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19. Complete the following :

$(CH_3)_3CBr + alc.\ KOH \rightarrow [A] \xrightarrow{HOCl} [B] \xrightarrow{NaCl} [C]$

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20. Give the necessary steps involved in the conversion of benzene to 1,2-diphenylethanol through styrene.

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Questions From Board Examinations

1. Why are boiling points of ethrs lower than those of alcohols of comparable molecular masses ?

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2. How will you convert anisole to phenol ?

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3. How do you account for the miscibility of ethoxyethane with water ?

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4. Describe the mechanism for the formation of diethyl ether from ethanol in the presence of concentrated H_2SO_4

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5. Complete the following reaction :

$C_6H_5Ona + C_2H_5CI \rightarrow$

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6. Write the IUPAC name of the compound :

$$CH_3 - O - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$$

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

i. 1-Propoxypropane

ii. Ethoxybenzene

iii. 2-Methoxy-2-methylpropane

iv. 1-Methoxyethane

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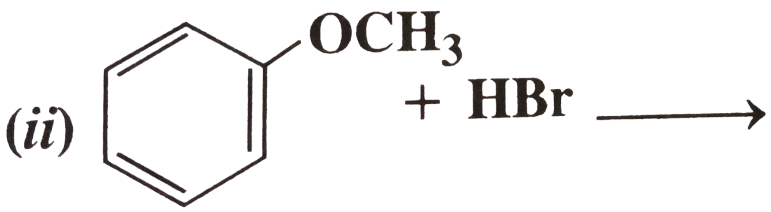
8. State the products of the following reactions

(i) $CH_3 - CH_2 - CH_2 - OCH_3 + HBr \rightarrow$

(ii) 

(iii) $(CH_3)_3C - OC_2H_5 + HI$

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9. Give a brief account of Williamson's synthesis.

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10. Name the reagent used in the Friedel Craft's alkylation of anisole.

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11. $(CH_3)_3C-OCH_3$ on reaction with HI gives $(CH_3)_3C-I$ and CH_3-OH as the main products and not $(CH_3)_3C-OH$ and CH_3-I. Explain.

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12. $(CH_3)_3C-Br$ on reaction with sodium methoxide $\left(Na^+O^-CH_3\right)$ gives as the main product and not an ether.

Assign reason.

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13. Complete the following :

$CH_3 - CH_2 - O - C_6H_5 + HI(\text{Conc.}) \rightarrow$

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14. Anisole on reaction with HI gives phenol and $CH_3 - I$ as the main products and not iodobenzene and CH_3OH. Assign reasons.

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15. Write chemical equatio involved in Friedel Crafts acetylation of anisole.

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16. Why is boiling point of n-butyl alcohol $(118^{\circ}C)$ higher than that of dethyl ether $(35^{\circ}C)$?

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17. Complete the reaction :

$$CH_3 - \underset{\underset{CH_3}{|}}{CH_3} - O - CH_2 - CH_3 \xrightarrow{HI}$$

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Higher Order Thinking Skills Hots Questions

1. Two compounds [A] and [B] have molecular formula C_2H_6O. On reacting with HI [A] gives alkyl iodide and water while [B] gives alkyl iodide and alcohol . What are the compounds [A] and [B] ? Write the reactions involved.

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2. A neutral compound (A) having C,H and O, on refluxing with HI yields methyl iodide and an alkyl iodide (B), which contains 74.6 per cent iodine. (B) when treated with moist Ag_2O produces a prodcut which undergoes the haloform reaction. Characterize (A), what would have been produced if (B) were treated with dry Ag_2O ?

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3. When aqueous HI reacts with methoxyethane, methyl iodide and ethanol are formed, but when aqueous HI reacts with 2-methoxy-2-methylpropane, a mixture of methanol and t-butyl iodide is formed. Explain ?

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4. Compound (A) $C_4H_{10}O$, is found to be soluble in sulphuric acid . (A) does not react with sodium or potassium permanganate. When (A) is

heated with excess of HI, it is converted into a single alkyl halide. What is (A) ?

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5. An organic compound A (C_2H_6O) reacts with sodium to form a compound B with the evolution of H_2 and gives a yellow compound C on reacting with iodine and NaOH. When heated with conc. H_2SO_4 at 413 K, it gives a compound D $(C_4H_{10}O)$ which on reaction wiht conc. HI at 373 K gives compound E. The compound D is also obtained when B is heated with E. Idntify the compounds A,B,C,D and E write the equations for the reaction involved.

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6. Write the strucrtures of the products. $(CH_3)_2CH-OCH_3 \xrightarrow[\text{heat}]{\text{HI(excess)}}$

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Multiple Choice Questions Type I

1. Monochlorination of toluene in sunlight followed by hydroysis with aq. NaOH yiedls

A. oCresol

B. m-Cresol

C. 2,4-Dihydroxytoluene

D. Benxyl alcohol.

Answer: D

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2. How many alcohols with molecular formula $C_4H_{10}O$ are chiral in nature ?

A. 1

B. 2

C. 3

D. 4

Answer: A

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3. What is the correct order of reactivity of alcohols in the following reaction ?

$$R-OH+HCl \xrightarrow{ZnCl_2} R-Cl+H_2O$$

A. $1^\circ > 2^\circ > 3^\circ$

B. $1^\circ < 3^\circ < 2^\circ$

C. $3^\circ > 2^\circ > 1^\circ$

D. $3^\circ > 1^\circ > 2^\circ$

Answer: C

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4. CH_3CH_2OH can be converted into CH_3CHO by..... .

A. catalytic hydrogenation

B. treatement with $LiAIH_4$

C. treatment with pyridinium chlorochromate

D. treatement with $KMnO_4$

Answer: C

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5. The process of converting alkyl halides into alcohols involves..... .

A. addition reaction

B. substitution reaction

C. dehydrohalogenation reaction

D. rearrangement reaction

Answer: B

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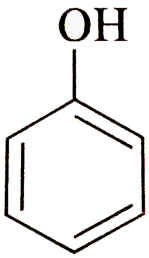
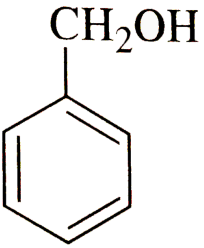
6. Which of the following compounds is /are aromatic alcohols ?



(A)



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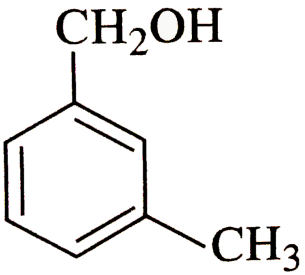

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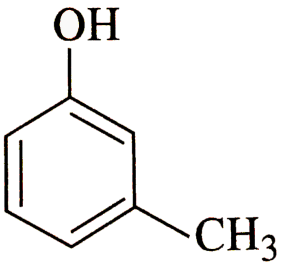

(D)

A. A,B,C,D

B. A,D

C. B,C

D. A

Answer: C

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7. Give IUPAC name of the compound given below.

$$CH_3 - \underset{\underset{CI}{|}}{CH} - CH_2 - CH_2 - \underset{\underset{OH}{|}}{CH} - CH_3$$

A. 2-Chloro-5-hydroxyhexane

B. 2-Hydroxy-5-chlorohexane

C. 5- Chlorohexn-2-ol

D. 2-Cholorohexan-5-ol

Answer: C

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8. IUPAC name of m-cresol is..... .

A. 3-Methylphenol

B. 3-Chlorophenol

C. 3-Methoxyphenol

D. Benxene-1,3-diol

Answer: A

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9. IUPAC name of the compound $CH_3 - \underset{\underset{CH_3}{|}}{CH} - OCH_3$ is..... .

A. 1-Methoxy-1-methylethane

B. 2-Methoxy-2-methylethane

C. 2-Methoxypropane

D. Isopropylmethyl ether.

Answer: C

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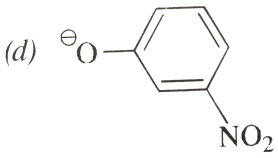
10. Which of the following species can act as the strongest base ?

A. $^{\ominus}OH$

B. $^{\ominus}OR$

C. $^{\ominus}OC_6H_5$

D. (d) 

Answer: B

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11. Which of the following compounds will react with sodium hydroxide solution in water ?

A. C_6H_5OH

B. $C_6H_5CH_2OH$

C. $(CH_3)_3COH$

D. C_2H_5OH

Answer: A

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12. Phenol is less acidic than

A. ethanol

B. o-nitrophenol

C. o-methylphenol

D. o-methoxyphenol

Answer: B

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13. Which of the following is most acidic ?

A. Benzyl alcohol

B. Cyclohexanol

C. Phenol

D. m-Chlorophenol.

Answer: D

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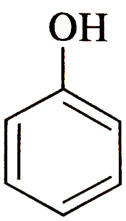
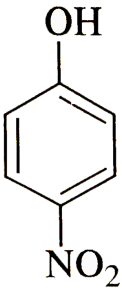
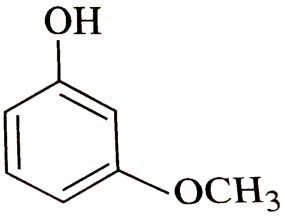
14. Mark the correct order of decreasing acid strength of the following compounds



(I)



(II)



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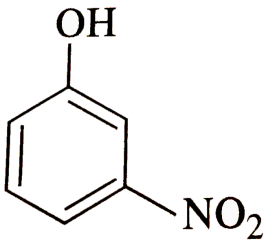
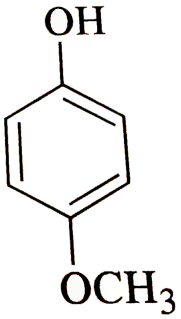


(IV)



(V)

A. $(V) > (IV) > (II) > (I) > (III)$

B. $(II) > (IV) > (I) > (III) > (V)$

C. $(IV) > (V) > (III) > (II) > (I)$

D. $(V) > (IV) > (III) > (II) > (I).$

Answer: B

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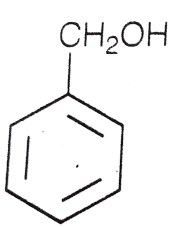
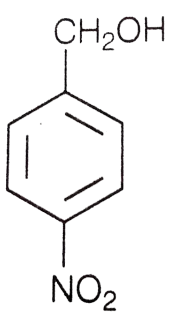
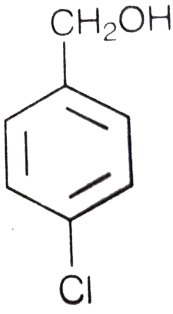
15. Mark the correct increasing order of reactivity of the following compounds with HBr/HCl.



(I)



(II)



(III)

A. $(I) < (II) < (III)$

B. $(II) < (I) < (III)$

C. $(II) < (III) < (I)$

D. $(III) < (II) < (I)$.

Answer: C

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16. Arrange the following compounds in increasing order of boiling point

:

Prpane-1-ol, butan-1-ol, butan-2-ol, pentan-1-ol

A. Propan-1-ol,butan-2-ol, butan-1-ol, pentan-1-ol

B. Propan-1-ol,butan-1-ol, butan-2-ol, pentan-1-ol

C. Pentan-1-ol, butan-2-ol, butan-1-ol, propan-1-ol

D. Pentan-1-ol, butan-1-ol, butan-2-ol, propan-1-ol

Answer: A

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Multiple Choice Questions Type Ii

1. Which of the following are used to convert RCHO into RCH_2OH ?

A. H_2 / Pd

B. $LiAlH_4$

C. $NaBH_4$

D. Reaction with RMgX followed by hydrolysis.

Answer: A::B::C

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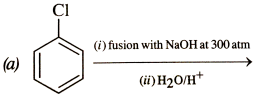
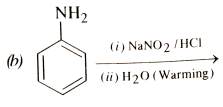
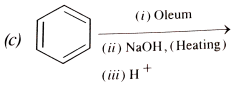
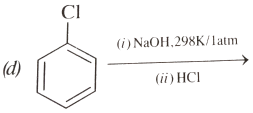
2. Which of the following reactions will yields phenol ?

A. 

B. 

C. 

D. 

Answer: A::B::C

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3. Which of the following reagents can be used to oxidise primary alcohols to aldehydes ?

A. CrO_3 in anhydrous medium

B. $KMnO_4$ in acidic medium

C. Pyridinium chlorochromate

D. Heat in the presence of Cu at 573 K

Answer: A::C::D

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4. Phenol can be distinguished from ethanol by the reactions with

A. $Br_2 / water$

B. Na

C. Neutral $FeCI_3$

D. All the above

Answer: A::C

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5. Which of the following are benzylic alcohols ?

A. $C_6H_5 - CH_2 - CH_2OH$

B. $C_6H_5CH_2OH$

C. $C_6H_5 - \underset{\underset{CH_3}{|}}{CH} - OH$

D. $C_6H_5 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - OH$

Answer: B::C

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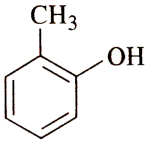
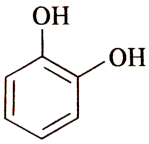
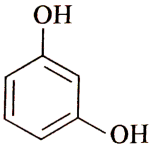
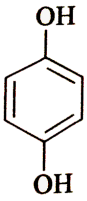
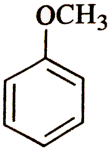
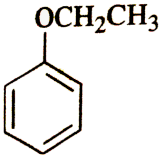
Matching Type Questions

1. Match the structureso of the compounds given in Column I with the name of compounds given in Column II.

Column I	Column II
(a) 	(I) Hydroquinone
(b) 	(II) Phenetoie
(c) 	(III) Catechol
(d) 	(IV) *o*-Cresol
(e) 	(V) Quinone
(f) 	(VI) Resorcinol
	(VII) Anisole

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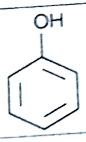
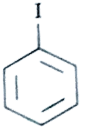
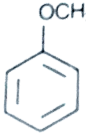
2. Match the starting material given in Column I with the products formed by these (Column II) in the reaction with HI.

Column I	Column II
A. $CH_3—O—CH_3$	1.  $+ CH_3I$
B. $(CH_3)_2CH—O—CH_3$	2. $CH_3—C(CH_3)_2—I + CH_3OH$
C. $H_3C—C(CH_3)_2—O—CH_3$	3.  $+ CH_3OH$
D 	4 $CH_3—OH + CH_3I$
	5 $(CH_3)_2CH—OH + CH_3I$
	6 $(CH_3)_2CH—I + CH_3OH$
	7 $CH_3—C(CH_3)_2—OH + CH_3I$

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3. Match the items of column I with items of column II.

Column I	Column II
(a) Antifreeze used in car engine	(I) Neutral ferric chlori
(b) Solvent used in perfumes	(II) Glycerol
(c) Starting meterial for picric acid	(III) Methanol
(d) Wood sprit	(IV) Phenol
(e) Reagent used for detection of phenolic group	(V) Ethylene glycol
(f) By product of soap industry used in cosmetics	(VI) Ethanol

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4. Match the items of colum I with items of column II.

Columnm I	Column II
(a) Metanol	(I) Conversion of phenol to o-hydrox
(b) Kolbe's reactions	(II) Ethyl alcohol
(c) Williamso's synthesis	(III) Conversion of phenol to salicyl
(d) Conversion of 2° alcohol to ketone	(IV) Wood spirit
(e) Reimer-Tiemann reaction	(V) Heated copper at 573
(f) Fermentation	(VI) Reaction of alkyl halide with so

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Asssertion Reason Type Questions

1. Assertion (A) Addition reaction of water to but-1-ene in acidic medium yields butan-1-ol.

Reason (R) Addition of water in acidic medium proceeds through the formation of primary carbocation.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: B

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2. Assertion (A) p-nitrophenol is more acidic than phenol.

Reason (R) Nitro group helps in the stabilisation of the phenoxide ion by dispersal of negative charge due to resonance.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: A

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3. Assertion (A) IUPAC name of the compound

$CH_3 - \underset{\underset{CH_3}{|}}{CH} - O - CH_2 - CH_2 - CH_3$ is 2-ethoxy-2-methylethane

Reason (R) In IUPAC nonmenclature, ether is regarded as hydrocarbon derivative in which a hydrogen atom is replaced by -OR and or -OAr group [where, R = alkyl group and Ar = aryl group].

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: D

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4. Assertion (A) Bond angle is ethers is slightly less than tetrahedral angle.

Reason (R) There is a repulsion between the two bulky (-R) groups.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: B

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5. Assertion (A) Boiling points of alcohols and ethers are high.

Reason (R) They can form intermolecular hydrogen-bonding.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: B

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6. Assertion (A) Like bromination of benzene, bromination of phenol is also carried out in the presence of Lewis acid.

Reason (R) Lewis acid polarises the bromine molecule.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: D

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7. Assertion (A) o-nitrophenol is less soluble in water than the m and p-isomers.

Reason (R) m and p-nitrophenols exist as associated molecules.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Both assertion and reason are correct statements but reasons in not correct explanation of assertion.

Answer:

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8. Assertion (A) Ethanol is a weaker acid than phenol.

Reason (R) Sodium ethoxide may be prepared by the reaction of ethanol with aqueous NaOH.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: C

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9. Assertion (A) Phenol forms 2, 4, 6-tribromophenol o treatement with Br_2 in carbon disulphide at 273K.

Reason (R) Bromine polarises in carbon disulphide.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: B

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10. Assertion (A) Phenols give o-and p-nitrophenol on nitration with conc. HNO_3 and H_2SO_4 mixture.

Reason (R) $-OH$ group in phenol is o-,p-directing.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reasons both are wrong statements.

C. Assertion is correct statement but reasons is wrong statement.

D. Assertion is wrong statement but reason is correct statement

Answer: D

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Assignment

1. Write the IUPAC names of :

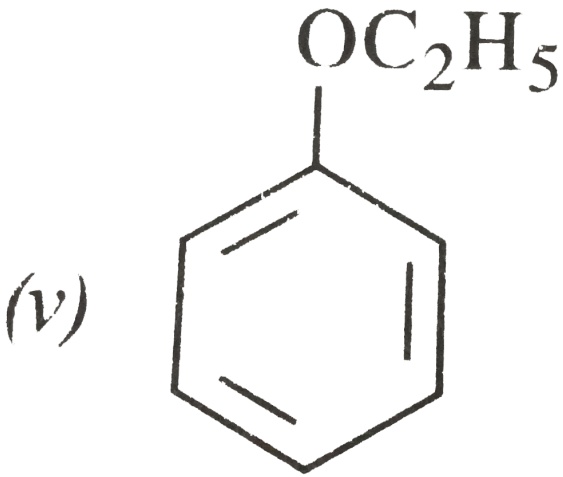
(i) $(C_2H_5)_2CHOC_2H_5$

(ii) $CH_3CH_2O-CH=CH_2$

(iii) $CH_3-\underset{\underset{CH_3}{|}}{CH}-O-\underset{\underset{CH_3}{|}}{CH}-CH_3$

(iv) $CH_3O-CH_2-CH_2-OCH_3$

(v)



(v)

(vi) $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{O_2H_5}{|}}{C}}-OH$

(vii) $CH_3CH_2O-\underset{CH_3}{CH}-CH_2-CH_3$

(viii) $CH_3-O-CH_2-\underset{\underset{CH_3}{|}}{CH}-CH_2-CH_3$

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2. Give the structural formula of :

(i) Anisol (ii) 2-Ethoxypropane

(iii) Di-isopropyl ether Phenetole.

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3. Differentiate between symmetrical and unsymmetircal ethers giving one example of each.

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4. The hybridisation of oxygen in both water and diethyl ether molecules is the same but they differ in their bond angles. Explain.

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5. What happens when ethyl alcohol is treated with diazomethane in the presence of HBF_4 ?

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6. Why are the boiling points of ethers lower than those of isomeric alcohols ?

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7. Dimethyl ether is completely soluble in water but diethyl ehter is soluble in water to small extent. Discuss.

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8. The acidic dehydration method is not souitble for converting a tertiary alcohol into ether. Justify.

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9. The reaction

$$2C_2H_5Oh \xrightarrow[140^\circ C]{Conc.H_2SO_4} (C_2H_5)_2O + H_2O$$

is an example of

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10. Give a brief account of Williamson's synthesis.

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11. An ether possesses dipole moment even if the alkyl groups present in it are idenitcal . Explain.

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12. Illustrate with examples the limitations of Williamson's synthesis for the preparation of certain types of ethers.

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13. C-O-C bond angle in ether is more than H-O-H bond angle in water although oxygen is sp^3 hybridised in both the cases. Explain

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14. Dimethyl ether is completely soluble in water but diethyl ehter is soluble in water to small extent. Discuss.

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15. Give a brief account of Williamson's synthesis.

Watch Video Solution

16. Write chemical equation to illustrate Williamson's synthesis.

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17. Describe the mechanism for the formation of diethyl ether from ethanol in the presence of concentrated H_2SO_4

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18. Complete the following reaction :

$C_6H_5ONa + C_2H_5CI \rightarrow$

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19. Write chemical equation to illustrate Williamson's synthesis.

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

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Properties Of Ethers

1. Why are ethers very little reactive chemically ?

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2. Enlist the important uses of diethyl ether.

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3. under what conditions do ethers from oxonium salts?

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4. How does anisole reacts with :

(i) Br_2 in CS_2

(ii) HI at 373 K ?

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5. Complete the following reactions :

(i) $C_6H_5OCH_3 + HNO_3 \rightarrow$

(ii) $C_6H_5OCH_3 + HI \rightarrow$

(iii) $(C_2H_5)_2O + HCI \rightarrow$

(iv) $CH_3OCH_3 + PCI_5 \rightarrow$

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6. Alkoxy group attached to benzene ring is ortho and para directing. Justify.

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7. Account for the product formed when phenyl methyl ether reacts with HI.

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8. Why are boiling points of ethrs lower than those of alcohols of comparable molecular masses ?

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9. How will you convert anisole to phenol ?

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10. How do you account for the miscibility of ethoxyethane with water ?

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11. Write chemical equation involved in Friedel Crafts acetylation of anisole.

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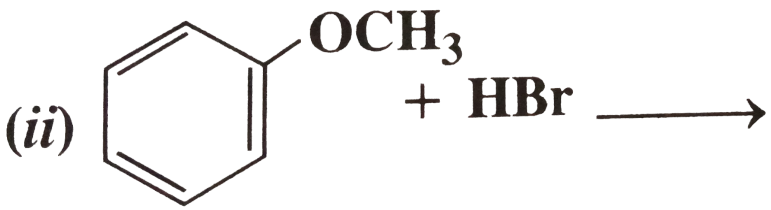
12. State the products of the following reactions

(i) $CH_3 - CH_2 - CH_2 - OCH_3 + Hbr \rightarrow$

(ii) 

(iii) $(CH_3)_3C - OC_2H_5 + HI$

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13. Name the reagent used in the Friedel Craft's alkylation of anisole.

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Multiple Choice Mcqb

1. State the product formed during the reaction between sodium phenoxide and ethyl iodide on heating :

A. Phenetole

B. Ethyl phenyl alcohol

C. Phenone

D. None of these

Answer: A

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2. On boiling with concentrated HBr, phenyl ether will give:

A. Phenol and ethyl bromide

B. Bromobenzene and ethanol

C. Phenol and ethane

D. Bromobezene and ethane.

Answer: A

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3. In Williamson's synthesis, ethoxyethane is prepared by

A. passing ethanol over heated Al_2O_3

B. heating sodium ethoxide with ethyl bromide

C. treating ethyl alcohol with excess of H_2SO_4 at 440 K

D. heating ethanol with dry Ag_2O.

Answer: B

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4. Higher homologous of ethers can be prepared from :

A. alkyl halides

B. diaamomethane

C. Grignard reagent

D. None of these

Answer: C

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5. Which is a simple ether ?

A. $C_2H_5OCH_3$

B. CH_3OCH_3

C. $C_6H_5OCH_3$

D. None of these

Answer: B

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6. Diethyl ether is prepared by passing vapours of ethyl alcohol over heated catalyst under high temperature and pressure. The catalyst is :

A. SiO_2

B. CuO

C. Al_2O_3

D. Ag_2O

Answer: C

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7. Diethyl ether is obtained from ethyl alcohol

A. in the presence of H_2SO_4 at 413 K

B. in the presence of H_2SO_4 at 470 K

C. in the presence of H_2SO_4 at 383 K

D. in the presence of H_2SO_4 at 273 K

Answer: A

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8. An organic compound (a) reacts with sodium metal and forms (b). On heating with conc. H_2S0_4 (a) gives diethyl ether. (a) and (b) are respectively

A. C_2H_5OH and C_2H_5ONa

B. C_3H_7OH and C_3H_7ONa

C. CH_3OH and CH_3ONa

D. C_4H_9OH and C_4H_9ONa

Answer: A

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9. Epichlorohydrin is

A. 3-Chloropropane

B. 3- Chloropropan-1-o1

C. 2-Chloromethyloxirane

D. None of these

Answer: C

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10. Which of the following compound is resistant to nucleophilic attack by hydroxyl ions?

A. Methyl acetate

B. Acetonitrile

C. Acetamide

D. Diethyl ether

Answer: D

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11. Which statement is true ?

A. The boiling points of diethyl ether and ethyl alcohol are equal

B. Diethyl ether has dipole moment

C. Diethyl ether is highly soluble in water

D.

Answer: C

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12. When ethyl alcohol is heated to $140^{\circ} C$ with conc. H_2SO_4, the product formed is :

A. Ethyl sulphate

B. Diethyl ether

C. Ethane

D. Ethanoyl sulphate

Answer: B

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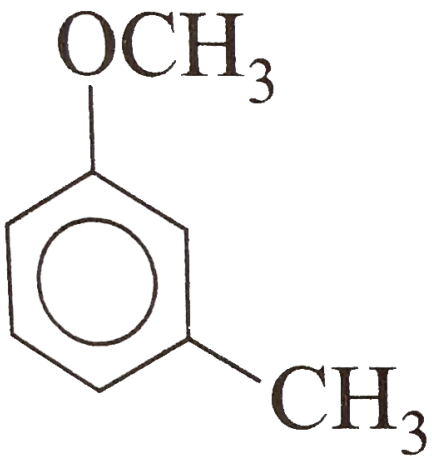
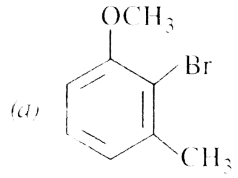


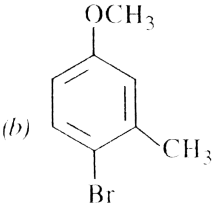
13.

The major product formed on monobromination $\left(\frac{Br_2}{FeBr_3}\right)$ of the following compound. Is

A.



B.



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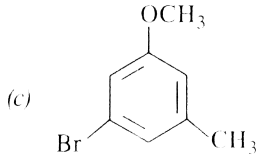

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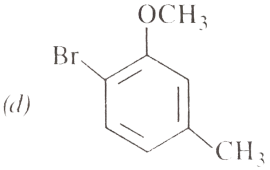

Answer: D

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14. The major organic product in the reaction

$CH_3 - O - CH(CH_3)_2 + HI \rightarrow$ product is

A. $CH_3I + (CH_3)_2 + HI \rightarrow$

B. $CH_3OH + (CH_3)_2CHI$

C. $ICH_2OCH(CH_3)_2$

D. $CH_3\underset{\underset{I}{|}}{O}C(CH_3)_2$

Answer: A

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15. In the reaction

$$CH_3\overset{CH_3}{\underset{|}{C}}H - CH_2 - O - CH_2CH_3 + HI \xrightarrow{Heated}$$

Which of the following compounds will be formed?

A. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CH_3 + CH_3CH_2OH$

B. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CH_2OH + CH_3CH_3$

C. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CH_2OH + CH_3CH_2I$

D. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CH_2I + CH_3CH_2OH.$

Answer: C

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16. Which isomerism is shown by the following pairs ?

$CH_3CH_2CH_2OH$ and $CH_3CH_2OCH_3$

A. Position isomerism

B. Functional isomerism

C. Structural isomerism

D. Chain isomerism.

Answer: B

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17. No. of acyclic isomers of the compound having the molecular formula $C_4H_{10}O$ is :

A. 4

B. 6

C. 5

D. 7

Answer: C

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18. Among the following ethers, which one will produce methyl alcohol on treatment with hot concentrated HI?

A. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - O - CH_3$

B. $CH_3 - CH_2 - CH_2 - CH_2 - O - CH_3$

C. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - O - CH_3$

D. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - OCH_3$

Answer: B

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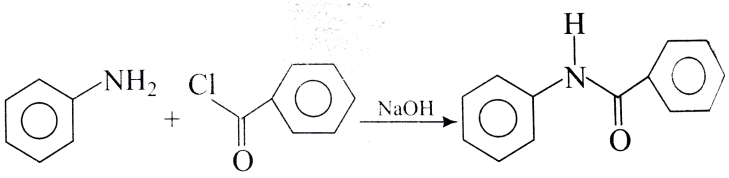
19. The following reaction is known by the name



A. Perkin's reaction

B. Acetylation reaction

C. Schotten-Baumann reaction

D. Friedel-Craft's reaction.

Answer: C

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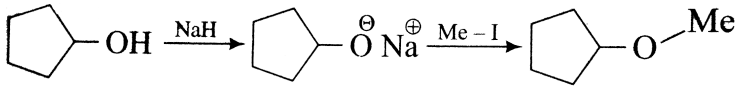
20. The reaction



can be classified as:

A. dehydration reaction

B. Williamson alcohol synthesis reaction

C. Williamson ether synthesis reaction

D. Alcohol formation reaction.

Answer: C

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21. The compound A on treatment with Na gives B, and with PCl_5 gives C. B and C react together to give di Ethyl ether. A, B and C are in the order

A. $C_2H_5OH, C_2H_6, C_2H_5CI$

B. $C_2H_5OH, C_2H_5CI, C_2H_5OH$

C. $C_2H_5CI, C_2H_6, C_2H_5OH$

D. $C_2H_5OH, C_2H_5ONa, C_2H_5CI$

Answer: D

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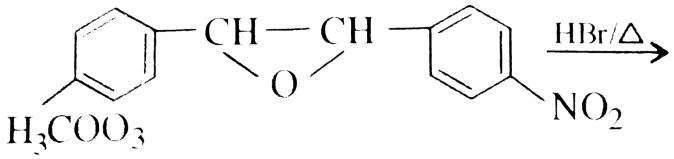
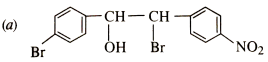
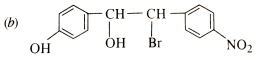
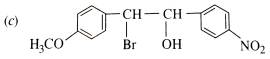
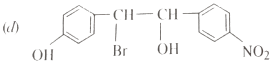
22. Identifiy the final prodcut of the given reaction.



A. 

B. 

C. 

D. 

Answer: C

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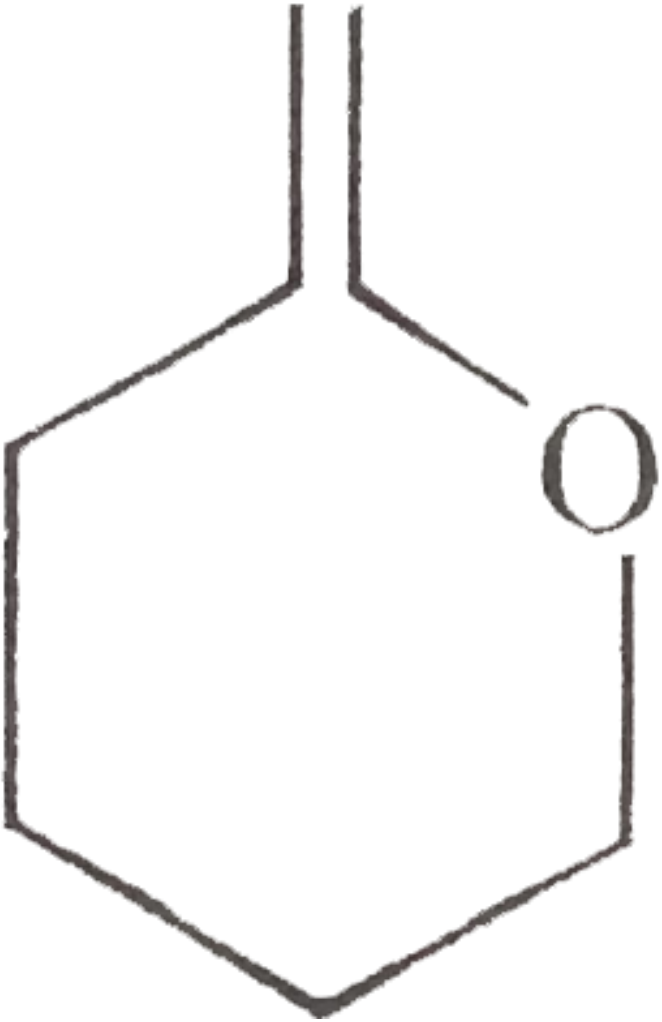
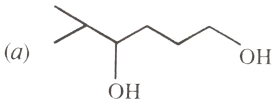
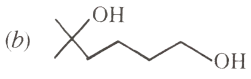
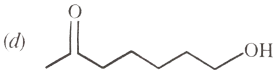


23. when reacted with two moles of CH_3MgI followed by hydrolysis, the prodcut formed is :

A. 

B. 

C. 

D. 

Answer: B

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24. $CH_3 - \overset{CH_2CH_3}{\underset{|}{C}}H\ CH = CHCH_3 \xrightarrow{H_3O^+}$

Major product of the reaction

A. is an potical isomer

B. gives white turbidity with HBr immediately

C. is dehydrated easily

D. all the above are correct

Answer: D

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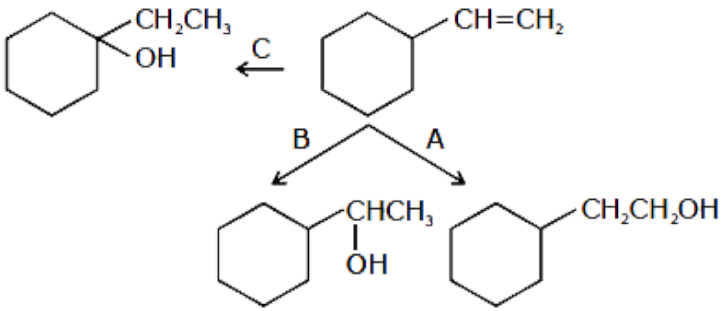

25.

Select schemes A, B, C out of -

I. acid catalysed hydration

II. HBO

III. Oxymercuration-demercuraton

A. I in all the cases

B. I,II,III

C. II,III,I

D. III,I,II.

Answer: B

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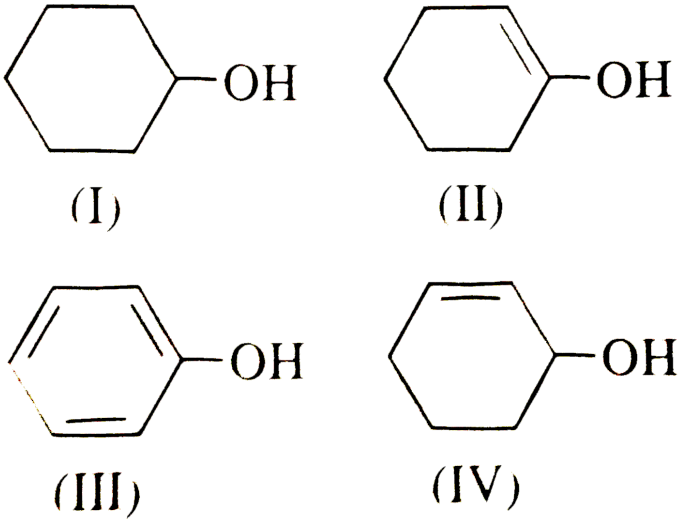
26. Acidic dehydration of the following alcohols is in the order :



A. $(I) < (II) < (III) < (IV)$

B. $(I) > (II) > (III) > (IV)$

C. $(III) < (II) < (I) < (IV)$

D. $(II) < (III) < (IV) < (I).$

Answer: C

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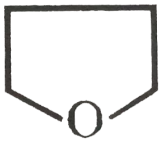
27. Which of the following is not cleaved by HI even at 525K ?

A. $C_6H_5OCH_3$

B. $C_6H_5OC_6H_5$

C. $C_6H_5OC_3H_7$

D. (d) 

Answer: B

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28. Rank the following subtances in order of increasing boiling points (lowest $\rightarrow$ highest) :

I. $CH_3CH_2CH_2OH$ II. $(CH_3)_2CHOCH_3$

III. $(CH_3)_3COH$ $IV.\ (CH_3)_4C.$

A. $I < III < II < IV$

B. $II < IV < III < I$

C. $IV < II < III < I$

D. $II < III < I < IV$

Answer: C

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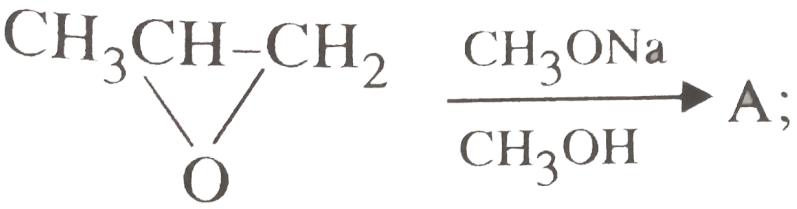
29.



The compound A will be :

A. $CH_3\underset{\underset{OH}{|}}{CH} - \underset{\underset{OCH_3}{|}}{CH_2}$

B. $CH_3\underset{\underset{OCH_3}{|}}{CH} - \underset{\underset{OH}{|}}{CH_2}$

C. $CH_3CH_2CH_2OCH_3$

D. $CH_3 - \underset{\underset{OCH_3}{|}}{CH}CH_3$.

Answer: A

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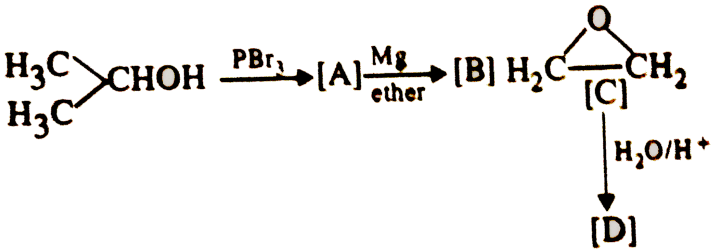
30. In the given sequence of reactions



The prodcut [D] can be :

A. $CH_3\underset{\underset{CH_3}{|}}{CH}OH$

B. $CH_3\underset{\underset{CH_3}{|}}{CH}CH_2CH_2Br$

C. $CH_3\underset{\underset{CH_3}{|}}{CH}OCH_2CH_3$

D. $CH_3\underset{\underset{CH_3}{|}}{CH}CH_2CH_2OH$

Answer: D

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31. Magnesium reacts with alkyl halide best in the solvent :

A. $C_2H_5OCH_3$

B. $C_6H_5N(CH_3)_2$

C. $C_2H_5OC_2H_5$

D. Equally in all.

Answer: C

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Jee Main Other Engineering Entrance Examinations

1. Oxygen atom in ether is

A. very acitve

B. replaceable

C. acitve

D. comparatively inert.

Answer: D

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2. When ethyl hydrogen sulphate is heated with excess of ethyl alcohol at 413 K the product is :

A. Ethane

B. Ethylene

C. Diethyl ether

D. Diethyl sulphate.

Answer: C

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3. $CH_3OC_2H_5$ and $(CH_3)_3COCH_3$ are treated with hydroiodic acid. The fragments after reaction obtained are

A. $CH_3I + C_2H_5OH, (CH_3)_3C - I + CH_3OH$

B. $CH_3OH + C_2H_5I, (CH_3)_3C - I + CH_3OH$

C. $CH_3OH + C_2H_5I, (CH_3)_3C - OH + CH_3I$

D. $CH_3I + C_2H_5OH, CH_3I + (CH_3)_3C - OH.$

Answer: A

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4. Anisole with conc. HNO_3 and conc. H_2SO_4 gives

A. Phenol

B. Nitrobenzene

C. o-and-p Nitroanisole

D. o-Nitroanisole.

Answer: C

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5. Which of the following can not be prepared by Williamson's synthesis ?

A. Methoxybenzene

B. Benzyl-p-nitrophenyl ether

C. Methyl tert-butyl ether

D. Di-tertiary butly ether.

Answer: D

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6. Which of the following will not give anisole ?

A. Phenol is reacted with dimethyl sulphate in the presenc of a base

B. Sodium phenoxide is treated with methyl iodide.

C. Diazomethane is reacted with phenol

D. Methyl magnesium iodide is treated with phenol.

Answer: D

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7. The products formed when diethyl ether is reacted with cold HI are :

A. Ethyl alcohol and ethyl iodide

B. Ethyl iodide only

C. Ethyl alcohol only

D. Ethyl iodide and ethane.

Answer: A

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8. Ethanol and dimethyl ether form a pair of of functional isomers. The boiling point of ethanol is higher than that of dimethyl ether due to the presence of

A. H-bonding in ethyl alcohol

B. H-bonding in dimethyl ether

C. CH_3 group in ethyl alcohol

D. CH_3 group in demethyl ether

Answer: A

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9. Methyl $-$ tert-butyl ether on heating with HI of one molar concentration gives

A. $CH_3OH + (CH_3)_3CCI$

B. $CH_3I + (CH_3)_3COH$

C. $CH_3I + (CH_3)_3CCI$

D. None of these

Answer: B

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10. When diethyl ether is treated with excess of CI_2 in the presence of sum light, the product formed is :

A. $CH_3CHCI - O - CH_2CH_3$

B. $CH_3CHCI - O - CHCICH_3$

C. $CCI_3CCI_2 - O - CCI_2CCI_3$

D. $CH_3CCI_2 - O - CHCICH_3$.

Answer: C

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11. How many isomeric alcohols with formula $C_4H_{10}O$ are possible ?

A. 3

B. 2

C. 4

D. 5

Answer: A

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12. An ether is more volatile than alcohol having the same molecular formula. This is due to:

A. alcohol having resonance structures

B. intermolecular hydrogen bonding in etheres

C. intermolecular hydrogen bonding in alcohols

D. dipolar character of ethers

Answer: C

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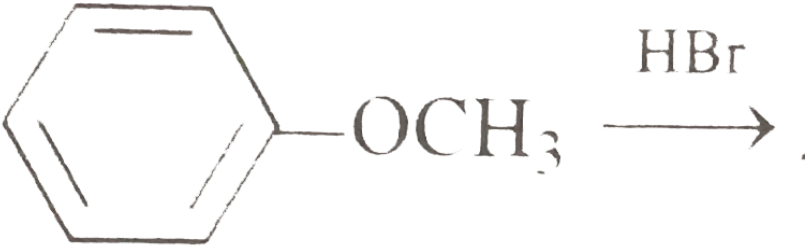
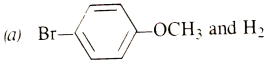
13. In the reaction



A. (a) 

B. (b)  —Br and CH_3Br

C. (c)  —Br and CH_3OH

D. (d)  —OH and CH_3Br.

Answer: D

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14. Formation of methyl tertiary butyl ether by the reaction of sodium tertiary butoxide and methyl bromide involves.

A. elimination reaction

B. electrophilic addition reaction

C. nuclephilic addition reaction

D. muclephilic substitution reaction

Answer: D

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15. Sodium ethoxide has reacted with ethanoyl chloride. The compound that is produced in this reaction is :

A. Diethyl ether

B. Butan-2-one

C. Ethyl chloride

D. Ethylethanoate.

Answer: D

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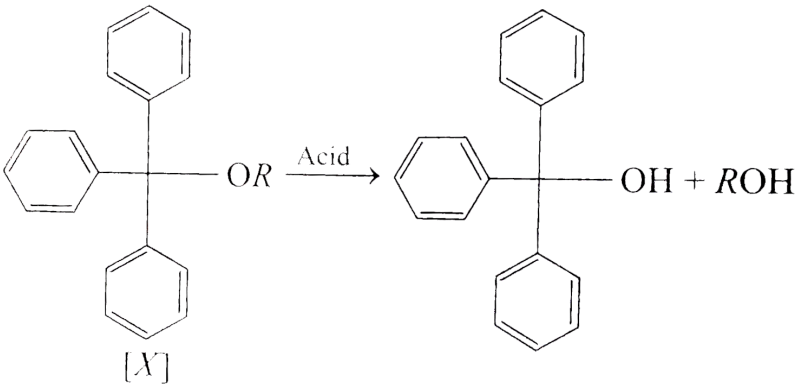
16. The acidic hydrolysis of ether (X) shown below is fastest when



[X]

A. one phenyl group is replaced by a methyl group

B. one phenyl group are replaced by a para-methoxyphenyl group

C. two phenyl groups are replaced by two para-methoxyphenyl groups

D. no-structural change is made to X

Answer: C

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17. 2-chloro-2-methylpentane on reaction with sodium methoxide in methanol yields:

(a) $C_2H_5CH_2\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - OCH_3$ (b) $C_2H_5CH_2\underset{\underset{CH_3}{|}}{C} = CH_2$ (c) $C_2H_5CH_2 = \underset{\underset{CH_3}{|}}{C} - CH_3$

A. (i) and (iii)

B. (iii) only

C. (i) and (ii)

D. All of these.

Answer: D

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Assertion Reason Type Questions

1. Assertion: Alcohols have higher boiling points than ethers of comparable molecular masses.

Reason: Alcohols and ethers are isomerism in nature.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: b

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2. Assertion : Ethers have specific dipole moment values

Reason : The C-O bond is polar nature.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: b

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3. (A) With HI, anisole forms iodobenzene and methyl alcohol.

(R) I^- ion will combine with smaller group to avoid steric hindrance.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: a

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4. Assertion : Ethers behave as bases in the presence of mineral acids.

Reason : Due to the presence of lone electrons pair on the oxygen atom.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: a

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5. Asssertion : $(CH_3)_3COH$ when heated with conc. H_2SO_4 gives isobutylene as the man product and not di-tertiary butyl ether.

Reason : All alcohols are radily dehydrated with conc. H_2SO_4.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: c

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6. Assertion : Tert- butyl methyl ether on cleavage with HI at 373 K gives tert-bytyl iodide and methano.

Reason : The reaction occurs by S_{N^1} mechanism.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: c

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7. Asssertion : 2-Bromobutane on reacting with sodium ehtoxide. In ethanol gives but -1-ene as the major prodcut.

Reason : But-1-ene is more stable than but-2-ene.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: d

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8. Assertion : The major product formed by heating $C_6H_5CH_2OCH_3$ with HI are $C_6H_5CH_2I$ and CH_3OH.

Reason : Benzyl cation is more stale than methyl cation.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: a

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9. Cleavage of anisole with HI at 373 K gives phenol and CH_3I

Reason : Due to resonance, $O - C_6H_5$ bond is stronger than $O - CH_3$ bond.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: a

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10. Phenol is more reactive than benzene towards electrophilic substitution reaction.

In case of Phenol, the intermediate carbocation is more resonance stabilised.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: b

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11. Assertion : Phenol undergoes Kolbe's reaction whereas ethanol does not .

Reason : Phenoxide ion is more basic than ethoxide ion .

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: c

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12. Assertion: The pK_a of acetic acid is lower than that of phenol.

Reason : Phenoxide ion is more resonance sabilised.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: a

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13. Assertion: Phenol forms $2, 4, 6 -$ tribromophenol on treatement with Br_2 water at $373K$.

Reason: Phenol is $o - p$-directing group.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: b

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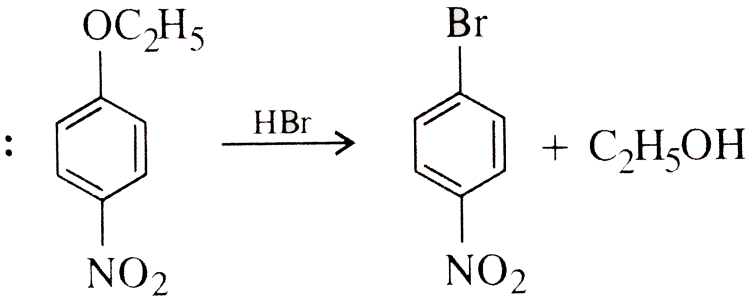

14. Assertion :

Reason : Alkyl arly ethers on reaction with halogen acids always from aryl halide due to formation of more stable carbocation.

A. If both assertion and reason are correct and reason is correct explanation for assertion.

B. If both assertion and reason are correct but reason is not correct for assertion.

C. If assertion is correct but reason is incorrect.

D. If both assertion and reason are incorrect.

Answer: c

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Integer Answer Type Questions

1. How many isomeric alkenes are possible by the dehydration of 2,3-dimethyl butan-1-ol?

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2. How many structurally isomeric pentyl alcohols will give immediate turbidity with lucas reagent ?

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3. Total number of open chain structural alcohols and ethers corresponding to molecular formula _ $(4)H_{10}O$ is :-

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4. How many will undergo haloform reaction among the following ?

CH_3COCH_3, $CH_3CH(OH)CH_3$, CH_3OH, C_2H_5OH

$CH_3CH_2CH_2OH$

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5. 30 g of CH_3MgBr reacts with excess of $CH_3CH_2CH_2OH$ forming xg of a gas. What is the value of x?

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6. Total number of isomeric ethers chrial carbon atom in the molecular formula $C_5H_{12}O$ is :

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7. How many of strucurally isomeric pentyl alcohols wil give immediate turbidiy in Lucas reagent ?

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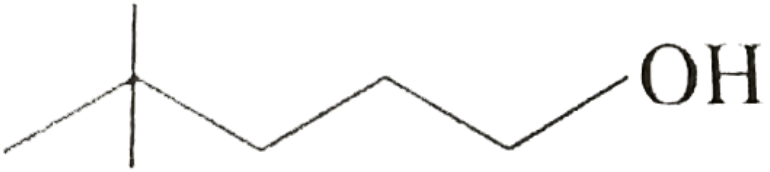
Mcqs

1. Predict the product when alcohol



undergoes dehydration with conc. H_2SO_4.

A.

B.

C. (c) 

D. (d) 

Answer: D

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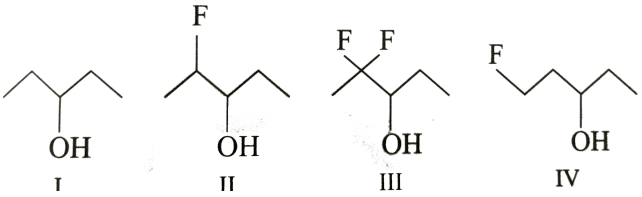
2. Arrange the following alcohols in order of reactivity towards gaseous HBr :



A. $II > III > IV > I$

B. $I > II > III > IV$

C. $III > II > IV > I$

D. $I > IV > II > III$

Answer: C

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3. An alcohol (A) on heating with concentrated H_2SO_4 gives alkene (B) as major product and (B) can shown the geometrical isomerism . The compound (A) is :

A. $(CH_3)_2C(OH)CH(CH_3)_2$

B. $(CH_3)_2(OH)CH_2CH_3$

C. $CH_3CH_2CH(OH)CH_3$

D. All the above.

Answer: C

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4. Consider the following reaction

$\underset{\text{Ester(x)}}{C_4H_8O_2} \xrightarrow[(ii)H_3O^+]{(i)\,CH_3MgBr\,(\text{Excess})} \underset{\text{Alcohol(Y)}}{C_4H_{10}O}$ Alcohol (Y) reacts fastest with Lucas reagent. Therefore (X) and (Y) are

A. (a) $CH_3\overset{\overset{O}{||}}{C}OC_2H_5, (CH_3)_3COH$

B. $H\overset{\overset{O}{||}}{C}OC_3H_7, (CH_3)_2CHOH$

C. $CH_3\overset{\overset{O}{||}}{C}OC_2H_5, (CH_3)_3COH$

D. $H\overset{\overset{O}{||}}{C}OC_3H_7, (CH_3)_2COH$

Answer: A

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5. $H_3C-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-CH=CH_2 \rightarrow H_3C-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-\underset{\underset{OH}{|}}{CH}-CH_3$. This change can be done by.

A. acid catalysed hydration

B. Oxymercuration -demercuration

C. hydroboration -oxidation

D. any mehod can be used.

Answer: B

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6. $CH_3 - \overset{CH_2CH_3}{\underset{|}{C}}H \ CH = CHCH_3 \xrightarrow{H_3O^+}$

Major product of the reaction

A. is an potical isomer

B. gives white turbidity with with Lucas reagent immediately

C. is dehydrated easily

D. All options are correct.

Answer: D

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7. The most effective pair of reagents for the preparation of tert bytyl ethyl ehter is :

A. potassium tert-bytoxide and ethyl bromide

B. potassium tert-butoxide and ethanol

C. sodium ethxoide and tert-butyl bromide.

D. tert-butyl alcohol and ethyl bromide.

Answer: A

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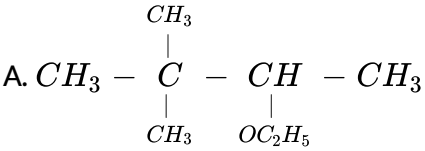
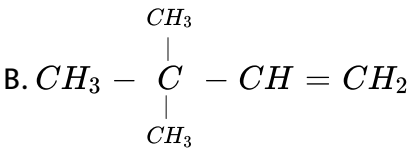
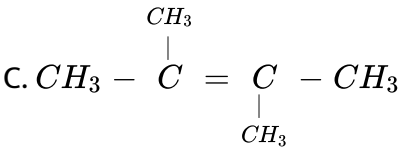
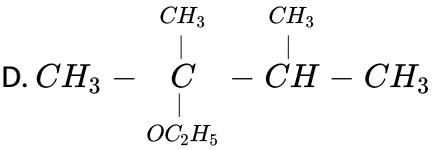
8. Major product of the given reaction is

$$CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{CI}{|}}{CH} - CH_3 \xrightarrow{C_2H_5O^-}$$

A. 

B. 

C. 

D. 

Answer: C

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