

Alcohol & Ether

1. Preparation of Alcohol, Hydrolysis of Ester

- Q 1. Which is reversible reaction with ester ?
 (A) Acid catalysed hydrolysis
 (B) Base catalysed ester
 (C) Both A and B
 (D) None of these
- Q 2. The ease of hydrolysis for the following ester
- $$\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{OC}_2\text{H}_5$$

I

$$\begin{array}{c} \text{CH}_3 \\ \diagdown \\ \text{CH} - \overset{\text{O}}{\parallel} \text{C} - \text{OC}_2\text{H}_5 \\ \diagup \\ \text{CH}_3 \end{array}$$

II
- $$\text{CF}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{OC}_2\text{H}_5$$

III
- (A) III > II > I (B) I > II > III
 (C) III > I > II (D) II > I > III
- Q 3. In the reaction
-
- Product, formed is
 (A) Retention product (B) Inversion product
 (C) Racemic mixture (D) d-l pair
- Q 4. In the reaction
- $$\text{CH}_3\text{NH}_2 \xrightarrow[\text{HCl}(0^\circ\text{C})]{\text{Aqs. NaNO}_2}$$
- Product is
 (A) CH₃OH (B) CH₃NO
 (C) CH₃Cl (D) CH₃CN
- Q 5. Which of the following amine gives an yellow oil with aqs. NaNO₂ / HCl
 (A) 1°R - NH₂ (B) 2°R - mine
 (C) 3° Amine (D) None of these
- Q 6. Which of the following Reactants in not reduced by NaBH₄ ?
 (A) R - CHO (B) R - $\overset{\text{O}}{\parallel}$ C - R'

- (C) R - $\overset{\text{O}}{\parallel}$ C - Cl (D) R - $\overset{\text{O}}{\parallel}$ C - OR'
- Q 7. B₂H₆ / H⁺, H₂O can reduce

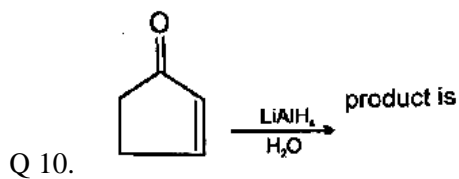
- (A) R - CHO (B) R - $\overset{\text{O}}{\parallel}$ C - R'
- (C) R - $\overset{\text{O}}{\parallel}$ C - Cl (D) R - $\overset{\text{O}}{\parallel}$ C - OR'


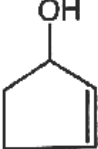
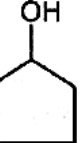
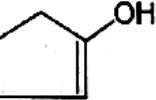
- Q 8. $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_3 \xrightarrow[\text{D}_2\text{O}]{\text{NaBH}_4}$ product is

- (A) $\text{CH}_3 - \overset{\text{OH}}{\text{C}} - \text{CH}_3$ (B) $\text{CH}_3 - \overset{\text{OD}}{\text{C}} - \text{CH}_3$
- (C) $\text{CH}_3 - \overset{\text{OD}}{\text{C}} - \text{CD}_3$ (D) $\text{CH}_3 - \overset{\text{OD}}{\text{C}} - \text{CH}_3$

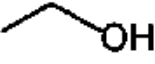
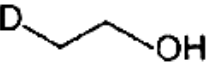
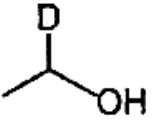
Q 9.

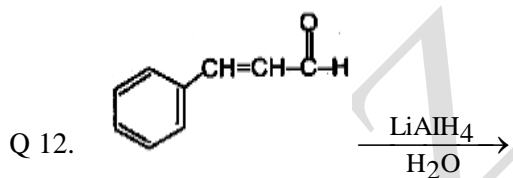
- product is
- (A)
- (B)
- (C)
- (D)

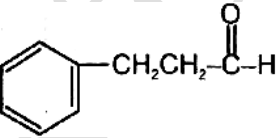
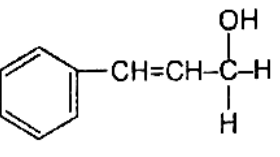


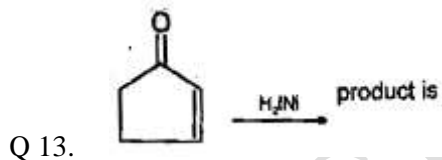
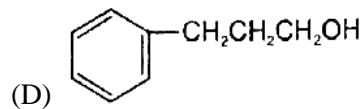
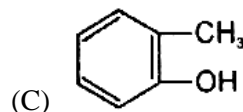
- (A)  (B) 
 (C)  (D) 

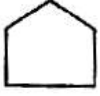
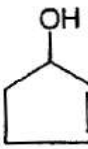
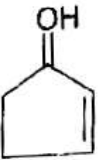
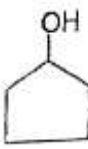


- (A)  (B) 
 (C)  (D) None of these

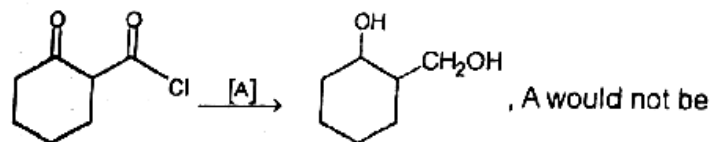


- (A) 
 (B) 



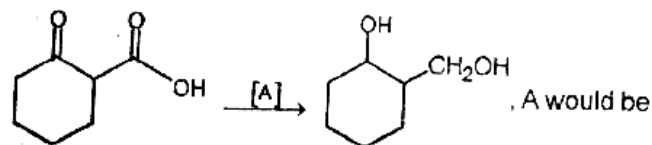
- (A)  (B) 
 (C)  (D) 

Q 14.



- (A) LiAlH_4 (B) NaBH_4
 (C) $\text{B}_2\text{H}_6/\text{THF}$ (D) Ni/H_2

Q 15.

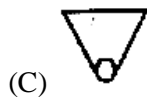


- (A) NaBH_4 (B) Ni/H_2
 (C) LiAlH_4 (D) Both B and C

Q 16. Write the product of the reaction of LiAlD_4

followed by H_3O^+ with

- (A) $\text{Ph}_2\text{C}=\text{O}$ (B) $\text{CH}_3\text{CH}=\text{CHCH}=\text{O}$



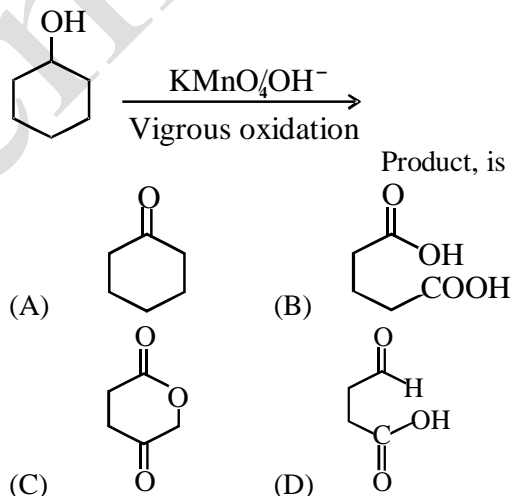
2. Physical & Chemical Properties of Alcohol

- Q 1. The correct acidic strength order is
 (A) $\text{CH}_3\text{OH} > \text{CH}_3\text{CH}_2\text{OH} > (\text{CH}_3)_2\text{CHOH}$
 (B) $(\text{CH}_3)_2\text{CHOH} > \text{CH}_3\text{CH}_2\text{OH} > \text{CH}_3\text{OH}$
 (C) $\text{CH}_3\text{OH} > (\text{CH}_3)_2\text{CHOH} > \text{CH}_3\text{CH}_2\text{OH}$
 (D) $\text{CH}_3\text{CH}_2\text{OH} > \text{CH}_3\text{OH} > (\text{CH}_3)_2\text{CHOH}$
- Q 2. Among isomeric alcohols, the correct order of M.P. is
 (A) $1^\circ\text{ROH} > 2^\circ\text{ROH} > 3^\circ\text{ROH}$
 (B) $3^\circ\text{ROH} > 2^\circ\text{ROH} > 1^\circ\text{ROH}$
 (C) $2^\circ\text{ROH} > 3^\circ\text{ROH} > 1^\circ\text{ROH}$
 (D) None of these
- Q 3. $\text{C}_2\text{H}_5\text{OH}$ is not dried using
 (A) P_2O_5 (B) H_2SO_4
 (C) CaCl_2 (D) None of these
- Q 4. Which of the following compounds is oxidized to prepare ethyl methyl ketone?
 (A) Propan-2-ol (B) Butan-2-ol
 (C) Butan-1-ol (D) Tertiary butyl alcohol
- Q 5. An alcohol on oxidation is found to give CH_3COOH and $\text{CH}_3\text{CH}_2\text{COOH}$. The structure of the alcohol is
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 (B) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$
 (C) $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$
 (D) $(\text{CH}_3)_3\text{C}(\text{OH})\text{CH}_2\text{CH}_3$
- Q 6. The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is
 (A) acidic permanganate
 (B) acidic dichromate
 (C) chromic anhydride in glacial acetic acid
 (D) pyridinium chlorochromate
- Q 7. The most suitable reagent for the conversion of

primary alcohol into aldehyde with the same number of carbon is

- (A) acidified $\text{K}_2\text{Cr}_2\text{O}_7$ (B) acidified KMnO_4
 (C) alkaline KMnO_4
 (D) pyridinium chlorochromate (PCC)
 (E) CrO_3

- Q 8. Write the steps in the Grignard reaction between an alkylmagnesium halide, RMgX , and (a) a carbonyl compound and (b) an ethylene oxide.
- Q 9. In general, oxidation of 1°ROH can't be stopped at R-CHO , because
 (A) RCHO is not stable
 (B) RCOOH is more stable
 (C) RCHO is easier to oxidise than ROH
 (D) RCHO is difficult
- Q 10. In the reaction



- Q 11. In the oxidation of 3°R-OH , which condition is required
 (A) Acidic condition (B) basic condition
 (C) Neutral condition (D) Any condition
- Q 12. A compound 'X' undergoes reduction with LiAlH_4 to yield 'Y'. When vapours of 'Y' are passed over freshly reduced copper at 300°C , 'X' is formed. What is 'Y' ?
 (A) CH_3COCH_3 (B) CH_3CHO
 (C) $\text{CH}_3\text{CH}_2\text{OH}$ (D) $\text{CH}_3-\text{O}-\text{CH}_3$
- Q 13. An organic compound 'X' on treatment with pyridinium chlorochromate in dichloromethane gives compound 'Y'. Compound 'Y', reacts with

I_2 and alkali to form tri-iodomethane. The compound 'X' is

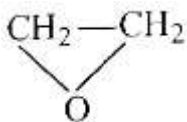
- (A) C_2H_5OH (B) CH_3CHO
(C) CH_3COCH_3 (D) CH_3COOH

Q 14. When compound 'X' is oxidized by acidified potassium dichromate, compound 'Y' is formed. Compound 'Y' on reduction with $LiAlH_4$ gives 'X'. 'X' and 'Y' respectively are

- (A) C_2H_5OH, CH_3COOH
(B) CH_3COCH_3, CH_3COOH
(C) C_2H_5OH, CH_3COCH_3
(D) CH_3CHO, CH_3COCH_3

Q 15. 2-Phenylethanol may be prepared by the reaction of phenyl magnesium bromide with

- (A) $HCHO$ (B) CH_3CHO



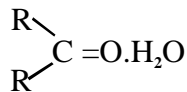
- (C) CH_3COCH_3 (D)

Q 16. Upon oxidation, an alcohol gave a carbonyl compound containing same number of carbon atoms. The alcohol is a

- (A) primary alcohol (B) secondary alcohol
(C) tertiary alcohol
(D) primary or secondary alcohol

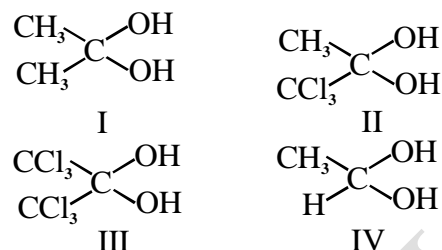
3. Hydrates, Hemiacetal, Hemiketal, Acetal, Ketal

Q 1. Which of the following hydrates is more stable ?



- (A) $R-CHO-H_2O$ (B)
(C) CCl_3CHO-H_2O (D) CH_3CHO-H_2O

Q 2. The correct order of stability of following hydrates is

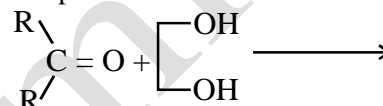


- (A) $I > II > III > IV$ (B) $III > IV > II > I$
(C) $III > II > IV > I$ (D) $IV > III > II > I$

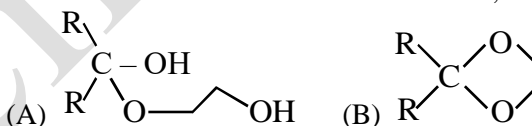
Q 3. Which of the following process is not reversible ?

- (A) Acid catalysed ketal formation
(B) base catalysed ketal forma
(C) Acid catalysed hemiacetal formation
(D) base catalysed hemiketal formation

Q 4. The product on the reaction

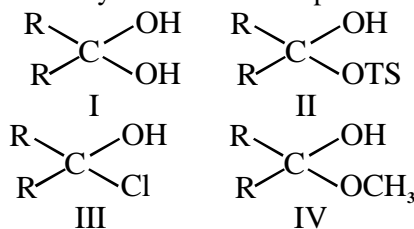


Product, is



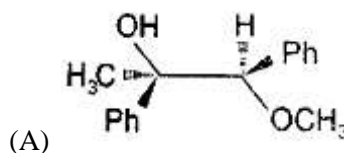
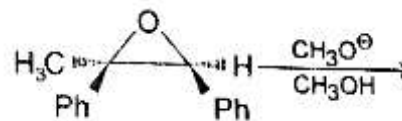
- (C) (D) None of these

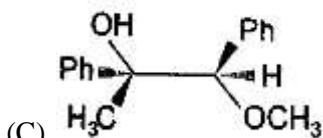
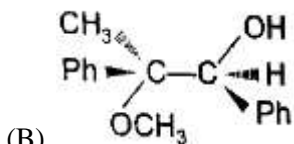
Q 5. The stability order of the compounds



- (A) $I > II > III > IV$ (B) $II > I > III > IV$
(C) $IV > I > III > II$ (D) $IV > II > III > I$

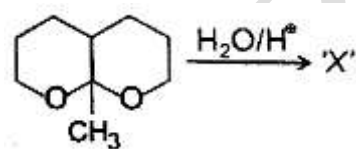
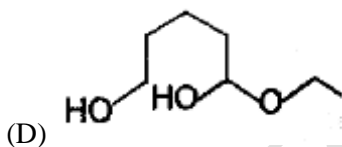
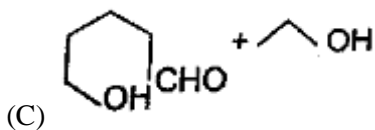
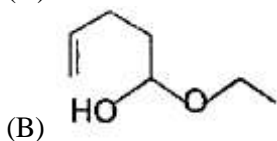
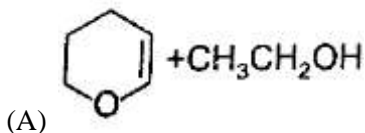
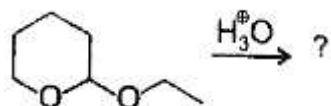
Q 6. What would be the major product of the following reaction ?





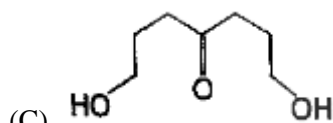
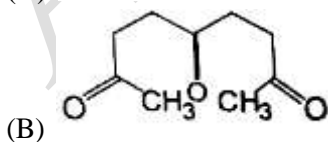
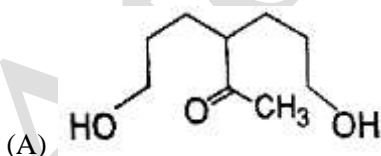
(D) None of these

Q 7. The major product formed in the reaction is



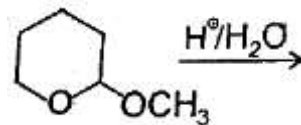
Q 8.

'X' will be

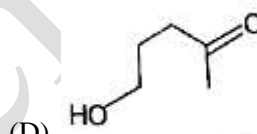
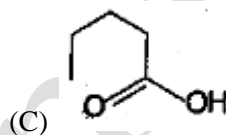
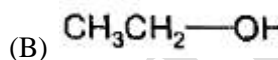
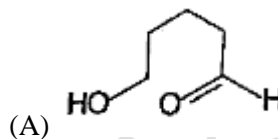


(D) All of these

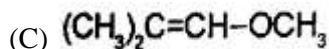
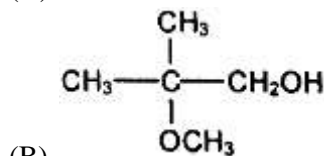
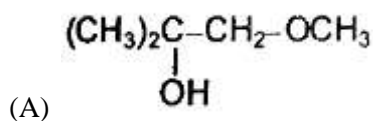
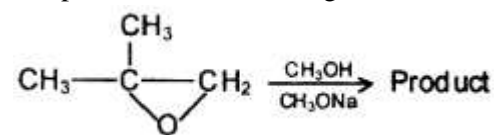
Q 9.



Major product (P), P is

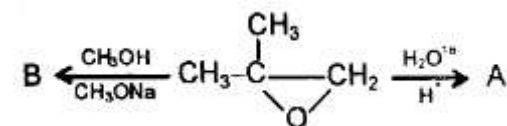


Q 10. The product formed in the given reaction is

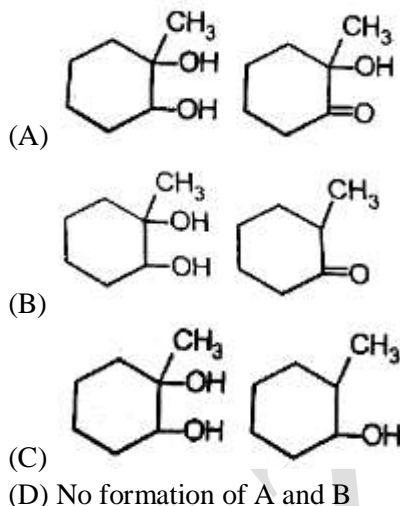
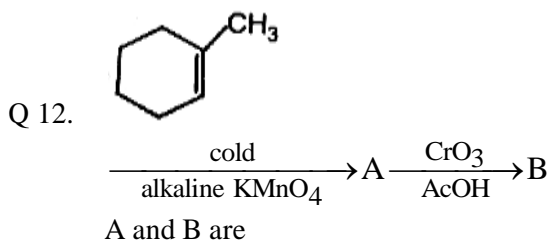
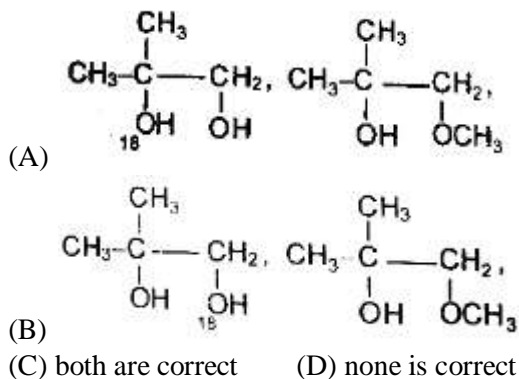


(D) None of these

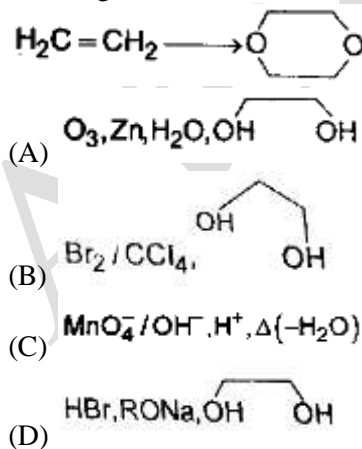
Q 11.



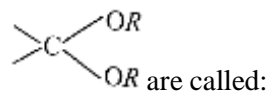
(A) and (B) are



Q 13. The reagents used in the following conversion are



Q 14. Compounds of general formula,



- (A) diesters (B) acid anhydrides
(C) hemiacetals (D) acetals

- Q 15. In the reaction,
 $(\text{CH}_3)_2\text{C}=\text{O} + \text{X} \rightarrow (\text{CH}_3)_2\text{C}(\text{OC}_2\text{H}_5)_2 + \text{HCOOC}_2\text{H}_5$, X is
 (A) ethyl oxalate (B) propan-2-ol
 (C) ethyl ortho formate (D) none of these

4. Test & Reaction of Alcohol

- Q 1. Which of the following gives effervescence of H_2 gas with Na-metal?
 (A) Acid (B) Alcohol
 (C) H_2O (D) All of these
- Q 2. In victor mayer test of alcohols, the reagent used is
 (A) $\text{PI}_3, \text{AgNO}_2$ (B) $\text{PI}_3, \text{AgNO}_2, \text{NaOH}$
 (C) $\text{PI}_3, \text{NaNO}_2$ (D) PI_3, AgOH
- Q 3. In victor mayer test, which alcohol gives blue colour
 (A) $1^\circ\text{R}-\text{OH}$ (B) 2°ROH
 (C) 3°ROH (D) None of these
- Q 4. Which of the following compound given red colour with ceric Ammonium Nitrate ?
 (A) Acid (B) Aldehyde
 (C) Alcohol (D) Amine
- Q 5. The hydroxyl compound that gives a precipitate immediately when treated with concentrated HCl and anhydrous ZnCl_2 is
 (A) 3-methyl-2-butanol (B) 3-methyl-1-butanol
 (C) 1-butanol (D) 2-methyl-2-butanol
 (E) 2,3-dimethyl-1-butanol
- Q 6. Lucas test is used for the determination of
 (A) aldehydes (B) phenols
 (C) carboxylic acids (D) alcohols
- Q 7. Compound 'A' of molecular formula $\text{C}_4\text{H}_{10}\text{O}$ on treatment with Lucas reagent at room temperature gives compound 'B'. When

- compound 'B' is heated with alcoholic KOH, it gives isobutene. Compound 'A' and 'B' are respectively:
- (A) 2-methyl-2-propanol and 2-methyl-2-chloropropane
 (B) 2-methyl-1-propanol and 1-chloro-2-methylpropane
 (C) 2-methyl-1-1-propanol and 2-methyl-2-chloropropane
 (D) butan-2-ol and 2-chlorobutane
 (E) butan-1-ol and 1-chlorobutane
- Q 6. The group reagent for the test of alcohols is
 (A) ceric ammonium nitrate
 (B) Schiff's reagent
 (C) Molisch's reagent
 (D) bromine water
- Q 7. Absolute alcohol cannot be obtained by simple fractional distillation because
 (A) pure C_2H_5OH is unstable
 (B) C_2H_5OH forms H bonding with water
 (C) B.P. of C_2H_5OH is close to that of water
 (D) constant boiling azeotropic mixture is formed with water
- Q 8. The boiling point of ethanol is higher as compared to the boiling point of diethyl ether though both have the same molecular formula. This is due to
 (A) resonance (B) H-bonding
 (C) R-group (D) covalent bonding
- Q 9. The product formed, when glycol is heated with anhydrous zinc chloride, is
 (A) acetaldehyde (B) glyoxal
 (C) oxalic acid (D) ethylene oxide
- Q 10. The product formed, when glycol is heated with conc. H_2SO_4 , is
 (A) ethylene (B) dioxane
 (C) ethylene oxide (D) glyoxal
- Q 11. An organic compound (A) reacts with methyl magnesium iodide to form an addition product which on hydrolysis forms the compound (B). Compound (B) gives blue colour slat in Victor Meyer's test. The compounds (A) and (B) are respectively:
 (A) acetaldehyde, tertiary butyl alcohol
 (B) acetaldehyde, ethyl alcohol
 (C) acetaldehyde, isopropyl alcohol
 (D) acetone, isopropyl alcohol
- Q 12. In the Victor Meyer's test, the colours given by 1° , 2° and 3° alcohols are respectively
 (A) red, colourless, blue (B) red, blue, colourless
 (C) colourless, red, blue (D) red, blue, violet
 (E) blue, red, violet
- Q 13. 0.44 g of a monohydric alcohol when added to CH_3MgI in ether liberates at NTP., 112 cc of methane. With PCC the same alcohol forms a carbonyl compound that answer silver mirror test. The monohydric alcohol is

$$CH_3-CH-CH_2-CH_3$$
 (A)
$$\begin{array}{c} | \\ OH \end{array}$$

 (B) $(CH_3)_3C-CH_2OH$

$$CH_3-CH-CH_2CH_2CH_3$$

 (C)
$$\begin{array}{c} | \\ OH \end{array}$$

 (D) $(CH_3)_2CH-CH_2OH$
- Q 14. Which of the following is the most suitable method for removing the traces of water from ethanol ?
 (A) Heating with Na metal
 (B) Distilling it
 (C) Passing dry HCl gas through it
 (D) Reacting with Mg

5. Reactions of Alcohol

- Q 1. Ethyl alcohol is heated with cone. H_2SO_4 . The product formed is
 (A) $H_3C-C(=O)-OC_2H_5$ (B) C_2H_6
 (C) C_2H_4 (D) C_2H_2
- Q 2. Which of the following is soluble in water?
 (A) CS_2 (B) C_2H_5OH
 (C) CCl_4 (D) $CHCl_3$
- Q 3. The compound which reacts faster with Lucas reagent at room temperature is
 (A) butan-1-ol (B) butan-2-ol
 (C) 2-methylpropan-1-ol
 (D) 2-methylpropan-2-ol

- Q 4. An industrial method of preparation of CH_3OH is
 (A) catalytic reduction of carbon monoxide in presence of $\text{ZnO-Cr}_2\text{O}_3$
 (B) by reacting methane with steam at 900°C with a nickel catalyst
 (C) by reducing formaldehyde with aqueous sodium hydroxide solution
 (D) None of these
- Q 5. HBr reacts fastest with
 (A) 2-methylpropane-2-ol (B) propan-1-ol
 (C) propan-2-ol (D) 2-methylpropan-1-ol
- Q 6. Which of the following compounds is oxidised to prepare ethyl methyl ketone?
 (A) 2-propanol (B) 1-butanol
 (C) 2-butanol (D) t-butyl alcohol
- Q 7. The product of acid catalysed hydration of 2-phenylpropene is
 (A) 3-phenyl-2-propanol
 (B) 1-phenyl-2-propanol
 (C) 2-phenyl-2-propanol
 (D) 2-phenyl-1-propanol
- Q 8. Ethyl alcohol can be distinguished from methyl alcohol by :
 (A) action of Cl_2
 (B) action of NH_3
 (C) Determining their solubility in H_2O
 (D) iodoform test
- Q 9. Why is methanol is more toxic than ethanol?
- Q 10. Predicts the R/S label of the product of the reaction of Conc. HX with
 (A) (R)-2-hexanol ($\text{S}_\text{N}2$ condition)
 (B) (R)-3-methyl-3-hexanol.
- Q 11. Explain why Na may be used to remove the last traces of H_2O from benzene but not from ethanol.
- Q 12. Outline a synthesis of each of the alcohol from the indicated starting materials:
 (A) Isopropyl alcohol from a hydrocarbon.
 (B) n-butyl alcohol from acetylene
 (C) allyl alcohol from propene
 (D) t-butyl alcohol from t-butyl chloride
- Q 13. Why is KMnO_4 not the reagent of choice for the preparation of methyl vinyl ketone from the corresponding alcohols?. Why can MnO_2 be used for this synthesis.
- Q 14. An organic liquid (A), containing C, H and O with boiling points 78°C and possessing a rather

pleasant odour, on heating with concentrated sulphuric acid gives a gaseous product (B) with the empirical formula, CH_2 . B decolourises bromine water as well as alkaline KMnO_4 solution and takes up one mole of H_2 (per mole of B) in the presence of finely divided nickel at high temperature Identify the structures A and B.

- Q 15. An alcohol A, when heated with concentrated H_2SO_4 gives an alkene B. When B is bubbled through bromine water and the product obtained is dehydrohalogenated with excess of sodamide, a new compound C is obtained. The compound C gives D when treated with warm dilute H_2SO_4 in presence of HgSO_4 . D can also be obtained either by oxidising A with KMnO_4 or from acetic acid through its Ca salt. Identify A, B, C & D.

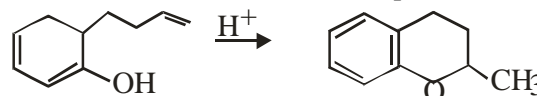
[IIT JEE 1983]

- Q 16. An optically active alcohol A ($\text{C}_6\text{H}_{10}\text{O}$) absorbs two moles of hydrogen per mole A upon catalytic hydrogenation and gives a product B. The compound B is resistant to oxidation by CrO_3 and does not show any optical activity. Deduce the structures of A and B.

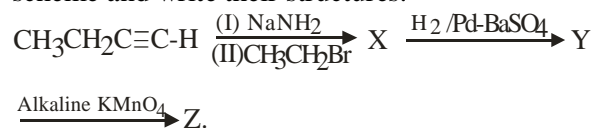
[IIT JEE 1996]

- Q 17. Write the intermediate steps for the following reaction.

[IIT JEE 2003]



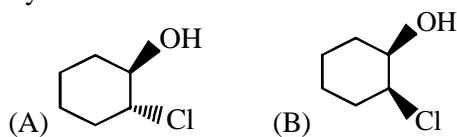
- Q 18. Identify X, Y and Z in the following synthetic scheme and write their structures.

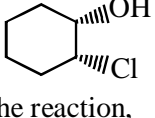


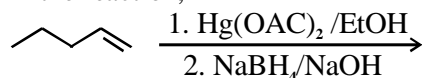
6. Ether & its properties

- Q 1. The bond angle $\angle \text{C-O-C}$ in CH_3OCH_3 is
 (A) $109^\circ 28'$ (B) 107°
 (C) 140.5° (D) 111°
- Q 2. Williamson synthesis of ether follows
 (A) $\text{S}_\text{N}1$ pathway (B) $\text{S}_\text{N}2$ pathway

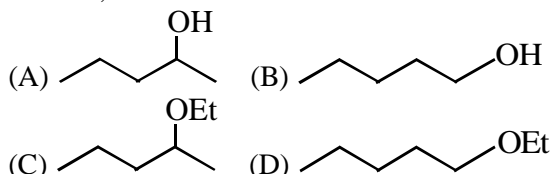
- (C) S_N1 pathway (D) None of these
- Q 3. Which of the following undergo Williamson Synthesis?



- (C)  (D) None of these
- Q 4. In the reaction,



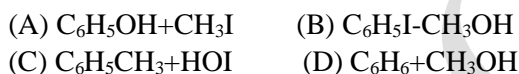
Product, is



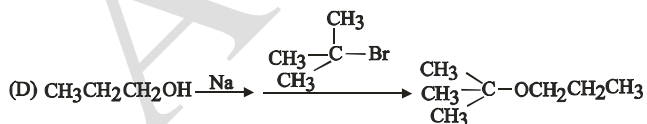
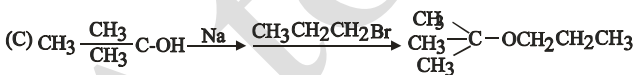
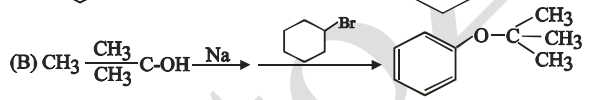
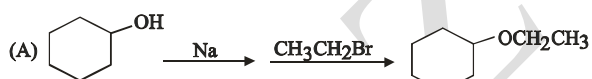
- Q 5. Diethyl ether on heating with concentrated HI gives two moles of



- Q 6. The reaction products of $\text{C}_6\text{H}_5\text{OCH}_3 + \text{HI} \xrightarrow{\Delta}$ is



- Q 7. Consider the following synthetic reactions involving Williamson Ether synthesis :

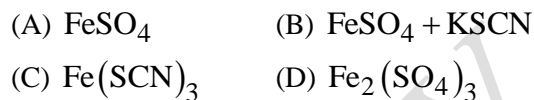


Which of the above reactions constitute good synthesis ?

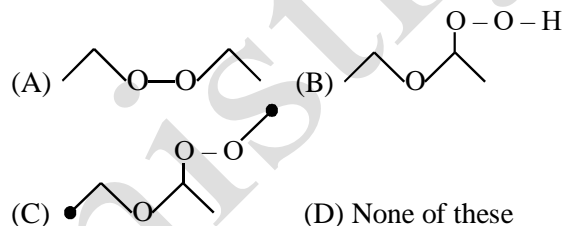
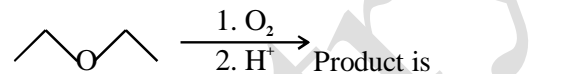


- Q 8. Ether on standing in air cause explosion due to

- (A) Alcohol formation (B) Ester formation
(C) Epoxide formation (D) peroxide formation
- Q 9. To prevent explosion of ether, which compound is used

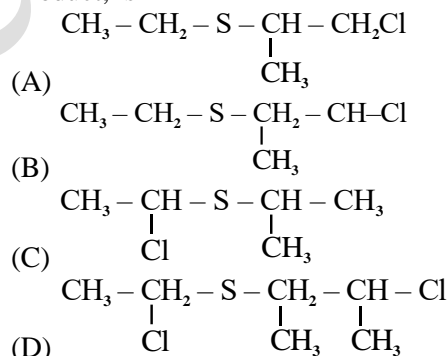


- Q 10. The Auto oxidation of ether

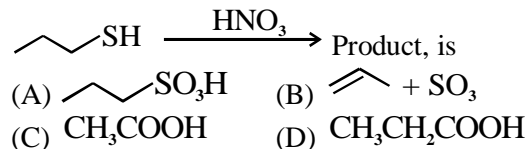


- Q 11. In the reaction
- $$\text{CH}_3 - \text{CH}_2 - \text{S} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2\text{OH} \xrightarrow{\text{HCl}}$$

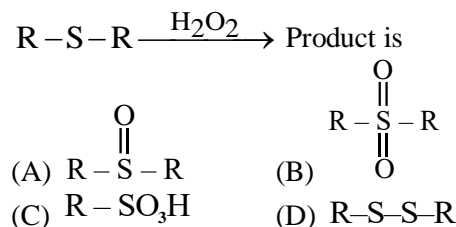
Product, is



- Q 12. In the reaction



- Q 13. In the reaction



Answer Key

1. Preparation of Alcohol, Hydrolysis of Ester

- (1). A (2). C (3). B
 (4). A (5). B (6). D
 (7). C (8). D (9). A
 (10). B (11). B (12). D
 (13). D (14). C (15). D
 (16).
 (A). $Ph-CD(OH)-Ph$
 (B). $CH_3-CHD-CH=CH-OH$
 (C). CH_2D-CH_2-OH

2. Physical & Chemical Properties of Alcohol

- (1). A (2). A (3). C
 (4). B (5). C (6). D
 (7). D (8). C (9). C
 (10). B (11). A (12). C
 (13). A (14). A (15). C
 (16). D

3. Hydrates, Hemiacetal, Hemiketal, Acetal, Ketal

- (1). C (2). C (3). B
 (4). B (5). C (6). A
 (7). C (8). A (9). A
 (10). A (11). A (12). A
 (13). A (14). D (15). A

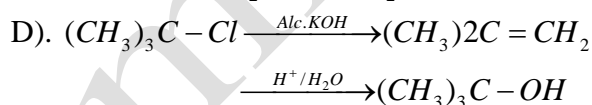
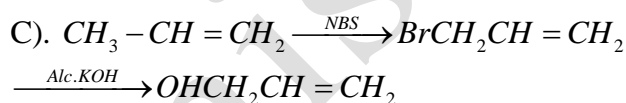
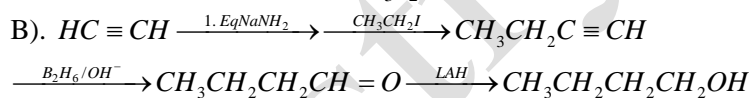
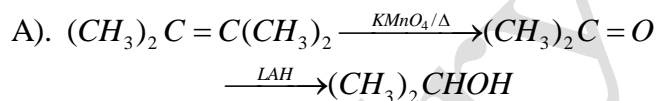
4. Test & Reaction of Alcohol

- (1). D (2). B (3). B
 (4). C (5). D (6). D
 (7). A (8). A (9). D
 (10). B (11). A (12). B
 (13). C (14). B (15). B
 (16). D

5. Reactions of Alcohol

- (1). C (2). B (3). D
 (4). A (5). A (6). C
 (7). C (8). D
 (9). Because Methanol is metabolized (converted by enzyme) to Formaldehyde (and then Formic Acid) whereas Ethanol is metabolized into Acetaldehyde (and then acetic Acid) which is less toxic than Formaldehyde.

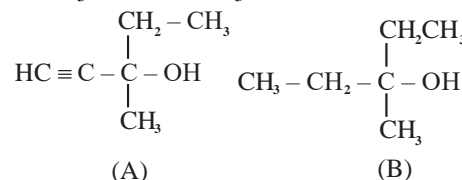
- (10). A). S configuration B). R & S both
 (11). Because Na reacts with Ethanol & evolve H_2 gas. $Na + C_2H_5OH \longrightarrow C_2H_5ONa + H_2$
 (12).



- (13). Because $KMnO_4$ will oxidise both Alcohol as well as double bonds. Whereas MnO_2 will oxidise only OH Group

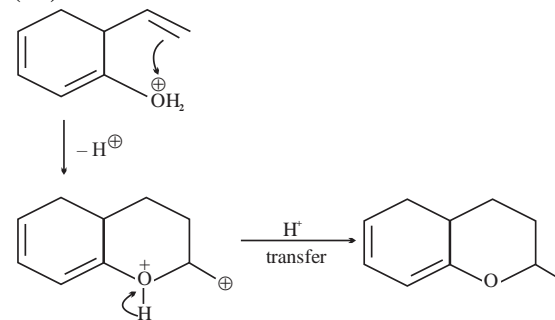
- (14). $CH_3CH_2OCH_2CH_3$ (A),
 $CH_2=CH_2$ (B)
 $CH_3-CH(OH)-CH_3$ (A)
 $CH_3-CH=CH_2$ (B)

- (15). $CH_3-C \equiv CH$ (C)
 $CH_3-CO-CH_3$ (D)

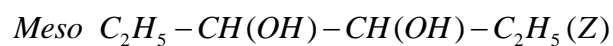
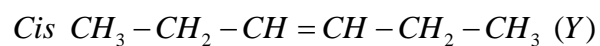
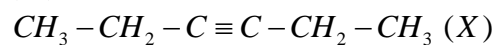


(16). (A)

(17).



(18).



6. Ether & its properties

- | | | |
|---------|---------|---------|
| (1). D | (2). B | (3). A |
| (4). C | (5). C | (6). A |
| (7). C | (8). D | (9). B |
| (10). B | (11). D | (12). A |
| (13). B | | |