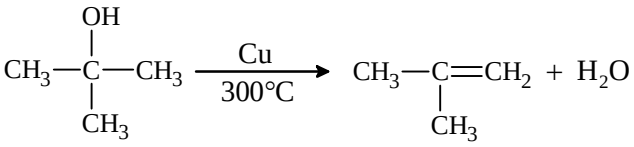
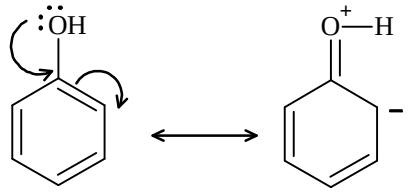
SOLUTION TEST-B

1. 2-methyl propan-2-ol undergo dehydration and not dehydrogenation at 300°C in the presence of Cu.



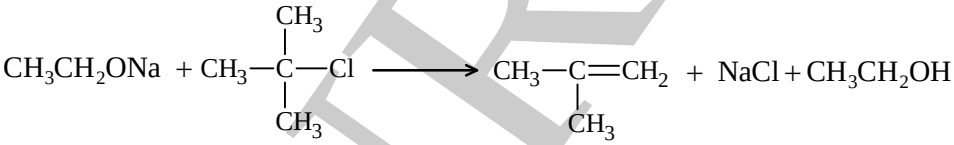
The correct answer is (iii)

2. Due to resonance, oxygen atom in phenol acquires positive charge. Therefore, it is difficult to add H^+ ion to phenol.



The correct answer is (iv)

3. Willamson's synthesis is an example of S_N2 reaction. The given alkyl halide is 3° alkyl halide and undergo dehydrohalogenation to form 2-methyl propene and not ether.

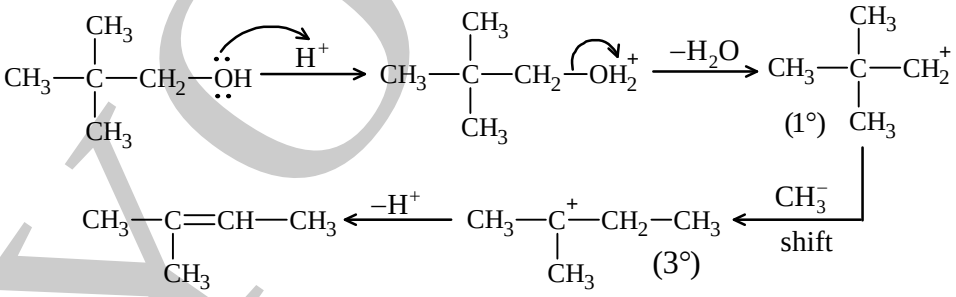


The correct answer is (iv)

4. The ethers have a lower boiling points than alcohols. This is due to inability of ethers to associate via intermolecular hydrogen bonding.

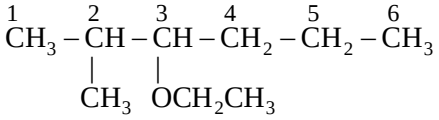
The correct answer is (ii)

5.

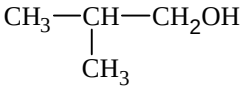


The correct answer is (i)

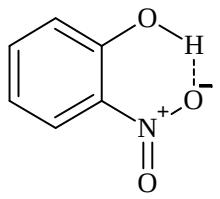
6. (i)



(ii)

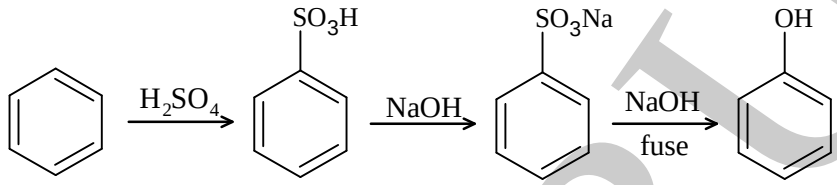


7. Orthonitro phenol is steam volatile due to intramolecular hydrogen bonding.



8. (i) $CH_3 - MgBr + CH_3CHO \xrightarrow{\text{dry ether}} CH_3-\underset{\underset{OMgBr}{|}}{CH}-CH_3 \xrightarrow{H_2O/H^+} CH_3-\underset{\underset{OH}{|}}{CH}-CH_3$

(ii)

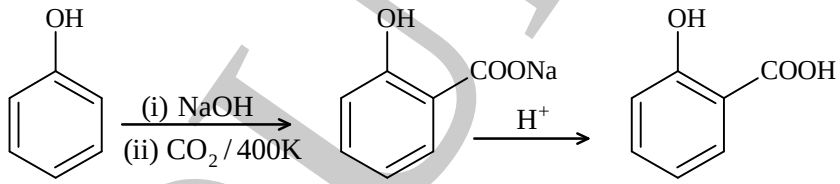


9. (i) **Hydroboration-oxidaiton**

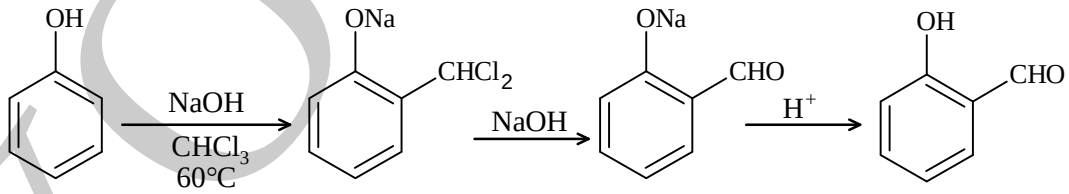
Alkene on reaction with diborane gives trialkyl borane. Trialkyl borane on oxidation with alkaline hydrogen peroxide gives alcohol.

$$3CH_3CH=CH_2 \xrightarrow{B_2H_6} (CH_3CH_2CH_2)_3B \xrightarrow{H_2O_2/OH^-} 3CH_3CH_2CH_2OH$$

(ii) **Kolbe reaction:** Phenol on reaction with sodium hydroxide and carbon dioxide gas at 400 K, 4-7 atm gives sodium salicylate which on hydrolysis gives salicylic acid.



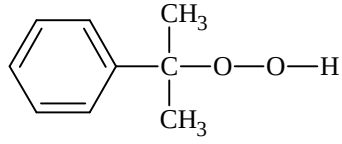
10. (i)



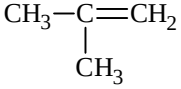
(ii)

$$CH_3CH=CH_2 \xrightarrow[H^+]{H_2O} CH_3-\underset{\underset{CH_3}{|}}{CHOH} \xrightarrow{Na} CH_3-\underset{\underset{CH_3}{|}}{CHO^-}Na^+ \xrightarrow{CH_3-Br} CH_3-\underset{\underset{CH_3}{|}}{CH}-O-CH_3$$

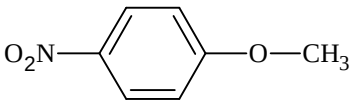
11. (i)



(ii)

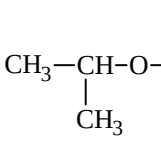
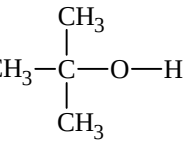


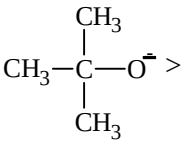
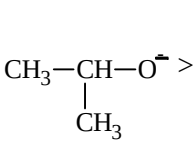
(iii)



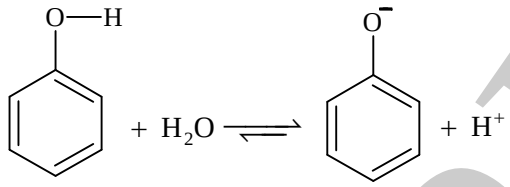
12. (i) This is because secondary and tertiary alcohols tends to form alkene as their carbocations are stable.

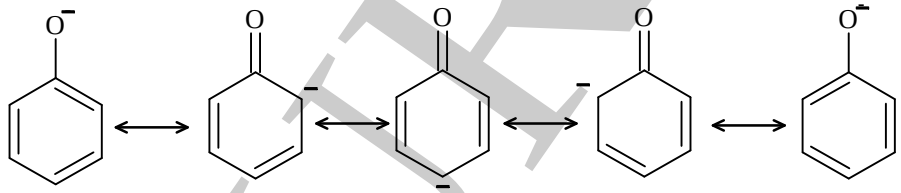
(ii) The acidic strength of alcohols is due to the polar O – H bond. An electron-releasing group (CH_3 or C_2H_5) increases electron density over the oxygen atoms tending to decrease the polarity of O – H bond. This decreases the acid strength. For this reason, the acid strength of alcohols decreases in the order

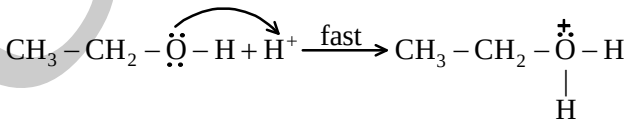
$CH_3CH_2O - H >$  $>$  obviously, the basic strength of their alkoxides

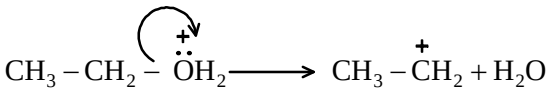
follows the order  $>$  $>$ $CH_3 - CH_2 - O^-$

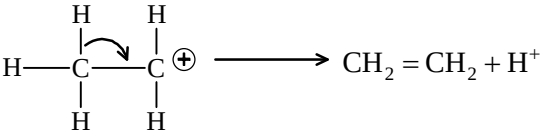
(iii) Phenol is more ionised in water than ethanol because the conjugate base of phenol, the phenoxide ion is more resonance stabilised than ethoxide

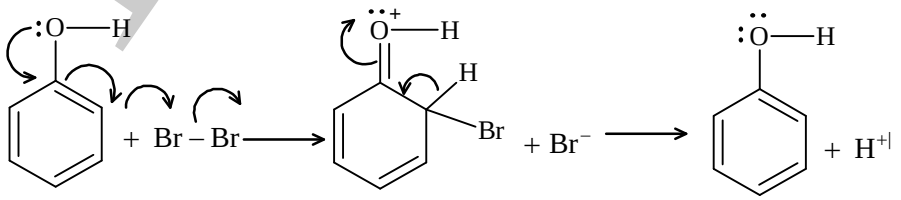




13. (i) Step-(i): Protonation of ethanol 

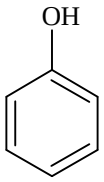
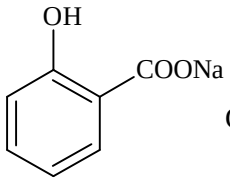
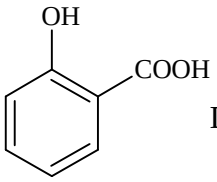
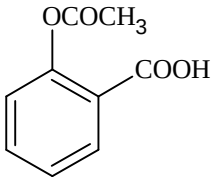
Step-(ii): Loss of water to form carbocation 

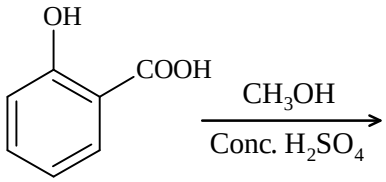
Step-(iii): Loss of H^+ to form ethene 

(ii) 

14. (a) (i) n-butane < ethoxyethane < butan-2-ol < pentanol

(ii) propan-1-ol < 4-methylphenol < phenol < nitrophenol < 3, 5-dinitrophenol < 2, 4, 6-trinitro phenol.

15. (a) (i) A →  B →  C →  D → 

(ii) 

Salicylic acid — Methyl salicylate

(b)

$$HCHO \xrightarrow[H_3O^+]{CH_3MgBr} CH_3CH_2OH \xrightarrow{SOCl_2} CH_3CH_2Cl \xrightarrow{Na\,/\,dry\,ether} CH_3-CH_2-CH_2-CH_3$$

(c) $CH_3CH_2CH_2OH \xrightarrow[413K]{Conc.\ H_2SO_4} CH_3CH_2CH_2OCH_2CH_2CH_3$

