25 Alcohols, Phenols and Ethers

Conceptual MCQs

1. Which one of the following alcohols is least soluble in water?
(a) CH_3OH (b) C_3H_7OH
(c) C_4H_9OH (d) $C_{10}H_{21}OH$

2. How many isomers of $C_5H_{11}OH$ will be primary alcohols ?
(a) 5 (b) 4 (c) 2 (d) 3

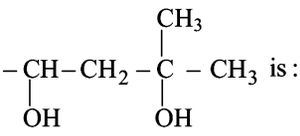
3. Ethyl alcohol can be prepared from Grignard reagent by the reaction of :
(a) HCHO (b) R_2CO (c) RCN (d) RCOCl

4. Methylated spirit is :
(a) methanol (b) methanol + ethanol
(c) methanoic acid (d) methanamide

5. Glycerol is more viscous than ethanol due to :
(a) high molecular weight.
(b) high boiling point.
(c) many hydrogen bonds per molecule.
(d) Fajan's rule.

6. Carbolic acid is :
(a) phenol (b) phenyl benzoate
(c) phenyl acetate (d) salol

7. Which one of the following compounds will be most readily attacked by an electrophile ?
(a) Chlorobenzene (b) Benzene
(c) Phenol (d) Toluene

8. The IUPAC name of  is :
(a) 1, 1-dimethyl-1, 3-butanediol
(b) 2-methyl-2, 4-pentanediol
(c) 4-methyl-2, 4-pentanediol
(d) 1, 3, 3-trimethyl-1, 3-propanediol

9. Which of the following has lowest boiling point ?
(a) *p*-Nitrophenol (b) *m*-Nitrophenol
(c) *o*-Nitrophenol (d) Phenol

10. HBr reacts fastest with :
(a) 2-Methylpropan-1-ol (b) 2-Methylpropan-2-ol
(c) propan-2-ol (d) propan-1-ol.

11. Williamson's synthesis is used to prepare
(a) acetone (b) diethyl ether
(c) P.V.C. (d) bakelite

12. What is formed when a primary alcohol undergoes catalytic dehydrogenation ?
(a) Aldehyde (b) Ketone
(c) Alkene (d) Acid

13. The reaction of sodium ethoxide with ethyl iodide to form diethyl ether is termed :
(a) electrophilic substitution
(b) nucleophilic substitution
(c) electrophilic addition
(d) radical substitution

14. Which one of the following is not formed when glycerol reacts with HI ?
(a) $CH_3 — CHI — CH_3$
(b) $CH_3 — CH = CH_2$
(c) $CH_2OH — CHI — CH_2OH$
(d) $CH_2 = CH — CH_2I$

15. Which of the following product is formed, when ether is exposed to air ?
(a) Oxide (b) Alkanes
(c) Alkene (d) Peroxide of diethyl ether

Application Based MCQs

16. Which is formed when benzylamine react with nitrous acid?
(a) C_6H_5OH (b) C_6H_5ON
(c) $C_6H_5N_2OH$ (d) $C_6H_5CH_2OH$

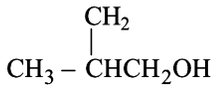
17. *n*-Propyl alcohol and isopropyl alcohol can be chemically distinguished by which reagent?
(a) PCl_5
(b) Reduction
(c) Oxidation with potassium dichromate
(d) Ozonolysis

18. The major product obtained on interaction of phenol with sodium hydroxide and carbon dioxide is :
(a) salicylaldehyde (b) salicylic acid
(c) phthalic acid (d) benzoic acid

19. Ethylene oxide when treated with Grignard reagent yields :
(a) tertiary alcohol (b) cyclopropyl alcohol
(c) primary alcohol (d) secondary alcohol

20. From amongst the following alcohols the one that would react fastest with conc. HCl and anhydrous $ZnCl_2$, is :
(a) 2-Butanol (b) 2- Methylpropan-2-ol
(c) 2-Methylpropanol (d) 1- Butanol

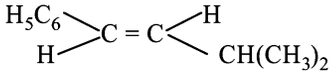
21. Among the following the one that gives positive iodoform test upon reaction with I_2 and NaOH is :

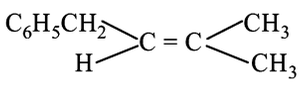
(a) 

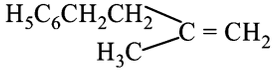
(b) $PhCHOHCH_3$
(c) $CH_3CH_2CH(OH)CH_2CH_3$
(d) $C_6H_5CH_2CH_2OH$

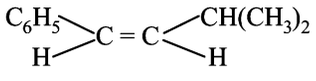
22. The main product of the following reaction is

$C_6H_5CH_2CH(OH)CH(CH_3)_2 \xrightarrow{conc.H_2SO_4} ?$

(a) 

(b) 

(c) 

(d) 

23. The best method to prepare cyclohexene from cyclohexanol is by using :
(a) Conc. $HCl + ZnCl_2$ (b) Conc. H_3PO_4
(c) HBr (d) Conc. HCl

24. The correct order of acid strength of the following compounds :
(A) Phenol (B) *p*–Cresol
(C) *m*–Nitrophenol (D) *p*–Nitrophenol
(a) D > C > A > B (b) B > D > A > C
(c) A > B > D > C (d) C > B > A > D

25. In order to get 2-hydroxybenzaldehyde from phenol, which of the following reagents is required ?
(a) $(CH_3CO)_2O, H_2SO_4$ (b) $CHCl_3$/NaOH
(c) CO_2, NaOH (d) CCl_4/NaOH

26. Consider the following reaction :

$C_2H_5OH + H_2SO_4 \longrightarrow$ Product

Among the following, which one cannot be formed as a product under any conditions ?
(a) Ethylene (b) Acetylene
(c) Diethyl ether (d) Ethyl-hydrogen sulphate

27. Dehydration of 2-butanol yields :
(a) 1-butene (b) 2-butene
(c) 2-butyne (d) both (a) and (b)

28. Phenol is heated with a solution of mixture of KBr and $KBrO_3$. The major product obtained in the above reaction is :
(a) 2-Bromophenol (b) 3-Bromophenol
(c) 4-Bromophenol (d) 2,4,6-Tribromophenol

29. The dehydration of 2-methylbutanol with conc. H_2SO_4 gives:
(a) 2-Methylbutene as major product
(b) Pentene
(c) 2-Methylbut-2-ene as major product
(d) 2-Methylpent-2-ene

30. Which of the following reagents may be used to distinguish between phenol and benzoic acid?
(a) Aqueous NaOH (b) Tollen's reagent
(c) Molisch reagent (d) Neutral $FeCl_3$

31. In the reaction :

$CH_3OH \xrightarrow{\text{oxidation}} A \xrightarrow{NH_3} B$; A and B respectively are

(a) $HCHO, HCOONH_4$ (b) $HCOOH, HCOONH_4$

(c) $HCOOH, HCONH_2$ (d) $HCHO, HCONH_2$

32. The major organic product in the reaction,

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

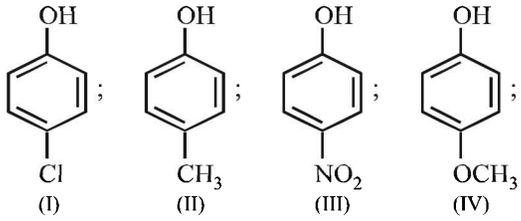
(a) $ICH_2OCH(CH_3)_2$

(b) $CH_3OC(CH_3)_2$ (I)

(c) $CH_3I + (CH_3)_2CHOH$

(d) $CH_3OH + (CH_3)_2CHI$

33. Arrange the following compounds in order of decreasing acidity :



(a) II > IV > I > III (b) I > II > III > IV

(c) III > I > II > IV (d) IV > III > I > II

34. The most suitable reagent for the conversion of

$R - CH_2 - OH \longrightarrow R - CHO$ is:

(a) $KMnO_4$

(b) $K_2Cr_2O_7$

(c) CrO_3

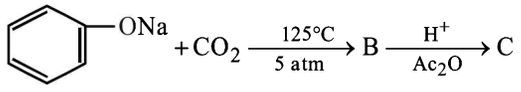
(d) PCC (Pyridinium chlorochromate)

35. Which of the following reagent is best to change glycerol to acrolein ?

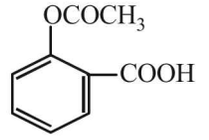
(a) P_2O_5 (b) Conc. H_2SO_4

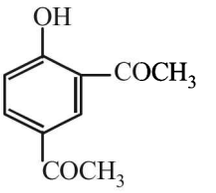
(c) Anhydrous $CaCl_2$ (d) $KHSO_4$

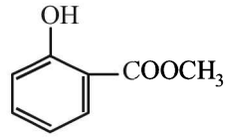
36. Sodium phenoxide when heated with CO_2 under pressure at 125°C yields a product which on acetylation produces C

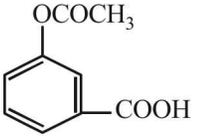


The major product C would be :

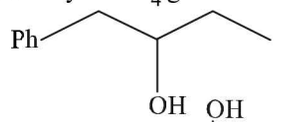
(a) 

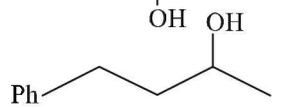
(b) 

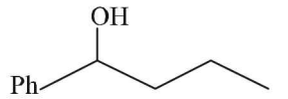
(c) 

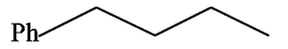
(d) 

37. Heating of 2-chloro-1-phenylbutane with EtOK/EtOH gives X as the major product. Reaction of X with $Hg(OAc)_2/H_2O$ followed by $NaBH_4$ gives Y as the major product. Y is :

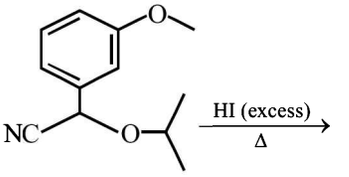
(a) 

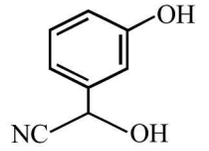
(b) 

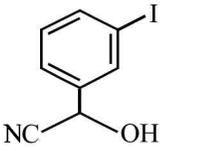
(c) 

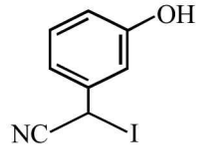
(d) 

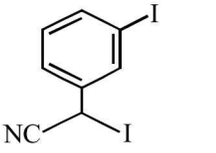
38. The major product of the following reaction is:



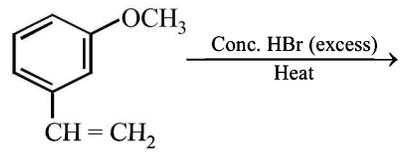
(a) 

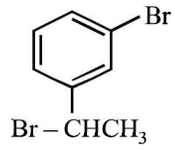
(b) 

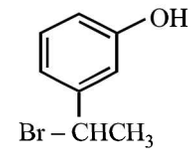
(c) 

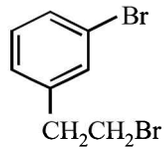
(d) 

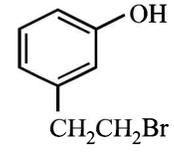
39. The major product of the following reaction is :



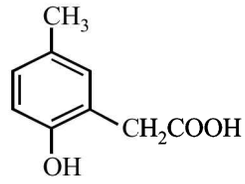
(a) 

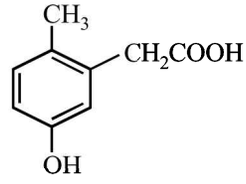
(b) 

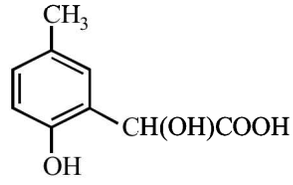
(c) 

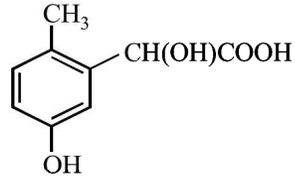
(d) 

40. *p*-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form, the compound B. The latter on acidic hydrolysis gives chiral carboxylic acid. The structure of the carboxylic acid is

(a) 

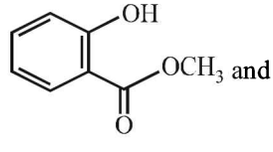
(b) 

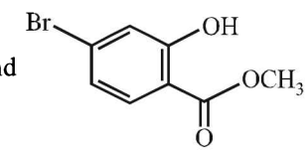
(c) 

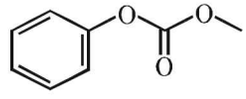
(d) 

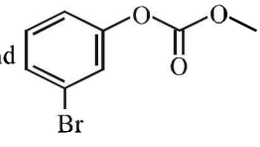
Skill Based MCQs

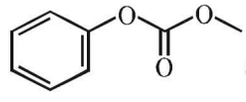
41. Phenol reacts with methyl chloroformate in the presence of NaOH to form product A. A reacts with Br_2 to form product B. A and B are respectively :

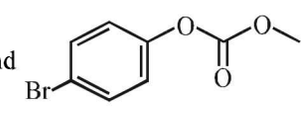
(a) 

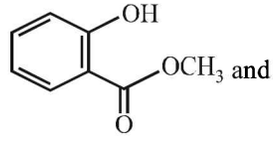
and 

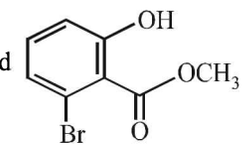
(b) 

and 

(c) 

and 

(d) 

and 

42. $Y\ (mix) \xleftarrow[2]{\text{conc. HI}} (CH_3)_3C-O-CH_3 \xrightarrow[1]{\text{Anhydrous HI}} X\ (mix)$

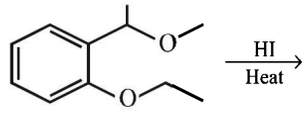
(a) X and Y are identical mixture of CH_3I and $(CH_3)_3C-OH$

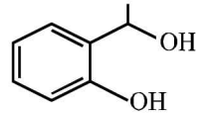
(b) X and Y are identical mixture of CH_3OH & $(CH_3)_3C$–I

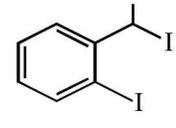
(c) X is mixture of CH_3I and $(CH_3)_3C-OH$

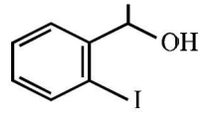
(d) Y is mixture of CH_3OH & $(CH_3)_3C$–I

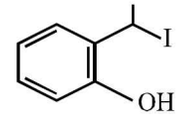
43. The major product formed in the following reaction is :



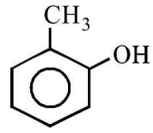
(a) 

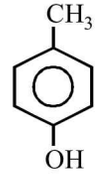
(b) 

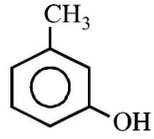
(c) 

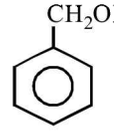
(d) 

44. The structure of the compound that gives a tribromo derivative on treatment with bromine water is

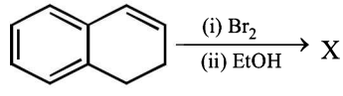
(a) 

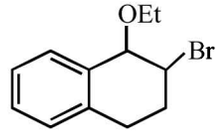
(b) 

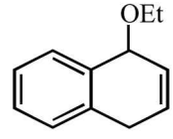
(c) 

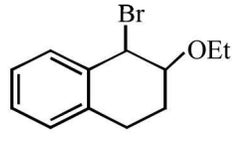
(d) 

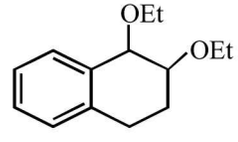
45. The major product (X) of the following reaction is:



(a) 

(b) 

(c) 

(d) 

46. $CH_3-CH=CH_2 \xrightarrow[(ii)\ NaBH_4]{(i)\ Hg(OAc)_2/H_2O} X + Na$

$\longrightarrow Y + CH_3Cl \longrightarrow Z + HI \xrightarrow{0°C} A + B$

What are A and B ?

(a) $CH_3-CH_2-CH_2-OH$ & CH_3I

(b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-OH$ & CH_3I

(c) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-I$ & CH_3OH

(d) $CH_3-CH_2CH_2I$ & CH_3OH

47. $CH_3\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH=CH_2 \xrightarrow[(ii)\ H_2O_2/OH^-]{(i)\ B_2H_6} X \xrightarrow[140°C]{H_2SO_4} Y$.

What is Y ?

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

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

(b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH=CH_2$

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

(d) $CH_3-\underset{\displaystyle C_2H_5}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-O-\underset{\displaystyle C_2H_5}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}-CH_3$

48. $\underset{(C_5H_{10}O)}{(X)} \xrightarrow{H_3O^+} Y + Z$

(Y and Z both give the Iodoform test). The compound X is–

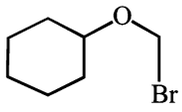
(a) $CH_3-CH=CH-O-CH_2-CH_3$

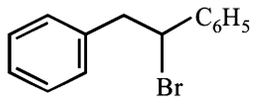
(b) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle H}{\overset{|}{C}}}}-O-CH_2-CH_3$

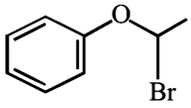
(c) $CH_3-\underset{\displaystyle CH_2}{\underset{\|}{C}}-O-CH_2-CH_3$

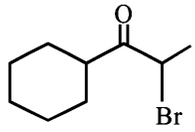
(d) Both (a) and (c)

49. Which of the following , upon treatment with tert-BuONa followed by addition of bromine water, fails to decolourize the colour of bromine?

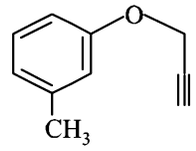
(a) 

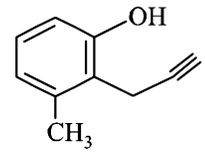
(b) 

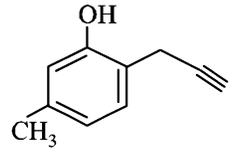
(c) 

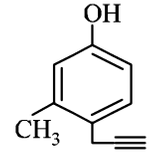
(d) 

50. What will be the major product when *m*-cresol is reacted with propargyl bromide ($HC \equiv C - CH_2Br$) in presence of K_2CO_3 in acetone ?

(a) 

(b) 

(c) 

(d) 

ANSWER KEY																			
Conceptual MCQs																			
1	(d)	**3**	(a)	**5**	(c)	**7**	(c)	**9**	(c)	**11**	(b)	**13**	(b)	**15**	(d)				
2	(b)	**4**	(b)	**6**	(a)	**8**	(b)	**10**	(b)	**12**	(a)	**14**	(c)						
Application Based MCQs																			
16	(d)	**19**	(c)	**22**	(a)	**25**	(b)	**28**	(d)	**31**	(b)	**34**	(d)	**37**	(c)	**40**	(c)		
17	(c)	**20**	(b)	**23**	(b)	**26**	(b)	**29**	(c)	**32**	(c)	**35**	(d)	**38**	(c)				
18	(b)	**21**	(b)	**24**	(a)	**27**	(d)	**30**	(d)	**33**	(c)	**36**	(a)	**39**	(b)				
Skill Based MCQs																			
41	(c)	**42**	(b)	**43**	(d)	**44**	(c)	**45**	(a)	**46**	(b)	**47**	(a)	**48**	(c)	**49**	(a)	**50**	(a)