29. Alcohols, Phenols and Ethers - Multiple Choice Questions

1. Preparation of Alcohols, Phenols and Ethers

1. Which of the following are known as mercaptans

(a) Thio-alcohols (b) Thio-ethers

(c) Thio-acids (d) Thio-aldehydes

2. $CH_2 = CH_2 + B_2H_6 \xrightarrow[H_2SO_4]{NaOH}$ Product in above reaction is

(a) CH_3CH_2CHO (b) CH_3CH_2OH

(c) CH_3CHO (d) None of these

3. C_2H_5MgI reacts with $HCHO$ to form last product

(a) CH_3CHO (b) C_3H_7OH

(c) CH_3COCH_3 (d) CH_3COOCH_3

4. $RMgBr$ on reaction with an excess of oxygen followed by hydrolysis gives

(a) RH (b) ROOR

(c) $ROOH$ (d) ROH

5. In the sequence of the following reactions

$CH_3OH \xrightarrow{HI} CH_3I \xrightarrow{KCN}$

$CH_3CN \xrightarrow{\text{reduction}} X \xrightarrow{HNO_2} Y$; X and Y are respectively

(a) $CH_3CH_2NH_2$ and CH_3CH_2OH

(b) $CH_3CH_2NH_2$ and CH_3COOH

(c) CH_3CH_2OH and CH_3CHO

(d) CH_3OCH_3 and CH_3CHO

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

(a) Addition reaction

(b) Substitution reaction

(c) Dehydrohalogenation reaction

(d) Rearrangement reaction

7. The total number of organic products obtained by the reduction of methyl ethanoate using $LiAlH_4$ is

(a) 2 (b) 3

(c) 4 (d) 5

8. Formaldehyde gives an additive product with methyl magnesium iodide which on aqueous hydrolysis gives

(a) Isopropyl alcohol (b) Ethyl alcohol

(c) Methyl alcohol (d) Propyl alcohol

9. $A \xrightarrow[\text{dil. } H_2SO_4]{K_2Cr_2O_7} B \xrightarrow[H_2O]{CH_3MgI} CH_3-\underset{\displaystyle OH}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}}-CH_3$. The reactant A is

(a) $CH_3CHOHCH_3$ (b) CH_3COCH_3

(c) C_2H_5OH (d) CH_3COOH

10. Acetone on treatment with $CH_3 - Mg - I$ and on further hydrolysis gives

(a) Isopropyl alcohol (b) Primary alcohol

(c) Acetic acid (d) 2-methyl 2-propanol

11. Which of these methods can be used to prepare alcohols

(I) Hydrolysis of cyanides

(II) Hydration of olefins

(III) Reduction of carbonyl compounds

(a) I, II and III (b) I and II

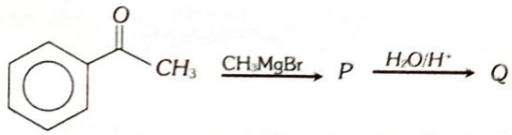
(c) II and III (d) I and III

12. In the reaction

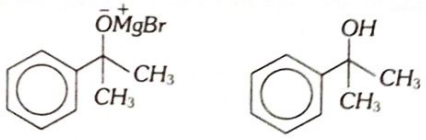
Ethanol $\xrightarrow{PCl_5} X \xrightarrow{\text{alc. } KOH} Y \xrightarrow[H_2O,\,\Delta]{H_2SO_4,\,\text{Room temp.}} Z$ the product Z is

(a) C_2H_4 (b) $CH_3CH_2OCH_2CH_3$

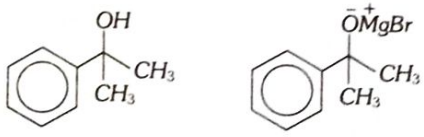
(c) $CH_3CH_2OSO_3H$ (d) 

13. 

In above reaction P and Q are

(a) 

(P) (Q)

(b) 

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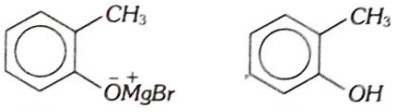
(c) 

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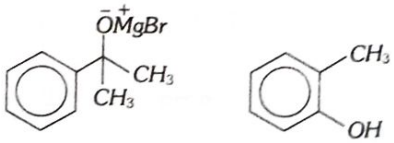
(d) 

(P) (Q)

14. Anisole can be prepared by the action of methyl iodide on sodium phenate. The reaction is called

(a) Fittig reaction (b) Etard reaction

(c) Wurtz reaction (d) Williamson reaction

15. Benzene diazonium chloride on boiling with dilute sulphuric acid gives

(a) Toluene (b) Benzoic acid

(c) Benzene (d) Phenol

16. When anisole is heated with *HI*, the product is

(a) Phenyl iodide and methyl iodide

(b) Phenol and methanol

(c) Phenyl iodide and methanol

(d) Methyl iodide and phenol

17. Carbolic acid is

(a) Phenol (b) Phenyl benzoate

(c) Phenyl acetate (d) Salol

18. When phenol reacts with $CHCl_3$ and KOH, the product obtained would be

(a) Salicylaldehyde (b) *p*-hydroxy benzaldehyde

(c) Both (a) and (b) (d) Chloretone

19. The reaction given below is known as

$$C_2H_5ONa + IC_2H_5 \longrightarrow C_2H_5OC_2H_5 + NaI$$

(a) Kolbe's synthesis (b) Wurtz's synthesis

(c) Williamson's synthesis (d) Grignard's synthesis

20. The reagent used for the preparation of higher ether from halogenated ethers is

(a) Conc. H_2SO_4 (b) Sodium alkoxide

(c) Dry silver oxide (d) Grignard reagent

21. Anisole is the product obtained from phenol by the reaction known as

(a) Coupling (b) Etherification

(c) Oxidation (d) Esterification

22. When a mixture of ethanol and methanol is heated in the presence of concentrated H_2SO_4 the resulting organic product or products is/are

(a) $CH_3OC_2H_5$

(b) CH_3OCH_3 and $C_2H_5OC_2H_5$

(c) $CH_3OC_2H_5$ and CH_3OCH_3

(d) $CH_3OC_2H_5$, CH_3OCH_3 and $C_2H_5OC_2H_5$

23. 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) Nucleophilic addition reaction

(d) Nucleophilic substitution reaction

24. Ethanol is converted into ethoxyethane

(a) By heating excess of ethanol with conc. H_2SO_4 at 140°C

(b) By heating ethanol with excess of conc. H_2SO_4 at 443 K

(c) By treating with conc. H_2SO_4 at room temperature

(d) By treating with conc. H_2SO_4 at 273 K

25. Decreasing order of reactivity in Williamson ether synthesis of the following

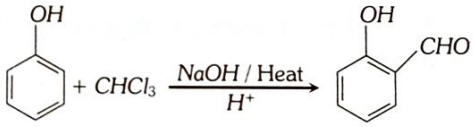
I. Me_3CCH_2Br II. $CH_3CH_2CH_2Br$

III. $CH_2 = CHCH_2Cl$ IV. $CH_3CH_2CH_2Cl$

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

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

26. The reaction



is known as

(a) Perkin reaction

(b) Sandmeyer reaction

(c) Reimer–Tiemann reaction

(d) Cannizzaro reaction

2. Properties of Alcohols, Phenols and Ethers

1. An organic liquid *A* containing *C*, *H* and *O* has a pleasant odour with a boiling point of $78°C$. On boiling *A* with conc. H_2SO_4 a colourless gas is produced which decolourises bromine water and alkaline $KMnO_4$. One mole of this gas also takes one mole of H_2. The organic liquid *A* is

(a) C_2H_5Cl (b) C_2H_5CHO

(c) C_2H_6 (d) C_2H_5OH

2. The compound '*A*' when treated with cerric ammonium nitrate solution gives red *ppt*. The compound '*A*' is

(a) Alcohol (b) Aldehyde

(c) Acid (d) Alkane

3. Which of the following compounds is oxidised to prepare methyl ethyl ketone

(a) 2 - propanol (b) 1 - butanol

(c) 2 - butanol (d) *Tert*-butyl alcohol

4. Isopropyl alcohol heated at $300^\circ C$ with copper catalyst to form

(a) Acetone (b) Dimethyl ether

(c) Acetaldehyde (d) Ethane

5. The reagent used for the dehydration of an alcohol is

(a) Phosphorus pentachloride (b) Calcium chloride

(c) Aluminium oxide (d) Sodium chloride

6. Which of the following compounds has highest boiling point

(a) Propan-1-ol (b) *N*-butane

(c) Chloroethane (d) Propanal

7. A compound '*A*' on oxidation gave acetaldehyde, then again on oxidation gave acid. After first oxidation it was reacted with ammoniacal $AgNO_3$ then silver mirror was produced. *A* is likely to be

(a) Primary alcohol (b) Tertiary alcohol

(c) Acetaldehyde (d) Acetone

8. The compound which gives the most stable carbonium ion on dehydration is

(a) $CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2OH$

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

(c) $CH_3-CH_2-CH_2-CH_2OH$

(d) $CH_3-\overset{CH_3}{\overset{|}{CH}}-CH_2-CH_3$

9. When primary alcohol is oxidised with chlorine, it produces

(a) $HCHO$ (b) CH_3CHO

(c) CCl_3CHO (d) C_3H_7CHO

10. The dehydration of 2-methyl butanol with conc. H_2SO_4 gives

(a) 2-methyl butene as major product

(b) Pentene

(c) 2-methyl but-2-ene as major product

(d) 2-methyl pent-2-ene

11. Which one of the following is correct

(a) $RCH_2OH \xrightarrow{KMnO_4}$ No reaction

(b) $CH_3CH_2OH \xrightarrow{Na_2Cr_2O_7+H_2SO_4}$ No reaction

(c) $CH_3CHO \xrightarrow{Na_2Cr_2O_7+H_2SO_4}$ No reaction

(d) $CH_3-\underset{CH_3}{\underset{|}{\overset{CH_3}{\overset{|}{C}}}}-OH \xrightarrow{\text{alkaline}KMnO_4}$ No reaction

12. In which of the following reactions of alcohol there is no cleavage of *C-O* bond

(a) Oxidation reaction of alcohol

(b) Dehydration reaction of alcohol

(c) Reduction reaction of alcohol

(d) Reaction of alcohol with phosphorous tribromide

13. Which of the following compounds would not react with Lucas reagent at room temperature

(a) $H_2C=CHCH_2OH$ (b) $C_6H_5CH_2OH$

(c) $CH_3CH_2CH_2OH$ (d) $(CH_3)_3COH$

14. Butanal with dilute $NaOH$ gives

(a) $CH_3CH_2CH_2\underset{H}{\underset{|}{\overset{OH}{\overset{|}{C}}}}CH_2CH_2CH_2CH_2CHO$

(b) $CH_3CH_2CH_2\overset{O}{\overset{||}{C}}CH_2CH_2CH_2CHO$

(c) $OHCCH_2CH_2CH_2CH_2CH_2CH_2CHO$

(d) $CH_3CH_2CH_2\underset{H}{\underset{|}{\overset{OH}{\overset{|}{C}}}}-\underset{\underset{CH_3}{\underset{|}{CH_2}}}{\underset{|}{CH}}CHO$

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

(a) 1 (b) 2

(c) 3 (d) 4

16. Give IUPAC name of the compound given below

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

(a) 2-chloro-5-hydroxyhexane

(b) 2-hydroxy-5-chlorohexane

(c) 5-chlorohexan-2-ol

(d) 2-chlorohexan-5-ol

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

Propan-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) Butan-2-ol, propan-1-ol, butan-1-ol, pentan-1-ol

(d) Propan-1-ol, butan-1-ol, butan-2-ol, pentan-1-ol

18. What will be the bond angle $C-O-H$ in alcohol if C and O atom possess sp^3 hybridisation

(a) 109°28' (b) 111°42'

(c) 109° (d) 108°30'

19. For the reaction,

$(CH_3)_2CH-CH=CH_2+C_2H_5OH \rightarrow$ Product the catalyst that can be used is

(a) Dilute H_2SO_4 (b) Dilute $NaOH$

(c) Dilute $NaCl$ (d) None of these

20. Iodoform reaction is shown by

(a) $CH_3CH_2CH_2CH(OH)CH_3$

(b) $C_2H_5OC_2H_5$

(c) $CH_3CH_2CH_2CH_2OH$

(d) $(CH_3)_3COH$

21. Which of the following is not characteristic of alcohols

(a) Lower alcohols are stronger and have bitter taste

(b) Higher alcohols are stronger and have bitter taste

(c) The boiling points of alcohols increase with increasing molecular mass

(D)The lower alcohols are soluble in water

22. In the following series of chemical reactions, identify Z

$$C_3H_7OH \xrightarrow[160-180^oC]{Conc.H_2SO_4} X \xrightarrow{Br_2} Y \xrightarrow[Alc.KOH]{Excess\ of} Z$$

(a) $CH_3-\underset{NH_2}{\underset{|}{CH}}-\underset{NH_2}{\underset{|}{CH_2}}$ (b) $CH_3-\underset{OH}{\underset{|}{CH}}-\underset{OH}{\underset{|}{CH_2}}$

(c) $CH_3-\underset{OH}{\underset{|}{C}}=CH_2$ (d) $CH_3C\equiv CH$

23. The role of conc. H_2SO_4 in the esterification process is

(a) Catalyst

(b) Dehydrating agent

(c) Hydrolysing agent

(d) Dehydrating agent and catalyst

24. An organic compound X on treatment with acidified $K_2Cr_2O_7$ gives a compound Y which reacts with I_2 and sodium carbonate to form tri-iodomethane. The compound X is

(a) CH_3OH (b) $CH_3-CO-CH_3$

(c) CH_3CHO (d) $CH_3CH(OH)CH_3$

25. Which one of the following compounds gives a positive iodoform test

(a) Pentanal (b) 1-phenyl ethanol

(c) 2-phenyl ethanol (d) 3-pentanol

26. Which of the following is most soluble in water

(a) Normal butyl alcohol (b) Isobutyl alcohol

(c) Tertiary butyl alcohol (d) Secondary butyl alcohol

27. Addition of alcohols to aldehydes in presence of anhydrous acids yield

(a) Carboxylic acids (b) Ethers

(c) Cyclic ethers (d) Acetals

28. A substance $C_4H_{10}O$ yields on oxidation a compound C_4H_8O which gives an oxime and a positive iodoform test. The original substance on treatment with conc. H_2SO_4 gives C_4H_8. The structure of the compound is

(a) $CH_3CH_2CH_2CH_2OH$

(b) $CH_3CH(OH)CH_2CH_3$

(c) $(CH_3)_3COH$

(d) $CH_3CH_2-O-CH_2CH_3$

29. The function of $ZnCl_2$ in Lucas test for alcohols is

(a) To act as acid catalyst and react with HCl to form H_2ZnCl_4

(b) To act as base catalyst and react with $NaOH$ to form $Na_2Zn(OH)_4$

(c) To act as amphoteric catalyst

(d) To act as neutral catalyst

30. Number of isomeric alcohols of molecular formula $C_6H_{14}O$ which give positive iodoform test is

(a) Three (b) Four

(c) Five (d) Two

31. $CH_3-\underset{\underset{OH}{|}}{CH}-CH_3 \xrightarrow{PBr_3} A \xrightarrow{Mg} B \xrightarrow{\overset{O}{\diagup\diagdown}\ CH_2-CH_2} C \xrightarrow{H_2O} D$ Here, D is

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

(b) $CH_3-O-\underset{\underset{CH_3}{|}}{CH}-CH_2CH_3$

(c) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2CH_2OH$

(d) $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-CH_2OH$

32. 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) $1^\circ < 2^\circ > 3^\circ$

(c) $3^\circ > 2^\circ > 1^\circ$ (d) $3^\circ > 1^\circ > 2^\circ$

33. Which of the following would undergo dehydration most readily

(a) 1-phenyl-1butanol (b) 2-phenyl-2-butanol

(c) 1-phenyl-2-butanol (d) 2-phenyl-1-butanol

34. $C_6H_5OH+ClCOCH_3 \xrightarrow{\text{aq. } NaOH} C_6H_5OCOCH_3$ is an example of

(a) Dow's reaction

(b) Reimer-Tiemann reaction

(c) Schotten-Baumann reaction

(d) Kolbe's reaction

35. Which of the following statements is correct

(a) Phenol is less acidic than ethyl alcohol

(b) Phenol is more acidic than ethyl alcohol

(c) Phenol is more acidic than carboxylic acid

(d) Phenol is more acidic than carbonic acid

36. Which statement is incorrect

(a) Phenol is a weak acid

(b) Phenol is an aromatic compound

(c) Phenol liberates CO_2 from Na_2CO_3 solution

(d) Phenol is soluble in $NaOH$

37. When phenol reacts with ammonia in presence of $ZnCl_2$ at 300°C, it gives

(a) Primary amine (b) Secondary amine

(c) Tertiary amine (d) Both (b) and (c)

38. For phenol, which of the following statements is correct

(a) It is insoluble in water

(b) It has lower melting point compared to aromatic hydrocarbons of comparable molecular weight

(c) It has higher boiling point than toluene

(d) It does not show acidic property

39. Phenol on heating with CCl_4 and alcoholic KOH, gives salicylic acid. This reaction is

(a) Friedal-Craft reaction

(b) Diels-Alder reaction

(c) Riemer-Tieman reaction

(d) Witting reaction

40. Liebermann's test is answered by

(a) Aniline (b) Methylamine

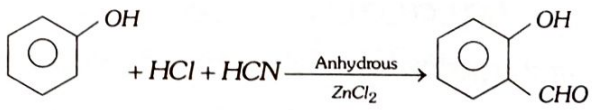
(c) Ethyl benzoate (d) Phenol

41. The reaction of conc. HNO_3 and phenol forms

(a) Benzoic acid (b) Salicylic acid

(c) *o*-and *p*-nitrophenol (d) Picric acid

42. The following reaction



is known as

(a) Perkin reaction

(b) Gattermann reaction

(c) Kolbe reaction

(d) Gattermann-Koch reaction

43. Benzoylation of phenol in alkaline medium is known as

(a) Friedel Craft reaction

(b) Wurtz-Fittig reaction

(c) Schotten-Baumann reaction

(d) Sabatier-Senderen's reaction

44. What amount of bromine will be required to convert 2 *g* of phenol into 2, 4, 6-tribromophenol

(a) 4.00 (b) 6.00

(c) 10.22 (d) 20.44

45. When $FeCl_3$ is added to phenol

(a) No reaction occurs

(b) A coloured complex will be formed

(c) Fe^{3+} will be oxidized to higher state

(d) *o* -Chlorophenol will be formed

46. Phenol on distillation with zinc dust gives

(a) C_6H_6 (b) C_6H_{12}

(c) $C_6H_5OC_6H_5$ (d) $C_6H_5 - C_6H_5$

47. Phenol $\xrightarrow{NaNO_2/H_2SO_4} B \xrightarrow{H_2O} C \xrightarrow{NaOH} D$

Name of the above reaction is

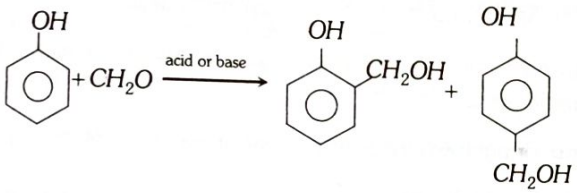
(a) Liebermann's reaction

(b) Phthalein fusion test

(c) Reimer-Tiemann reaction

(d) Schotten-Baumann reaction

48. Reaction



is called

(a) Lederer Manasse reaction

(b) Claisen condensation

(c) Benzoin condensation

(d) Etard reaction

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

(a) 3-methylphenol (b) 3-chlorophenol

(c) 3-methoxyphenol (d) benzene-1, 3-diol

50. The compound obtained by heating salicylic acid with phenol in the presence of phosphorus oxychloride is

(a) Salol (b) Aspirin

(c) Oil of wintergreen (d) o-chlorobenzoyl chloride

51. Phenol reacts with CCl_4 in presence of aqueous alkali and forms a product which on hydrolysis gives

(a) Salicylaldehyde (b) Salicylic acid

(c) Benzaldehyde (d) Benzoic acid

52. Which one of the following properties is exhibited by phenol

(a) It is soluble in *aq.* $NaOH$ and evolves CO_2 with *aq.* $NaHCO_3$

(b) It is soluble in *aq.* $NaOH$ and does not evolve CO_2 with *aq.* $NaHCO_3$

(c) It is not soluble in *aq.* $NaOH$ but evolves CO_2 with *aq.* $NaHCO_3$

(d) It is insoluble in *aq.* $NaOH$ and does not evolve CO_2 with *aq.* $NaHCO_3$

53. Phenol $\xrightarrow{X}$ forms a tribromo derivative. "X" is

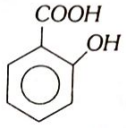
(a) Bromine in benzene

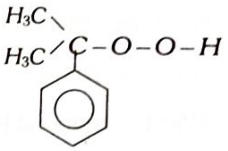
(b) Bromine in water

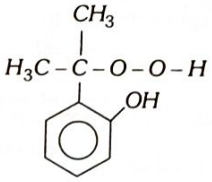
(c) Potassium bromide solution

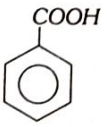
(d) Bromine in carbon tetrachloride at 0^oC

54. Phenol is distilled with Zn dust followed by Fridel Crafts alkylation with propyl chloride in the presence of $AlCl_3$ to give a compound (B). (B) is oxidised in the presence of air to form the compound (C). The structural formula of (C) is

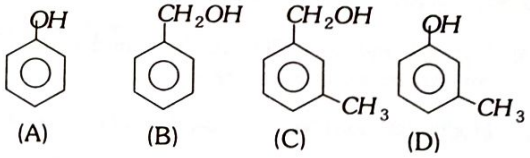
(a) 

(b) 

(c) 

(d) 

55. Which of the following compounds is aromatic alcohol



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

(a) *A, B, C, D* (b) *A, D*

(c) *B, C* (d) *A*

56. Phenol is less acidic than.....

(a) Ethanol (b) o-nitrophenol

(c) o-methylphenol (d) o-methoxyphenol

57. In the Liebermann's nitroso reaction, sequential changes in the colour of phenol occurs as

(a) Brown or red → green → red → deep blue

(b) Red → deep blue → green

(c) Red → green → white

(d) White → red → green

58. When ether is exposed in air for sometime an explosive substance produced is

(a) Peroxide (b) TNT

(c) Oxide (d) Superoxide

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

(a) Dipolar character of ethers

(b) Alcohols having resonance structures

(c) Inter-molecular hydrogen bonding in ethers

(d) Inter-molecular hydrogen bonding in alcohols

60. 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

61. Which compound has the highest boiling point

(a) Acetone (b) Diethyl ether

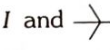
(c) Methanol (d) Ethanol

62. Acetylsalicylic acid is a pain killer and is commonly known as

(a) Paracetamol (b) Ibuprofen

(c) Aspirin (d) Penicillin

63. Major products formed in the reaction of t–butyl methyl ether with HI are

(a) H_3C-I and  (b) and H_3C-OH

(c) H_3C-OH and (d) and H_3C-OH

3. Uses of Alcohols, Phenols and Ethers

1. Glycerol as a triester is present in

(a) Petroleum (b) Kerosene

(c) Vegetable oil and fat (d) Naphtha

2. Glycerol is not used in which of following cases

(a) Explosive making (b) Shaving soap making

(c) As an antifreeze for water (d) As an antiseptic agent

3. In order to make alcohol undrinkable pyridine and methanol are added to it. The resulting alcohol is called

(a) Power alcohol (b) Proof spirit

(c) Denatured spirit (d) Poison alcohol

4. Main constituent of dynamite is

(a) Nitrobenzene (b) Nitroglycerine

(c) Picric acid (d) TNT

5. Wine (alcoholic beverages) contains

(a) CH_3OH (b) Glycerol

(c) C_2H_5OH (d) 2-propanol

6. Tonics in general contain

(a) Ether (b) Methanol

(c) Ethanol (d) Rectified spirit

7. Widespread deaths due to liquor poisoning occurs due to

(a) Presence of carbonic acid in liquor

(b) Presence of ethyl alcohol in liquor

(c) Presence of methyl alcohol in liquor

(d) Presence of lead compounds in liquor

8. Diethyl ether finds use in medicine as

(a) A pain killer (b) A hypnotic

(c) An antiseptic (d) An anaesthetic

9. In cold countries ethylene glycol is added to water in the radiators to

(a) Bring down the specific heat of water

(b) Lower the viscosity

(c) Reduce the viscosity

(d) Make water a better lubricant

10. Power alcohol is a mixture of

(a) 80% petrol + 20% benzene + small quantity of ethanol

(b) 80% petrol + 20% ethanol + small quantity of benzene

(c) 80% ethanol + 20% benzene + small quantity of petrol

(d) 50% petrol + 50% ethanol + small quantity of benzene

11. Rectified spirit is a mixture of

(a) 95% ethyl alcohol + 5% water

(b) 94% ethyl alcohol + 4.53% water

(c) 94.4% ethyl alcohol + 5.43 % water

(d) 95.57% ethyl alcohol + 4.43% water

4. Methanol and Ethanol

1. Wood spirit is known as

(a) Methanol (b) Ethanol

(c) Acetone (d) Benzene

2. Fermentation is an

(a) Endothermic reaction (b) Exothermic reaction

(c) Reversible reaction (d) None of these

3. The fermentation of starch to give alcohol occurs mainly with the help of

(a) O_2 (b) Air

(c) CO_2 (d) Enzymes

4. The reaction, water gas $(CO + H_2) + H_2$ $673K, 300$ atmosphere in presence of the catalyst Cr_2O_3 / ZnO is used for the manufacture of

(a) $HCHO$ (b) $HCOOH$

(c) CH_3OH (d) CH_3COOH

5. Methyl alcohol can be distinguished from ethyl alcohol using

(a) Fehling solution

(b) Schiff's reagent

(c) Sodium hydroxide and iodine

(d) Phthalein fusion test

6. When vapour of ethanol are passed over platinised asbestos in excess of air, the compound formed is

(a) CH_3CHO (b) CH_3COCH_3

(c) C_2H_2 (d) CH_3COOH

7. Which reagent can convert acetic acid into ethanol

(a) Na + alcohol (b) $LiAlH_4$ + ether

(c) $H_2 + Pt$ (d) $Sn + HCl$

8. Absolute alcohol cannot be prepared by fractional distillation of rectified spirit since

(a) It forms azeotropic mixture

(b) It is used as power alcohol

(c) It is used in wines

(d) None of the above

9. Ethyl alcohol exhibits acidic character on reacting with

(a) Acetic acid

(b) Sodium metal

(c) Hydrogen iodide

(d) Acidic potassium dichromate

10. Conc. H_2SO_4 heated with excess of C_2H_5OH at $140°C$ to form

(a) $CH_3CH_2 - O - CH_3$

(b) $CH_3CH_2 - O - CH_2CH_3$

(c) $CH_3 - O - CH_2 - CH_2 - CH_3$

(d) $CH_2 = CH_2$

11. The vapour pressure of aqueous solution of methanol is

(a) Equal to water (b) Equal to methanal

(c) More than water (d) Less than water

12. Ethyl alcohol cannot be used as a solvent for methyl magnesium iodide because

(a) Methyl magnesium iodide reacts with alcohol giving methane

(b) The reaction between them is explosive in nature

(c) Methyl magnesium iodide is converted to ethyl magnesium iodide

(d) Alcohol is immiscible with methyl magnesium iodide

13. Ethyl alcohol on oxidation with $K_2Cr_2O_7$ gives

(a) Acetic acid (b) Acetaldehyde

(c) Formaldehyde (d) Formic acid

14. Which of the following is the most suitable method for removing the traces of water from ethanol

(a) Heating with Na metal

(b) Passing dry HCl through it

(c) Distilling it

(d) Reacting with Mg

15. The boiling point of ethyl alcohol should be less than that of

(a) Propane (b) Formic acid

(c) Dimethyl ether (d) None of these

16. If ethanol dissolves in water, then which of the following would be done

(a) Absorption of heat and contraction in volume

(b) Emission of heat and contraction in volume

(c) Absorption of heat and increase in volume

(d) Emission of heat and increase in volume

17. CH_3CH_2OH can be converted into CH_3CHO by

(a) Catalytic hydrogenation

(b) Treatment with $LiAlH_4$

(c) Treatment with pyridinium chlorochromate

(d) Treatment with $KMnO_4$

18. A sweet smelling compounds formed by reacting acetic acid with ethanol in the presence of hydrochloric acid is

(a) $CH_3COOC_2H_5$ (b) C_2H_5COOH

(c) $C_2H_5COOH_3$ (d) CH_3OH

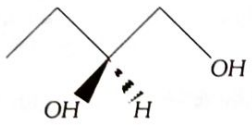
5. Dihydric, Trihydric and Unsaturated Alcohols

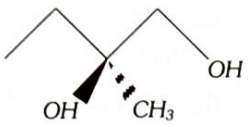
1. Ethylene glycol gives oxalic acid on oxidation with

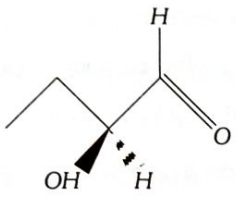
(a) Acidified $K_2Cr_2O_7$ (b) Acidified $KMnO_4$

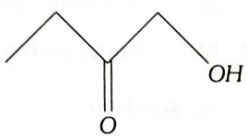
(c) Alkaline $KMnO_4$ (d) Periodic acid

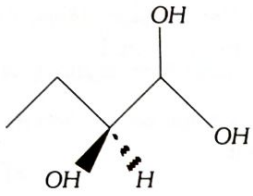
2. Which of the following compounds contain at least one secondary alcohol

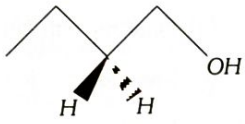

(i)


(ii)


(iii)


(iv)


(v)


(vi)

(a) (i), (ii), (iv), (vi) (b) (i), (ii), (iii)

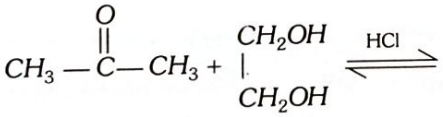
(c) (i), (ii), (iii) (v) (d) (i), (iii), (v)

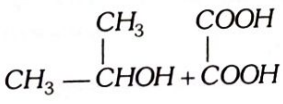
3. Which of the following is industrially prepared by passing ethylene into hypochlorous acid

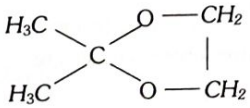
(a) Ethylene glycol (b) Ethylene oxide

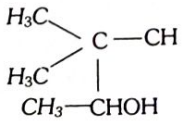
(c) Ethylene dinitrate (d) Ethane

4. Identify the product for the following reaction



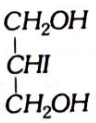
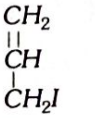
(a) 

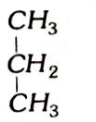
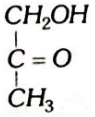
(b) 

(c) 

(d) No reaction

5. What is formed when glycerol reacts with *HI*

(a)  (b) 

(c)  (d) 

6. When glycerol is heated with $KHSO_4$ it gives

(a) $CH_2 = CH - CH_3$ (b) $CH_2 = CH - CH_2OH$

(c) $CH_2 = CH - CHO$ (d) $CH_2 = C = CH_2$

7. With oxalic acid, glycerol at 260^oC gives

(a) Allyl alcohol (b) Glyceryl mono-oxalate

(c) Formic acid (d) Glyceraldehyde

8. Glycerol on reaction with $NaHCO_3$ gives

(a) Acrolein (b) Acetic Acid

(c) Formic acid (d) Propanol

9. Glycerol boils at 290^oC with slight decomposition. Impure glycerine can be purified by

(a) Steam distillation (b) Simple distillation

(c) Vacuum distillation (d) Extraction with a solvent

10. $CH_3 - CH = CH - CH(OH) - CH_3 \xrightarrow[\text{reagent}]{\text{Jone's}} X$,

Product X

(a) $CH_3CH_2CH_2CH(OH)CH_3$

(b) $CH_3CH = CHCOCH_3$

(c) Both (a) and (b) are correct

(d) $CH_3CH_2CH_2COCH_3$

11. The compound which reacts with excess bromine to produce 2,4,6 – tribromophenol, is

(a) 1,3,–cyclohexadiene (b) 1,3 – cyclohexanedione,

(c) Salicylic acid (d) Cyclohexanone

6. Nitrophenols, Dihydric and Trihydric Phenols

1. Picric acid is

(a) Trinitroaniline (b) Trinitrotoluene

(c) A volatile liquid (d) 2, 4, 6-trinitrophenol

2. The order of melting point of *ortho*, *para*, *meta*-nitrophenol is

(a) $o > m > p$ (b) $p > m > o$

(c) $m > p > o$ (d) $p > o > m$

3. Which of the following statement is not correct

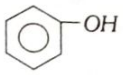
(a) Phenol is used to prepare analgesic drugs

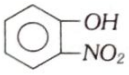
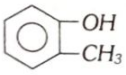
(b) Phenol is neutralised by sodium carbonate

(c) Solubility of phenol in water is more than that of chlorobenzene

(d) Boiling point of o-nitrophenol is lower than that of p-nitrophenol

4. Which of the following compounds is most acidic

(a) $Cl-CH_2-CH_2-OH$ (b) 

(c)  (d) 

5. The strongest acid among the following aromatic compounds is

(a) *Ortho*-nitrophenol (b) *Para*-chlorophenol

(c) *Para*-nitrophenol (d) *Meta*-nitrophenol

6. The correct order of acid strength of the following substituted phenols in water at $28^{\circ}C$ is

(a) p-nitrophenol<p-fluorophenol<p-chlorophenol

(b) p-chlorophenol<p-fluorophenol<p-nitrophenol

(c) p-fluorophenol<p-chlorophenol<p-nitrophenol

(d) p-fluorophenol<p-nitrophenol<p-chlorophenol

7. Arrange the following compounds in the increasing order of their acidic strength

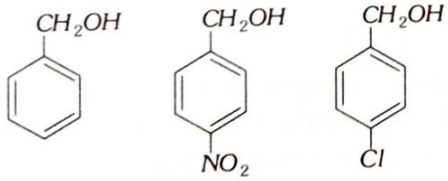
i. m-nitrophenol ii. m-cresol

iii Phenol iv. m- chlorophenol

(a) ii < iii < iv <i (b) iii < ii < i < iv

(c) ii < iii < i< iv (d) ii < iv <iii < i

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

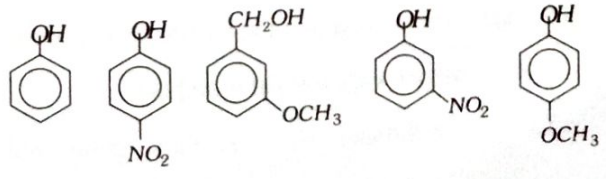


I II III

(a) I < II < III (b) II < I < III

(c) II < III < I (d) III < II < I

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



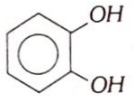
(I) (II) (III) (IV) (V)

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

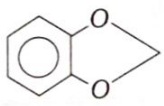
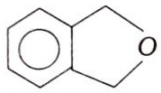
(b) (II) > (IV) > (I) > (III) > (V)

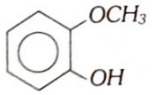
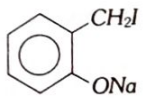
(c) (IV) > (V) > (III) > (II) > (I)

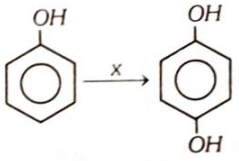
(d) (V) > (IV) > (III) > (II) > (I)

10.  $+CH_2I_2+NaOH \rightarrow$

The product is

(a)  (b) 

(c)  (d) 

11.  . X is

(a) Air (b) $KMnO_4/H_2SO_4$

(c) $K_2S_2O_8$ (d) K_2SO_5

7. Cyclic and Aromatic Ethers

1. Which reagent is used for bromination of methyl phenyl ether

(a) Br_2 / Red P (b) Br_2/CH_3COOH

(c) $Br_2/FeBr_3$ (d) HBr/Δ

2. Epoxides are

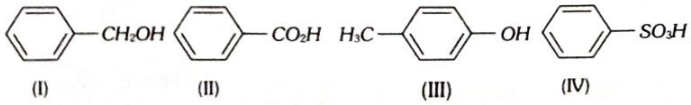
(a) Cyclic ethers

(b) Not ethers

(c) Aryl-alkyl ethers

(d) Ethers with another functional group

3. The order of acidity of compounds $I-IV$, is



(I) (II) (III) (IV)

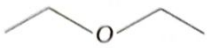
(a) $I < III < II < IV$ (b) $IV < I < II < III$

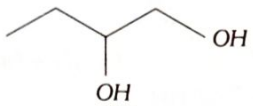
(c) $III < I < II < IV$ (d) $II < IV < III < I$

4. Among the compounds I-IV, the compound having the lowest boiling point is


(I)


(II)


(III)


(IV)

(a) (I) (b) (II)

(c) (III) (d) (IV)

8. Different Ethers and Hydroxy Compounds

1. Cyclohexanol is a

(a) Primary alcohol (b) Secondary alcohol

(c) Tertiary alcohol (d) Phenol

2. An oxygen containing organic compound upon oxidation forms a carboxylic acid as the only organic product with its molecular mass higher by 14 units. The organic compound is

(a) An aldehyde (b) A primary alcohol

(c) A secondary alcohol (d) A ketone

3. Which of the following compounds shows evidence of the strongest hydrogen bonding

(a) Propane-1-ol (b) Propane-2-ol

(c) Propane-1,2-diol (d) Propane-1,2,3-triol

4. The detection of leakage from LPG Cylinders is facilitated by the addition of

(a) Phenols (b) Glycols

(c) Thioalcohols (d) Alcohol

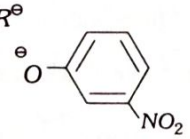
5. Which of the following alcohol has highest solubility in water

(a) Secondary butyl alcohol (b) Tertiary butyl alcohol

(c) Ethelene glycol (d) Glycerol

6. Which of the following species can act as the strongest base

(a) $\overset{\ominus}{O}H$ (b) $OR^{\ominus}$

(c) $\overset{\ominus}{O}C_6H_5$ (d) 

7. Which of the following is most acidic

(a) Phenol (b) Benzyl alcohol

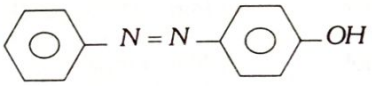
(c) *m*-chlorophenol (d) Cyclohexanol

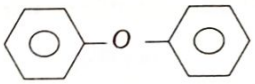
8. If there be a compound of the formula $CH_3C(OH)_3$ which one of the following compounds would be obtained from it without reaction with any reagent

(a) CH_3OH (b) C_2H_5OH

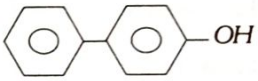
(c) CH_3COOH (d) $HCHO$

9. 

(a) 

(b) 

(c) 

(d) 

10. The major product formed in the following reaction

$CH_3CH(Cl)CH_2 - CH_2OH \xrightarrow{aq.KOH}$ is

(a) $CH_3CH = CH - CH_2OH$

(b) $CH_2 = CH - CH_2 - CH_2OH$

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

(d) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - CH_2OH$

11. One mole of an organic compound A with the formula C_3H_8O reacts completely with two moles of HI to form X and Y. When Y is boiled with aqueous alkali it forms Z. Z answers the iodoform test. The compound A is

(a) Propan-2-ol (b) Propan-1-ol

(c) Ethoxyethane (d) Methoxyethane

12. Replacement of Cl of chlorobenzene to give phenol requires drastic conditions, but Cl of 2,4-dinitrochlorobenzene is readily replaced. This is because

(a) $-NO_2$ group makes the ring electron rich at *ortho* and *para* positions

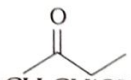
(b) $-NO_2$ group withdraws electrons from *meta* position

(c) $-NO_2$ donates electrons at *meta* position

(d) $-NO_2$ withdraws electrons from *ortho* and *para* positions

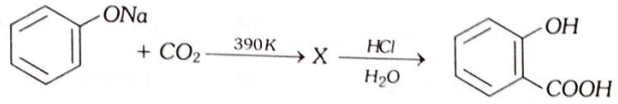
13. Predict the product 'C' in the following series of reactions

$$CH_3-COOH \xrightarrow{PCl_5} A \xrightarrow[\text{Anhyd. } AlCl_3]{C_6H_6} B \xrightarrow{CH_3MgBr} C$$

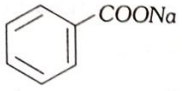
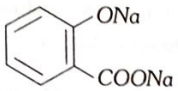
(a)  (b) $CH_3CH(OH)C_6H_5$

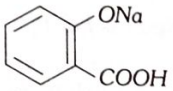
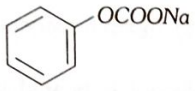
(c) $CH_3CH(OH)C_2H_5$ (d) $(CH_3)_2C(OH)C_6H_5$

14. The compound X in the reaction



is

(a)  (b) 

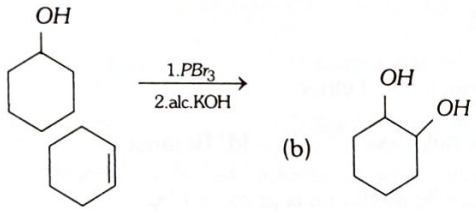
(c)  (d) 

15. 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

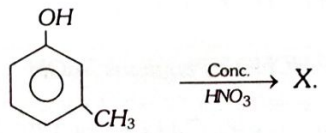
16. Predict the product



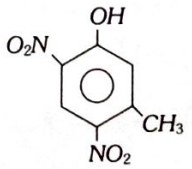
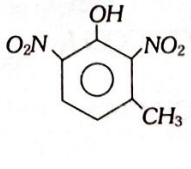
(a) (b)

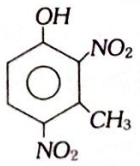
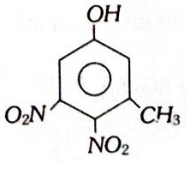
(c) (d)

17. In the reaction for dinitration

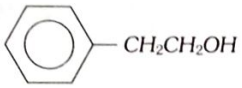
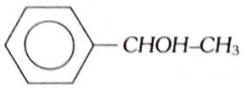


The major dinitrated product X is

(a)  (b) 

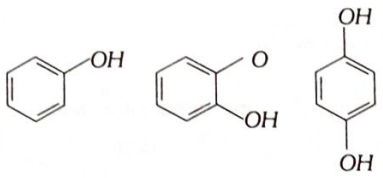
(c)  (d) 

18. Which of the following reacts fastest with conc. HCl

(a)  (b) 

(c) $(CH_3)_3COH$ (d) $CH_2=CH-CH_2OH$

19. Among (i) – (iii)



(i) (ii) (iii)

The boiling point follows the order

(a) (ii) < (i) < (iii) (b) (iii) < (ii) < (i)

(c) (i) < (ii) < (iii) (d) (ii) < (iii) < (i)

9. IIT-JEE/ AIEEE

1. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives **[2004]**

(a) 2-methyl-2-propanol (b) Acetamide

(c) Acetone (d) Acetyl iodide

2. Acid catalyzed hydration of alkenes except ethene leads to the formation of **[2005]**

(a) Primary alcohol

(b) Secondary or tertiary alcohol

(c) Mixture of primary and secondary alcohols

(d) Mixture of secondary and tertiary alcohols

3. Chlorination of toluene in the presence of light and heat followed by treatment with aqueous $NaOH$ gives **[1990]**

(a) *o*-cresol (b) *p*-cresol

(c) 2, 4-dihydroxy toluene (d) Benzyl alcohol

4. During dehydration of alcohols to alkenes by heating with conc. H_2SO_4 the initiation step is **[2003]**

(a) Protonation of alcohol molecule

(b) Formation of carbocation

(c) Elimination of water

(d) Formation of an ester

5. Amongst the following, HBr reacts fastest with **[1986]**

(a) Propane-1-ol (b) Propane-2-ol

(c) 2-methyl propane-1-ol (d) 2-methyl propane-2-ol

6. An unknown alcohol is treated with the "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest and by what mechanism **[2010; 2013]**

(a) Secondary alcohol by S_N^1

(b) Tertiary alcohol by S_N^1

(c) Secondary alcohol by S_N^2

(d) Tertiary alcohol by S_N^2

7. In CH_3CH_2OH which bond dissociates heterolytically more readily **[1988]**

(a) $C-C$ (b) $C-O$

(c) $C-H$ (d) $O-H$

8. Among the following the one that gives positive iodoform test upon reaction with I_2 and $NaOH$ is **[2006]**

(a) $CH_3CH_2CH(OH)CH_2CH_3$

(b) $C_6H_5CH_2CH_2OH$

(c) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2OH$

(d) $PhCHOHCH_3$

9. The main product of the following reaction is

$$C_6H_5CH_2CH(OH)CH(CH_3)_2 \xrightarrow{conc.\,H_2SO_4}$$ **[2010]**

(a) $H_5C_6CH_2CH_2 \diagdown \atop H_3C \diagup C = CH_2$

(b) $H_5C_6 \diagdown \atop H \diagup C = C \diagup H \atop \diagdown CH(CH_3)_2$

(c) $C_6H_5CH_2 \diagdown \atop H \diagup C = C \diagup CH_3 \atop \diagdown CH_3$

(d) $C_6H_5 \diagdown \atop H \diagup C = C \diagup CH(CH_3)_2 \atop \diagdown H$

10. In the following sequence of reactions,

$$CH_3CH_2OH \xrightarrow{P+I_2} A \xrightarrow[ether]{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$$

the compound 'D' is **[2007]**

(a) Butanal (b) n-butyl alcohol

(c) n-propyl alcohol (d) Propanal

11. Benzenediazonium chloride on reaction with phenol in weakly basic medium gives **[1998]**

(a) Diphenyl ether (b) p-hydroxyazobenzene

(c) Chlorobenzene (d) Benzene

12. At low temperature phenol reacts with Br_2 in CS_2 to form **[1982]**

(a) m-bromophenol (b) o-and p-bromophenol

(c) p-bromophenol (d) 2, 4, 6-tribromophenol

13. Which of the following reagents may be used to distinguish between phenol and benzoic acid **[2011]**

(a) Aqueous $NaOH$ (b) Tollen's reagent

(c) Molisch reagent (d) Neutral $FeCl_3$

14. Phenol is heated with a solution of mixture of KBr and $KBrO_3$. The major product obtained in the above reaction is **[2011]**

(a) 2-bromophenol (b) 3-bromophenol

(c) 4-bromophenol (d) 2,4,6-tribromophenol

15. The compound which is not isomeric with diethyl ether is **[1981]**

(a) n-propylmethyl ether (b) Butan-1-*ol*

(c) 2-methylpropan-2-*ol* (d) Butanone

16. Commercially methanol is prepared by **[1984]**

(a) Reduction of CO in presence of $ZnO.Cr_2O_3$

(b) Methane reacts with water vapours at $900°C$ in presence of Ni catalyst

(c) Reduction of $HCHO$ by $LiAlH_4$

(d) Reduction of $HCHO$ by aqueous $NaOH$

17. Conc. H_2SO_4 reacts with C_2H_5OH at $170°C$ to form **[1981]**

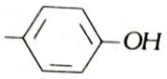
(a) CH_3COCH_3 (b) CH_3COOH

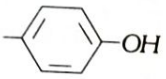
(c) CH_3CHO (d) C_2H_4

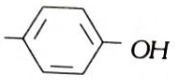
18. The compound that will react most readily with $NaOH$ to form methanol is **[2001]**

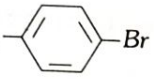
(a) $(CH_3)_4N^+I^-$ (b) CH_3OCH_3

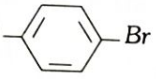
(c) $(CH_3)_3S^+I^-$ (d) $(CH_3)_3Cl$

19. The reaction of $CH_3CH=CH$  with HBr gives **[1998]**

(a) $CH_3CHBrCH_2$ 

(b) CH_3CH_2CHBr 

(c) $CH_3CHBrCH_2$ 

(d) CH_3CH_2CHBr 

20. The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is **[2005]**

(a) Acidic permanganate

(b) Acidic dichromate

(c) Chromic anhydride in glacial acetic acid

(d) Pyridinium chloro-chromate

21. Phenol, when first reacts with concentrated sulphuric acid and then with concentrated nitric acid, gives **[2008; 2010]**

(a) *o*-nitrophenol (b) *p*-nitrophenol

(c) Nitrobenzene (d) 2,4,6-trinitrophenol

22. Ortho-Nitrophenol is less soluble in water than *p*– and *m*– Nitrophenos because **[2012]**

(a) *o* – nitrophenol is more volatile steam than those of *m*- and *p*-isomers

(b) *o* – nitrophenol shows intramolecular *H* – bonding

(c) *o* – nitrophenol shows intermolecular *H* – bonding

(d) Melting point of *o* – nitrophenol is lower than those of *m*– and *p* – isomers

23. The products formed in the following reaction

$C_6H_5-O-CH_3+HI \xrightarrow{\text{heat}}$ are **[1995]**

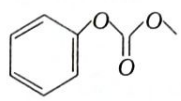
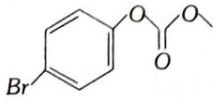
(a) C_6H_5-I and CH_3-OH

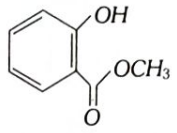
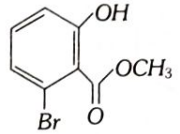
(b) C_6H_5-OH and CH_3-I

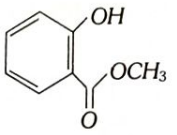
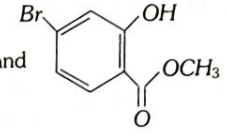
(c) $C_6H_5-CH_3$ and HOI

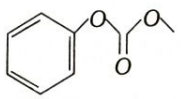
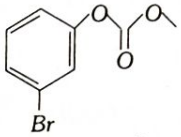
(d) C_6H_6 and CH_3OI

24. Phenol reacts with methyl chloroformate in the presence of $NaOH$ to form product A. A react with Br_2 to form product B. A and B are respectively **[2018]**

(a)  and 

(b)  and 

(c)  and 

(d)  and 

25. The best method to prepare cyclohexene from cyclohexanol is by using **[2005]**

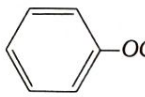
(a) Conc. HCl + $ZnCl_2$ (b) Conc. H_3PO_4

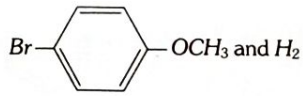
(c) HBr (d) Conc. HCl

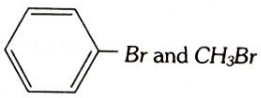
26. When benzene sulphonic acid and *p*-nitrophenol are treated with $NaHCO_3$, the gases released respectively are **[2006]**

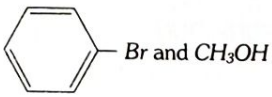
(a) SO_2, NO_2 (b) SO_2, NO

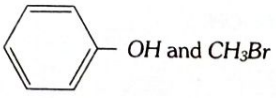
(c) SO_2, CO_2 (d) CO_2, CO_2

27. In the reaction  the products are **[2010]**

(a) 

(b) 

(c) 

(d) 

28. Phenyl magnesium bromide reacts with methanol to give **[2006]**

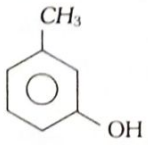
(a) A mixture of anisole and $Mg(OH)Br$

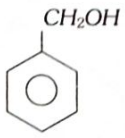
(b) A mixture of benzene and $Mg(OMe)Br$

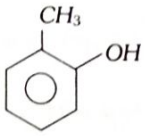
(c) A mixture of toluene and $Mg(OH)Br$

(d) A mixture of phenol and $Mg(Me)Br$

29. The structure of the compound that gives a tribromo derivative on treatment with bromine water is **[2006]**

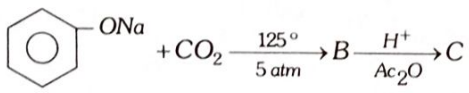
(a) 

(b) 

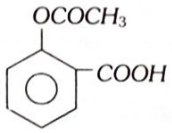
(c) 

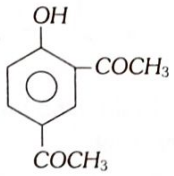
(d) 

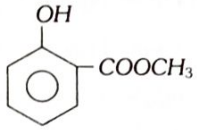
30. Sodium phenoxide when heated with CO_2 under pressure at $125°C$ yields a product which on acetylation produce C

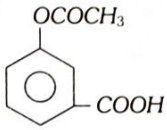


The major product C would be **[2014]**

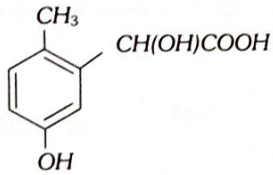
(a) 

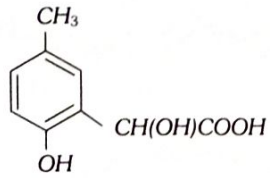
(b) 

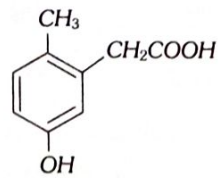
(c) 

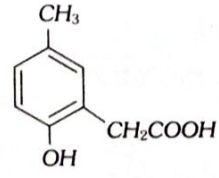
(d) 

31. *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 **[2005]**

(a) 

(b) 

(c) 

(d) 

10. NEET/ AIPMT/ CBSE-PMT

1. Compound A reacts with PCl_5 to give B which on treatment with KCN followed by hydrolysis gave propanoic acid. What is A and B respectively **[2002]**

(a) C_3H_8 and C_3H_7Cl (b) C_2H_6 and C_2H_5Cl

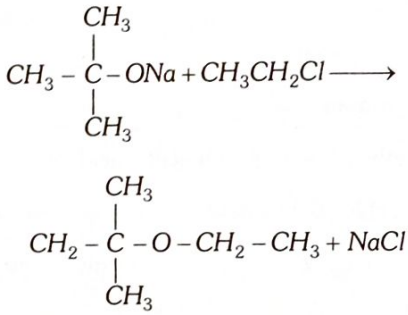
(c) C_2H_5Cl and C_2H_5Cl (d) C_2H_5OH and C_2H_5Cl

2. Which of the following reagents convert the propene to 1-propanol **[2000]**

(a) H_2O, H_2SO_4 (b) Aqueous KOH

(c) $MgSO_4, NaBH_4 / H_2O$ (d) B_2H_6, H_2O_2, OH^-

3. The reaction



is called **[2015]**

(a) Williamson continuous etherification process

(b) Etard reaction

(c) Gatterman-Koch reaction

(d) Williamson Synthesis

4. Which of the following will not form a yellow precipitate on heating with an alkaline solution of iodine **[2004]**

(a) CH_3OH (b) CH_3CH_2OH

(c) $CH_3CH(OH)CH_3$ (d) $CH_3CH_2CH(OH)CH_3$

5. An aromatic amine (A) was treated with alcoholic potash and another compound (Y). A foul smelling gas was formed with formula C_6H_5NC. Y was formed by reacting a compound (Z) with Cl_2 in the presence of slaked lime. The compound (Z) is **[1990]**

(a) $C_6H_5NH_2$ (b) C_2H_5OH

(c) CH_3OCH_3 (d) $CHCl_3$

6. The alcohol that produces turbidity immediately with $ZnCl_2$ + conc. HCl at room temperature **[1989]**

(a) 1-hydroxybutane

(b) 2-hydroxybutane

(c) 2-hydroxy-2-methylpropane

(d) 1-hydroxy-2-methylpropane

7. Following compound are given

1. CH_3CH_2OH
2. CH_3COCH_3
3. $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}HOH$
4. CH_3OH

Which of the above compound(s), on being warmed with iodine solution and $NaOH$, will give iodoform **[2010]**

(a) 1, 3 and 4 (b) Only 2

(c) 1, 2 and 3 (d) 1 and 2

8. When Phenol is heated with phthalic anhydride in concentrated sulphuric acid and the hot reaction mixture is poured into a dilute solution of sodium hydroxide, the product formed is **[1988]**

(a) Alizarin (b) Methyl orange

(c) Fluorescein (d) Phenolphthalein

9. Consider the following reaction :

$$\text{Phenol} \xrightarrow[Zn\ dust]{} X \xrightarrow[\text{Anhydrous } AlCl_3]{CH_3Cl} Y \xrightarrow{\text{Alkaline } KMnO_4} Z,$$

The product Z is **[2009]**

(a) Toluene (b) Benzaldehyde

(c) Benzoic acid (d) Benzene

10. Kolbe-Schmidt reaction is used for **[1991]**

(a) Salicylic acid (b) Salicylaldehyde

(c) Phenol (d) Hydrocarbon

11. Reaction of phenol with chloroform in presence of dilute sodium hydroxide finally introduces which one of the following functional group **[2015]**

(a) $-CH_2Cl$ (b) $-COOH$

(c) $-CHCl_2$ (d) $-CHO$

12. In the reaction

$$CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}H-CH_2-O-CH_2-CH_3+HI \xrightarrow{\text{heated}} ....$$

Which of the following compounds will be formed **[2007]**

(a) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}H-CH_2-I+CH_3CH_2OH$

(b) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}H-CH_3+CH_3CH_2OH$

(c) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}H-CH_2OH+CH_3CH_3$

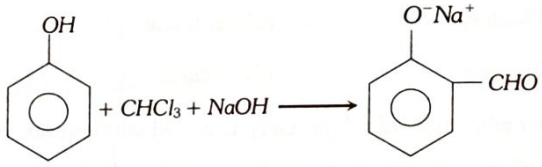
(d) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}H-CH_2OH+CH_3-CH_2-I$

13. The major organic product in the reaction $CH_3-O-CH(CH_3)_2+HI \rightarrow$ product is **[2006]**

(a) $CH_3O\underset{\displaystyle I}{\overset{\displaystyle |}{C}}(CH_3)_2$ (b) $CH_3I+(CH_3)_2CHOH$

(c) $CH_3OH+(CH_3)_2CHI$ (d) $ICH_2OCH(CH_3)_2$

14. In the reaction



The electrophile involved is **[2018]**

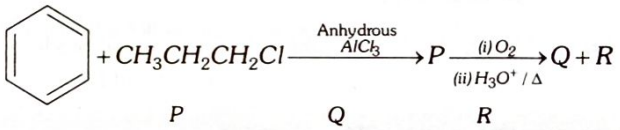
(a) Dichloromethyl cation $(\overset{\oplus}{C}HCl_2)$

(b) Formyl cation $(\overset{\oplus}{C}HO)$

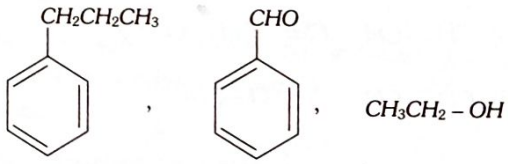
(c) Dichloromethyl anion $(CHCl_2^{\ominus})$

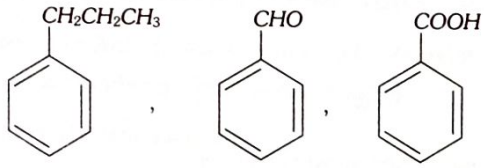
(d) Dichlorocarbene $(:CCl_2)$

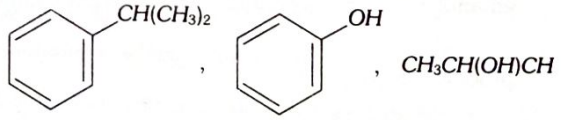
15. Identify the major products P, Q and R in the following sequence of reaction

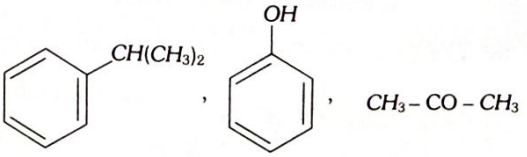


[2018]

(a) 

(b) 

(c) 

(d) 

16. Which of the following compounds can be used as antifreeze in automobile radiators **[2012]**

(a) Methyl alcohol (b) Glycol

(c) Nitrophenol (d) Ethyl alcohol

17. Which enzyme converts glucose and fructose both into ethanol **[1989]**

(a) Diastase (b) Invertase

(c) Zymase (d) Maltase

18. When ethyl alcohol (C_2H_5OH) is mixed with ammonia and passed over heated alumina, the compound formed is **[1989, 90]**

(a) $C_2H_5NH_2$ (b) C_2H_4

(c) $C_2H_5OC_2H_5$ (d) CH_3OCH_3

19. Methanol and ethanol are miscible in water due to **[1991]**

(a) Covalent character

(b) Hydrogen bonding character

(c) Oxygen bonding character

(d) None of these

20. Among the following ethers, which one will produce methyl alcohol on treatment with hot concentrated *HI* **[2013]**

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

(b) $CH_3-CH_2-CH_2-CH_2-O-CH_3$

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

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

21. Consider the following reaction,

ethanol $\xrightarrow{PBr_3} X \xrightarrow{alc.\ KOH} Y \xrightarrow[(ii)\ H_2O,\ heat]{(i)\ H_2SO_4\ room\ temperature} Z;$

product *Z* is **[2009]**

(a) $CH_2=CH_2$

(b) $CH_3CH_2-O-CH_2-CH_3$

(c) $CH_3-CH_2-O-SO_3H$

(d) CH_3CH_2OH

22. $H_2COH.CH_2OH$ on heating with periodic acid gives **[2009]**

(a) $2CO_2$ (b) $2HCOOH$

(c) $\underset{\displaystyle CHO}{\overset{|}{\underset{|}{CHO}}}$ (d) $2\ \overset{H}{H}\!>\!C=O$

23. On heating glycerol with conc. H_2SO_4, a compound is obtained which has a bad odour. The compound is **[1994]**

(a) Glycerol sulphate (b) Acrolein

(c) Formic acid (d) Allyl alcohol

24. Glycerol reacts with $P_4 + I_2$ to form **[1991]**

(a) Aldehyde (b) Allyl iodide

(c) Allyl alcohol (d) Acetylene

25. Ortho-nitrophenol is steam volatile whereas para-nitrophenol is not. This is due to **[1989]**

(a) Intramolecular hydrogen bonding present in ortho-nitrophenol

(b) Intermolecular hydrogen bonding

(c) Intramolecular hydrogen bonding present in para-nitrophenol

(d) None of these

26. The increasing order of acidity among phenol, *p*-methylphenol, *m*-nitrophenol and *p*-nitrophenol is **[1995; 2010]**

(a) *m*-nitrophenol, *p*-nitrophenol, phenol, *p*-methylphenol

(b) *p*-methylphenol, *m*-nitrophenol, phenol, *p*-nitrophenol

(c) *p*-methylphenol, phenol, *m*-nitrophenol, *p*-nitrophenol

(d) Phenol, *p*-methylphenol, *p*-nitrophenol, *m*-nitrophenol

27. Which of the following will not be soluble in sodium hydrogen carbonate **[2014]**

(a) *o*-Nitrophenol (b) Benzenesulphonic acid

(c) 2,4,6-trinitrophenol (d) Benzoic acid

28. The most suitable method of separation of 1 : 1 mixture of ortho and para-nitrophenols is **[2017]**

(a) Sublimation (b) Chromatography

(c) Crystallisation (d) Steam distillation

29. In the following reaction 'A' is

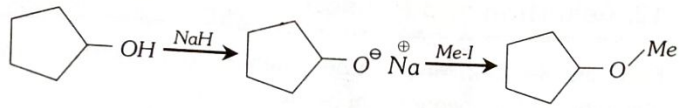
$$C_2H_5MgBr + H_2C-CH_2 \xrightarrow{H_2O} A$$
(O)

[1998]

(a) $C_2H_5CH_2CHO$ (b) $C_2H_5CH_2CH_2OH$

(c) $C_2H_5CH_2OH$ (d) C_2H_5CHO

30. The reaction



Can be classified as **[2016]**

(a) Williamson ether synthesis reaction

(b) Alcohol formation reaction

(c) Dehydration reaction

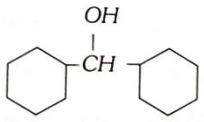
(d) Williamson alcohol synthesis reaction

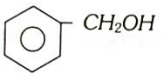
31. The compound which does not react with sodium is **[1994]**

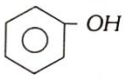
(a) C_2H_5OH (b) CH_3-O-CH_3

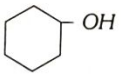
(c) CH_3COOH (d) $CH_3-CHOH-CH_3$

32. Which of the following compounds has the most acidic nature **[2010]**

(a) 

(b) 

(c) 

(d) 

33. Among the following sets of reactants which one produces anisole **[2014]**

(a) C_6H_5OH; neutral $FeCl_3$

(b) $C_6H_5-CH_3$; CH_3COCl; $AlCl_3$

(c) CH_3CHO; $RMgX$

(d) C_6H_5OH; $NaOH$; CH_3I

34. Given are cyclohexanol (I), acetic acid (II), 2, 4, 6-trinitrophenol (III) and phenol (IV). In these the order of decreasing acidic character will be **[2010]**

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

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

35. The heating of phenyl-methyl ethers with HI produces **[2017]**

(a) Ethyl chlorides (b) Iodobenzene

(c) Phenol (d) Benzene

36. The compound A on treatment with Na gives B, and with PCl_5 gives $C.B$ and C react together to give diethyl ether. A, B and C are in the order **[2018]**

(a) C_2H_5OH, C_2H_6, C_2H_5Cl

(b) C_2H_5OH, C_2H_5Cl, C_2H_5ONa

(c) C_2H_5Cl, C_2H_6, C_2H_5OH

(d) C_2H_5OH, C_2H_5ONa, C_2H_5Cl

11. AIIMS

1. Propene, $CH_3-CH=CH_2$ can be converted to 1-propanol by oxidation. Which set of reagents among the following is ideal to effect the conversion **[2003]**

(a) Alkaline $KMnO_4$

(b) B_2H_6 and alkaline H_2O_2

(c) O_3 / Zn dust

(d) OsO_4 / CH_4, Cl_2

2. In which case methyl-*t*-butyl ether is formed **[2008]**

(a) $(C_2H_5)_3CONa+CH_3Cl$

(b) $(CH_3)_3CONa+CH_3Cl$

(c) $(CH_3)_3CONa+C_2H_5Cl$

(d) $(C_2H_5)_3CONa+C_2H_5Cl$

3. Lucas test is used for **[2002]**

(a) Alcohols (b) Amines

(c) Diethyl ether (d) Glacial acetic acid

4. Which of the following is not characteristic of alcohols **[1980]**

(a) They are lighter than water

(b) Their boiling points rise fairly uniformly with increasing molecular weight

(c) Lower members are insoluble in water and organic solvents but solubility regularly increases with molecular weight

(d) Lower members have pleasant smell and burning taste, while higher members are odourless and tasteless

5. In presence of $NaOH$, phenol react with $CHCl_3$ to form *o*-hydroxy benzaldehyde. This reaction is called **[1992]**

(a) Riemer-Tiemann's reaction

(b) Sandmeyer's reaction

(c) Hoffmann's degradation reaction

(d) Gattermann's aldehyde synthesis

6. Phenol is treated with bromine water and shaken well. The white precipitate formed during the process is **[1996]**

(a) *m*-bromophenol

(b) 2, 4-dibromophenol

(c) 2, 4, 6-tribromophenol

(d) A mixture of *o*- and *p*-bromophenols

7. At higher temperature, iodoform reaction is given by **[2003]**

(a) $CH_3CO_2CH_3$ (b) $CH_3CO_2C_2H_5$

(c) $C_6H_5CO_2CH_3$ (d) $CH_3CO_2C_6H_5$

8. What is the product obtained when chlorine reacts with ethyl alcohol in the presence of $NaOH$ **[2007]**

(a) CH_3Cl (b) C_2H_5Cl

(c) CCl_3CHO (d) $CHCl_3$

9. Glycerine has **[1997]**

(a) One primary and two secondary $-OH$ groups

(b) One secondary and two primary $-OH$ groups

(c) Three primary $-OH$ groups

(d) Three secondary $-OH$ groups

10. On boiling with concentrated hydrobromic acid, phenyl ethyl ether will yield **[1992]**

(a) Phenol and ethyl bromide

(b) Phenol and ethane

(c) Bromobenzene and ethanol

(d) Bromobenzene and ethane

11. Ethylene oxide when treated with Grignard reagent yields **[2007]**

(a) Cyclopropyl alcohol (b) Primary alcohol

(c) Secondary alcohol (d) Tertiary alcohol

12. An organic compound X on treatment with pyridinium chloro chromate in dichloromethane gives compound Y. Compound Y reacts with I_2 and alkali to form triiodomethane. The compound 'X' is **[2008]**

(a) C_2H_5OH (b) CH_3CHO

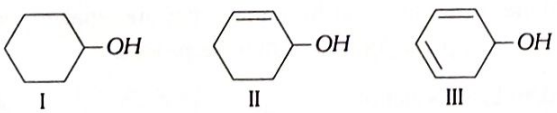
(c) CH_3COCH_3 (d) CH_3COOH

13. Isopropylbenzene on air oxidation in the presence of dilute acid gives **[2006]**

(a) C_6H_5COOH (b) $C_6H_5COCH_3$

(c) C_6H_5CHO (d) C_6H_5OH

14. The correct order of ease of dehydration of following is



I II III

[2007]

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

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

12. Assertion and Reason

Read the assertion and reason carefully to mark the correct option out of the options given below:

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

(e) If assertion is false but reason is true.

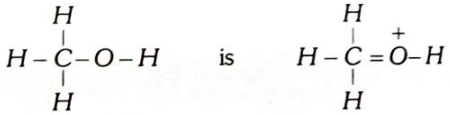
1. Assertion : A triester of glycerol and palmitic acid on boiling with aqueous $NaOH$ gives a solid cake having soapy touch.

Reason : Free glycerol is liberated which is a greasy solid. **[AIIMS 1996]**

2. Assertion : Phenol is a weak acid than ethanol.

Reason : Groups with + M effect and – I effect decrease acidity at *p*-position. **[AIIMS 2002]**

3. Assertion : The resonance structure of



Reason : Methanol cannot be represented by a resonance structure since the carbon atom has five bonds. **[MP PMT 2008]**

4. Assertion : Phenol undergo Kolbe reaction, ethanol does not.

Reason : Phenoxide ion is more basic than ethoxide ion. **[AIIMS 1994]**

5. Assertion : Lucas reagent is a mixture of anhydrous $ZnCl_2$ and concentrated HCl.

Reason : Primary alcohol produce ppt. with Lucas reagents. **[AIIMS 1995]**

6. Assertion : Resorcinol turns $FeCl_3$ solution purple.

Reason : Resorcinol have phenolic group. **[AIIMS 2000]**

7. Assertion : Alcohol and phenol can be distinguished by sodium hydroxide.

Reason : Phenol is acidic while alcohol is neutral.

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

Reason : Benzyl cation is more stable than methyl cation. **[AIIMS 2004]**

9. Assertion : The *pka* of acetic acid is lower than that of phenol.

Reason : Phenoxide ion is more resonance stabilized.

[AIIMS 2004, 15]

10. Assertion : Phenols cannot be converted into esters by direct reaction with carboxylic acids.

Reason : Electron withdrawing groups increase the acidity of phenols.

11. Assertion : $(CH_3)_3C-Br$ and CH_3CH_2ONa react to form $(CH_3)_3C-O-CH_2CH_3$.

Reason : Good yields of ethers are obtained when tert-alkyl halides are treated with alkoxides.

12. Assertion : A rate of hydrolysis of methyl chloride to methanol is higher in DMF than in water.

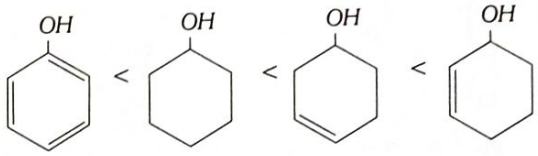
Reason : Hydrolysis of methyl chloride follows second order kinetics. **[AIIMS 2005]**

13. Assertion : *t*-Butyl methyl ether is not prepared by the reaction of *t*-butyl bromide with sodium methoxide.

Reason : Sodium methoxide is a strong nucleophile.

[AIIMS 2005]

14. Assertion : The ease of dehydration of the following alcohols is



Reason : Alcohols leading to conjugated alkenes are dehydrated to a greater extent. **[AIIMS 2008]**

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

Reason : Alcohols and ethers are isomeric in nature.

[AIIMS 2007]

29. Alcohols, Phenols and Ethers – Answers Keys

1. Preparation of Alcohols, Phenols and Ethers

1	a	**2**	b	**3**	b	**4**	d	**5**	a
6	b	**7**	a	**8**	b	**9**	a	**10**	d
11	c	**12**	d	**13**	a	**14**	d	**15**	d
16	d	**17**	a	**18**	c	**19**	c	**20**	d
21	b	**22**	d	**23**	d	**24**	a	**25**	a
26	c								

2. Properties of Alcohols, Phenols and Ethers

1	d	**2**	a	**3**	c	**4**	a	**5**	c
6	a	**7**	a	**8**	b	**9**	c	**10**	a
11	d	**12**	a	**13**	c	**14**	d	**15**	a
16	c	**17**	a	**18**	d	**19**	a	**20**	a
21	b	**22**	d	**23**	d	**24**	d	**25**	b
26	c	**27**	d	**28**	b	**29**	a	**30**	b
31	c	**32**	c	**33**	b	**34**	c	**35**	b
36	c	**37**	a	**38**	c	**39**	c	**40**	d
41	d	**42**	b	**43**	c	**44**	c	**45**	b
46	a	**47**	a	**48**	a	**49**	a	**50**	a
51	b	**52**	b	**53**	b	**54**	b	**55**	c
56	b	**57**	a	**58**	a	**59**	d	**60**	c
61	d	**62**	c	**63**	c				

3. Uses of Alcohols, Phenols and Ethers

1	c	**2**	d	**3**	c	**4**	b	**5**	c
6	c	**7**	c	**8**	d	**9**	a	**10**	b
11	d								

4. Methanol and Ethanol

1	a	**2**	b	**3**	d	**4**	c	**5**	c
6	a	**7**	b	**8**	a	**9**	b	**10**	b
11	c	**12**	a	**13**	a	**14**	d	**15**	b
16	b	**17**	c	**18**	a				

5. Dihydric, Trihydric and Unsaturated Alcohols

1	a	**2**	d	**3**	a	**4**	b	**5**	b
6	c	**7**	a	**8**	a	**9**	c	**10**	b
11	c								

6. Nitrophenols, Dihydric and Trihydric Phenols

1	d	**2**	b	**3**	b	**4**	c	**5**	c
6	c	**7**	a	**8**	c	**9**	b	**10**	a
11	c								

7. Cyclic and Aromatic Ethers

1	b	**2**	a	**3**	a	**4**	c	**5**	

8. Different Ethers and Hydroxy Compounds

1	b	**2**	b	**3**	d	**4**	c	**5**	d
6	b	**7**	c	**8**	c	**9**	a	**10**	d
11	d	**12**	d	**13**	d	**14**	d	**15**	a
16	a	**17**	a	**18**	b	**19**	c		

9. IIT-JEE/ AIEEE

1	a	**2**	b	**3**	d	**4**	a	**5**	d
6	b	**7**	d	**8**	d	**9**	b	**10**	c
11	b	**12**	b	**13**	d	**14**	d	**15**	d
16	a	**17**	d	**18**	a	**19**	b	**20**	c
21	d	**22**	b	**23**	b	**24**	a	**25**	b
26	d	**27**	d	**28**	b	**29**	a	**30**	a
31	b								

10. NEET/ AIPMT/ CBSE-PMT

1	d	**2**	d	**3**	d	**4**	a	**5**	b
6	c	**7**	c	**8**	d	**9**	c	**10**	a
11	d	**12**	d	**13**	b	**14**	d	**15**	d
16	b	**17**	c	**18**	a	**19**	b	**20**	d
21	d	**22**	d	**23**	b	**24**	b	**25**	a
26	c	**27**	a	**28**	d	**29**	b	**30**	a
31	b	**32**	c	**33**	d	**34**	b	**35**	c
36	d								

11. AIIMS

1	b	**2**	b	**3**	a	**4**	c	**5**	a
6	c	**7**	b	**8**	d	**9**	b	**10**	a
11	b	**12**	a	**13**	d	**14**	b		

12. Assertion and Reason

1	c	**2**	d	**3**	d	**4**	c	**5**	c
6	a	**7**	a	**8**	a	**9**	c	**10**	b
11	d	**12**	a	**13**	b	**14**	a	**15**	b