CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 12 FOR CHEMISTRY

ALCOHOL, ETHERS & PHENOL, OXIDATION & REDUCTION

Mcq S

1. Which of the following reaction is called as 'Bouveault-Blanc reduction'

A. reduction of acyl halide through Na/C_2H_5OH

B. Reduction of ester through Na/C_2H_5OH

C. Reduction of anhydride through Na/C_2H_5OH

D. Reduction of carbonyl compounds through Na/C_2H_5OH

Answer: D

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2. In which of the following reaction alcohol is not formed-

A. $R-CH=CH_2+H_2O \xrightarrow[\text{high pr.}]{H^+}$

B. $R-COCl+2H_2 \xrightarrow{LiAlH_4}$

C. $(R-CO)_2O+4H_2+4H_2 \xrightarrow{LiAlH_4}$

D. $R-CH_2-CH_3+H_2O \xrightarrow[\text{High pr}]{H^+}$

Answer: D

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3. Which one of the following alcohol has highest boiling point-

A. Methanol

B. ethanol

C. Propanol

D. Isopropanol

Answer: C

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4. Dimethyl ether and ethanol has same molecular weight but boiling point of ethanol is greater than dimethyl ether, cause of this is that dimethyl ether-

A. Having less no. of branches

B. Arrangemnt of hydrogen is different

C. Due to hydrogen bonding in alcohol

D. None of these

Answer: C

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5. Reactivity order of alcohols towards Na will be-

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

B. $MeOH > 1^\circ > 2^\circ > 3^\circ$

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

D. $1^\circ = 2^\circ = 3^\circ = MeOH$

Answer: B

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6. In the esterification of alcohol by carboxylic acid, proton is given by-

A. Alcohol

B. Conc. H_2SO_4

C. Acid carboxylic

D. None of these

Answer: B

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7. 2-methyl 2-propanol with Fenton's reagent gives-

A. 1,2-methyl propene-1

B. 2-methyl propene-2

C. 2,5-dimethyl hexanediol-2,5

D. 2,2,3,3-tetramethyl butane

Answer: C

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8. When methane is passed in copper tube at $200^{\circ} C$ with air, it gives.

A. Methanol

B. Ethanol

C. Acetylene

D. Ethene

Answer: A

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9. Acetic acid is removed from pyroligneous acid by the passing it in-

A. $Al(OH)_3$ solution

B. $Ba(OH)_2$ solution

C. $Ca(OH)_2$ solution

D. Ethanol

Answer: C

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10. Crushed germinated barley solution is called-

A. Mesh

B. Malt

C. Wort

D. Was

Answer: B

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11. Which one test is also known as RBW test-

A. Lucal test

B. Victor meyer test

C. carbilamine test

D. Mullical-Barker test

Answer: B

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12. Ethyl iodide reacts with most Ag_2O to form

A. Ether

B. Alcohol

C. Alkene

D. Alkane

Answer: B

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13. Ethyl iodide reacts with sodium ethoxide to form

A. Ethene

B. Ethoxy ethane

C. Alcohol

D. None

Answer: B

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14. Ether reacts with halogen in in dark and in light to give-

A. Same products

B. Different products

C. It does not react in light

D. It does ot react in dark

Answer: B

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15. Ether reacts with PCl_5 to form

A. Ethyl chloride

B. Phosphorous oxy trichloride

C. Both A and B

D. None

Answer: C

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16. An example of compound with functional group $-O-$ is

A. Acetic acid

B. Methyl alcohol

C. Diethyl ether

D. Acetone

Answer: C

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17. An organic compound A reacts with sodium metal and forms B. On heating with conc. H_2SO_4, A gives diethyl ether. So A and B are

A. C_3H_7OH and CH_3ONa

B. CH_3OH and CH_3ONa

C. C_4H_9OH and C_4H_9ONa

D. C_2H_5OH and C_2H_5ONa

Answer: D

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18. In the presence of an acid catalyst, two alcohol molecules will undergo dehydration to give

A. Ester

B. Anhydride

C. Ether

D. Unsaturated hydrocarbon.

Answer: C

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19. A carbon compound A forms B with sodium metal and again A forms C with PCl_5 but B and C form diethylether. Therefore A, B & C are -

A. $C_2H_5OH, C_2H_5OHa, C_2H_5Cl$

B. $C_2H_5Cl, C_2H_5ONa, C_2H_5OH$

C. $C_2H_5OH, C_2H_6, C_2H_6Cl_2$

D. $C_2H_5OH, C_2H_5Cl, C_2H_5ONa$

Answer: A

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20. When ethyl iodide is treated with dry silver oxide, it forms-

A. Ag

B. $C_2H_5OC_2H_5$

C. C_2H_5OH

D. $COOH - COOH$

Answer: B

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21. $C-O-C$ bond angle in diethyl ether is about-

A. 180°

B. 110°

C. 150°

D. 90°

Answer: B

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22. In chlorobenzene, the $-Cl$ group

A. Activates the benzene ring more, via resonance effect that deactivating it via inductive effect.

B. Deactivates the benzene ring more, via inductive effect that activating it via resonance effect.

C. Activates the benzene ring via resonance effect and deactivates it via inductive effect. Both these effect are evenly matched.

D. It is a net deactivating group with director characteristics.

Answer: B

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23. 

Identify 'Z' in the reaction given below.

A. 

B. 

C. 

D. 

Answer: C

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24. The correct order of reactivity towards electrophilic substitution is-

A. PhenolgtBenzenegtChlorobenzenegtBenzoic acid

B. Benzoic acidgt ChlorobenzenegtBenzenegtPhenol

C. PhenolgtChlorobenzenegtBenzenegt Benzoic acid

D. Benzoic acidgtPhenolgtBenzenegtChlorobenzene

Answer: A

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25. Which among the following is the strongest ortho-para directing group?

A. $-OH$

B. $-Cl$

C. $-OCH_3$

D. $-CH_3$

Answer: A

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26. The compound represented by the molecular formula, C_7H_8O are-

A. Only alcohol

B. Only ether

C. Only phenolic compound

D. All the three types of compounds.

Answer: D

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27. Identify A, B and C in the following reactions-

A. Sodalime, benzene, potassium phenoxide

B. Zn,benzene,sodium ethoxide

C. Zn, cyclohexanone, sodium ethoxide

D. None of the above.

Answer: A

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28. What insoluble aromatic compound dissolves in sodium hydroxide but remain insoluble in sodium bicarbonate. Hence the expected compound should be - [where $\phi = C_6H_5$]

A. $\phi - COOH$

B. $\phi - OH$

C. $\phi - CO - CH_3$

D. $\phi - NH_2$

Answer: B

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29. Salicylaldehyde and o-nitrophenol are less soluble in water because-

A. Their molecular weights are high

B. They exhibit intra molecular H-bonding

C. They are aromatic compound

D. $-CHO$ and $-NO_2$ groups are not polar

Answer: B

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30. Rate of substitution reaction in phenol is-

A. Slower than the rate of benzene

B. Faster than the rate of benzene

C. Equal to the rate of benzene

D. None

Answer: B

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Exercise 1

1. Which of the following is produced when an aqueous solution of butan-2-ol is refluxed with dilute acidic $KMnO_4$?

A. butanol

B. butanoic acid

C. potassium butanoate

D. butanone

Answer: D

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2. Consider the reaction $CH_3CH_2CH_2OH \xrightarrow{PCl_5} A \xrightarrow[KOH]{alc} B$. The compound 'B' is

A. propane

B. propene

C. propyne

D. propanal

Answer: B

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3. Which of the following has the lowest solubility in water?

A. $CH_3CH_2CH_2CH_2OH$

B. $CH_3 - \overset{CH_3}{\underset{|}{C}} HCH_2OH$

C. $HOH_2C - CH_2OH$

D. $C_6H_5CH_2CH_2OH$

Answer: D

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4. Chlorine reacts with ethanol to give

A. Ethylchloride

B. chloroform

C. chloral

D. acetaldehyde.

Answer: C

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5. Ethanol is heated with concentrated H_2SO_4. The product formed is

A. $CH_3 = \underset{\underset{O}{||}}{C} - O - C_2H_5$

B. C_2H_6

C. C_2H_4

D. C_2H_2

Answer: C

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6. Which of the following has the highest boiling value pK_a?

A. $CH_3 - CH_2OH$

B. $Cl - CH_2 - CH_2OH$

C. $F_3C - CH_2 - OH$

D. $CH_3 - \underset{\underset{CH_3}{|}}{C}\ H - CH_2OH$

Answer: D

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7. Which of the following has the highest boiling point?

A. $CH_3 - CH_2 - \underset{\underset{OH}{|}}{C}\ H - CH_3$

B. $CH_3 - CH_2 - CH_2 - CH_2OH$

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{CH_3}{C}}\ H - CH_2OH$

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

Answer: B

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8. Wood spirit contains

A. Only methanol

B. only ethanol

C. methanol+ethanol

D. a mixture of a number of alcohols

Answer: A

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9. The compound which reacts fastest with Lucas reagent at room temperature is

A. butan-1-ol

B. butan-2-ol

C. 2-methyl propan-1-ol

D. 2-methyl propan-2-ol

Answer: D

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10. The hydroboration oxidation of 2-methyl propene yields-

A. 1° alcohol

B. 2° alcohol

C. 3° alcohol

D. None

Answer: A

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11. $LiAlH_4$ converts acetic acid into-

A. Acetaldehyde

B. Methane

C. Ethyl alcohol

D. methyl alcohol

Answer: C

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12. Action of HNO_2 on CH_3NH_2 gives

A. CH_3OH

B. $CH_3 - O - CH_3$

C. $CH_3 - O - N = O$

D. B and C both

Answer: D

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13. Acetaldehyde racts with CH_3MgBr. The compound formed will be-

A. CH_3CH_2OH

B. $CH_3CHOHCH_3$

C. $CH_3CH_2CH_2OH$

D. None of these

Answer: B

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14. Action of nitrous acid on ethyl amine gives-

A. C_2H_6

B. C_2H_5OH

C. NH_3

D. Nitromethane

Answer: B

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15. Which of the following isomeric alcohols have highest melting and boiling points

A. Primary

B. Secondary

C. Tertiary

D. All equal

Answer: A

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16. Hydrogen bonding is posslb ein -

A. Ethers

B. Hydrocarbons

C. Alkanes

D. Alcohols

Answer: D

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17. The increasing order of boiling points of $1^\circ, 2^\circ, 3^\circ$ alcohol is-

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

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

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

D. none

Answer: A

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18. The solubility of lower alcohols in water is due to

A. Formation of hydrogen bond between alcohol and water molecules

B. Hydrophobic nature of alcohol

C. Increases in boiling points

D. None of these

Answer: A

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19. Conversion of CH_3OH to CH_3COOH can suitablly be carried out with the reagent (under high pressure condition).

A. CO_2 / H_2SO_4

B. CO / BF_3

C. CO_2 / BF_3

D. CO / H_2SO_4

Answer: B

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20. Which of the following reactions of an alcohol does not involve O-H bond breaking:

A. Reaction with alkali metals

B. reaction with an acyl chloride

C. reaction with sulphonyl chloride

D. reaction with conc. Sulphuric acid

Answer: D

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21. Alkyl chloride is formed when alcohol is treated with HCl in presence of anhydrous $ZnCl_2$. The order of reactivity with respect to alcohol is

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

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

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

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

Answer: A

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22. When ethyl alcohol reacts with acetic acid, the products formed are

A. Sodium ethoxide+hydrogen

B. Ethyl acetate+water

C. Ethyl acetate+soap

D. Ethyl alcohol + water

Answer: B

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23. Methyl alcohol reacts with phosphorus to form-

A. Methane

B. Methyl chloride

C. Acetyl chloride

D. Dimethyl ether.

Answer: B

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24. The $-OH$ group of Methyl alcohol cannot be replaced by chlorine by the the action of

A. Chlorine

B. Hydrogen chloride

C. Phosphorus trichloride

D. Phosphorus pentachloride

Answer: A

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25. Reaction of alcohol does not show cleavage of R-O linkage-

A. $ROH + PCl_5$

B. $ROH + SOCl_2$

C. $ROH + HCl$

D. $ROH + Na$

Answer: D

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26. Replacement of -OH group in alcohol by -Cl cannot be carried out with-

A. PCl_5

B. SO_2Cl_2

C. PCl_3

D. $SOCl_2$

Answer: B

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27. Which alcohol does not give a ketone on oxidation-

A. Isopropyl alcohol

B. Allyl alcohol

C. Ethylmethylcarbinol

D. Methylphenylcarbinol

Answer: C

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28. A compound X with molecular formula C_3H_8O can be oxidised to a compound Y with the moleculr formula $C_3H_6O_2$, X is most likely to be -

A. Primary alcohol

B. Secondary alcohol

C. Aldehyde

D. Ketone

Answer: A

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29. Tertiary alcohols are resistance to oxidation because:

A. They do not have α hydrogen atom

B. Of large +I effect of alkyl groups

C. Of greater steric hindrance

D. All the above

Answer: A

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30. The number of alkanols and ethers represented by the molecular formulae C_3H_8O and $C_4H_{10}O$ respectively are gives by the set :

A. 2,1,3,2

B. 1,2,2,3

C. 2,1,4,3

D. 2,1,3,4

Answer: C

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31. Which is mixmatched-

A. $C_2H_5 - C_2H_5$ Four primary carbon atoms

B. $CH_3 - CH_2 - CH(OH)CH_3$ Optical active

C. $CH_3 - O - CH(CH_3)_2$ Two secondary carbon atoms

D. Ether is heated with CH_3COCl in presence of $AlCl_3$ to give

$CH_3COOC_2H_5 + C_2H_5Cl$

Answer: C

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32. Diethyl ether is metamer of -

A. Ethoxyethane

B. Methyl propyl ether

C. Methoxyethane

D. Ethoxymethane

Answer: B

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33. Anhydrides of alcohol are nothing but -

A. Ethers

B. Aldehydes

C. Esters

D. Alkyl anhydrides.

Answer: A

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34. Electron pair donating tendency is maximum in-

A. Me-O-H

B. Me-O-Me

C. Et-O-H

D. Et-O-Et

Answer: D

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35. Which of the following is a cyclic ether-

A. Ethyl ether

B. Phenyl ether

C. Tetrahydrofurane

D. Vinyl ether

Answer: C

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36. In which case the product is neither a cyclic ether nor open chain symmetrical ether-

A. $CH_3 - CH = CH - CH_3 \xrightarrow{C_6H_5CO_3H}$

B. $CH_3CH_2ONa + C_2H_5Br \rightarrow$

C. $KCN + (CH_3)_3Cbr \rightarrow$

D. $C_2H_5OH(\text{Excess}) + H_2SO_4 \xrightarrow{140^\circ}$

Answer: C

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37. In order to obtain diethyl ether from ethanol, the latter is taken in-

A. In equal amount of sulphuri acid

B. In slightly lesser amount of sulphuric acid

C. In excess amount of sulphuric acid

D. in far lesser amount of sulphuric acid

Answer: C

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38. For making $(CH_3)_3C - O - C_2H_5$ the ideal combination is-

A. $(CH_3)_3CONa$ and C_2H_5Br

B. $(CH_3)_3CBr$ and C_2H_5ONa

C. both the above

D. None

Answer: A

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39. Mixed ether will not be formed in the reaction-

A. $CH_3OCH_2Cl + C_2H_5MgBr$

B. $CH_2N_2 + C_2H_5OH$

C. $C_2H_5ONa + CH_3I$

D. $C_2H_5OH + H_2SO_4(140^\circ C)$

Answer: D

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40. In which case ether is formed-

A. $(CH_3)_3C - Br + \overset{\ominus}{C}N$

B. $CH_3CH_2Br + (CH_3)_3CO^-$

C. $(CH_3)_3C - Cl + \overset{\ominus}{O}C_2H_5$

D. None of the above.

Answer: B

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41. Diethyl ether acts as a

A. Lewis acid

B. Lewis base

C. Reducing agent

D. Oxidising agent

Answer: B

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42. Ethers like alcohols do not form strong.. . Bonding. Hence they are more volatile

A. Covalent

B. Hydrogen chloride

C. coordinate

D. None of the above.

Answer: B

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43. The compound obtained by the reaction of diethyl ether with chlorine in the presence of sum light, is-

A. perchloro diethyl ether $H_5C_2 - OC_2Cl_5$

B. Perchloro diethyl ether $Cl_5C_2 - O - C_2Cl_5$

C. β, β'-Dichloro diethyl ether $ClCH_2CH_2 - O - CH_2CH_2Cl$

D. α, α'-Dichlorodiethylether $CH_3 - \underset{Cl}{\underset{|}{CH}} - O - \underset{Cl}{\overset{C}{H}} - CH_3$

Answer: B

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44. Diethyl ether absorbs oxygen to form-

A. Red coloured sweety smelling compound

B. Acetic acid

C. Ether sub oxide

D. Ether peroxide.

Answer: D

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45. Ethers in contact with air for a long time form peroxides. The presence of peroxide in ether can be tested b y adding Fe^{2+} ions followed by the addition of

A. KCNS

B. $SnCl_2$

C. $HgCl_2$

D. KI

Answer: A

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46. Diethyl Ether reacts with chlorine in the dark to form-

A. $CH_2Cl - CH_2 - O - CH_2 - CH_3$

B. $CH_3Cl - CH_2 - O - CH_2 - CH_2Cl$

C. $CH_3 - CH(Cl) - O - CH(Cl) - CH_3$

D. $CH_3 - CH(Cl) - O - CH_2 - CH_3$

Answer: C

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47. Ether does not form oxonium salt on reaction with-

A. Cold conc. H_2SO_4

B. Cold conc. HCl

C. Conc. HI

D. None of the above.

Answer: C

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48. The ordinary alkyl ethers are cleaved by-

A. Ethanol

B. Ethyl halide

C. BF_3

D. Hydrogen iodide

Answer: D

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49. The decomposition of ethers by KI or HBr is called-

A. Zerewitinoff's reaction

B. Ziesel's method

C. Williamson's method

D. Hell-Volhard-Zelinsky reaction

Answer: B

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50. Ether is not formed in this reaction-

A. $2C_2H_5Oh \xrightarrow[140^\circ]{Conc.\,H_2SO_4}$

B. $(CH_3)_3C - Cl + C_2H_5ONa \rightarrow$

C. $C_2H_5Cl + (CH_3)_3C - ONa \rightarrow$

D. Oxygen of ether can be replaced by chlorine when treated with

PCl_5

Answer: B

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51. Unsymmetrical ethers are best prepared by-

A. Williamson's continuous etherification process

B. Reacting grignard reagent with alkyl halide

C. Treating sodium alkoxides with alkyl bromides

D. Heating an alkanol with conc. H_2SO_4

Answer: C

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52. Which of the followig is used as an additive by fire departments under the name Rapid-Water-

A. Ethylene glycol

B. Polyethylene oxide

C. Epichlorohydrin

D. Epoxy oxide

Answer: B

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53. In the Williamson's synthesis for diethyl ether, which species workds as a nucleophile-

A. Halide ion

B. Ethoxide ion

C. Ethyde ion

D. Hydride ion

Answer: B

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54. The structure of the compounds formed by the the reaction of diethyl ether with oxygen of air is :

A. $CH_3CH_2 - O - O - CH_2CH_3$

B. $CH_3CH_2 - O - \overset{CH_3}{\overset{|}{C}}H - O - O - H$

C. $CH_3CH_2 - O - O - CH_2 - O - CH_3$

D. $CH_2(OCH_3) - CH_2 - O - C_2H_5$

Answer: B

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55. Ether bottles should not be kept open in air because-

A. Ether is an anaesthetic

B. Ether forms an explosive peroxide

C. Ether is costly

D. Ether gets oxidised to ethanol

Answer: B

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56. Isopropyl alcohol vapour is passed over alumina heated at about at about $240^{\circ} C$. The product formed is-

A. diisopropyl ether

B. propene

C. a mixture of diisopropyl ether and propene

D. 3-hexene

Answer: C

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57. Which of the following is not expected to give ether on reaction with sodium methoxide?

A. $CH_3CH_2CH_2Cl$

B. $CH_2 = CHCH_2Cl$

C. $PhCH_2Cl$

D. $CH_2 = CHCl$

Answer: D

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58. Consider the following reactions

$$CH_3CH = CH_2 \xrightarrow[2.NaBH_4]{1.(CH_3COOH)_2Hg.CH_3OH}$$

A. $CH_3\overset{CH_3}{\overset{|}{C}}H - O - \overset{O}{\overset{||}{C}} - CH_3$

B. $CH_3 - \overset{CH_3}{\overset{|}{C}}H - OCH_3$

C. 

D. 

Answer: B

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59. What is the end product 'B' of following sequence of reaction?

$$C_6H_5NH_2 \xrightarrow[H_\circ SO_4/O^\circ C]{HNO_2} 'A' \xrightarrow[\Delta]{H_2O} 'B'$$

A. $C_6H_5N_2Cl$

B. C_6H_6

C. $C_6H_5NH_2.H_2SO_4$

D. C_6H_5OH

Answer: D

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60. What are the final products of the following sequence of reactions?

$$C_6H_6 + CH_3CH = CH_2 \xrightarrow{Anhy.AlCl_3} ? \xrightarrow[\text{Catalyst}]{O_2/130^\circ C} ? \xrightarrow{H^+} ?$$

A. cumene and phenol

B. Phenol and acetone

C. Cumene and acetone

D. Benzoic acid and ethane

Answer: B

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61. Phenol is obtained in large scale from which fraction of coal-tar?

A. Light oil fraction

B. Green oil fraction

C. Pitch

D. Middle oil fraction

Answer: D

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62. By which of the following reactions phenol can be prepared industrially-

A. Rasching process

B. Dow process

C. Cumene is oxidised and the product obtained is treated with dil.

H_2SO_4

D. All of the above

Answer: D

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63. The compound obtained by heating cumenehydroperoxide with dil.

H_2SO_4 is

A. Phenol

B. Isopropyl benzene

C. Benzene sulphonic acid

D. none of these

Answer: A

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64. The product of the reaction of benzene with oxygen in the presenec of V_2O_5 as catalyst at $200^\circ C$ is-

A. Maleic anhydride

B. Benzoic acid

C. Phenol

D. None of these

Answer: C

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65. Dow's process used in the industrial preparation of phenol, is-

A. $C_6H_5Cl \xrightarrow[CuCl_2 \cdot 300^\circ]{NaOH} C_6H_5OH + NaCl$

B. $C_6H_5Cl + H_2O \xrightarrow[425^\circ]{SiO_2} C_6H_5OH + HCl$

C. $C_6H_5NH_2 + HNO_2 \xrightarrow{\Delta} C_6H_5OH + N_2 + H_2O$

D. $C_6H_5N_2Cl + H_2O \rightarrow C_6H_5OH + N_2 + HCl$

Answer: A

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66. Benzo radical in the following is-

A. $C_6H_5CH_2^-$

B. $C_6H_4 <$

C. $C_6H_5 -$

D. 

Answer: D

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67. Next higher homologue of phenol is-

A. Hydroxy toluene

B. Hydroxy benzene

C. Dihydroxy benzene

D. None of the above.

Answer: A

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68. Which of the following is not a phenolic compound-

A. Salol

B. o-Cresol

C. Anisole

D. Quinol

Answer: C

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69. Unacceptable name for a compound containing one-OH group attached to benzene nucleus would be-

A. Carbolic acid

B. Hydroxybenzene

C. Catechol

D. Phenol

Answer: C

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70. How many π electrons are there in a planar ring of phenol

A. 4

B. 6

C. 8

D. 10

Answer: C

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71. When phenol reactes with $CHCl_3$ and NaOH followed by acidification, salicyladehyde is obtained. Which of the following species are involed in the above-mentioned reaction as intermediates ?

A. 

B. 

C. 

D. Both A and B

Answer: D

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72. The presence of -OH on adjacent carbon atoms can be detected by the reaction of the compound with-

A. Conc. H_2SO_4

B. Conc. HNO_3

C. HIO_4

D. Acidic $KMnO_4$

Answer: C

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73. In phenols-

A. $-OH$ group is attached in side chain

B. $-OH$ group is directly attached to benzene nucleus

C. Both A and B

D. None

Answer: B

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74. The compound containing hydrogen bond is-

A. Toluene

B. Phenol

C. Chlorobenzene

D. Nitrobenzene

Answer: B

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75. Phenol on treatement with ammonia gives-

A. Benzene

B. Benzoic acid

C. Aniline

D. None

Answer: C

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76. Salicylic acid, aspirin, nylon, plastics and picric acid have a common raw material namely-

A. Methane

B. Formic acid

C. Phenol

D. Alcohol

Answer: C

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77. Which of the following will not be soluble in sodium carbonate solution.

A. 

B. 

C. 

D. 

Answer: C

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78. Under suitable conditions $C_6H_5CH_2OH(A) C_6H_5OH(B)$ and $C_6H_5COOH(C)$ can act as acids. The increasing order of their acidic strength is-

A. AltBltC

B. AltCltB

C. BltAltC

D. CltBltA

Answer: A

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79. Kolbe's reaction consists in obtaining-

A. Anisol from phenol

B. Salicylaldehyde from phenol and CHI_3

C. Salicylic acid from sodium phenate and CO_2

D. Salicylic acid from phenol and CO_2.

Answer: C

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80. The most suitable method of separation of a 1:1 mixture of o- and p-nitrophenol is-

A. Sublimation

B. Chromatography

C. crystallisation

D. Distillation

Answer: D

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81. p-Nitrophenol is stronger acid than phenol because nitro group is-

A. Electron withdrawing

B. Electron donating

C. Basic

D. Acidic

Answer: A

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82. Which derivative of phenol gives effervescence with $NaHCO_3$-

A. o-Cresol

B. Catechol

C. 2,4,6-Trinitrophenol

D. 2,4,6-Tribromophenol

Answer: C

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83. When phenol reacts with benzene diazonium chloride , the product obtained is :

A. Phenyl hydroxylamine

B. Para amino azobenzene

C. Phenyl hydrazine

D. Para hydroxy azobenzene

Answer: D

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84. Phenol and benzoic acid can be distinguished by-

A. Aqueous $NaHCO_3$

B. Aqueous $NaNO_3$

C. Aqueous NaOH

D. Conc. H_2SO_4

Answer: A

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85. Phenol is converted into salicylaldehyde by-

A. Etard reaction

B. Kolbe reaction

C. Reimer-Tiemann reaction

D. Cannizzaro reaction

Answer: C

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86. 

In the following compounds, the order of acidity is:

A. IIIgtIVgtIgtII

B. IgtIVgtIIIgtII

C. IIgtIgtIIIgtIV

D. IVgtIIIgtIgtII

Answer: D

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Exercise 2

1. Dehydration require an acid catalyst to protonate the hydroxy group of the alcohol and convert and convert it into good leaving group. Loss of water followed by a loss of a proton, given the alkene an equilibrium is established between reactants and products.

Q. To improve the yield of above reaction which of following is correct.

A. High temperature

B. Distillation (removal of alkene)

C. Addition of H_2O

D. Both A and B

Answer: D

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2. Dehydration require an acid catalyst to protonate the hydroxy group of the alcohol and convert and convert it into good leaving group. Loss of water followed by a loss of a proton, given the alkene an equilibrium is established between reactants and products.

Q. 

total number of α-hydrogen in A+B is

A. 13

B. 15

C. 17

D. 19

Answer: D

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3. Dehydration require an acid catalyst to protonate the hydroxy group of the alcohol and convert and convert it into good leaving group. Loss of water followed by a loss of a proton, given the alkene an equilibrium is established between reactants and products.

Q. Which alcohol is most reactive towards dehydration of alcohol in acid catalysed reaction.

A. 

B. 

C. 

D. 

Answer: A

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4. A compound $(X)C_4H_{10}O_7O$, does not give iodoform test but it can change the colouf of acidic dischromate solution, compound (Y) is another isomer of (X), that also does not give iodoform test but it can not chang ethe colour of acidic dichromate solution but it can give immediate turbidity with lucas reagent compound (Z) is another isomer of (X) which can ive positive iodoform test & can change the colour of acidic dihromate solution. X, Y & Z all are alcohols.

Q. Which of the followig can be X?

A. 

B. 

C. 

D. 

Answer: C

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5. A compound $(X)C_4H_{10}O_7O$, does not give iodoform test but it can change the colouf of acidic dischromate solution, compound (Y) is another isomer of (X), that also does not give iodoform test but it can not chang ethe colour of acidic dichromate solution but it can give immediate turbidity with lucas reagent compound (Z) is another isomer of (X) which can ive positive iodoform test & can change the colour of acidic dihromate solution. X, Y & Z all are alcohols.

Q. Which of the following statement is correct about Y.

A. It gives red colour during victor meyer's test

B. it is a secondary alcohol

C. It can not give red colour with cerric ammonium nitrate

D. it can not give rd colour with fehling solution.

Answer: D

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6. A compound $(X)C_4H_{10}O_7O$, does not give iodoform test but it can change the colouf of acidic dischromate solution, compound (Y) is another isomer of (X), that also does not give iodoform test but it can not chang ethe colour of acidic dichromate solution but it can give immediate turbidity with lucas reagent compound (Z) is another isomer of (X) which can ive positive iodoform test & can change the colour of acidic dihromate solution. X, Y & Z all are alcohols.

Q. Which of the following is not correct about compound Z?

A. It is a secondary alcohol.

B. It is a chain isomer of X.

C. It is functional isomer of diethyl ether.

D. It is a positional isomer of Y.

Answer: D

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7.

Reimer-Tiemann reaction introduces an aldehyde group on to the aromatic ring of phenol, ortho to the hydroxyl group. Thi reaction involves electrophilic aromatic substitution. It is a general method for the synthesis of substituted salicylaldehydes as depicted below:

Q. Which one of the following reagents is used ini the above reaction?

A. aq. $NaOH + CH_3Cl$

B. aq. $NaOH + CH_2Cl_2$

C. aq. $NaOH + CHCl_3$

D. aq. $NaOH + CCl_4$

Answer: C

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8.

Reimer-Tiemann reaction introduces an aldehyde group on to the

aromatic ring of phenol, ortho to the hydroxyl group. Thi reaction involves electrophilic aromatic substitution. It is a general method for the synthesis of substituted salicylaldehydes as depicted below:

Q. The electrophilic in this reaction is-

A. $:CHCl$

B. $.^{\oplus}CHCl_2$

C. $:CCl_2$

D. $*CCl_3$

Answer: C

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9.

Reimer-Tiemann reaction introduces an aldehyde group on to the aromatic ring of phenol, ortho to the hydroxyl group. Thi reaction involves electrophilic aromatic substitution. It is a general method for

the synthesis of substituted salicylaldehydes as depicted below:

Q. The structure of intermediate (I) is:

A. 

B. 

C. 

D. 

Answer: B

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10. Statement-I: The major products formed by heating  with HI are

Statement-II: Benzyl carbocation is more stable.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: A

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11. Statement-I: The major products formed by heating  with excess HI are:

Statement-II: ArSN reaction takes place if the ring is activated by EW (eg., $(-NO_2)$ group), at $o-$, $p-$ and m-position.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: C

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12. Statement-I: The boiling pint of diethyl ehter is greater than furan

Statement-II: Furan is more compact and has less suface area.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: A

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13. Statement-I: Fuan  is more soluble than DHF Dihydrofuran,  in H_2O

Statement-II: Greater e^- density on the O atom, stronger is the H-bonding and more soluble is the ether.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: D

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14. Statement-I: 

Statement-II: $p-NO_2-C_6H_4O^-$ is a stronger nucleophilic than PhO^-

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: C

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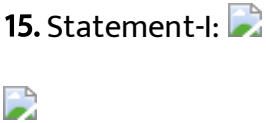
15. Statement-I: 

Statement-II Phenol cannot be chlorinated because the ring is susceptible to oxidation by Cl_2.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: A

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16. Assertion (A): 2,6-Dimethyl-4-nitrophenol (I) is more acidic than 3,5-dimethyl-4-nitrophenol (II).

Reason (R): It is due to the steric inhibition of the resonance of $(-NO_2)$ group with two (Me) groups in (II).

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: A

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17. Statement-I: Diphynyl ether (I) on dinitration gives the

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: D

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18. Statement-I: Reduction potential value (E°) of o-benzoquine  (I) is greater than p- benzoquinone 

Statement-II: Two adjacent $(C=O)$ group in (I) destabilse (I) relative to (II).

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: A

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19. Statement-I: Ethers o reaction with air and light form hydroperoxides. These peroxides decompose vilently at high temperature. Allyln-n-propyl ether with O_2 in lgiht gives mainly l-hydroperoxide allyl-n-propyl ether

Statement-II: The reaction proceeds via the formation of radical anion.

A. If both statement-I & statement-II are true & the statement-II is a correct explanation of the statement-I

B. if both statement-I & statement-II are true but statement-II is not a correct explanation of the statement-I

C. If statement-I is true but the statement-II is false.

D. If statement-I is false but the statement-II is true.

Answer: C

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20. HBO. Oxymericuration-demercuration and acid catalysed hydration will not give same product in

A. 

B. 

C. 

D. 

Answer: A::B::D

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21. In the reaction sepuence, $CaC_2 \xrightarrow{H_2O} A \xrightarrow[Hg^{2+}]{dil.\,H_2SO_4} B \xrightarrow[Ni]{H_2} C$, the product $C$is

A. Give yellow ppt. with NaOI

B. it's final oxidationproduct is carbonyl compound

C. Its final oxidation product is CO_2 and H_2O

D. Its final oxidation product is CH_3COOH

Answer: A::C

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22. Compound which gives alcohol on reduction is/are

A. $Me - \underset{\underset{O}{||}}{C} - Cl$

B. $Me - \underset{\underset{O}{||}}{C} - NH_2$

C. 

D. $Me - \overset{\overset{O}{||}}{C} - O - \overset{\overset{O}{||}}{C} - Me$

Answer: A::C::D

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23. Select the correct synthesis products

A. 

B. 

C. 

D. 

Answer: A::B::C

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24. Lucas test is used to make distinguation between $1^\circ, 2^\circ$ and 3° alcohols.

$$ROH + \underset{\text{conc.}}{HCl} \xrightarrow{\text{anydrous } ZnCl_2} \underset{\text{whiteturvidity}}{RCl \downarrow} + H_2O$$

This shown that -

A. ROH behaves as a base greater the value of pK_a (alcohol), greater reactivity with conc. HCl and thus sooner the formation of white turbidity.

B. Alcohol which reacts fastest with Na metal, will give turbidity at fastest rate

C. alcohol which reacts fastest with Na metal, will give turbidity at fastest rate.

D. Alcohol which gives red colour during victor mayor test, will always give turbidity at slowerrate then those giving blu or white colour during victor mayor test.

Answer: A::B

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25. End-product of which of following reaction give positive Iodoform test.

A. $H-\overset{O}{\overset{||}{C}}-Clunderst\left((ii).\,H^{\oplus}\right)\xrightarrow{(i)\,.CH_3MgBr\,(\text{excess})}$

B. $Ph-\overset{O}{\overset{||}{C}}-O-Et\xrightarrow[(ii)\,H^{+}]{(i)\,CH_3MgBr\,(\text{excess})}$

C. $H-\overset{O}{\overset{||}{C}}-O-Et\xrightarrow[(ii)\,.H^{\oplus}]{(i)\,.CH_3MgBr\,(\text{excess})}$

D. $CH_3 - \overset{\overset{O}{||}}{C} - H \xrightarrow[(ii)\, H^+]{(i)\, .CH_3MgBr\,(\text{excess})}$

Answer: A::B::C::D

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26.

Dehydration of alcohols take place more rapidly with $POCl_3$ than with H_2SO_4 select the correct statement(s) about the following dehydration reaction.

A. It does not involve carbocation

B. It involves $R - OPOCl_2$ with $-OPOCl_2$ as a batter leaving group.

C. It involves $E2$ mechanism as pyridine base abstrcts proton from the adjacent carbon as the same time at which $-OPOCl_2$ is leaving.

D. It is E1 reaction without formation of carbocation.

Answer: A::B::C

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27.

Consider the following compound A (below) Select the correct statement (s)

A. It is more acidic that CH_3OH

B. it is more acidic than $CH_3\overset{\overset{O}{||}}{C}OH$

C. it reacts very fast with Lucas reagent

D. It is a diacidic base

Answer: A::B

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28. 

Which of the following are possible products in the above reaction?

A. 

B. 

C. 

D. 

Answer: B::C::D

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29. 

Products form by following reactions are

A. 

B. 

C. 

D. 

Answer: A::C

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30. $C_2H_5NH_2 \xrightarrow[\text{reagent}]{\text{Tilden}} (i) \xrightarrow{NH_3} (ii) \xrightarrow[HCl]{NaNO_2} (iii)$. The product (iii) can be

A. Alcohol

B. Ether forms an explosive peroxide

C. Alkyl chloride

D. Alkyl nitrite

Answer: A::B::C::D

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31. Which of the following reaction represent major product.

A. 

B. 

C. 

D. 

Answer: A::C

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32. Which of the following will get oxidised by Br_2/KOH into carboxylic acid?

A. $CH_3 - CH_2 - OH$

B. 

C. 

D. 

Answer: A::B

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33. Diethyl ether reacts with PCl_5 to form

A. Ethyl chloride

B. Phosphorous oxy trichloride

C. 1,2-dichloro ethane

D. Ethene

Answer: A::B

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34. Which method is useful for the synthesis of ether?

A. 

B. $C_2H_5ONa + (CH_3)_2SO_4 \rightarrow$

C. 

D. $(CH_3)_3CBr + CH_3CH_2ONa \rightarrow$

Answer: A::B::C

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35. Which is/are correct statement?

A. 

B. 

C. This is oly affected in reduction to 2° alcohol 

D. 

Answer: A::B::C::D

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36. In the reaction  the intermediate (s) is/are

A. 

B. 

C. 

D. 

Answer: A::B::C

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37. $CH_3 - \underset{\underset{CH_3}{|}}{C}\ H - CH = CH_2 = \xrightarrow{\text{Reagent}}$ Alcohol

Which is true about alcohol and Reagent?

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38. Match the column

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39. Match the column

View Text Solution

40. Match structures given in list I with names given in list II and then select the correct answer from the codes given below the list

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41. Match this list I with list II and then select the answer from the codes given below the lists-

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42. Match list I and II and then select the correct answer from the codes given below the lists-

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43. Match the column-

View Text Solution

44. Match the column-

View Text Solution

45. Match the column

View Text Solution

46. Match the column

View Text Solution

47. Match ilst I with list II and then select the correct answer from the codes given below the lists-

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48. 

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49. A to F alkenes with minimum possible carbon.

(i). $A \xrightarrow[\Delta]{H^{\oplus}/KMnO_4} MeCOOH$ as the only product

(iii). $C \xrightarrow[\Delta]{H^{\oplus}/KMnO_4} MeCH_2COOH$ as the only organic product.

(iv). 

(v).

$$E \xrightarrow[\Delta]{H^{\oplus}/KMnO_4} HOOC-C-C-C-\overset{\overset{O}{||}}{C}-\underset{\underset{O}{||}}{C}-C-C-C-COOH$$

(vi). $F \xrightarrow[\Delta]{H^{\oplus}/KMnO_4}$ acetone+ethanoic acid

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50. 

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51. 

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52. (i) $CH_2 = CH - (CH_2)_3 - CH_2 - OH \xrightarrow{P\mathbb{C}}$

(ii). $C_6H_5 - CH = CH - CH_2 - OH \xrightarrow{PCC}$

(iii).

$$CH_3 - \overset{OH}{\overset{|}{C}}H - CH_2 - CH_2 - CH_2 - OH \xrightarrow{PCC} (A) \xrightarrow[(ii)\,.\,\Delta]{(i)\,.\,NaOH} (B).$$

(iv). 

(v). $CH_2 = CH - CH_2 - OH \xrightarrow{MnO_2}$?

(vi). 

(vii). $CH \equiv C - CH = \overset{\overset{CH_3}{|}}{C} - CH_2 - OH \xrightarrow[\text{acetone}]{MnO_2}$?

(viii). $C_6H_5 - \overset{\overset{OH}{|}}{CH} - CH_3 \xrightarrow[CCl_4]{MnO_2}$?

(ix).

$$C_6H_5 - CH = CH - CH_2 - \underset{\underset{CH_3}{|}}{C}H - CH_2 - OH \xrightarrow{DMSO + TsCl + NaHCO_3}$$

?

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53. (i). 

(ii). $CH_2 = CH - CH_2 - \overset{\overset{OH}{|}}{C}H - CH_3 \xrightarrow{\text{Aluminium tert butoxide}}$

(iii).  .

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54. (i). $Me-\underset{\underset{OH}{|}}{CH}-CH_2-OH \xrightarrow[\Delta]{HlO_4}$

(ii). $Me_2\underset{\underset{OH}{|}}{C}-\underset{\underset{OH}{|}}{CH}-Et- \xrightarrow[\Delta]{HIO_4}$

(iii). 

(iv). $HO-CH_2-CH_2-\underset{\underset{OH}{|}}{CH}-CH_2-OH \xrightarrow[\Delta]{HIO_4}$

(v). $\underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH}-CH_2-CH-CH_3 \xrightarrow[\Delta]{HIO_4}$

(vi). $\underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3 \xrightarrow[\Delta]{HIO_4}$

(vii). $\underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-\underset{\underset{OH}{|}}{CH_2} \xrightarrow[\Delta]{HIO_4}$

(viii). $Me-\underset{\underset{O}{||}}{C}-\underset{\underset{OH}{|}}{CH}-Me \xrightarrow[\Delta]{HIO_4}$

(ix). $Me-\underset{\underset{O}{||}}{C}-\underset{\underset{O}{||}}{C}-Me \xrightarrow[\Delta]{HIO_4}$.

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55. (a). $C-C-\overset{\overset{O}{||}}{C}-C \xrightarrow[\Delta]{[O]}$ ltb rgt (b). $Me_2CH-\overset{\overset{O}{||}}{C}-Me \xrightarrow[\Delta]{[O]}$

(c). $Me_3C-\overset{\overset{O}{||}}{C}-Me \xrightarrow[\Delta]{[O]}$

(d).  .

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56. (a). $CH_3 - CHO \xrightarrow[\Delta]{SeO_2}$

(b). $Me_2CO \xrightarrow[\Delta]{SeO_2}$

(c). $H_3C - CH_2 - \overset{\overset{O}{||}}{C} - CH_3 \xrightarrow[\Delta]{SeO_2} P_1 \xrightarrow{mCPBA} P_2 \xrightarrow{LAH} P_3.$

(f). $CH_3 - CH = CH_2 \xrightarrow{?}$ acrolein

(g). 

(h). $CH_3 - \overset{\overset{O}{||}}{C} - H \xrightarrow{SeO_2} H - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - H \xrightarrow{conc.NaOH} P_1 \xrightarrow{H^+ / \Delta} P_2$

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57. How will you differentiate HCHO and PhCHO?

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58. How will you differentiate HCHO and MeCHO?

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59. How many alkene on catalytic reduction give normal butane as product.

(i). $(A) \xrightarrow{H_2/Pt}$ n-butene

(ii) $(B) \xrightarrow{H_2/Pt}$ Iso-pentane

(iii). $(C) \xrightarrow{H_2/Pt}$ Neo-pentane

(iv). $(D) \xrightarrow{H_2/Pt}$ Cyclopentane

(v).  .

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60. Give the expected major product for each reaction, including stereochemistry where applicable.

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61.  .

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62. Identify the product?

(i). $\overset{NaBH_4}{\longleftarrow} Me - CHO \overset{LiAlH_4}{\longrightarrow}$

(ii). $\overset{NaBH_4}{\longleftarrow} Me_2C \infty verset(LiAlH_4) \rightarrow$

(iii). $\overset{NaBH_4}{\longrightarrow} Me - COCl \overset{LiAlH_4}{\longrightarrow}$

(iv). $\overset{NaBH_4}{\longleftarrow} Me - COOE \rightarrow verset(LiAlH_4) \rightarrow$

(v). $\overset{NaBH_4}{\longrightarrow} Me - COOH \overset{LiAlH_4}{\longrightarrow}$

(vi). $\overset{NaBH_4}{\longleftarrow} Me - COOMe \overset{LiAlH_4}{\longrightarrow}$

(vii). $\overset{NaBH_4}{\longleftarrow} Me - CONH_2 \overset{LiAlH_4}{\longrightarrow}$

(viii). $\overset{NaBH_4}{\longleftarrow} Me - CONH - Me \overset{LiAlH_4}{\longrightarrow}$

(ix). $\overset{NaBH_4}{\longleftarrow} Me - CONMe_2 \overset{LiAlH_4}{\longrightarrow}$

(x). $\overset{NaBH_4}{\longleftarrow} Me - CH = NH \overset{LiAlH_4}{\longrightarrow}$

(xi). $\overset{NaBH_4}{\longleftarrow} CH_3 - CH = CH_2 \overset{LiAlH_4}{\longrightarrow}$

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63. Give product in following reactions.

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64. Give product in following reaction.

 .

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65. give product in following reactions.

 .

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66. Give product in following reaction.

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67. 

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68. Suggest appropriate reagents for following conversion.

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Exercise 3

1. How can you convert $PhCH = CHCOCH_3$ to

(i). $PhCH = CHCO_2H$

(ii). $PhCH = CHCH_2CH_3$

(iii). $PhCH_2CH_2CH_2CH_3$

(iv). $PhCH = CHCH(OH)CH_3$

(v) $PhCH_2CH_2COCH_3$

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2. What reagents could you use for te following conversions.

(a). $MeCO(CH_2)_2CO_2EoMeCHOH(CH_2)_2CO_2Et$

(b). $HO_2C(CH_2)_4COCl \rightarrow HO_2C - (CH_2)_4CH_2OH$

(c). $O_2N(CH_2)_2CN \rightarrow O_2N(CH_2)_2CH_2NH_2$

(d). $O_2N(CH_2)_2CH = CH_2 \rightarrow H_2N(CH_2)_2CH = CH_2$

(e). $Me_2CHCOC < oMe_2CHCHO$

(f). $O_2N(CH_2)_3CHO \rightarrow O_2N(CH_2)_3CH_2OH$

(g). $O_2N(CH_2)_2CH = CH_2 \rightarrow O_2N(CH_2)_3CH_3$

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3. What are the order of rates of oxidation with HIO_4 of the following diols. Explain with reactions.

A. $Me_2C(OH)C(OH)Me_2$

B. $Me_2C(OH)CH(OH)Me$

C. $CH_2(OH)CH_2(OH)$

D. $MeCH(OH)CH(OH)Me$

Answer:

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4. Complete the following equations

(i) $n-C_3H_7-CO_2H \rightarrow n-C_4H_9OH$

(ii). $Me_2CO + EtMgI \rightarrow ? \xrightarrow{H^+} ?$

(iii). $EtCO_2Et + 2MeMgI \rightarrow ? \xrightarrow{H_2O} ?$

(iv). 

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5. t-butyl alcohol reacts less rapidly with metalic sodium than the primary alcohol. Explain why?

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6. Ethyl alcohol reacts with HI but not with HCN. Explain why?

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7. Write the structure of the principal organic product formed in the reaction of 1-propanol with each of the followinng reagents.

(i). Potassium dichromate $(K_2Cr_2O_7)$ I aqueous sulfuric acid, heat

(ii). Acetic acid $CH_3\overset{\overset{O}{||}}{C}OH$ in the presence of dissolved hydrogen chloride.

(iii).  Cl in the presence of pyridine.

(iv). $C_6H_5\overset{\overset{O}{||}}{C}O\overset{\overset{O}{||}}{C}C_6H_5$ in the presence of pyridine

(v).  . in the presence of pyridine.

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8. Complete the following series of equations by writing structural formula for compounds A through I:

(a). 

(b).

$$CH_2=CHCH_2CH_2\underset{\underset{OH}{|}}{C}HCH_3 \xrightarrow[\text{pyridine}]{SOCl_2} \underset{(E)}{C_6H_{11}Cl} \xrightarrow[(D)]{\substack{(i)\ .O_3\\(ii)\ .Zn/H_2O}} C_5H_9ClO$$

(c).  .

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9. Predict the principal organic product of each of the following reactions. Specify stereochemistry where appropriate.

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10. Deduce the identify of the missinig compounds in the following raction sequences. Show stereochemistry in parts (b) through (d).

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11. Explain why ArOR ethers are cleaved to give RI and ArOH rather than Arl and ROH.

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12. $C_2H_5OH \xrightarrow{PCl_5} (A) \xrightarrow{KCN} (B) \xrightarrow{H_3O^+} (C) \xrightarrow{NH_3} (D) \xrightarrow{\text{heat}} (E)$

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13. $CH_3CH_2CH_2OH \xrightarrow{PBr_5} (A) \xrightarrow{KOH\,(Alc)} (B) \xrightarrow{HBr} (C) \xrightarrow{NH_3} (D)$

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14. A compound (X) with the molecular formula C_3H_8O can be oxidized to another (Y) whose molecular formula is $C_6H_6O_2$

The compound (X) may be

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15. Outline a mechanism to account for different isomer formed when reacts with CH_3OH in acidic and in basic medium.

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16. Differentiate:

(a). 1-Hexanol and 1-chlorohexane

(b). Diethyl ether and n-butanol

(c). Diethyl ether and n-pentane

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17. Complete the following equations & comment

(i). $MeOE \rightarrow verset(HI) \rightarrow ?$

(ii). $Et_2O \xrightarrow{Na} ?$

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18. Diethyl ether behaves as base. Why?

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

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20. Explain why ArOR ethers are cleaved to give RI and ArOH rather than Arl and ROH.

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21. 

Complete the following with appropriate reagent:

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22. Indicate steps which would convent:

(A) Phenol to acetophenone

(B). Acetic acid to tert-butyl alcohol.

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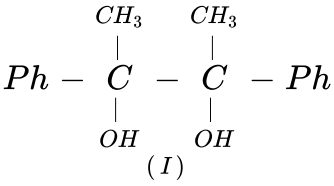
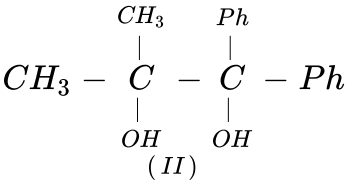
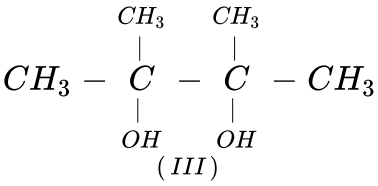
23. Compare rate of reaction towards pinacol pinacolone rearrangement.



(I)



(II)



(III)

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24. Give the product of the following reaction:

(iii). $Me - \overset{\overset{O}{||}}{C} - Et \xrightarrow[H_2O]{Mg} \xrightarrow[\Delta]{H_2SO_4} C$

(iv). $Ph - \overset{\overset{O}{||}}{C} - Me \xrightarrow[H_2O]{Mg} \xrightarrow[\Delta]{H_2SO_4} D$

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25. Sometimes exploson occurs during distillation of ether sample. Give the reason.

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26. Choose the reaction in each of the following pairs that proceeds at the faster rate. Explain your reasoning.

(a). Base-propmoted hydrolysis of phenyl acetate or m-nitrophenyl acetate

(b). Base-promoted hydrolysis of m-nitrophenyl acetate or p-nitrophenyl acetate.

(c). Reaction of ethyl bromide with phenol or with the sodium salt of

phenol.

(d). Reaction of ehtylene oxide with the sodium salt of phenol or with the sodium salt of p-nitrophenol

(e). Bromination of phenol or phenyl actetate.

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27. Which has higher b.p.?

(a). Phenol

(b). Benzenethiol

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28. Which has higher m.p?

(a). Hydrozqunone

(b). Catechol

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