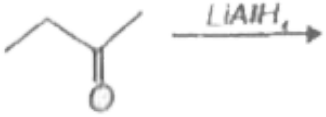
CHEMISTRY

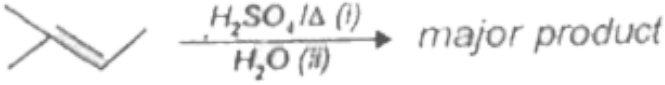
JEE MAIN AND ADVANCED

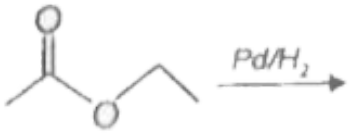
ALCOHOLS, PHENOLS AND ETHERS

Example

1. Give IUPAC name of the expected product in the following reactions .

(i) 

(ii) 

(iii) 

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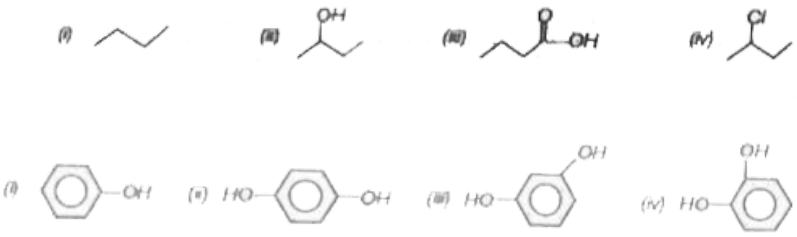
2. Arrange the following as mentioned



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3. Arrange the following in decreasing order of acidic nature of

(a) (i) F_3CCH_2OH , (ii) $(CH_3)_3CCH_2OH$, (iii) $FCH_2CH_2C_2OH$

(b)

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4. a : When 3° alkyl halide is used in Williamson 's synthesis what will be the major product and why ?

b : When 3° alkoxide is used in Williamson's synthesis what will be the major product and why ?

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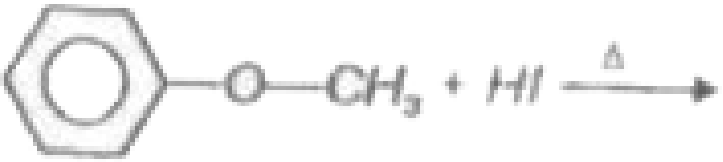
5. (a) What is the reactivity order of given halogen acids towards ethers ? HCl, HBr, HI

(b) What will be final products ? (i) , (ii)

$$CH_3 - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{C} - O - CH_3 + Hl \xrightarrow{\Delta}$$, (iii)

$$CH_3CH_2 - O - CH_3 + Hl \xrightarrow{\Delta}$$



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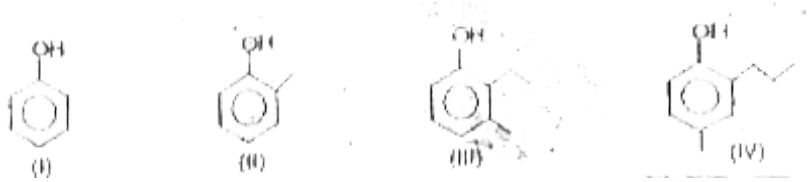
Try Yourself

1. Arrange the following in increasing order of their

(i) Solubility and , (ii) Boiling point



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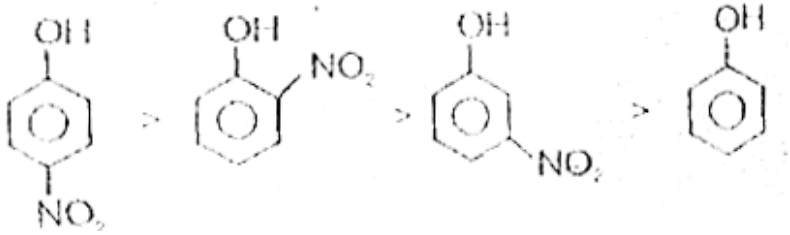
2. (a) Why acidic nature of alcohol and phenol increases with electron with electron withdrawing substituent ? (b) Explain the order of acidic nature of



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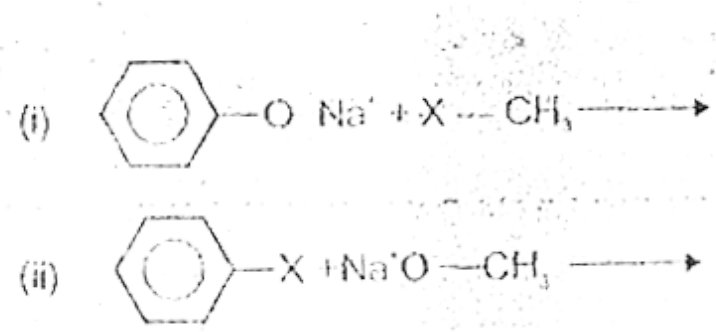
3. For the preparation of anisold which one is preferable reaction and why ?



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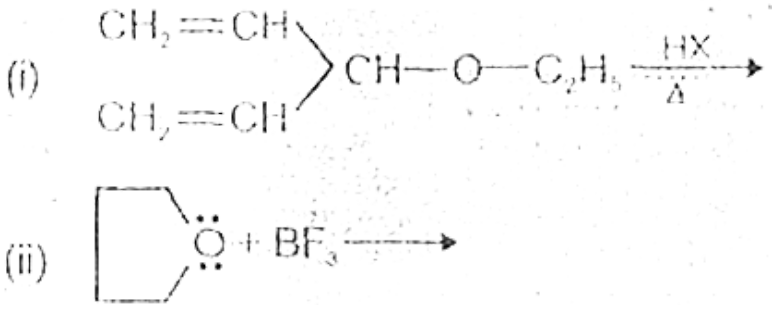
4. Predict final products in the reactions



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Exercise

1. Ketones can be converted to tertiary alcohols by

A. Reduction

B. Oxidation

C. Reaction with Grignard reagent

D. All of these

Answer: C

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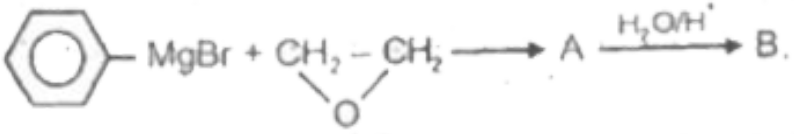
2. In the sequence of reactions , . The product B is



A. Benzyl alcohol

B. 2-phenyl ethanol

C. 1-phenyl ethanol

D. Quinol

Answer: B

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3. Iso - butylene when subjected to hydroboration oxidation reaction yields

A. Sec-butyl alcohol

B. Tert-butyl alcohol

C. Iso-butyl alcohol

D. n-butyl alcohol

Answer: C

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4. Identify the final product $CH_2 = CH_2 \xrightarrow{Cl_2 / H_2O} X \xrightarrow{-aq.KOH} Y$

A. 2-chloroethanol

B. 2-chloromethanol

C. 1-chloroethanol

D. Ethylene giycol

Answer: D

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5. 3 - methyl - 1 - butene on oxymercuration - demercuration yields . . .

. . . As the major product

A. 3-methyl-2-butanol

B. 2-methyl-r-butanol

C. 3-methyl-1-butanol

D. 2-methyl-1-butanol

Answer: A

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6. What is Z in the following sequence of reactions?

$$Z \xrightarrow{PCl_3} X \xrightarrow{alc.KOH} Y \xrightarrow[(ii)\,H_2Oboil]{(i)\,Conc.H_2SO_4} Z$$

A. $CH_3CH_2CH_2OH$

B. $CH_3CHOHCH_3$

C. $(CH_3CH_2)_2CHOH$

D. $CH_3 - CH = CH_2$

Answer: B

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7. Which of the followig is the strongest base ?

A. tert-butoxide

B. Ethoxide

C. iso-propoxide

D. Methoxide

Answer: A

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8. An alcohol on vigorous oxidation is found to give ethanoic acid and propanoic acid . The alcohol may be

A. 1-pentanol

B. 2-pentanol

C. 1-butanol

D. 2-butanol

Answer: B

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9. The order of reactivity of alcohols with sodium metal is

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

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

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

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

Answer: B

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10. Which one of the following compounds would not be easily oxidised by $K_2Cr_2O_7 \text{in dil} H_2SO_4$?

A. CH_3OH

B. $(CH_3)_3COH$

C. CH_3CH_2OH

D. CH_3CHO

Answer: B

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11. Which of the following alcohols can be most easily dehydrated?

A. C_2H_5OH

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - OH$

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

D. $CH_3CH_2CH_2OH$

Answer: C

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12. When wine is exposed to air it becomes sour due to

A. Bactena

B. Oxidation of $C_2H_5OHtoCH_3COOH$

C. Virus

D. Formic acid formation

Answer: B

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13. Starch is converted to maltose by

A. Zymase

B. Maltase

C. Diastase

D. Invertase

Answer: C

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14. Rectified spirit is a mixture of

A. $95\ \%\ C_2H_5OH$ and $5\ \%\ H_2O$

B. $94\ \%\ C_2H_5OH$ and $6\ \%\ H_2O$

C. $95.6\% C_2H_5OH$ and $4.4\% H_2O$

D. $94.47\% C_2H_5OH$ and $5.53\% H_2O$

Answer: C

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15. Methanol and ethanol can be distinguished by

A. Lucas test

B. Iodoform test

C. Victor Meyer's test

D. All of these

Answer: B

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16. In Reimer Tiemann reaction dichlorocarbene acts as

A. Nucleophile

B. Electrophile

C. Free radical

D. All of these

Answer: B

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17. Carbolic acid is

A. Phenol

B. Phenyl benzoate

C. Phenyl acetate

D. Salot

Answer: A

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18. Which of the following is a trihydric phenol ?

A. Resorcinol

B. p - cresol

C. phloroglucinol

D. Catechol

Answer: C

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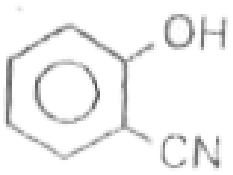
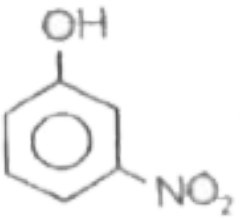
19. Which of the following is the strongest acid ?

A. 

B. 

C. 

D. 

Answer: C

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20. Electrophilic subsitution reaction in phenol take place at :

A. Ortho and para positions

B. Meta - position

C. Ortho - position

D. Para - position

Answer: A

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21. The following reaction is known as :

Phenol $\xrightarrow{1.CHCl_3/NaOH}$ Salicylaldehyde

A. Gattermann aldehyde synthesis

B. Sandemeyer's reaction

C. Kolbe's reaction

D. Reimer - Tiemann reaction

Answer: D

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22. What amount of bromine will be required to convert $2g$ of phenol into $2, 4, 6 -$ tribromphenol

A. 4.0

B. 6.0

C. 10.22

D. 20.44

Answer: C

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23. Identify the product Z in the following sequence of reactions

$$\text{"}phenol \xrightarrow{NaOH} X \xrightarrow[4-7atm, 410K]{CO_2} Y \xrightarrow{H_3O^+} Z$$

A. Aspirin

B. Salicylaldehyde

C. Benzoic acid

D. Salicylic acid

Answer: D

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24. Phenol can be distinguished from ethanol by the following reagents except

A. NaOH

B. $FeCl_3$

C. Br_2 / H_2O

D. Na

Answer: D

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25. The most suitable convenient method of separation of $o-$ and $p-$ nitrophenol from an eequimolar mixture of the two is

A. Subimation

B. Chromatography

C. Crystallisation

D. Steam distillation

Answer: D

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26. Neutral $FeCl_3$ gives purple colour with

A. Only phenol

B. p-cresol

C. 2,4,6-tribromophenol

D. All of these

Answer: D

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27. Asqirin is obtained by the reaction of salicylic acid with

A. Acetic anhydride

B. Acetaldehyde

C. Acetyl chloride

D. Methanol

Answer: A

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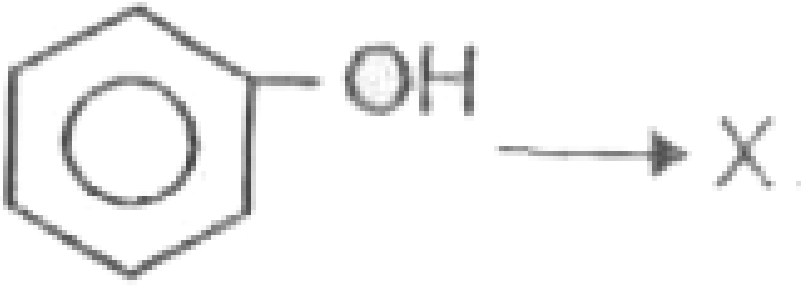
28. Zine powder . In the above reaction X will be



A. Benzaldehyde

B. Benzene

C. Anisole

D. Phenyl acetate

Answer: B

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29. The ionization constant of a phenol is higher than that of ethanol because

A. Phenoxide ion is a stronger base than ethoxide ion

B. Phenoxide ion is stabilized through delocalisation

C. Phenoxide ion is less stable than ethoxide ion

D. Phenoxide ion is bulkier than ethoxide ion

Answer: B

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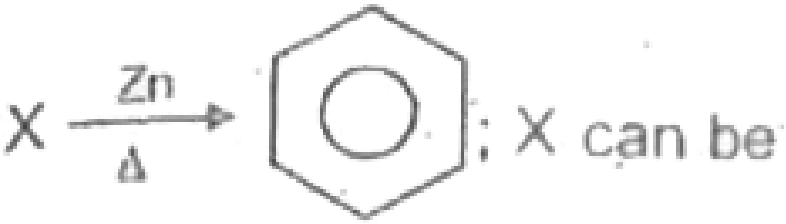
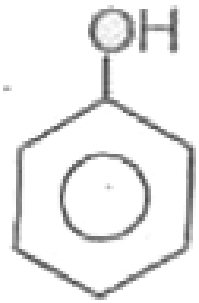
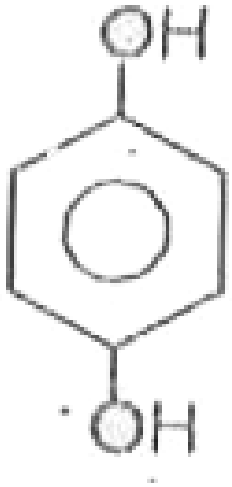
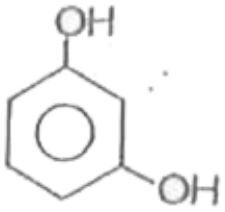
30. Can be



A. 

B. 

C. 

D. All of these

Answer: D

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31. The number of metamers possible for $C_4H_{10}O$ is

A. 2

B. 3

C. 4

D. 1

Answer: B

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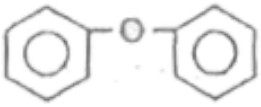
32. Which of the following has maximum bond angle around oxygen ?

A. $CH_3 - O - CH_3$

B. $C_2H_5 - O - C_6H_5$

C. 

D. Same in all

Answer: C

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33. OCH_3 group is

A. Stronger + R group than - OH

B. Weaker + R group than - OH

C. Stronger + 1 group than - OH

D. Inert group

Answer: B

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34. $CH_3CH_2 + cl + Ag_2O \xrightarrow{\Delta}$ Product . Product formed in the reaction is

A. $CH_3CH_2 - O - CH_2CH_3$

B. $CH_3CH_2Cl + AgCl$

C. $CH_3CH_2 - OH + AgCl$

D. $(CH_3CH_2 - O)_2Ag$

Answer: A

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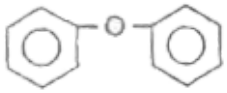
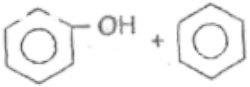
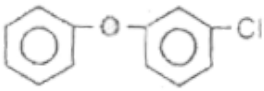
35. Product . Product of the reaction is

A. 

B. 

C. 

D. No reaction

Answer: D

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36. The ether that undergoes electrophilic substitution reactions is

A. $CH_3OC_2H_5$

B. $C_6H_5OCH_3$

C. CH_3OCH_3

D. $C_2H_5OC_2H_5$

Answer: B

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37. When ether is exposed to air for some time, an explosive substance produced is :

A. Peroxide

B. TNT

C. Oxide

D. Superoxide

Answer: A

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38. An ether is more volatile than an alcohol having the same molecualr formula. This is due to -

A. Inter - molecular hydrogen bonding in alcohols

B. Dipolar character of ethers

C. Alcohols having resonance structure

D. Inter - molecular hydrogen bonding in ether

Answer: A

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39. Anisole with conc. HNO_3 and conc. H_2SO_4 gives

A. Phenol

B. nitrobenzene

C. o-and p-nitroanisole

D. o-nitroanisole

Answer: C

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40. Williamson's synthesis involves

A. S_N1 mechanism

B. S_N2 mechanism

C. Nucleophilic addition

D. Electrophilic addition

Answer: B

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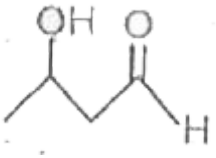
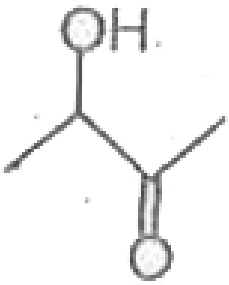
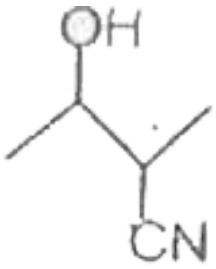
Assignment Section A Objective Type Questions

1. Which among the following is 1 alcohol ?

A. 

B. 

C. 

D. 

Answer: B

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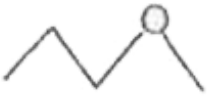
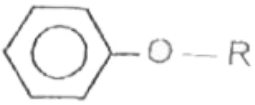
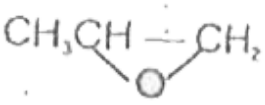
2. Which one is ether ?

A. 

B. 

C. 

D. all of these

Answer: D

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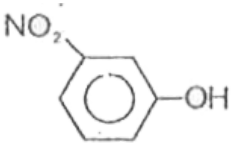
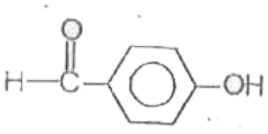
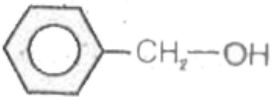
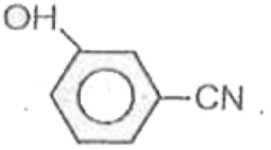
3. Which one is phenol ?

A. 

B. 

C. 

D. 

Answer: A

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4. IUPAC name of $CH_2OH - CH_2OH$ is

A. Ethylene glyocol

B. Ethane -1-2-diol

C. Ethyl -1,2-diol

D. Ethylene diol

Answer: B

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5. IUPAC name of is

A. Ethyl propyl ether

B. Propyl elhoxide

C. Ethoxy propane

D. Propoxy ethane

Answer: C

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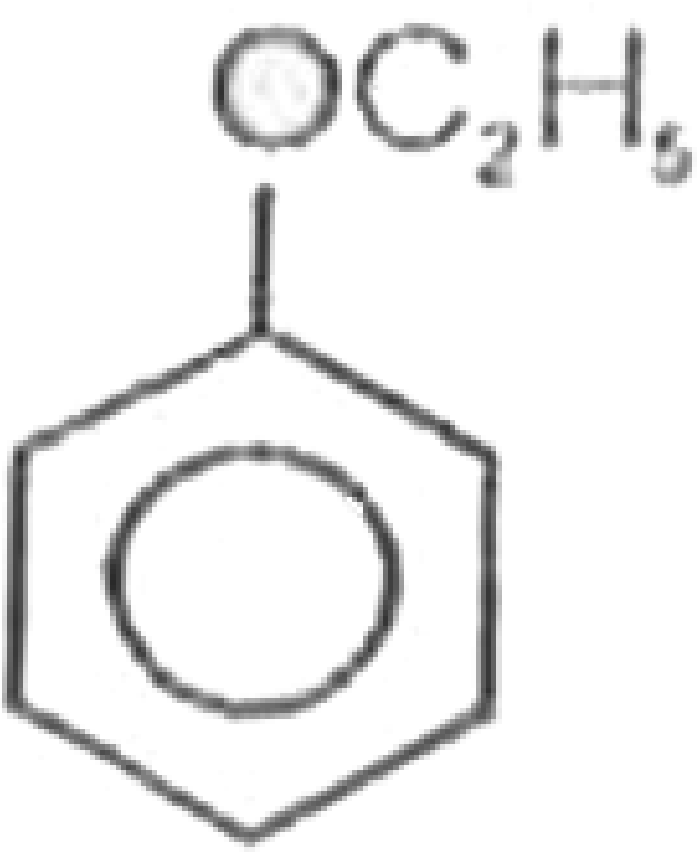
6. IUPAC name of is



A. Benzyl ethoxide

B. Ethoxy benzyl

C. Benzene ethoxide

D. Ethoxy benzene

Answer: D

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7. Which among the following show tautomerism ?

A. Alcohols

B. Phenol

C. Ethers

D. Anisole

Answer: B

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8. Alcohols and ethers are

A. Position isomers

B. Functional isomers

C. Chain isomers

D. Metamers

Answer: B

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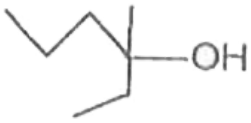
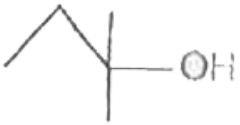
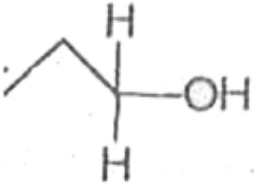
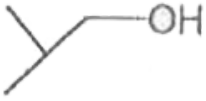
9. Which of the following be optically active ?

A. 

B. 

C. 

D. 

Answer: A

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10. How many minimum number of carbons are needed for an optically active ether ?

A. 2

B. 3

C. 4

D. 5

Answer: B

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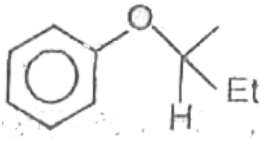
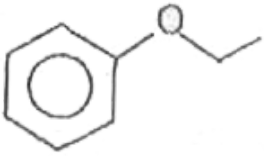
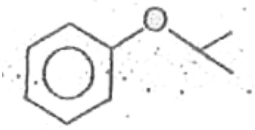
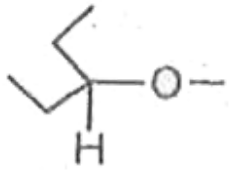
11. Which one is optically active aromatic ether ?

A. 

B. 

C. 

D. 

Answer: A

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12. 3° alkyl halides form alcohols preferably via

A. S_N2

B. S_N1

C. Transition state

D. S_Ni

Answer: B

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13. Which one is preferable reagent for given reaction ?

$RCH_2 - X \rightarrow HO - CH_2R$

A. $(H_2O + KOH)$

B. (OH+KOH)

C. $(ROH + KOH)/\Delta$

D. $(H_2O + KOH)/\Delta$

Answer: A

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14. ROH + $SOCI_2 \rightarrow$

The final product is

A. Alkyl chloride

B. Alkyl sulphate

C. Alkene

D. Ether

Answer: A

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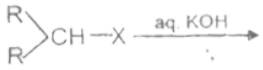
15. S_N1 is observed in

A. 

B. $R-OH+SOCl_2 \rightarrow$ a

C. $R-X \xrightarrow{alc.KOH}$

D. $ROH+HX \rightarrow$

Answer: A

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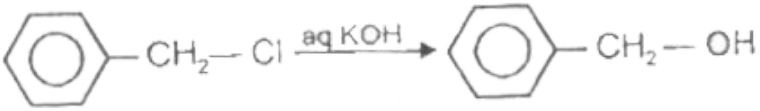
16. Reaction happens via



A. S_N1

B. S_N2

C. S_Ni

D. ArS_N1

Answer: A

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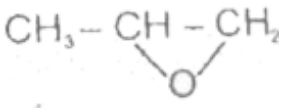
17. $CH_3CH = CH_2 \xrightarrow{H\,/\,H_2O}$ major product is

A. 

B. $CH_3\overset{\overset{OH}{|}}{C}HCH_3$

C. $CH_3CH_2CH_2OH$

D. $\underset{OH}{\overset{|}{CH_3CH}} - \underset{OH}{\overset{|}{CH_2}}$

Answer: B

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18. $RCH = CH_2 \xrightarrow[(2)\,H_2\overset{\emptyset}{\underset{Z}{}}\,n]{(1)\,O_3} (A) \xrightarrow[LiAlH_4]{H_2O} (B)$

Product (B) is

A. RCHO +HCHO

B. RCHO + HCOOH

C. RCOOH + HCOOH

D. $RCH_2OH + CH_3OH$

Answer: D

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19. Reaction invoiving anti addition is

A. $CH_2 = CH_2 \xrightarrow{H/H_2O}$

B. $CH_3CH = CH_2 \xrightarrow{HX}$

C. $CH_3CH = CH_2 \xrightarrow[NaBH_4]{Hg(OAc)_2/H_2O}$

D. $CH_2 = CH_2 \xrightarrow[H_2O_2/OH]{B_2H_6/THF}$

Answer: B

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20. Grignard reagent is most suitable for preparation of which of the following alcohol with carbonyl compound ?

A. 1° alcohols

B. 2° alcohols

C. 3° alcohols

D. All of these

Answer: D

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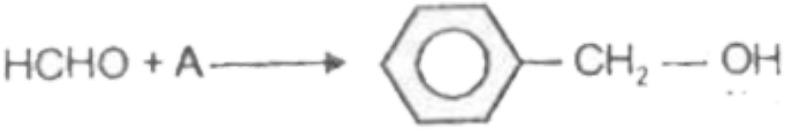
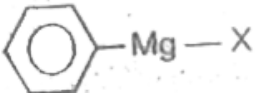
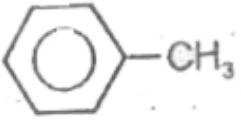
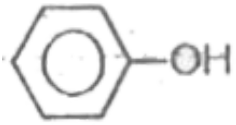
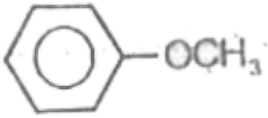
21. A is



A. 

B. 

C. 

D. 

Answer: A

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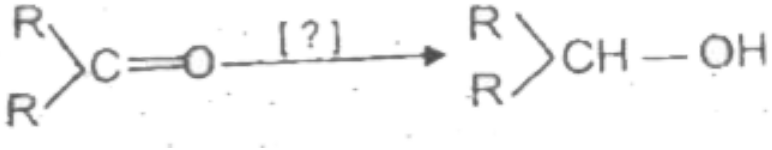
22. Here reagent is



A. $LiAlH_4$

B. $NaBH_4$

C. Ni / H_2

D. All of these

Answer: D

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23. $R-\overset{\overset{O}{||}}{C}-OH \xrightarrow{[?]} RCH_2-OH$

Here reagent is

A. $LiAlH_4$

B. $NaBH_4$

C. Both (1) & (2)

D. Red P /Hl

Answer: A

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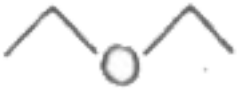
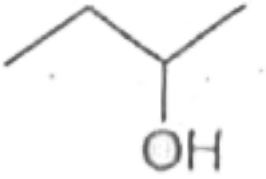
24. Boiling poin will be least for

A. 

B. 

C. 

D. 

Answer: B

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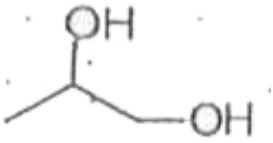
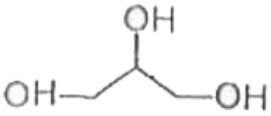
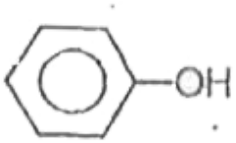
25. Which of the most viscous ?

A. 

B. 

C. 

D. 

Answer: C

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26. Lowest boiling point is for

A. Butanol

B. Pentanol

C. 2-methyl propane - 2 - ol

D. 2-methyl butane -2-ol

Answer: C

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27. $R - OH \xrightarrow[ZnCI_3]{HX}$

A. R - X

B. Alkene

C. Both (1) & (2)

D. No product

Answer: A

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28. Order of nucteophilicity is

A. $CH_3O^- < C_2H_5O^-$

B. $C_2H_5O^- < C_2H_5S^-$

C. $CH_3O^- < CH_3S^-$

D. All of these

Answer: D

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29. 1° alcohols preferably undergo dehydration via

A. E_1

B. E_2

C. S_N1

D. S_N2

Answer: B

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30. Which of the inter- molecular dehydration ?

A. $ROH \rightarrow R - OR$

B. $ROH \rightarrow R - X$

C. $ROH \rightarrow$ alkene

D. $R - X \rightarrow ROH$

Answer: A

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31. $R - overset(18)(OH) + \overset{O}{\overset{||}{R}}C - OH \xrightarrow{H}$

Products are

A. $R - \overset{O}{\overset{||}{C}} - \overset{18}{C}R' + H_2O$

B. $R - \overset{O}{\overset{||}{C}} - \overset{18}{O}R' + H_2^{18}O$

C. $R - \overset{O}{\overset{||}{C}} - \overset{18}{O}R + H_2^{18}O$

D. $R - \overset{O}{\overset{||}{C}} - \overset{18}{O}R + H_2O$

Answer: A

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32. Lucase test is used to distinguish

A. Phenols

B. Ethers

C. Alcohols

D. Alkyl halides

Answer: C

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33. Which of the following can give immediate turbidity on treatment with Lucas Reagent?

A. 3° alcohols

B. 2° alcohols

C. 1° alcohols

D. Phenol

Answer: A

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34. Phenols can be distinguished from alcohols by

A. $FeCl_3$ (neutral)

B. Fehling solution

C. Tollen's reagent

D. 2,4-DNP

Answer: A

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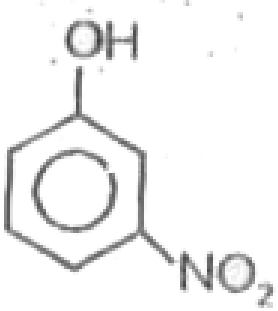
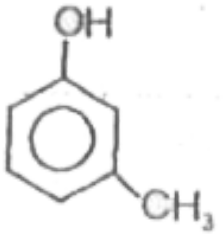
35. Most acidic among the following is

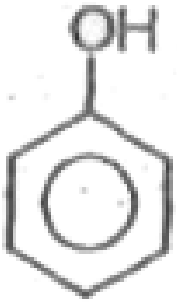
A.



B.



C.



D.

Answer: D

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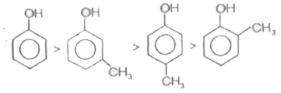
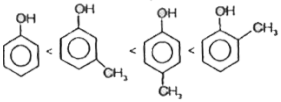
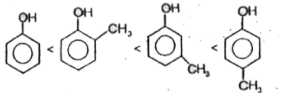
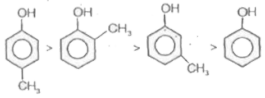
36. Correct acidic order is

A. 

B. 

C. 

D. 

Answer: A

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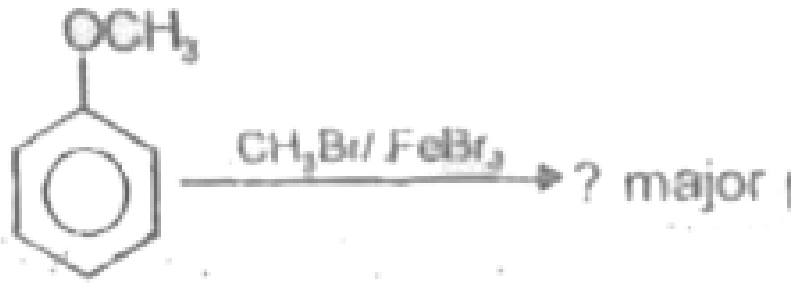
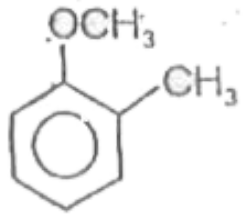
37. Major product is



A.



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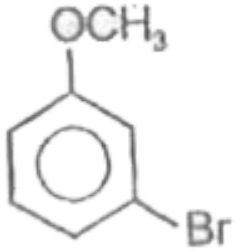
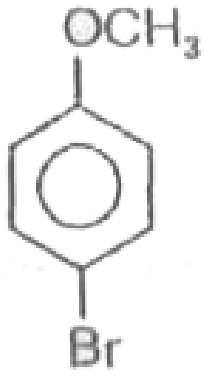
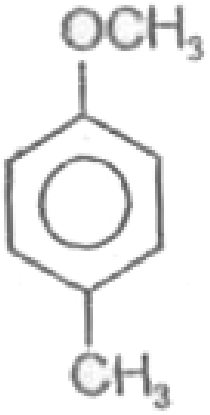


C.





D.

Answer: D

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38. The reagent $\otimes$ required for above conversion is

A. $LiAlH_4$

B. Zn

C. 

D. $NaBH_4$

Answer: B

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39. The electrophile involved in the Reimer-Tiemann reaction is

A. $CHCl_3$

B. CH_2

C. CCl_2

D. CO_2

Answer: C

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40. In Reimer - Tiemann reaction the major produc is

A. Ortho isomer due to intra molecular H-bonding

B. Meta isomer

C. Para isomer due to symmetry

D. None of these

Answer: A

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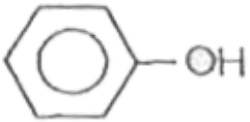
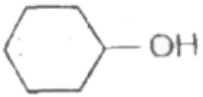
41. Molecule which does not oxidise

A. 

B. 

C. 

D. 

Answer: A

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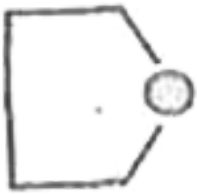
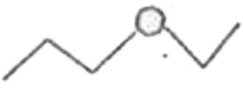
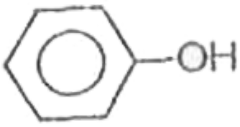
42. Which one of the following is best lewis base ?

A. 

B. 

C. 

D. 

Answer: B

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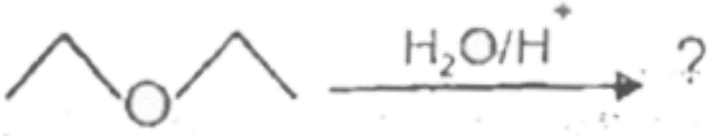
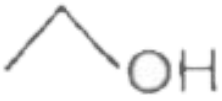
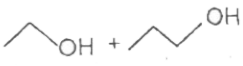
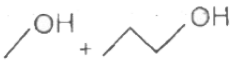
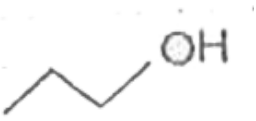
43. Product / (S) will be :



A. 

B. 

C. 

D. 

Answer: A

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44. $CH_3 - O - CH_2CH_3 \xrightarrow[\text{Excess}]{HI/\Delta} (A) + (B)$

Product (A) and (B) are

A. $CH_3OH + CH_3CH_2l$

B. $CH_3l + CH_3CH_2OH$

C. $CH_3l + CH_3CH_2l$

D. $CH_3OH + CH_3CH_2OH$

Answer: C

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45. Cumene $\xrightarrow[(II)\, H_2O, H^+]{(i)\, O_2} (X)$ and (Y) ,

(X) and (Y)respectively are :

A. Toluene, propene

B. Toluene, propylcholoride

C. Phenol, acetone

D. Phenol, acetaldehyde

Answer: C

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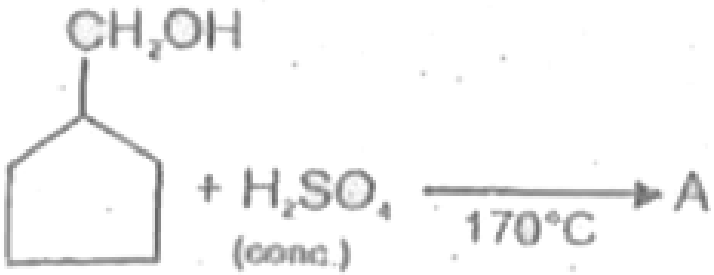
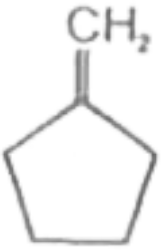
Assignment Section B Objective Type Questions

1. What is the major product A ?



A.



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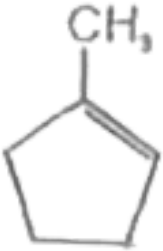

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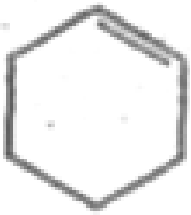
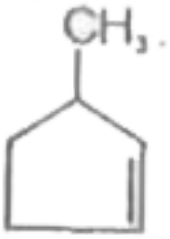


D. 

Answer: C

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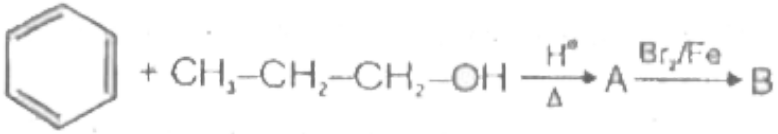
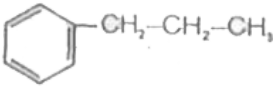
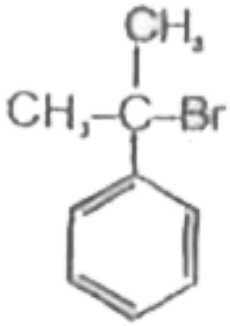
2. What is the major product B ?



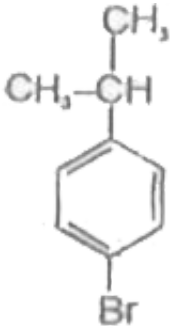
A. 

B. $CH_3 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{Br}{|}}{CH_2}$

C.



D.



Answer: D

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3. Which of the following is the correct increasing order of boiling point of following compounds ?

I $CH_3 - CH_2 - CH_2OH$, II $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$, III

$CH_3 - O - CH_2 - CH_3$

A. $II < I < III$

B. $III < II < I$

C. $I < II < III$

D. $II < III < I$

Answer: B

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4. $\underset{\underset{CH_3}{|}}{CH_3CH} - CH = CH_2 \xrightarrow[(ii)\, H_2O_2/OH]{(i)\, B_2H_4} X \xrightarrow[140^\circ]{H_2SO_4} Y$

What is Y ?

A.

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

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2$

C. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{CH_3}{|}}{CH} - O - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{CH_3}{|}}{CH} - CH_3$

D. $CH_3 - \underset{\underset{C_2H_5}{|}}{\overset{\overset{CH_3}{|}}{C}} - O - \underset{\underset{C_2H_5}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_3$

Answer: A

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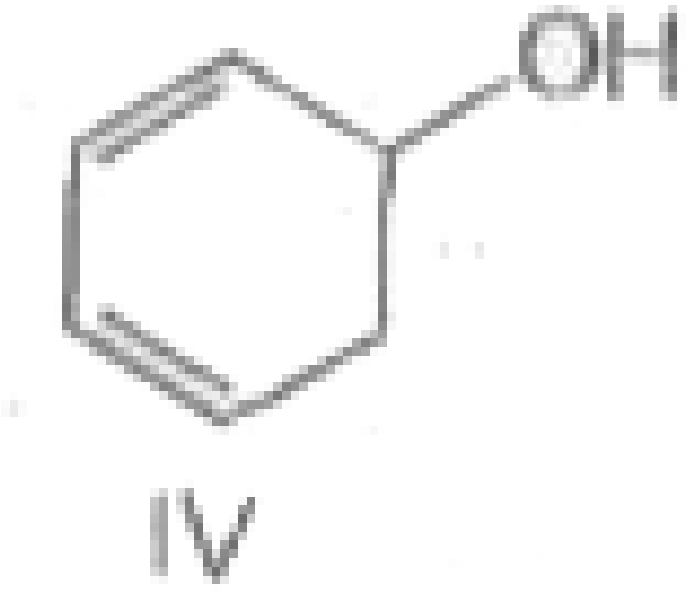
5. Which of the following is the correct ease of dehydration ?

I $CH_3 - CH_2 - CH_2 - \underset{\underset{OH}{|}}{CH_2}$, II $CH_3 - CH_2 - \overset{\overset{OH}{|}}{CH} - CH_3$, III

$$CH_2 = CH - \overset{\overset{OH}{|}}{CH} - CH_3, \text{IV}$$



IV

A. $I > III > II > IV$

B. $IV > III > II > I$

C. $IV > II > III > I$

D. $III > IV > II > I$

Answer: B

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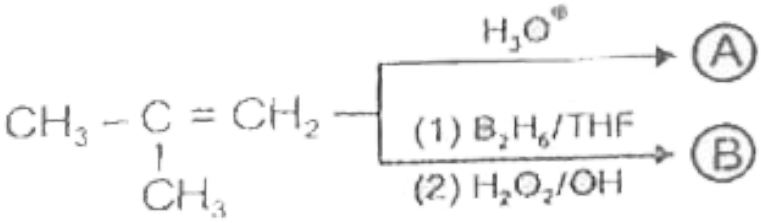
6. Product(A) and (B)can be distinguished by



A. Sodium metal

B. Neutral $FeCl_3$

C. Lucase reagent

D. Esterification reaction

Answer: C

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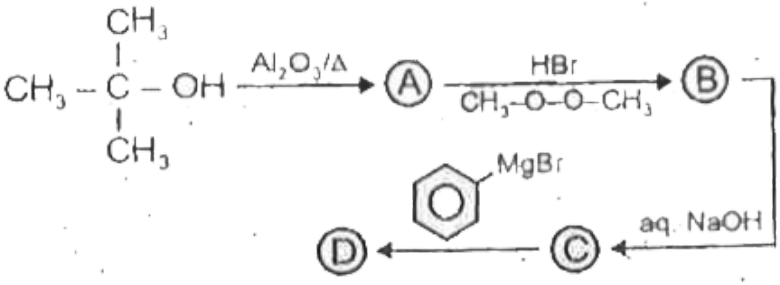
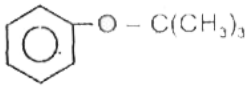
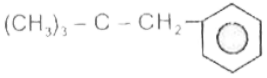
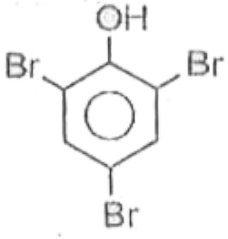
7. The end product (D) of the reaction is



A. 

B. 

C. 

D. 

Answer: C

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8. What is Z in the following sequence of reactions?

Phenol $\xrightarrow[\text{dust}]{Zn} X \xrightarrow[\text{Alhyd. } AlCl_3]{CH_3Cl} Y \xrightarrow[KMnO_4]{\text{Alkaline}} Z$ Phe

A. Benzene

B. Toluene

C. Benzldehyde

D. Benzoic acid

Answer: D

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9. $\overset{OH}{\underset{|}{}}\overset{OH}{\underset{|}{}}\overset{OH}{\underset{|}{}}$
$CH_2 - CH - CH_2 + \underset{\text{excess}}{Hi} \rightarrow X$

What is X ?

A. $\overset{|}{\underset{|}{}}\overset{|}{\underset{|}{}}\overset{|}{\underset{|}{}}$
$CH_2 - CH - CH_2$

B. $\overset{|}{\underset{|}{}}$
$CH_2 = CH - CH_2$

C. $CH_3 - CH = CH_2$

D. $CH_3 - \underset{|}{\overset{|}{CH}} - CH_3$

Answer: D

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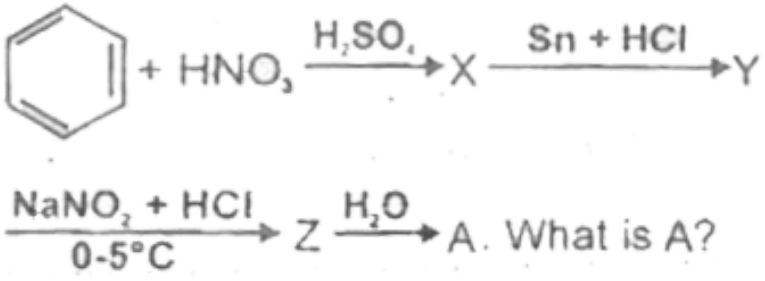
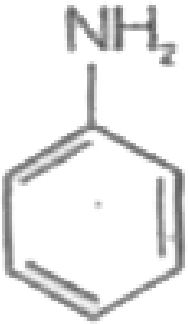
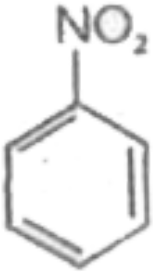
10. What is A ?

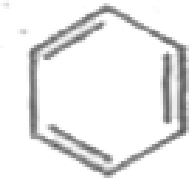


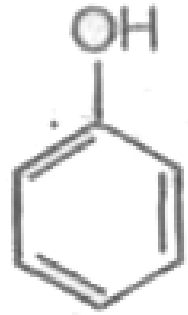


A.



B.

C. 

D. 

Answer: D

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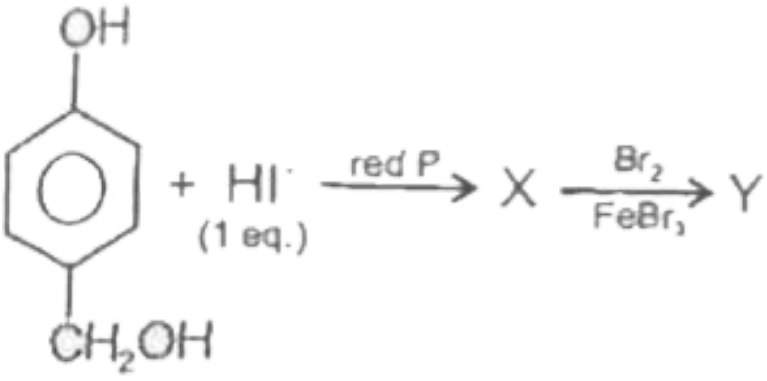
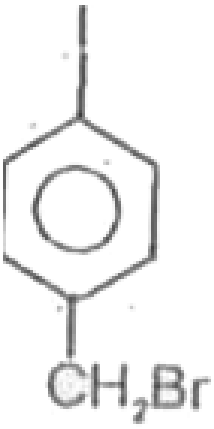
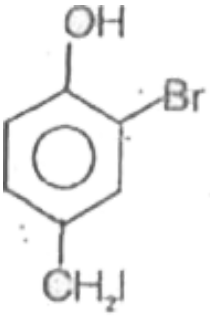
11. What is Y ?

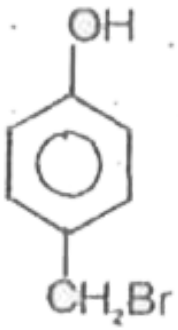


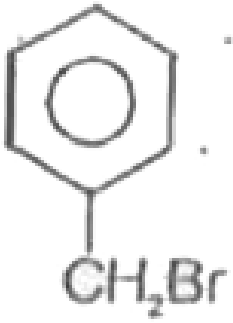


A.



B.

C. 

D. 

Answer: B

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12. Which of the following will not give positive test with neutral $FeCl_3$?

A. Nitrophenol

B. Phenol

C. Allyl alcohol

D. o-cresol

Answer: C

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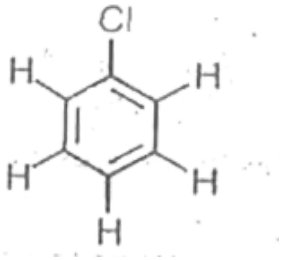
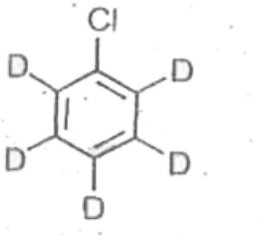
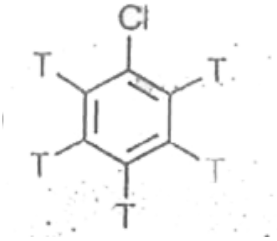
13. In Dow's process haloarene is converted to phenol with fused NAOH . The most reactive compound is

A. 

B. 

C. 

D. All are equally reactive

Answer: A

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14. Among the following four compounds

(a) Phenol

(b) methyl phenol

(c) metanitrophenol

(d) paranitrophenol

the acidity order is –

A. $a > c > a > b$

B. $c > d > a > b$

C. $a > d > c > b$

D. $b > a > c > d$

Answer: A

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15. Reaction of $t - butyl$ bromide with sodium methoxide produces

A. Sodium -t - butoxide

B. t-butyl methyl ether

C. Isobutane

D. Isobutylene

Answer: D

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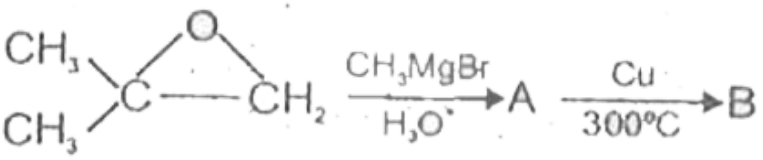
16. B is



A. $(CH_3)_3CHO$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - CH_3$

C. $(CH_3)_2CHCOCH_3$

D. $CH_3\underset{\underset{O}{||}}{C} - CH_2 = CH_2CH_3$

Answer: B

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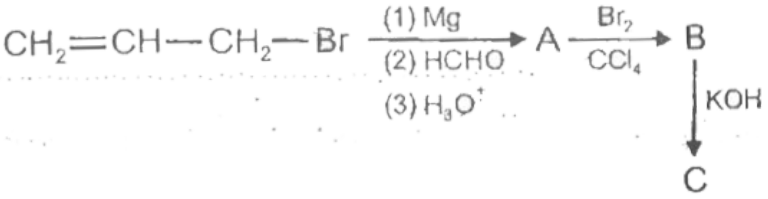
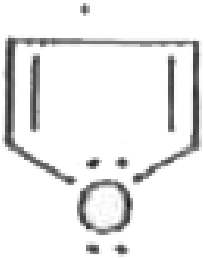
17. Product (C) is



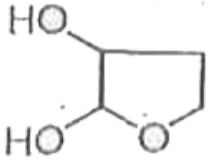
A.

B.



C. $CH_2(OH) - CH(OH) - CH_2 - CH_2 - OH$

D.



Answer: C

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18. Ethyl chloride is converted into diethyl ether by

A. Perkin's reaction

B. Grignard reaction

C. Wurtz synthesis

D. Williamson's synthesis

Answer: D

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19. Ethylene oxide when treated with Grignard reagent yields

A. Primary alcohol

B. Secondary alcohol

C. Tertiary alcohol

D. Cyclopropyl alcohol

Answer: A

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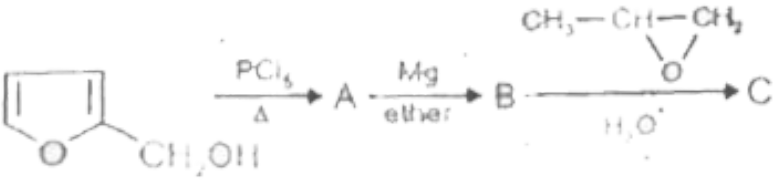
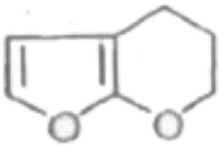
20. Product (C) is



A.



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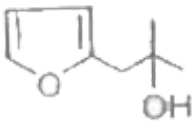
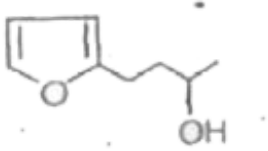
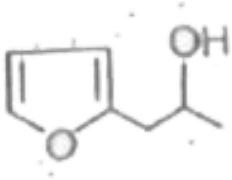


C. 

D. 

Answer: C

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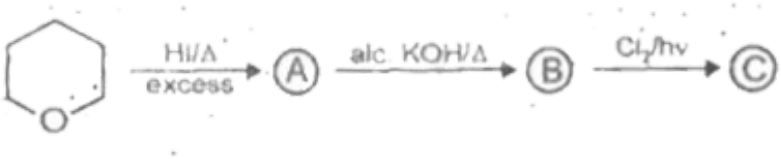
21. Product © is



A. Alkyl iodide

B. Vinyl chloride

C. Vinyl iodide

D. Allyl chloride

Answer: D

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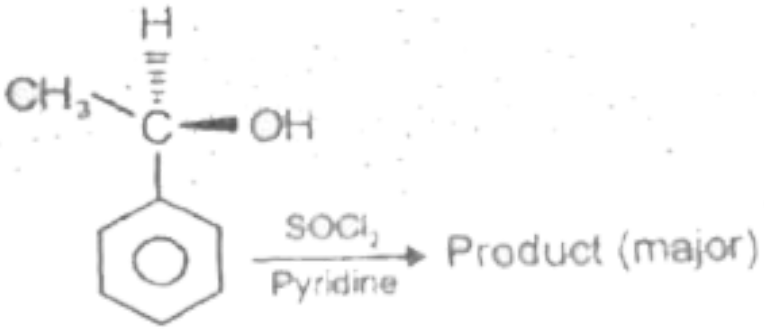
22. The product is



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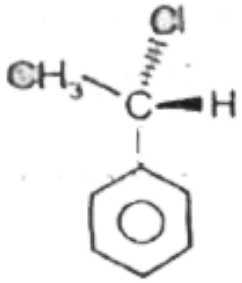
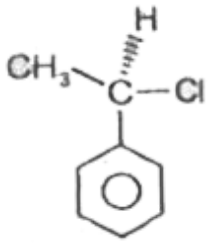


B. 

C. Mixture of (1) & (2)

D. No reaction

Answer: A

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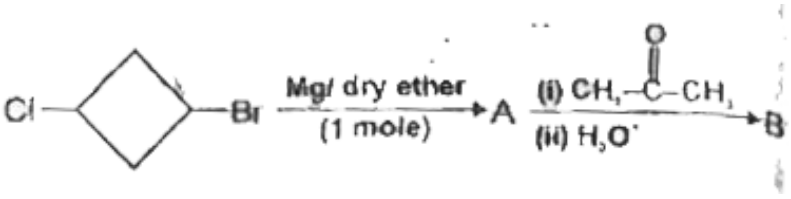
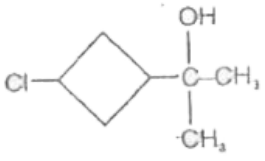
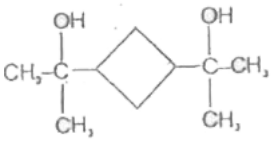
23. What is B ?

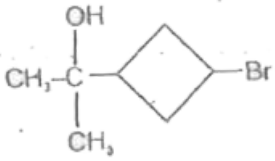


A. 

B.



C.



D.

Answer: A

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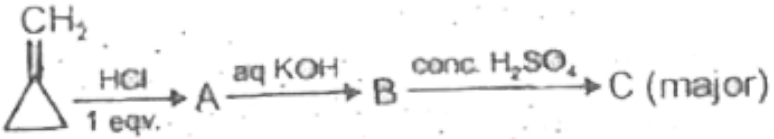
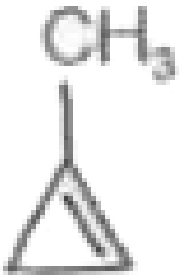
24. Product (C) is



A.



B.

C.

D.

Answer: B

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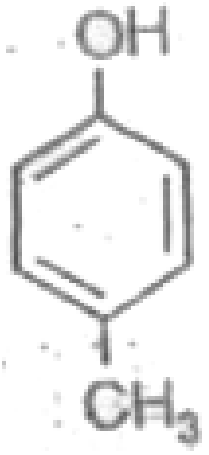
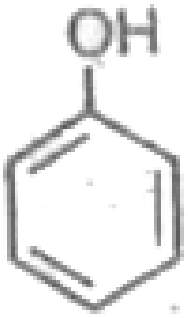
Assignment Section C Previous Years Questions

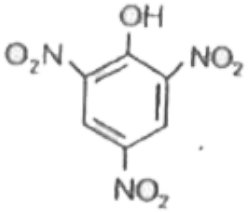
1. Which one is the most acidic compound?

A. 

B. 

C.

D.



Answer: D

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2. The heating of phenyl-methyl ethers with HI produces

A. Ethyl chlorides

B. Iodoenzene

C. Phenol

D. Benzene

Answer: D

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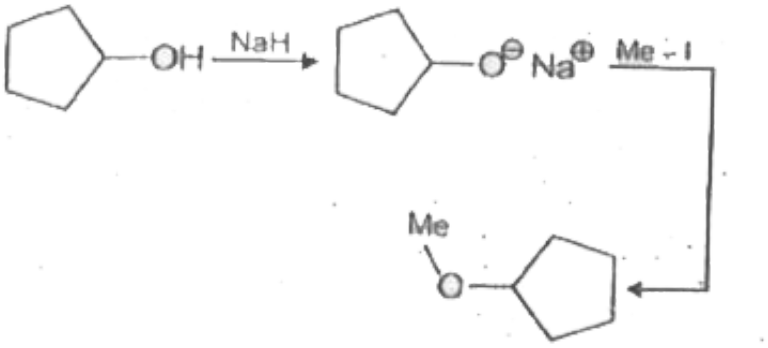
3. The reaction

can be classified as



A. Williamson alcohol synthesis reaction

B. Williamson ether synthesis reaction

C. Alcohol formation reaction

D. Dehydration reaction

Answer: B

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4. Which of the following reagents would distinguish ciscyclopenta $-1,2-$ diol from the trans-isomer?

A. Aluminium isopropoxide

B. Acetone

C. Ozone

D. MnO_2

Answer: B

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5. Reaction of phenol with chloroform in presence of dilute sodium hydroxide finally introduces which one of the following functional group ?

A. $-CHCl_2$

B. $-CHO$

C. $-CH_2Cl$

D. $-COOH$

Answer: B

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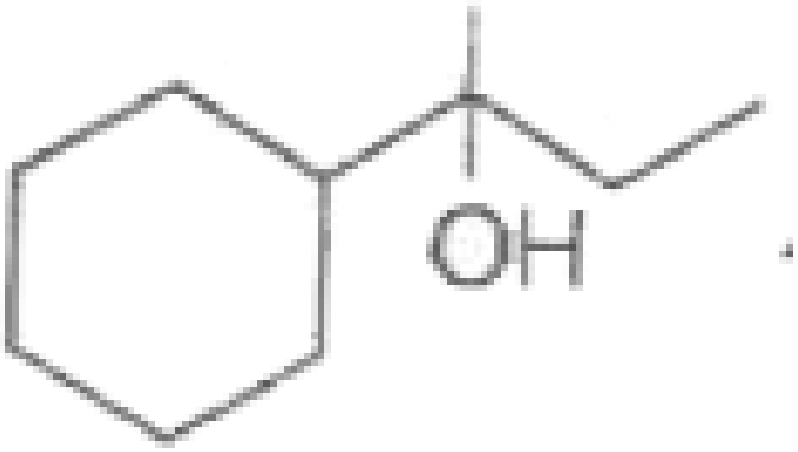
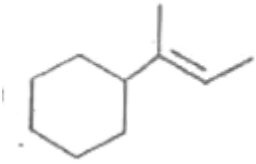
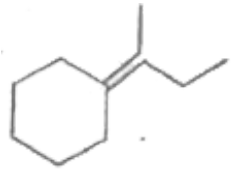
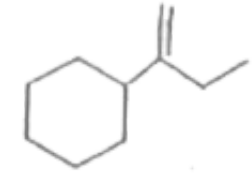
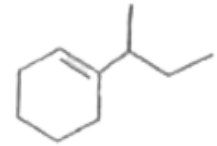
6. Which of the following is not the product of dehydration of



A. 

B. 

C. 

D. 

Answer: D

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7. Which of the following reaction(s) can be used for the preparation of alkyl halides?

(I) $CH_3CH_2OH + HCl \xrightarrow{anhy.\,ZnCl_2}$

(II) $CH_3CH_2OH + HCl \rightarrow$

(III) $(CH_3)_3COH + HCl \rightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{anhy.\,ZnCl_2}$

A. (IV) only

B. (III) and (IV) only

C. (I), (III) and (IV) only

D. (I), and (II) only

Answer: C

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8. The reaction

$$CH_3 - \underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}} - ONa + CH_3CH_2Cl \rightarrow CH_3 - \underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}} - O - CH_2 - CH_3$$

is called

A. Gatterman -Koch reaction

B. Williamson - synthesis

C. Williamson continuous etherification process

D. Etard reaction

Answer: B

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9. Among the following sets of reactants which one produces anisole?

A. $CH_3CHO, RMgX$

B. $C_6H_5OH, NaOH, CH_3l$

C. $C_6H_5OH,$ netural $FeCl_3$

D. $C_6H_5 - CH_3, CH_3COCl, AlCl_3$

Answer: B

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10. Identify Z in the sequence of reactions :

$$CH_3CH_2CH = CH_2 \xrightarrow[H_2O_2]{HBr} Y \xrightarrow{C_2H_5ONa} Z$$

A. $CH_3 - (CH_2)_3 - O - CH_2CH_3$

B. $(CH_3)_2CH_2 - O - CH_2CH_3$

C. $CH_3(CH_2)_4 - O - CH_3$

D. $CH_3CH_2 - CH(CH_3) - O - CH_2CH_3$

Answer: A

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11. Among the following ethers, which one will produce methyl alcohol on treatment with hot concentrated HI?

A. $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - O - CH_3$

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

C. $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - O - CH_3$

D. $CH_3 - CH_2 - CH_2 - CH_2 - O - CH_3$

Answer: B

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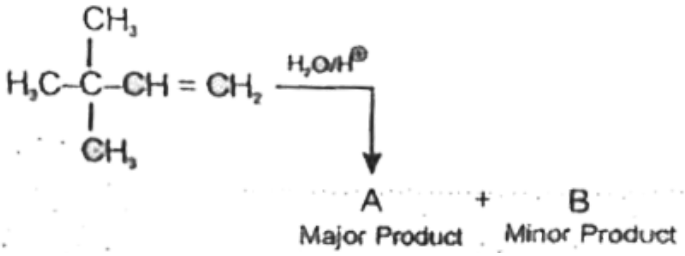
12. In the following reaction

The major product is



A. $H_3C - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{OH}{|}}{CH} - CH_3$

B. $H_3C - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - \underset{\underset{OH}{|}}{CH_2}$

C. $H_3C - \underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{CH_3}{|}}{CH} - CH_3$

D. $\underset{\underset{OH}{|}}{CH_2} - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - CH_3$

Answer: C

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13. In the following reactions,

(a) $H_3C-\overset{\overset{CH_3}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3 \xrightarrow{H^+/heat} \underset{\text{Major product}}{A} + \underset{\text{Minor product}}{B}$

(b) $A \xrightarrow[\text{in absence of peroxide}]{HBr, dark} \underset{\text{Major product}}{C} + \underset{\text{Minor product}}{D}$

The major products (A) and (C) are respectively:

A. $CH_2=\overset{\overset{CH_3}{|}}{C}-CH_2-CH_3$ and $CH_3-\underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_3$

B. $CH_2=\overset{\overset{CH_3}{|}}{C}-CH_2-CH_3$ and $\underset{\underset{Br}{|}}{CH_2}-\overset{\overset{CH_3}{|}}{CH}-CH_2-CH_3$

C. $CH_3-\overset{\overset{CH_3}{|}}{C}=CH-CH_3$ and $CH_3-\underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_3$

D. $CH_3-\overset{\overset{CH_3}{|}}{C}=CH-CH_3$ and $CH_3-\overset{\overset{CH_3}{|}}{CH}-\underset{\underset{Br}{|}}{CH}-CH_3$

Answer: C

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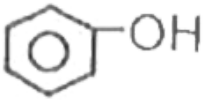
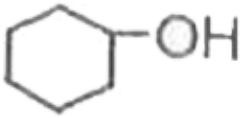
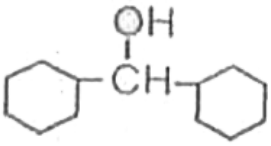
14. Which one of the following compounds has the most acidic nature ?

A. 

B. 

C. 

D. 

Answer: B

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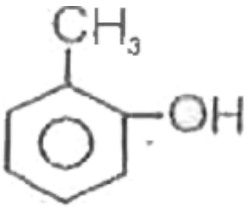
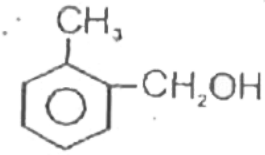
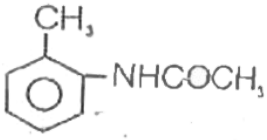
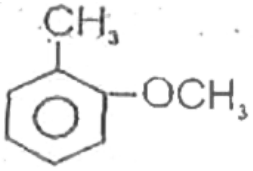
15. Which one of the following is most reactive towards electrophilic reagent ?

A. 

B. 

C. 

D. 

Answer: A

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16. Among the following four compounds

(a) Phenol

(b) methyl phenol

(c) metanitrophenol

(d) paranitrophenol

the acidity order is –

A. $d > c > a > b$

B. $c > d > a > b$

C. $a > d > c > b$

D. $b > a > c > d$

Answer: A

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17. When glycerol is treated with excess of HI, the product formed is.....

A. 2 - iodopropane

B. Allyl iodide

C. Propene

D. Glycerol triiodide

Answer: A

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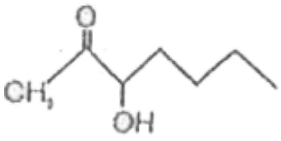
18. Which one of the following compounds will be most readily dehydrated?

A. 

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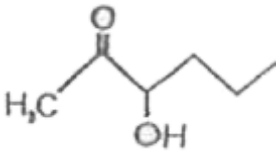
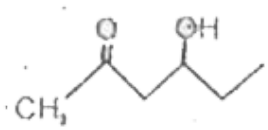
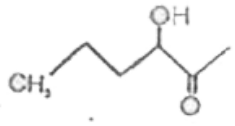


C.



D.



Answer: C

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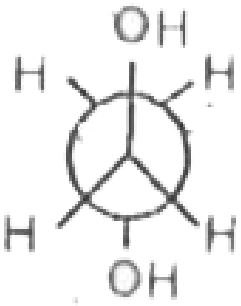
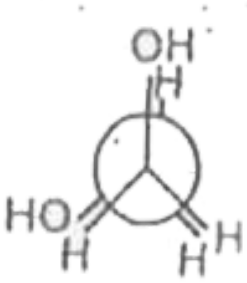
19. Which of the following conformers for ethylene glycol is most stable?

A.

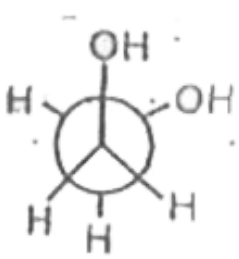


B.

C.



D.



Answer: D

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20. Consider the following reaction

ethanol $\xrightarrow{PBr_3} X \xrightarrow{alc.KOH} Y \xrightarrow[(ii)\,H_2O,heat]{(i)\,H_2SO_4,\text{room temp.}} Z$ the product Z is

A. $CH_3CH_2-O-CH_2-CH_3$

B. $CH_3-CH_2-O-SO_3H$

C. CH_3CH_2OH

D. $CH_2=CH_2$

Answer: C

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21. What is Z in the following sequence of reactions?

Phenol $\xrightarrow[\text{dust}]{Zn} X \xrightarrow[\text{Alhyd. } AlCl_3]{CH_3Cl} Y \xrightarrow[KMnO_4]{\text{Alkaline}} Z$ Phe

A. Benzaldehyde

B. Benzoic acid

C. Benzene

D. Toluene

Answer: B

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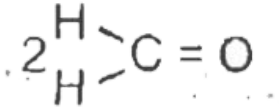
22. $CH_2OH.CH_2OH$ on heating with periodic acid gives

A. 2HCOOH

B. $\begin{matrix} CHO \\ | \\ CHO \end{matrix}$

C. 

D. $2CO_2$

Answer: C

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23. The major organic product in the reaction

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

A. $CH_3OH + (CH_3)_2CHl$

B. $lCH_2OCH(CH_3)_2$

C. $CH_3OC(CH_3)_2$ | |

D. $CH_3I + (CH_3)_2CHOH$

Answer: D

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24. Ethylene oxide when treated with Grignard reagent yields

A. Secondary alcohol

B. Tertiary alcohol

C. Cyclopropyl alcohol

D. Primary alcohol

Answer: D

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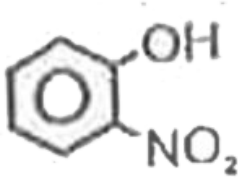
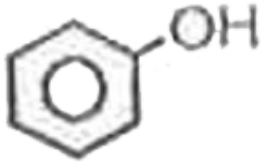
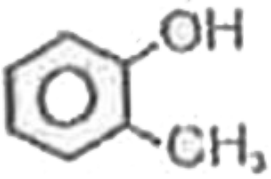
25. Which one of the following compounds is most acidic

A. $Cl - CH_2 - CH_2 - OH$

B. 

C. 



D.

Answer: B

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Assignment Section C Questions Asked Prior To Medical Ent Exams 2005

1. When $3,3-$ dimethyl$-2-$ butanol is heated with H_2SO_4 the major product obtained is

A. 2,3-dimethyl 2-butene

B. cis and trans isomers of 2,3-dimethy 2-butene

C. 2,3-dimethyl 1- butene

D. 3,3-dimethyl 1-butene

Answer: A

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2. The correct order of reactivity of hydrogen halides with ethyl alcohol is

A. $HCl > KBr > Hl > HF$

B. $Hl > HBr > HCl > HF$

C. $HF > HCl > HBr > Hl$

D. $HF > HBr > Hl > HCl$

Answer: B

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3. More acidic than ethanol is

A. $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_3$

B. $CH_3CO_2CH_2CH_3$

C. $CH_3COCH_2COCH_3$

D. CH_3COCH_3

Answer: C

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4. Which of the following reagents convert the propene to 1-propanol?

A. H_2O, H_2SO_4

B. B_2H_6, H_2O_2, OH^-

C. $Hg(Oac)_2, NaBH_4/H_2O$

D. Aq. KOH

Answer: B

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5. n-Propyl alcohol and isopropyl alcohol can be chemically distinguished by which reagent :

A. PCl_5

B. Reduction

C. Oxidation with potassium dichromate

D. Ozonolysis

Answer: C

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6. Which of the following will not form a yellow precipitate on heating with an alkaline solution of iodine?

A. $CH_3CH(OH)CH_3$

B. $CH_3CH_2CH(OH)CH_3$

C. CH_3OH

D. CH_3CH_2OH

Answer: C

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7. The general molecular formula, which represents the homologous series of alkanols is

A. $C_nH_{2n+2}O$

B. $C_nH_{2n}O_2$

C. $C_nH_{2n}O$

D. $C_nH_{2n+1}O$

Answer: A

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8. On heating glycerol with conc. H_2SO_4 a compound is obtained which has a bad odour. The compound is :

A. Acrolein

B. Formic acid

C. Allyl alcohol

D. Glycerol sulphate

Answer: A

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9. The correct acidic order of the following is

I. 

II. 

III. 

A. $I > II > III$

B. $III > I > II$

C. $II > III > I$

D. $I > III > II$

Answer: B

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10. When phenol is treated with $CHCl_3$ and $NaOH$, the product fromed is

A. Benzaldehyde

B. Salicylaldehyde

C. Salicylic acid

D. Benzoic acid

Answer: B

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11. The compound which does not react with sodium is

A. CH_3COOH

B. $CH_3 - CHOH - CH_3$

C. C_2H_5OH

D. $CH_3 - O - CH_3$

Answer: D

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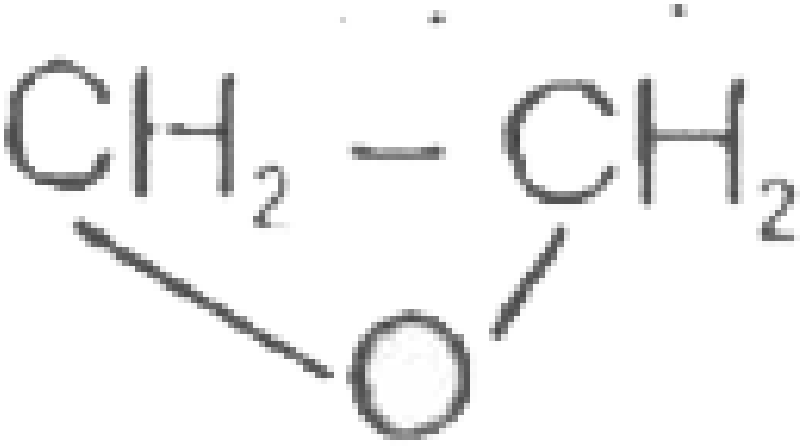
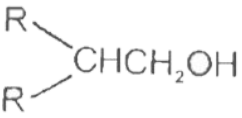
12. Reaction of with RMgX leads to formation of



A. RCH_2CH_2OH

B. $RCHOHCH_3$

C. RCHOHR

D. 

Answer: A

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13. Which of the following will not be soluble in sodium hydrogen carbonate?

A. 2,4,6 - trinitrophenol

B. Benzoic acid

C. o-Nitrophenol

D. Benzenesulphonic acid

Answer: C

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Assignment Section D Assertion Reason Type Question

1. A : p - nitrophenol has high pK_a in comparison to o-nitrophenol

R : In o-nitrophenol , intermolecular H-bonding is present

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: D

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2. A : When $C_2H_5 - O - CH_3$ is reacted with oen mole of Hl then $C_2H_5OH \& CH_3l$ is formed .

R : It is S_N1 reaction

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: C

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3. A : When 3,3-dimethyl butan - 2 - ol is heated in presence of concentrated H_2SO_4 then 2, 3-dimethyl but -2-ene is formed as major product .

R : In this reaction , carbocation is formed as an intermediate

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: B

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4. A : In esterification reaction , HCOOH is the most reactive acid among carboxylic acid .

R : Alcohol acts as nucleophile

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: B

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5. A : Ethers can't be distilled upto dryness due to fear of explosion .

R : Due to the formation of superoxide , it is explosive

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: C

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6. A : Phenol does not react with $NaHCO_3$.

R : Phenol is less acidic than H_2CO_3

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: A

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7. A : $CH_3 - \underset{\underset{O}{||}}{C} - COOH$ gives haloform reaction .

R : It is more acidic than acetic acid .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: B

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8. A : Diphenyl ether is prepared by Williamson synthesis .

R : This reaction generally proceed by S_N1 mechanism .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: D

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9. A : Grignard's reagent is prepared in the presence of ether .

R : Grignard's reagent is soluble and stable in ether.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: A

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10. A : $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH = CH_2$ on hydroboration oxidation gives $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - \underset{\underset{CH_3}{|}}{CH} - CH_3$ as major product .

R : It involves the formation of carbocation so undergoes rearrangement .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: D

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11. A : Two moles of Grignard reagent is consumed in the formation of tertiary alcohol from ester following by hydrolysis .

R : One mole of Grignard reagent convert ester into Ketone and second mole of Grignard reagent adds to Ketone .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark

(4)

Answer: A

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12. A : $CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - O - CH_3$ on reaction with conc. Hl gives $CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - l$ and CH_3OH major product .

R : This reaction proceed by S_N1 mechaism .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: A

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13. A : Ortho - cresol is weaker acidic than meta-cresol .

R : It is due to ortho effect .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: C

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14. A : Among all ortho halophenol , fluorophenol is least acidic .

R : Ortho - fluorophenol forms intramolecular H - bond .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: A

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15. A : In esterification reaction alcohol act as nucleophile .

R : In this reaction O - H bond of alcohol is broken .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: A

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16. A : Phenol is manufactured by Dow 's pocess.

R : It involves the formation of benzyne intermediate .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: B

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17. A : Primary alcohol is prepared by the reaction of primary amine with HNO_2 .

R : Dimethyl amine is a primary amine but does not form methyl alcohol with HNO_2 .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: C

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18. A : Thte reactivity order of alcohols is $1^\circ > 2^\circ > 3^\circ$ for the reaction in which O-H bond is broken .

R : The reactivity order of alcohol is $3^\circ > 2^\circ > 1^\circ$ for the reaction in which C - O bond is broken .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: B

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19. A : The dehydration of ethyl alcohol in presence of Al_2O_2 at 633 K gives ethene.

R : The reaction proceed through the formation of carbocation intermediate.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1)

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false , then mark (3)

D. If both Assertion and Reason are false statements , then mark (4)

Answer: C

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