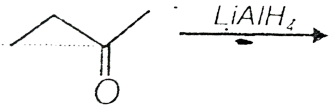
CHEMISTRY

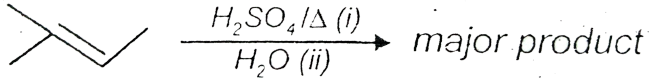
AAKASH INSTITUTE ENGLISH

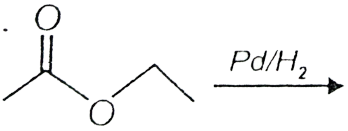
ALCOHOLS, PHENOLS AND ETHERS

Example

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

(i) 

(ii) 

(iii) 

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2. For the reaction: $NOCl(g) \Leftrightarrow 2NO(g) + Cl_2(g), K_c$ at $427^\circ C$ is $2 \times 10^6 Lmol^{-1}$. The value of K_p is

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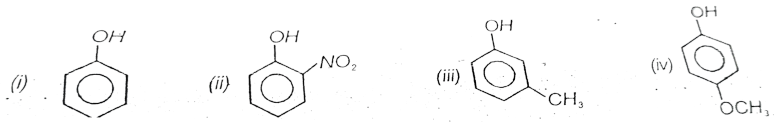
3. Arrange the following in decreasing order of acidic nature of



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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 if given halogen acids towards ethers ?

HCI, HBr, HI

b : What will be final products ?

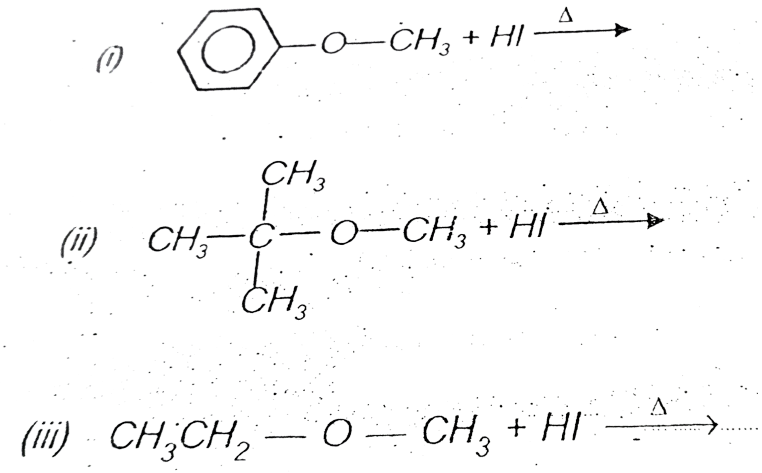

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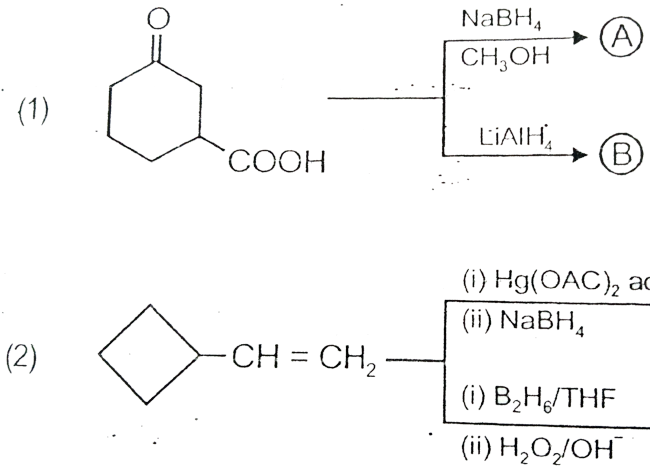
Illustration

1. What is the major product of the following



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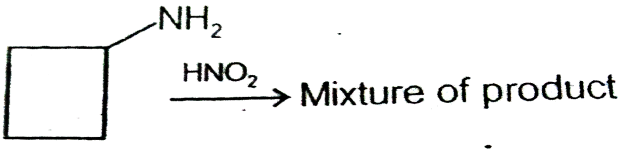
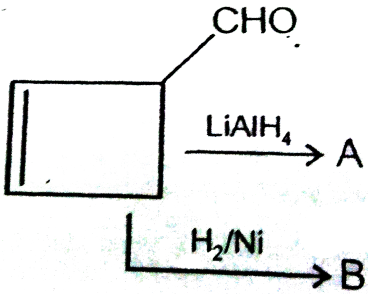
2. Complete the following reaction

(i)



Illustrate all possible product.

(ii)



Identify A and B.

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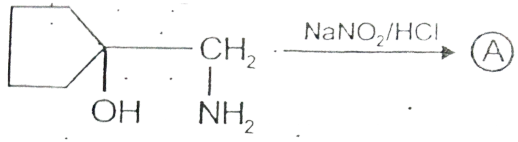
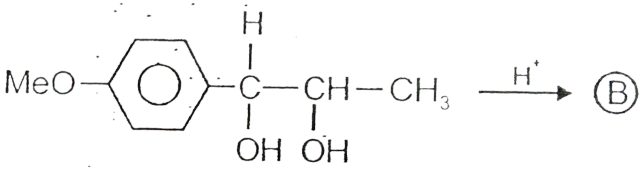
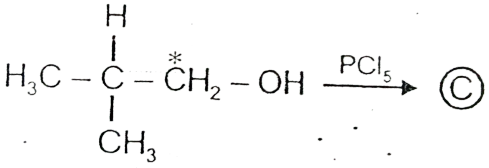
3. Predict the major products (A) , (B) & (C)

(1) 

(2) 

(3) 

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4. Predict the major products when reagents react with 2- phenyloxirane

$(a) sodiumphen \otimes ide$ $(b) HBr$

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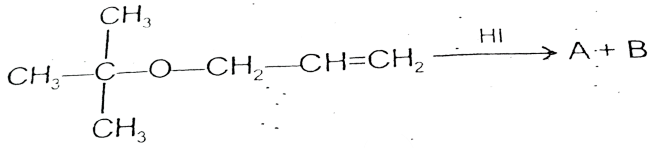
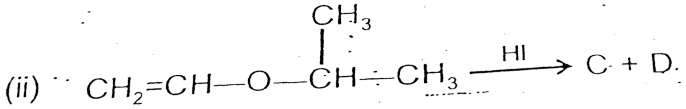
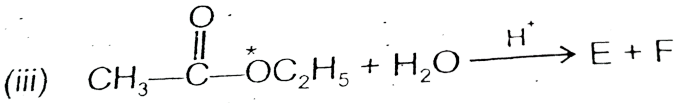
5. Complete the following reactions

(i) 

(ii) 

(iii) 

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Assignment Section A Competition Level Questions

1. IUPAC name of $CH_2OH - CH_2OH$ is

A. Ethylene glycol

B. Ethane -1,2- diol

C. Ethyl -1,2- diol

D. Ethylene diol

Answer: B

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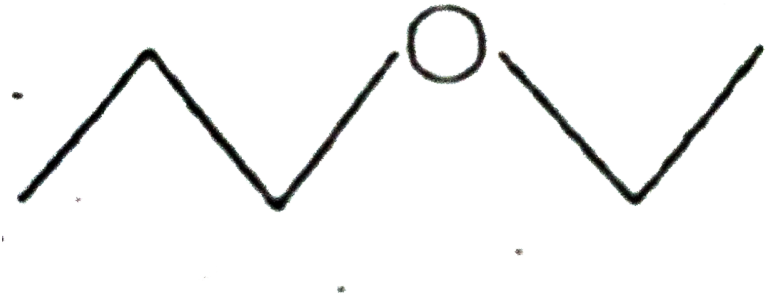
2. IUPAC name of



is

A. Ethyl propyl ether

B. Propyl ethoxide

C. Ethoxy propane

D. Propoxy ethane

Answer: C

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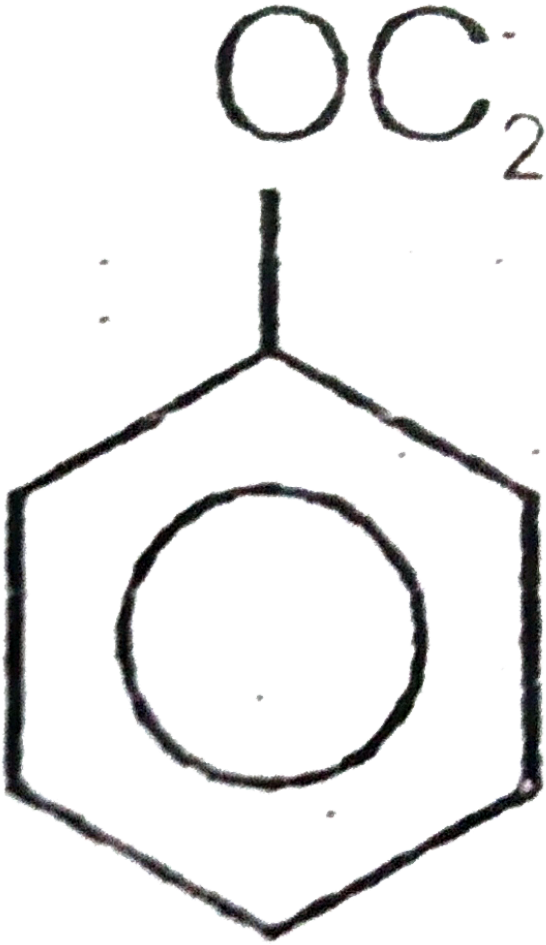
3. IUPAC name of



is

A. Benzyl ethoxide

B. Ethoxy benzyl

C. Benzene ethoxide

D. Ethoxy benzene

Answer: D

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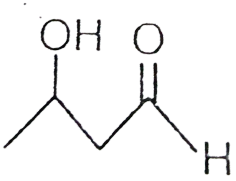
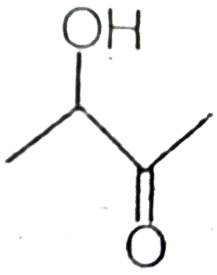
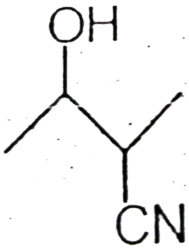
4. Which among the following is 1 alcohol ?

A. 

B. 

C. 

D. 

Answer: B

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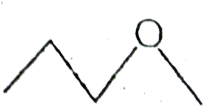
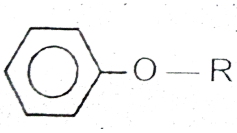
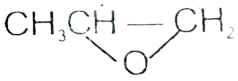
5. Which one is ether ?

A. 

B. 

C. 

D. All of these

Answer: D

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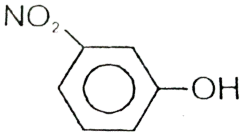
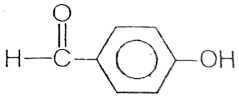
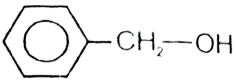
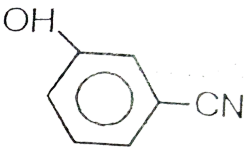
6. Which one is phenol ?

A. 

B. 

C. 

D. 

Answer: A

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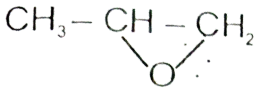
7. $CH_3CH = CH_2 \xrightarrow{H\,/\,H_2O}$ major product is

A. 

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

C. $CH_3CH_2CH_2OH$

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

Answer: B

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8. Reaction involving syn addition is

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

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

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

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

Answer: D

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9. Reaction involvin anti addition is

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

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

C. $CH_3CH = CH_2 \xrightarrow[NaBH_4]{Hg(OA_c)_2H_2O}$

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

Answer: C

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10. RCH

$= CH_2 \xrightarrow[(2)\, H_2O \setminus (Zn)]{(1)\, O_3} (A) \xrightarrow[LiAIH_4]{H_2O} (B)$

Product (B) is

A. RCHO + HCHO

B. RCHO + HCOOH

C. RCOOH + HCOOH

D. $RCH_2OH + CH_3OH$

Answer: D

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11. Which one is preferable reagent for given reaction ?

$RCH_2 - X \rightarrow HO - CH_2R$

A. $(H_2O + KOH)$

B. $(ROH + KOH)$

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

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

Answer: A

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12. 1° alkyl halides preferably undergo which of the following mechanism ?

A. E_1

B. E_{1cb}

C. S_N1

D. S_N2

Answer: D

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13. 2° alkyl halides from alcohols via

A. S_N1

B. S_N2

C. E_1

D. Both (1) & (2)

Answer: D

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14. 2° alkyl halides follow $SN1$ and $SN2$ both depending upon

A. (a) Solvent

B. (b) Termperature

C. (c) Basicity

D. (d) Size of halides

Answer: A

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15. 3° alkyl halides form alcohols preferably via

A. S_N2

B. S_N1

C. Transition state

D. S_N2i

Answer: B

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16. ROH + $SOCl_2 \rightarrow$

The final product is

A. Alkyl chloride

B. Alkyl sulphate

C. Alkene

D. Ether

Answer: A

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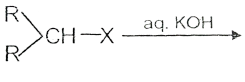
17. S_N1 is observed in

A. 

B. $R-OH+SOCl_2 \rightarrow$

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

D. $ROH+HX \rightarrow$

Answer: A

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

A. R-X

B. Alkene

C. Both (1) & (2)

D. No product

Answer: A

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19. Order of nucleophilicity is

A. $CH_3O^- < C_2H_5O^-$

B. $C_2H_5O^- < C_2H_5S^-$

C. $CH_3O^- < CH_3S^-$

D.

Answer: D

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20. 1° alcohols preferably undergo dehydration via

A. E_1

B. E_2

C. S_N1

D. S_N2

Answer: B

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

A. 1° alcohols

B. 2° alcohols

C. 3° alcohols

D. All of these

Answer: D

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

Products are

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

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

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

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

Answer: A

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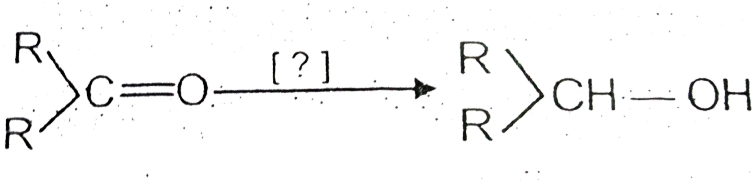
23.



Here reagent is

A. $LiAlH_4$

B. $NaBH_4$

C. Ni/H_2

D. All of these

Answer: D

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

Here reagent is

A. $LiAIH_4$

B. $NaBH_4$

C. Both (1)& (2)

D. Red P/HI

Answer: A

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25. Which of the inter- molecular dehydration ?

A. $ROH \rightarrow R-OR$

B. $ROH \rightarrow R-X$

C. $ROH \rightarrow alke \neq$

D. $R - X \rightarrow ROH$

Answer: A

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26. Lucas test is used to distinguish

A. Phenols

B. Ethers

C. Alcohols

D. Alkyl halides

Answer: C

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27. In lucas test immediately from alcohols by

A. 3° alcohols

B. 2° alcohols

C. 1° alcohols

D. Phenol

Answer: A

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28. 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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29. Which among the following show tautomerism ?

A. Alcohols

B. Phenols

C. Ethers

D. Anisole

Answer: B

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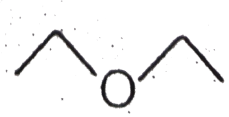
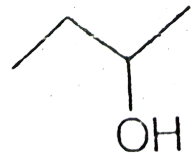
30. Boiling point will be least for

A. 

B. 

C. 

D. 

Answer: B

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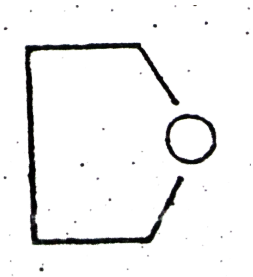
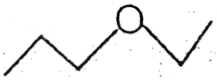
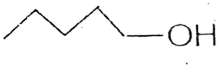
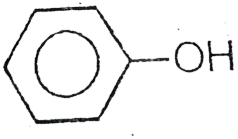
31. Which one of the following is best lewis base ?

A. 

B. 

C. 

D. 

Answer: A

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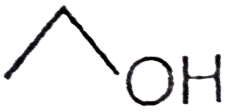
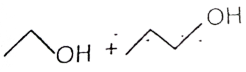
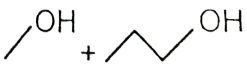
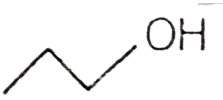
32. 

Product / (s) will be

A. 

B. 

C. 

D. 

Answer: A

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33. Alcohols and ethers are

A. Position isomers

B. Functional isomers

C. Chain isomers

D. Metamers

Answer: B

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34. RMgX reacts with a compound and gives RH , the compound should be

A. $RC \equiv CH$

B. $R - OH$

C. $RCOOH$

D. Any of these

Answer: D

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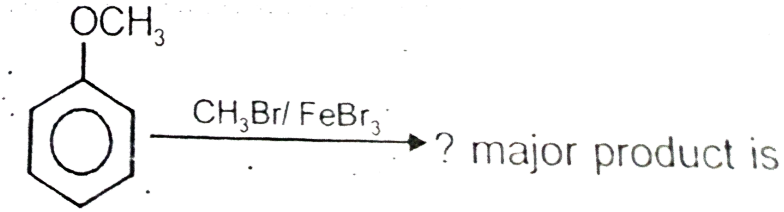
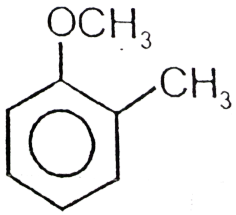
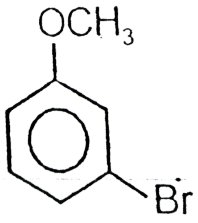
35. Complete the following reaction



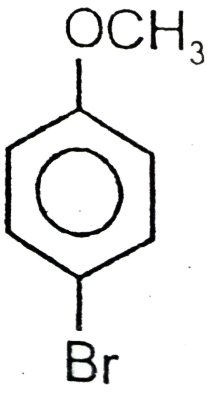
A.



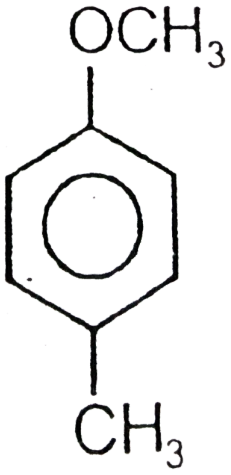
B.



C.



D.



Answer: D

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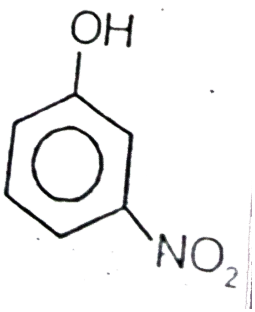
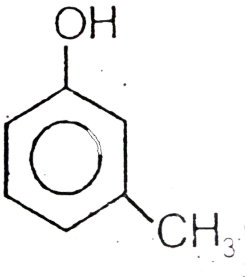
36. Most acidic among the following is

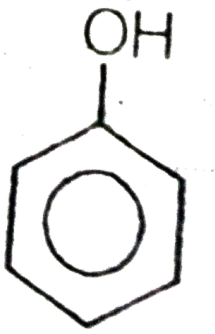
A. (a)

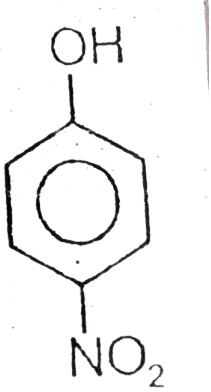


B. (b)



C. (c)





D. (d)

Answer: D

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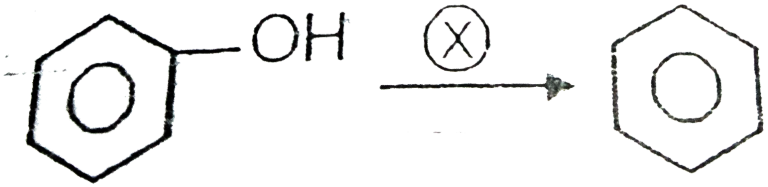
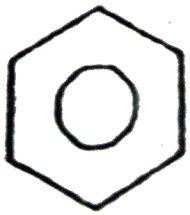


37.

The reagent (X) required for above conversion is

A. $LiAIH_4$

B. Zn

C. 

D. $NaBH_4$

Answer: B

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38. REIMER-TIEMANN REACTION

A. CH_3Cl

B. CH_2

C. CCl_2

D. CO_2

Answer: C

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39. 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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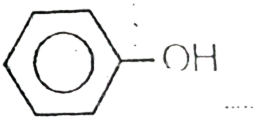
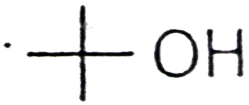
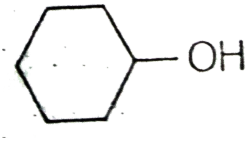
40. Molecule which does not oxidise

A. 

B. 

C. 

D. 

Answer: C

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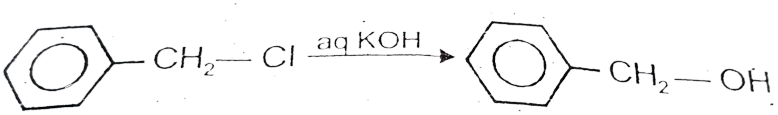
41. 

Reaction happens via

A. S_N1

B. S_N2

C. S_Ni

D. ArS_N1

Answer: A

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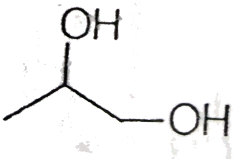
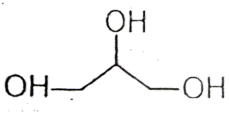
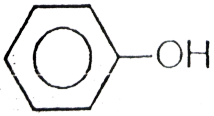
42. Which of the most viscous ?

A. 

B. 

C. 

D. 

Answer: B

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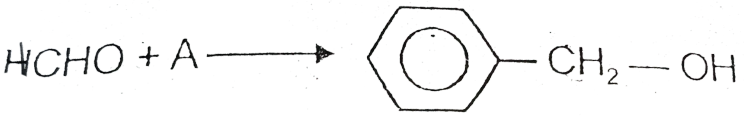
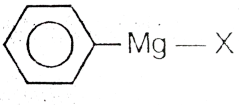
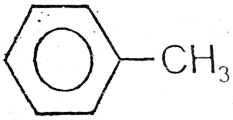
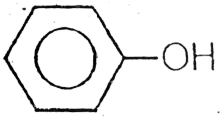
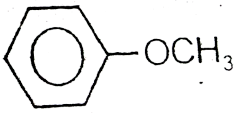
43. Complete the following reaction



A. 

B. 

C. 

D. 

Answer: A

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44. All the Phenols are

A. Enamines

B. Enols

C. Aci- nitro compound

D. Aprotic

Answer: C

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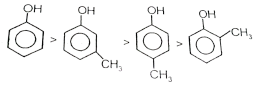
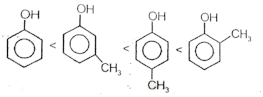
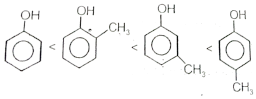
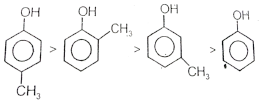
45. Correct acidic order is

A. 

B. 

C. 

D. 

Answer: A

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

Product (A) and (B) are

A. $CH_3OH + CH_3CH_2I$

B. $CH_3I + CH_3CH_2OH$

C. $CH_3I + CH_3CH_2I$

D. $CH_3OH + CH_3CH_2OH$

Answer: D

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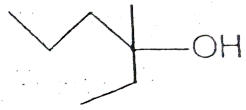
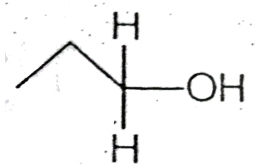
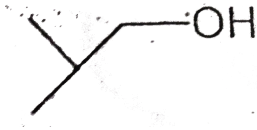
47. Which of the following be optically active ?

A. 

B. 

C. 

D. 

Answer: A

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

A. 2

B. 3

C. 4

D. 5

Answer: C

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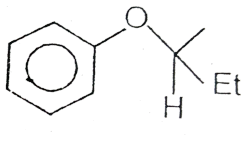
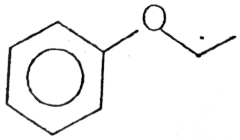
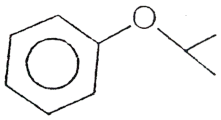
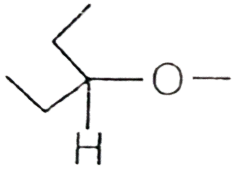
49. Which one is optically active aromatic ether ?

A. 

B. 

C. 

D. 

Answer: A

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50. 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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Assignment Section B Objective Type Questions One Option Is Correct

1. A compound (X) with the molecular formula C_3H_8O can be oxidized to another (Y) whose molecular formula is $C_3H_6O_2$

The compound (X) may be

A. $CH_3CH_2OCH_3$

B. CH_3CH_2CHO

C. $CH_3CH_2CH_2OH$

D. $CH_3CHOHCH_3$

Answer: C

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2. Which one among the followng compounds will produce a secondary alcohol on reaction with Grignard reagent ?

A. CH_3COCH_3

B. $CH_3 - COOCH_3$

C. $HCOOCH_3$

D. All of these

Answer: C

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3. An alekene X is obtained by dehydration of ann alcohol Y. X on ozonolysis gives two molecules of ethanal for every molecule of alkene. X and Y are

A. $CH_3CH_2CH_2OH$

B. CH_3CH_2OH

C. $CH_3 - CH = CHCH_2OH$

D. $CH_3CH_2CHOHCH_3$

Answer: D

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4. A compound X with the molecular formula , C_3H_8O can be oxidised to another compound Y whose molecular formula is $C_3H_6O_2$. The compound X may be

A. Phenol

B. Anisole

C. Benzoic acid

D. All of these

Answer: A

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5. When sodium or potassium phenoxide is heated with carbon dioxide, followed by acidification, we get

A. Salicylic acid

B. Salicyladehyde

C. Benzoic acid

D. Cinnamic acid

Answer: A

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6. An organic compound having molecular formula C_3H_6O does not react with 2,4-dintrophenol hydrazine and does not react Na metal. The compound is expected to be:

A. $CH_3 - CH_2 - CHO$

B. $CH_3 - CO - CH_3$

C. $CH_2 = CH - CH_2 - OH$

D. $CH_2 = CH - OCH_3$

Answer: D

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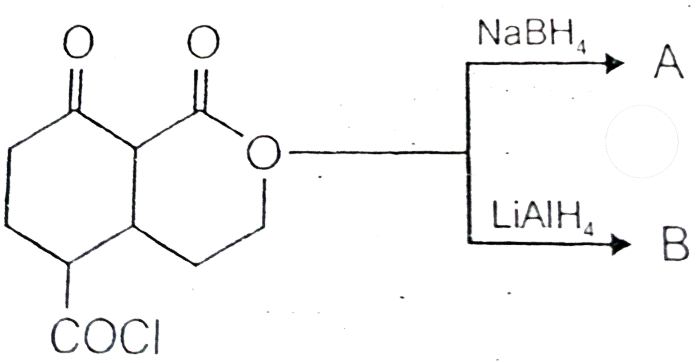
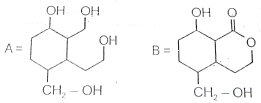
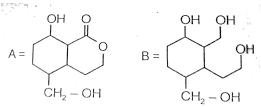
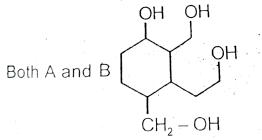


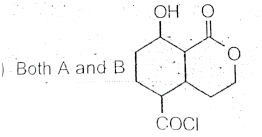
7.

A and B are respectively

A. 

B. 

C. 

D. 

Answer: B

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8. Choose the correct statement

A. $LiAlH_4$ cannot reduce isolated carbon - carbon double or triple bond

B. Borane and $LiAlH_4$ have generally same reducing power and same mechanism

C. $LiAlH_4$ can reduce isolated carbon - carbon double bond

D. $LiAlH_4$ is a weak hydride doner than $NaBH_4$

Answer: A

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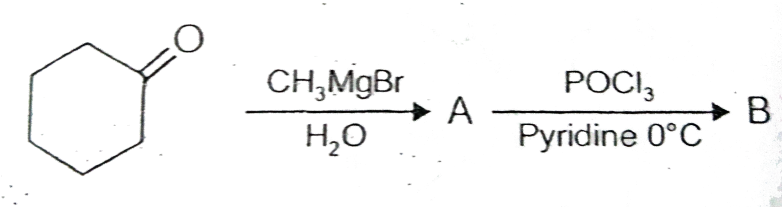
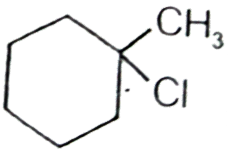
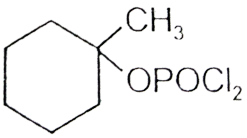
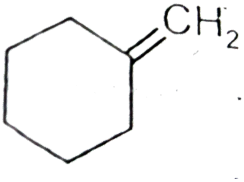
9. Consider the following reaction sequence

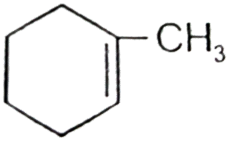


The product B is

A. 

B. 

C. 

D. 

Answer: D

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10. An organic compound $\underline{A}$ react with sodium to form another compound $\underline{B}$. The compound $\underline{A}$ when heated with concentrated H_2SO_4 forms diethyl ether . The compound $\underline{A}$ and $\underline{B}$ are respectively

A. C_3H_7OH and CH_3H_7ONa

B. CH_3OH and CH_3ONa

C. C_2H_5OH and C_2H_5ONa

D. C_2H_5OH and CH_3ONa

Answer: C

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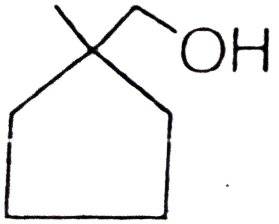
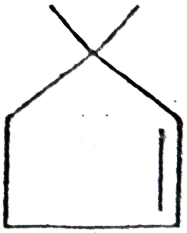
11. The product of the reaction

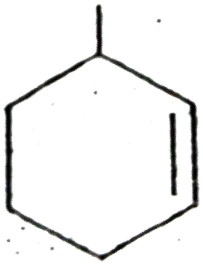


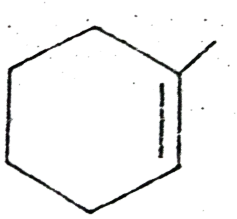
$\xrightarrow[\Delta]{H^+}$ X; is

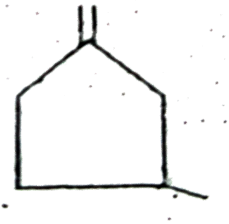
A.



B.



C. 

D. 

Answer: C

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12. Which of the following reaction does not form ether as major product ?

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - O - Na + CH_3CH_2Br \rightarrow$

B. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - Br + CH_3CH_2ONa \rightarrow$

C. $CH_3 - \underset{\underset{H}{|}}{\overset{\overset{H}{|}}{C}} - Br + CH_3ONa \rightarrow$

D. $CH_3l - \underset{\underset{H}{|}}{\overset{\overset{CH_3}{|}}{C}} - ONa + CH_3 - \overset{\overset{CH_2Br}{|}}{CH_2} \rightarrow$

Answer: B

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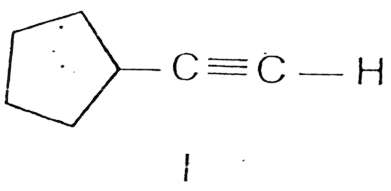
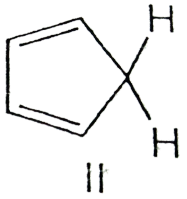
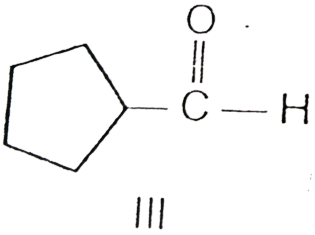
13. Arrange the given species in the increasing order of acidic strength



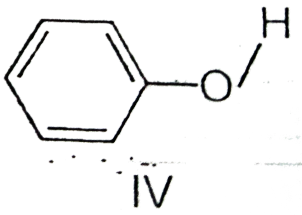
I



II



III



IV

A. $I < II < III < IV$

B. $I < III < II < IV$

C. $III < II < I < IV$

D. $II < III < I < IV$

Answer: B

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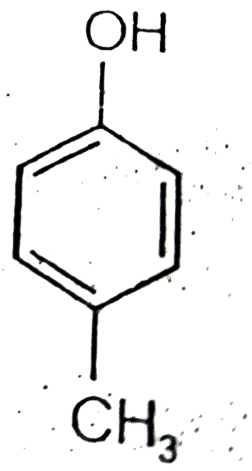
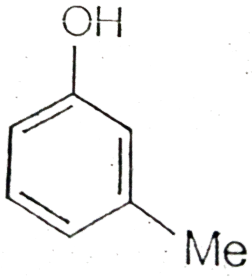
14. Compound (X) C_7H_8O dissolves in NaOH but not in $NaHCO_3$ (X) reacts rapidly with Br_2 to give (Y) $C_7H_5OBr_3$ Product structure of X would be

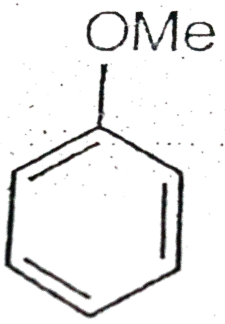
A.

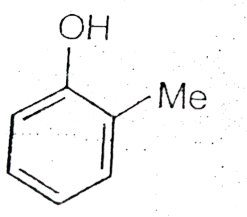


B.



C.



D. 

Answer: B

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15. During the chromic acid oxidation of isopropyl alcohol into acetone colour of the reaction mixture changes from yellow - orange to greenish blue . The greenish blue colour is because of

A. Acetone

B. H_2CrO_4

C. $HCrO_3$

D. $Cr^{\wedge}(3+)$

Answer: D

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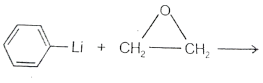
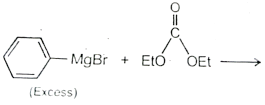
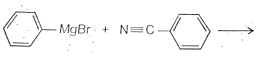
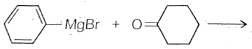
16. Which of the following reactions will not yield alcohol as the major product ?

A. 

B. 

C. 

D. 

Answer: C

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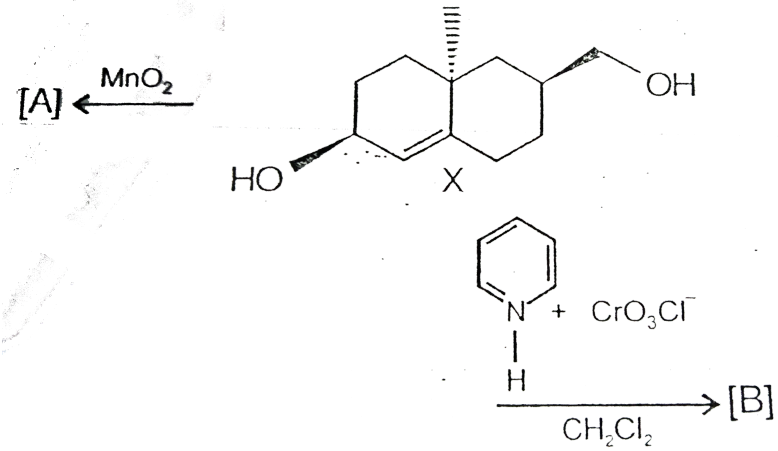
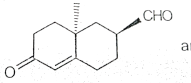
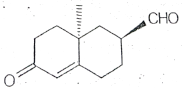
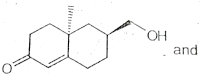
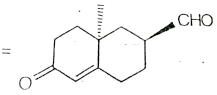
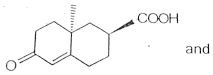
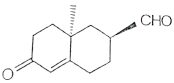
17. Pyridinium chloromate and MnO_2 are used as selective oxidizing agents in organic synthersis what would be the oxidation product of compound X when it reacts separately with PC C

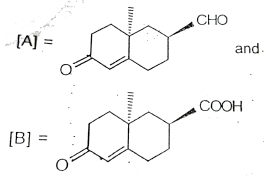
and MnO_2



A. [A] =  and [B] = 

B. [A] =  and [B] = 

C. [A] =  and [B] = 

D. 

Answer: B

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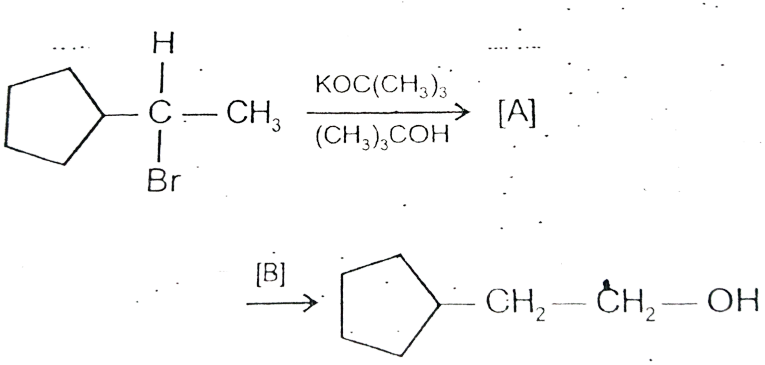
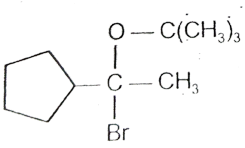
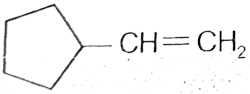
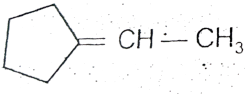
18. In the reaction

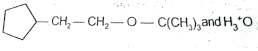


The molecule [A] and the reagent [B] are

A. 

B. 

C. 

D. 

Answer: B

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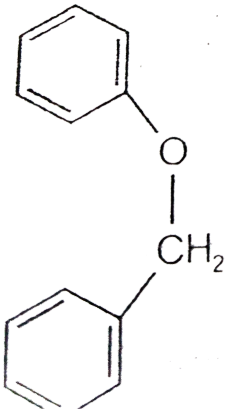
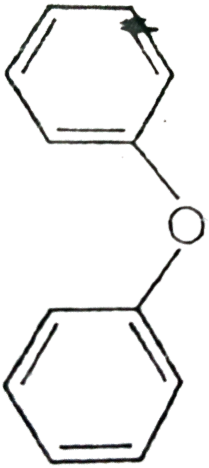
19. Which of the following ethers is unlikely to be cleaved by not conc. HI ?

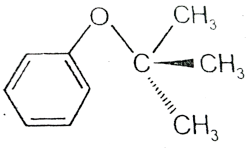
A.

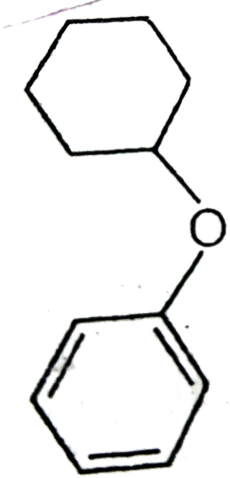


B.



C.



D. 

Answer: A

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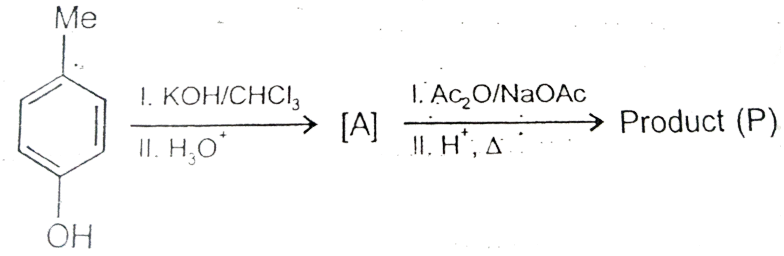
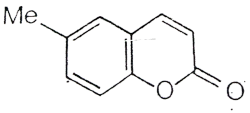
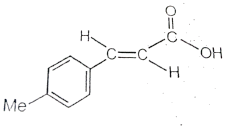
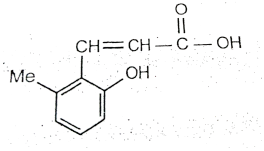
20. Consider the following sequence of reactions

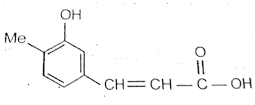


The major product (P) In the given reaction is

A. 

B. 

C. 

D. 

Answer: C

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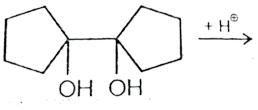
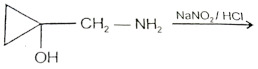
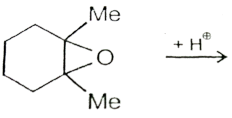
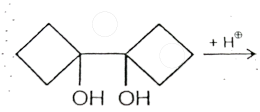
21. Which of the following pinacol - pinacolone type of reaction will involve ring contraction ?

A. 

B. 

C. 

D. 

Answer: C

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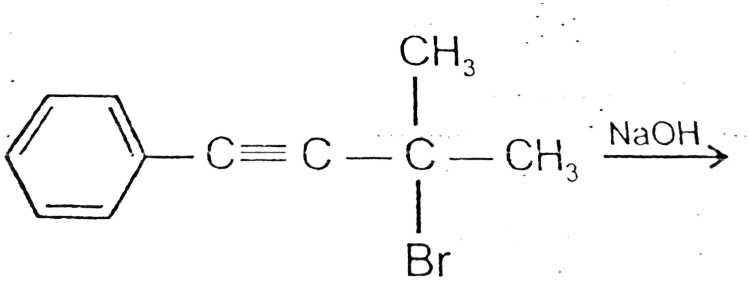
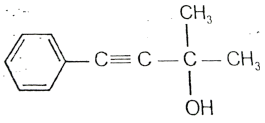
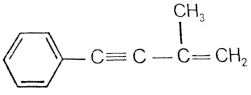
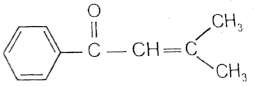
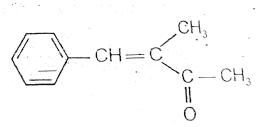
22. What would be the major product of the given reaction ?



A. 

B. 

C. 

D. 

Answer: C

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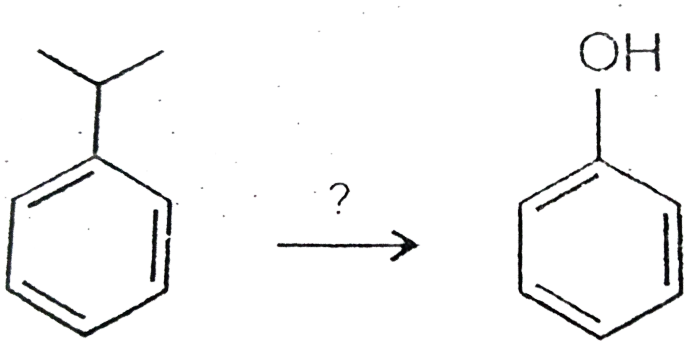
23. Reagents required to perform the given transformation is



A. $(i)O_2$ - oxidation (ii) H_3O^+

B. $(i)KMnO_4 \quad \text{hot} \quad LiAIH_4(iii)H_3O^+$

C. $(i) \quad \text{Hot} \quad KMnO_4(ii)NaBH_4(iii)H_3O^+$

D.

$$(i)H_2CrO_4(ii)lCaO + NaOH, \Delta(iii)NaOH$$

Answer: A

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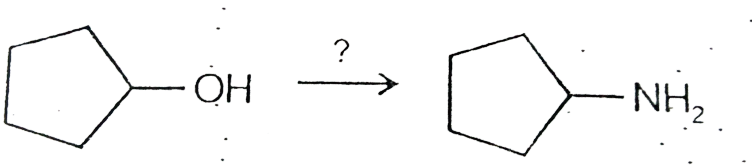
24. Which reaction or reaction sequence will furnish the following transformation ?



A. $(i)NaNH_2(ii)H_3O$

B. $(i)SOCI_2(ii)NaN_3(iii)Sn/HCI$

C. $(i)PCI_3(ii)NaNH_2(iii)H^{O+}$

D. $(i)HI(ii)NaNH_2(iii)H^{O+}$

Answer: B

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Assignment Section C Objective Type Questions More Than One Options Are Correct

1. Synthesis of cyclohexane -1,2 diol from cyclohexene may be accomplished in two ways :

I MnO_4 dilute $OH, O^\circ C$ dihydroxylation

II . Peracid epoxidation followed by NaOH opening of the epoxide ring .

Which of the following statement about the products from these reactions is correct ?

A. Methods I and II give same product

B. Method I gives resolvable racemic mixture while method II will give non- resolvable achiral product

C. Method I gives resolvable optically inactive compound while method II gives resolvable racemic mixture

D. Products obtained through method I and II will have diasteriomeric relationship

Answer: C::D

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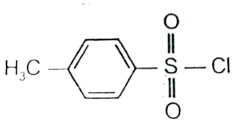
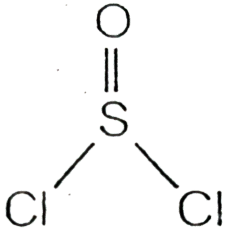
2. Which of the following convert a primary hydroxyl group into good leaving group for a

S_N2 reaction ?

A. 

B. 

C. PCl_5

D. Nal (5 molar solution)

Answer: A::B::C

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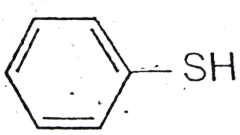
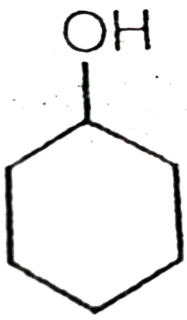
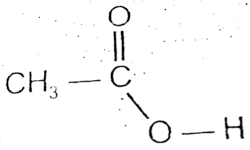
3. Which of the following compounds will dissolve in aq. NaOH ?

A. 

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

C. 

D. 

Answer: A::D

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4. Which of the following reagents can be used to distinguish phenol from Anisole ?

A. $FeCI_3$

B. Aqueous NaOH

C. Br_2

D. $NaHCO_3$

Answer: A::B

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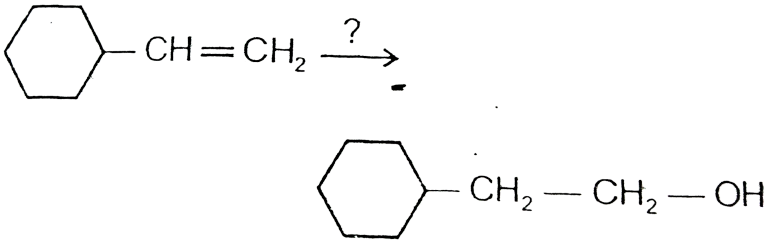
5. Which sequence of reactions can be used to perform the given transformation ?



A. $(i) B_2H_6 . THF \quad (ii) \overline{O}H / H_2O_2$

B. (i) conc $H_2SO_4 \quad (ii) H_2O, \Delta$

C. $(i) Hg(OAC) / H_2O \quad (ii) NaBH_4$

D. $(i) HBr /$ Peroxide $hv \quad (ii) NaOH$

Answer: A::D

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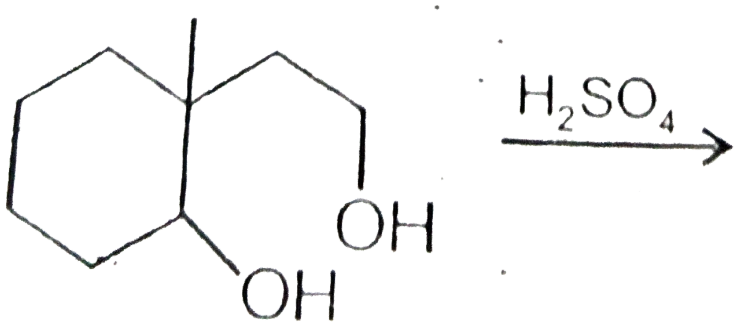
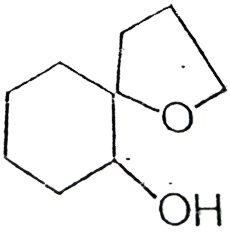
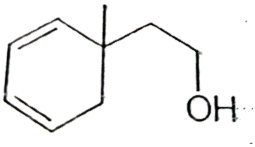
6. Consider the following reaction

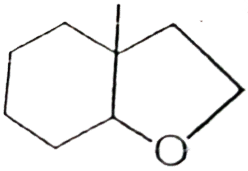


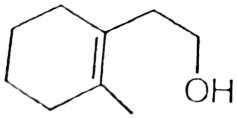
Probable product of the above reaction are

A.



B. 

C. 

D. 

Answer: C::D

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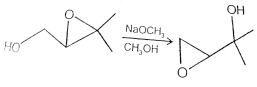
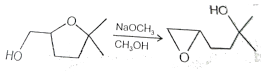
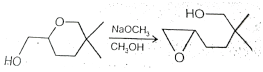
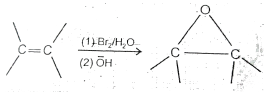
7. Which of the following reactions will not occur

?

A. 

B. 

C. 

D. 

Answer: B::C

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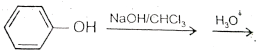
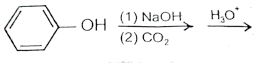
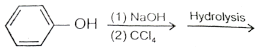
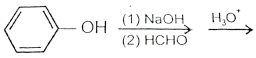
8. Ortho salicylic acid is frequently used as precursor for the preparation of Asprin. Which of

the following reactions can be used to prepare o-salicylic acid from phenol

A. 

B. 

C. 

D. 

Answer: B::C

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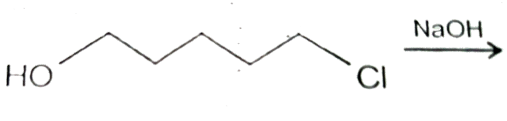
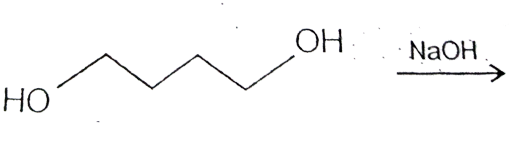
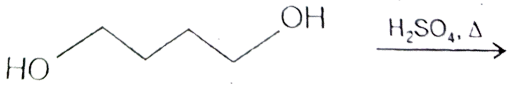
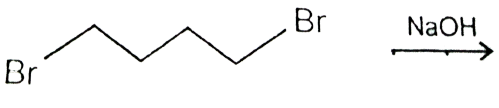
9. Which of the following reaction can be used to prepare cyclic ethers ?

A. 

B. 

C. 

D. 

Answer: A::C

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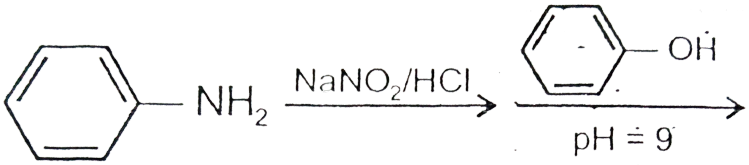
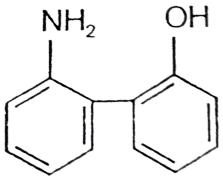
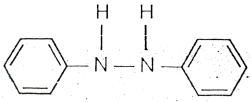
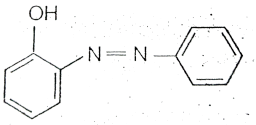
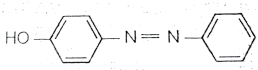
10. What would be the products of the given reaction ?



A. 

B. 

C. 

D. 

Answer: C::D

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11. Which of the following chemical tests can be used to distinguish primary . Secondary and tertiary alcohol from each other ?

A. Hinsberg test

B. Haloform Test

C. Lucas Test

D. Victor- Meyer's Test

Answer: C::D

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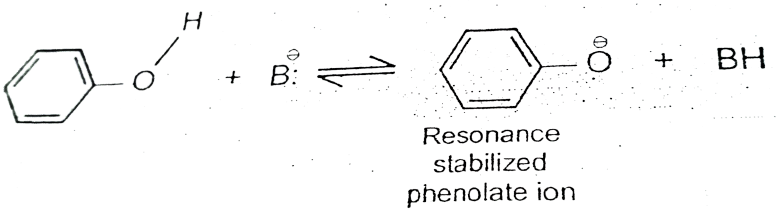
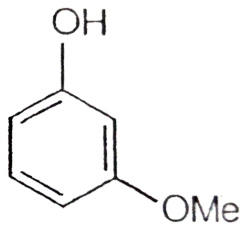
Assignment Section D Linked Comprehension Type Questions

1. Phenols are more acidic than aliphatic alcohols acidity of phenols can be further increased by the introduction of electron withdrawing groups in aromatic ring .Acidic nature of phenol is because of the resonance stabilization of phenoxide ion

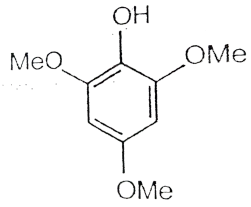


Which of the following will evolve CO_2 gas with aqueous $NaHCO_3$?

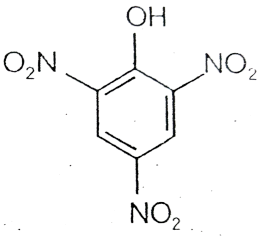
A.



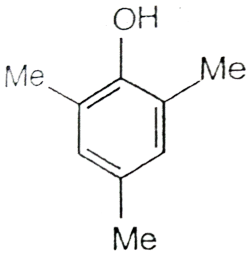
B.



C.



D.



Answer: C

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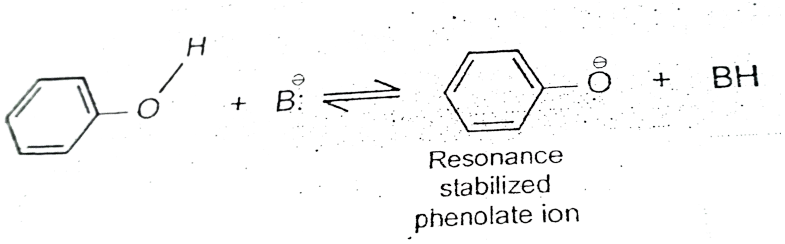
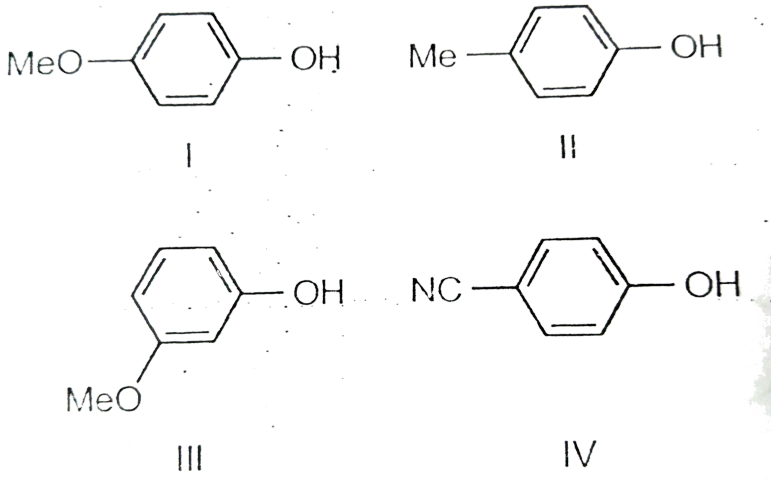
2. Phenols are more acidic than aliphatic alcohols acidity of phenols can be further increased by the introduction of electron withdrawing groups in aromatic ring .Acidic nature of phenol is because of the resonance stabilization of phenoxide ion



Arrange the given phanols in the increasing order

of acidic strength



A. $I < II < III < IV$

B. $II < I < III < IV$

C. $I < IV < III < II$

D. $II < IV < III$

Answer: B

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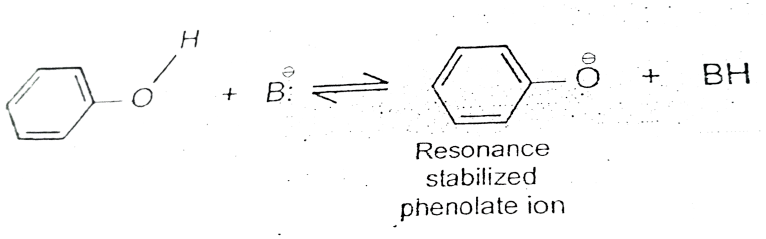
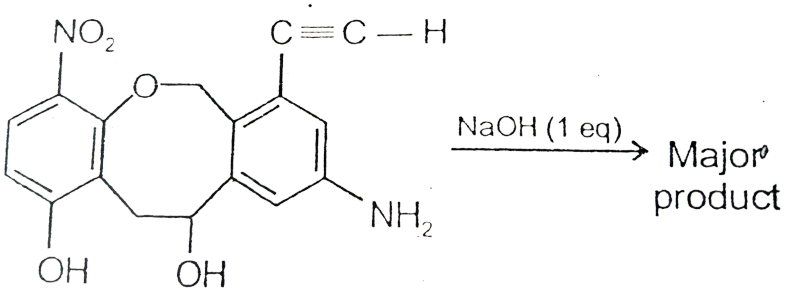
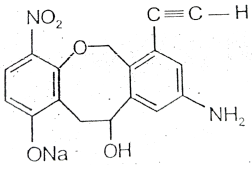
3. Phenols are more acidic than aliphatic alcohols acidity of phenols can be further increased by the introduction of electron withdrawing groups in aromatic ring .Acidic nature of phenol is because of the resonance stabilization of phenoxide ion

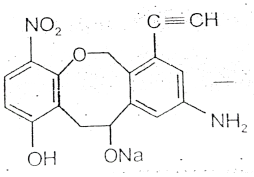


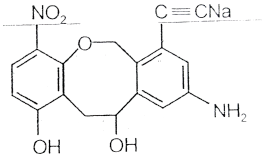
Consider the following reactions

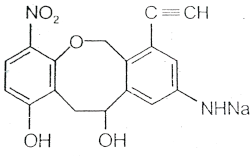


major product the above reaction would be

A. 

B. 

C. 

D. 

Answer: A

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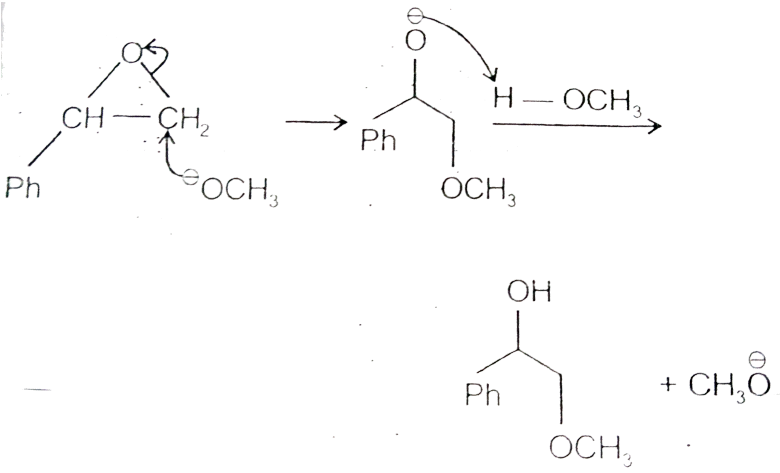
4. Attack by a strong nucleophile such as CH_3O^{Θ} (Methoxide ion) on an epoxide occurs at the least hindered carbon similar to an S_N2 reaction



Attack by a weak nucleophile such as MeOH . Can

occur only when the epoxide has been protonated so that a better leaving group is formed under acidic condition weak nucleophile attacks more substituted carbon to give final product .

Which statement is true about base ring opening reaction of epoxide ?

A. Base catalyzed epoxide opening is nonstereo selective reaction

B. Both acid catalyzed and base catalyzed ring opening is regioselective

C. In acidic medium attack of nucleophile take place at less substituted carbon of epoxide

D. Epoxides are less reactive than oxetanes

Answer: B

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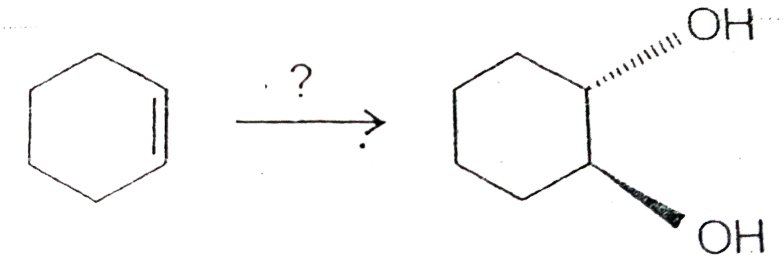
5. Given synthetic transformation can be performed by



A. $CH_3 - \overset{O}{\overset{||}{C}} - OOH / H_2O$

B. $(i) OsO_4 (ii)$ Hydrolysis

C. $(i) KMnO_4, \overset{\Theta}{O}H, 0^\circ C$ (ii) Hydrolysis

D. $(i) Br_2 / H_2O (ii) \overset{\Theta}{O}H$

Answer: A

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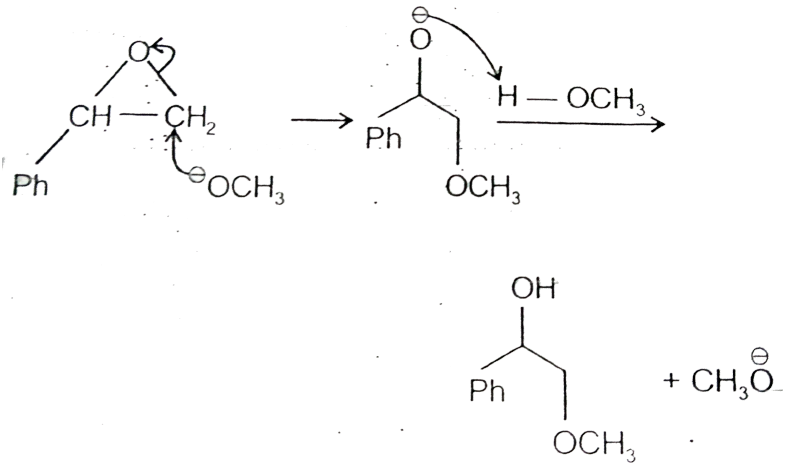
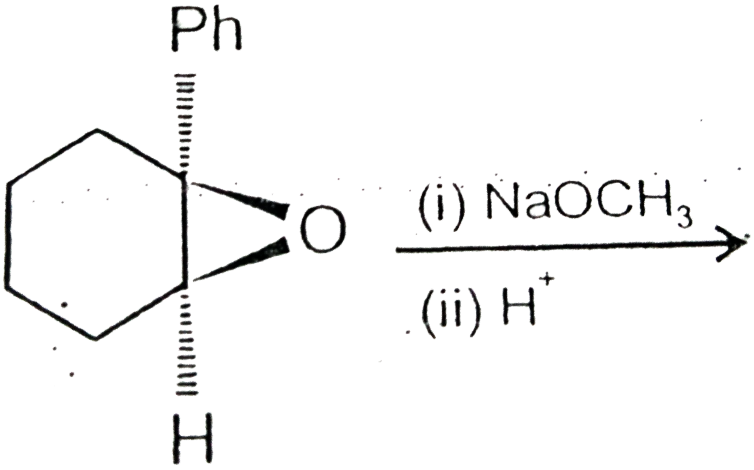
6. Attack by a strong nucleophile such as CH_3O^{Θ} (Methoxide ion) on an epoxide occurs at the least hindered carbon similar to an S_N2 reaction

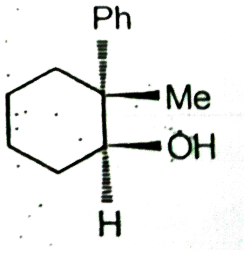


Attack by a weak nucleophile such as MeOH . Can occur only when the epoxide has been protonated so that a better leaving group is formed under acidic condition weak nucleophile attacks more substituted carbon to give final product .

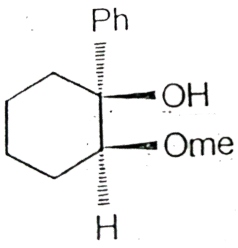
What would be the major product of the given transformation ?



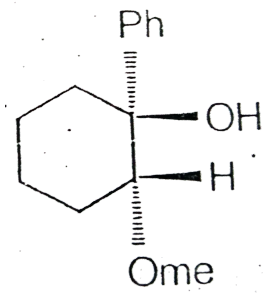
A.



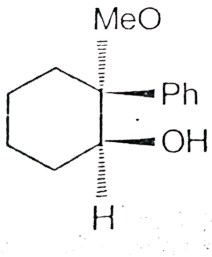
B.



C.



D.



Answer: C

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7. Draw 1,4-Dibromo- benzene

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Assignment Section E Assertion Reason Type Question

1. Statement - 1 Victor - Meyer's test can be used to distinguish primary and secondary alcohols Statement -2 under victor - Meyers' condition these alcohols give different colouration .

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: A

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2. Statement -1 Solubility of alcohols decreases with increasing molecular weight

Statement -2 : Increases in hydrophobic group decreases proportion of hydrogen bonding .

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: A

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3. Statement -1 Phenols cannot be converted into esters by direct reaction with carboxylic acids whereas alcohols can be

Statement -2 This is due to the fact that the esterification reaction is exothermic for alcohols but slightly endothermic for phenols.

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for

Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: A

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4. Statement -1 Secondary alcohols react faster than primary alcohols with Na

Statement -2 : O - H bond in secondary alcohol is less polar than than primary alcohol

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: D

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5. Statement-1 Resorcinol turns $FeCI_3$ solution purple

Statement - 2 Resorcinol is a dihydric phenol

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: B

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6. Statement -1 The C - O bond length of aliphatic alcohols is less than phenols

Statement - 2 in phenols C - O bond acquires π bond character.

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: D

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7. Statement - 1 $POCl_3$ can be used to dehydrate alcohols

Statement -2 This reaction proceeds by formation of carbocation in 1^{st} step

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: C

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8. Statement -1 In phenylbenzoate Frie's rearrangements is faster than ethylbenzoate

Statement -2 Phenyl acylium cation is more stable than ethylacylium cation.

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: A

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9. Statement -1 : When phenol is treated with PBr_3 is gives bromobenzene.

Statement -2 It is an example of nucleophilic substitution

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: C

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10. Statement -1 : Phenol and benzoic acid can be distinguished by $NaHCO_3$

Statement -2 Phenol releases CO_2 gas from $NaHCO_3$

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: C

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11. Statement-1 Hydration of alkenes may give more than one type of alcohol

Statement -2 Carbocation intermediate may show rearrangement

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: A

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12. Statement- 1 Phenols are more acidic than carboxylic acid

Statement -2 Acidity depends on reasonance stabilisation of the conjugate base formed

A. Statement -1 is true ,Statement -2 is True , Statement -2 is a correct explanation for Statement -1

B. Statement -1 is True , Statement -2 is True Statement -2 is NOT a correct explanation for Statement -1

C. Statement -1 is True Statement -2 is False

D. Statement -1 is False Statement -2 is True

Answer: D

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Assignment Section F Matrix Match Type Questions

1. Calculate mole fraction of ethyl alcohol and water in a solution containing 46 g ethyl and 36g water.

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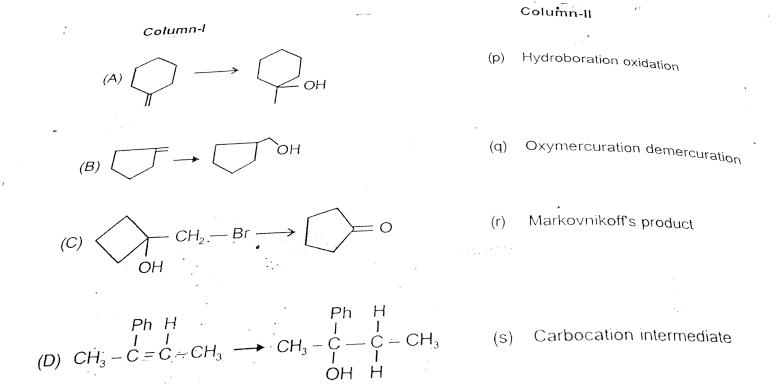
2. Match the column - I (Chemical Transformation) with column - II (Name reaction)



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3. At a given temperature, Kc is 4 for the reaction:

$H_2(g) + CO_2(g) \Leftrightarrow H_2O(g) + CO(g)$.Initially 0.6 moles each ofH_2 and CO_2 are taken in 1 liter

flask. The equilibrium concentration of $H_2O(g)$ is

:

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4. Find the pH of $0.001MNH_3$ $\left(K_b = 1.8 \times 10^{-5}\right)$

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5. Calculate the pH of a 0.01 M of NaOH solution.

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6. Match the following

column I	column II
$Cr_2O_7^{2+} + H^+$	(p) Aldehydes
$(B) SOCI_2$	(q) Alkene
$(c) H_2SO_4 \Delta$	(r) Carboxylic acid
$(D) P\mathbb{C}$	(s) Chloroalkene

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Assignment Section G Integer Answer Type Questions

1. How much KOH must be dissolved in one litre of solution to get a pH of 12 at $25^\circ C$?

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2. If the pH of a solution is 3, what is the value of the pOH of the solution?

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3. The number of isomer (including stereoisomers) of $C_5H_{12}O$ which can give positive haloform test is

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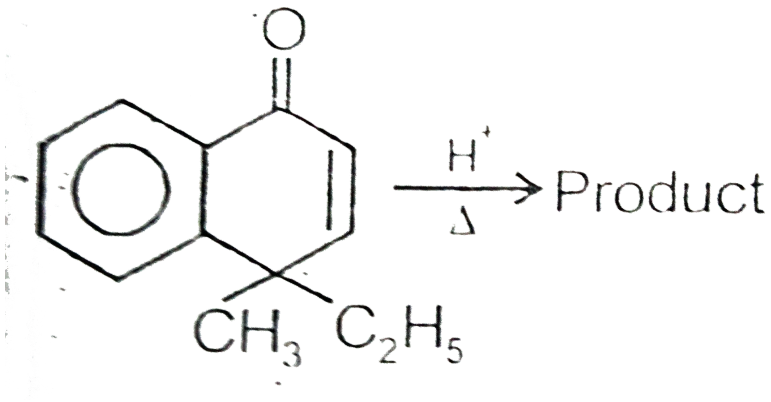
4. 

In the final product , the number of π electrons involved in aromaticity is 2x . The value of x is

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Assignment Section H Multiple True False Type Questions

1. Statement -1 : Phenol is more acidic than ethyl alcohol

Statement -2 : Phenol is a weaker acid than benzoic acid

Statement -3 : Phenol is a good substrate to prepare o- salicylic acid

A. TTF

B. TTT

C. FFF

D. FTT

Answer: B

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2. Statement- 1 Pyridinium chlorochromate can convert primary alcohols into corresponding aldehyde

Statement -2 MnO_2 can oxidize benzylic alcohol into corresponding carboxylic acid

Statement - 3 : OsO_4 can convert alkene into trans 1,2- diol

A. FFF

B. TTT

C. TTF

D. TFF

Answer: C

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Assignment Section I Subjective Type Questions

1. For $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ at equilibrium, $K_p = \frac{P}{3}$, where P is equilibrium pressure. Then degree of dissociation of PCl_5 at that temperature is ?

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2. Calculate the pH of a 0.01 M of HCl solution.

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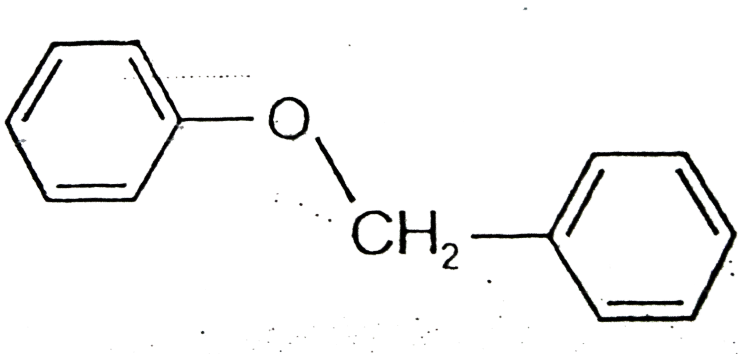
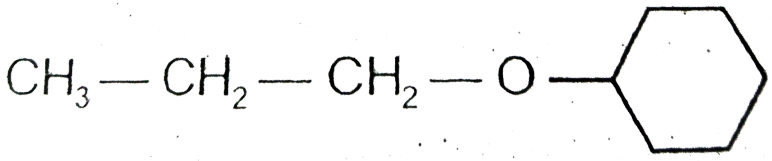
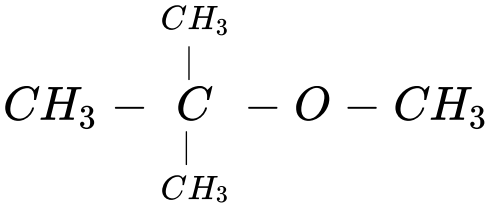
3. Prepare the following ethers via the williamson's synthesis







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4. Give the products of the reaction of styrene oxide with

(a) NaSH

(b) $LiAID_4$

(c) $MeOH / H^+$

(d) $HBr(1eq)$

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5. The pH of $0.25MBa(OH)_2$ solution is:

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6. Use simple chemical tests to differentiate between each member of the following pairs of compounds

(a) n - Propylalcohol and phenol

(b) Phenol and Benzoic acid

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7. What will be the molality of a solution of glucose in water which is $10\ \%\ w/W$?

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8. An organic compound made of C,H and N contains 20% nitrogen. Its minimum molecular weight is:

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9. To prepare a buffer solution of pH=4.04, amount of Barium acetate to be added to 100 mL of 0.1 M acetic acid solution $\left[pK_b\left(CH_3COO^-\right) = 9.26\right]$ is:

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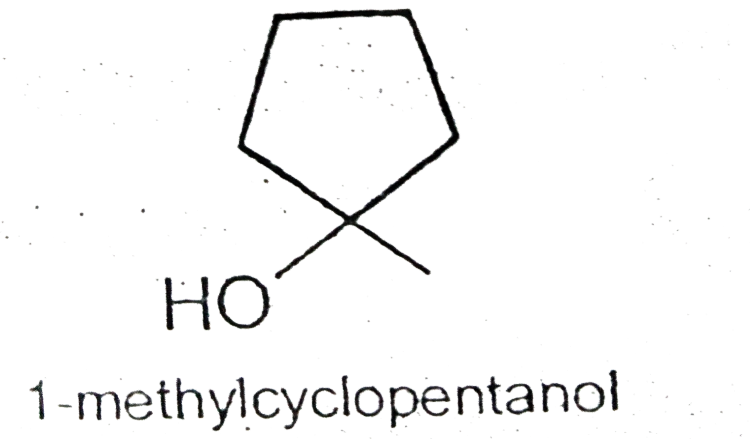
10. Design a synthesis of 1- methylcyclopentanol using alcohol with no more than five carbon atoms as the only source of carbon in the final

product.



1-methylcyclopentanol

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11. 0.037g of an alcohol, R-OH was added to CH_3MgBr and the gas evolved measured 11.2 mL at STP. The Molecular mass of R-OH will be .

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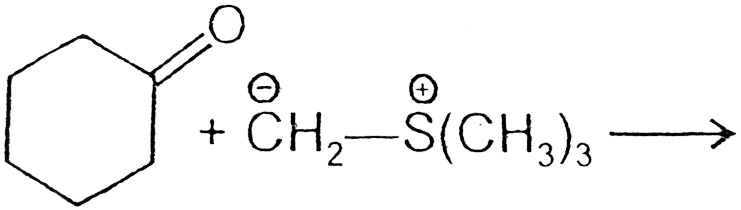
Assignment Section J Aakash Challengers Questions

1. Show the product from the following Write mechanism in support of your product



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2. 60 mL of H_2 and 42 mL of I_2 are heated in a closed vessel. At equilibrium, the vessel contains 20 mL HI. Calculate degree of dissociation of HI.

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3. The pH of NaOH solution is 12. What is the amount in grams of NaOH present in one litre of a solution?

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4. An acidic buffer contains equal concentrations of acid and salt. The dissociation constant of acid is 10^{-5}. The P^H of the buffer solution is

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5. The volume of water required to prepare one litre of 0.1 N HNO_3 solution from 10 ml of 10 N HNO_3 solution is:

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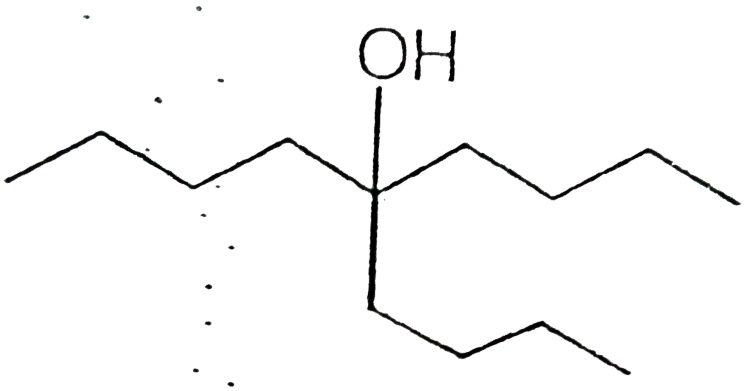
6. Show how you would synthesize the following compound .As starting materials you may use any organic compound containing four or fewer carbons



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7. 2g of NaOH and 4.9 g of H_2SO_4 were mixed and volume is made 1 litre. The normality of the resulting solution will be:

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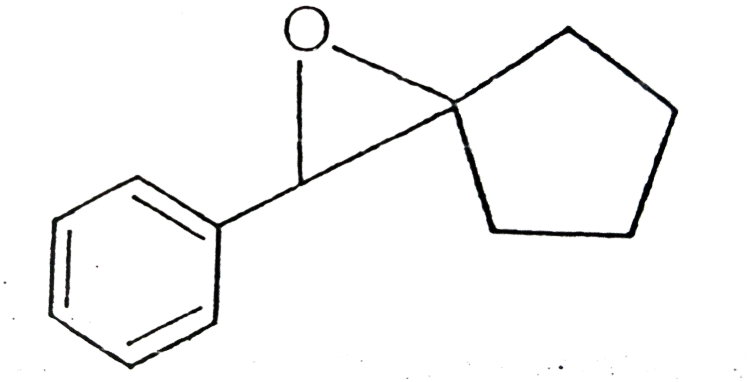
8. Show how you would synthesize the following compound from any starting materials containing

no more than six carbon atoms.



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9. The molality of a solution having 36 g of glucose dissolved in 500 g of water is

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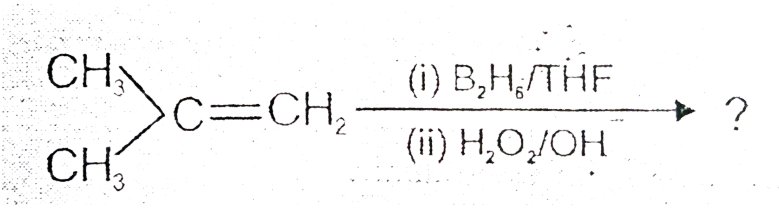
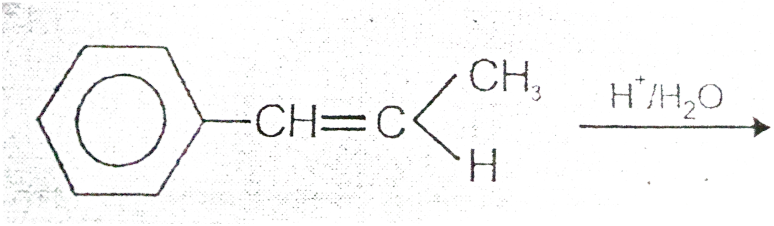
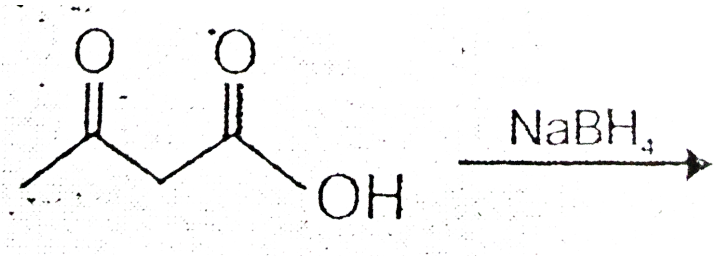
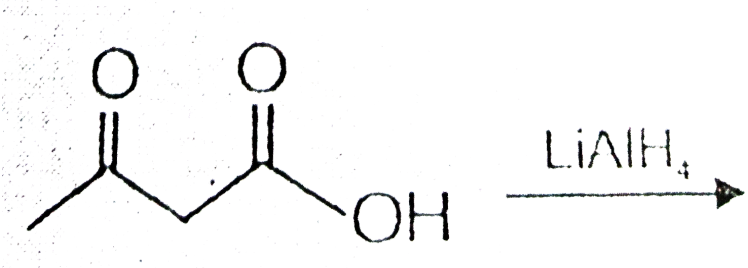
Try Yourself

1. Find the product of given reaction









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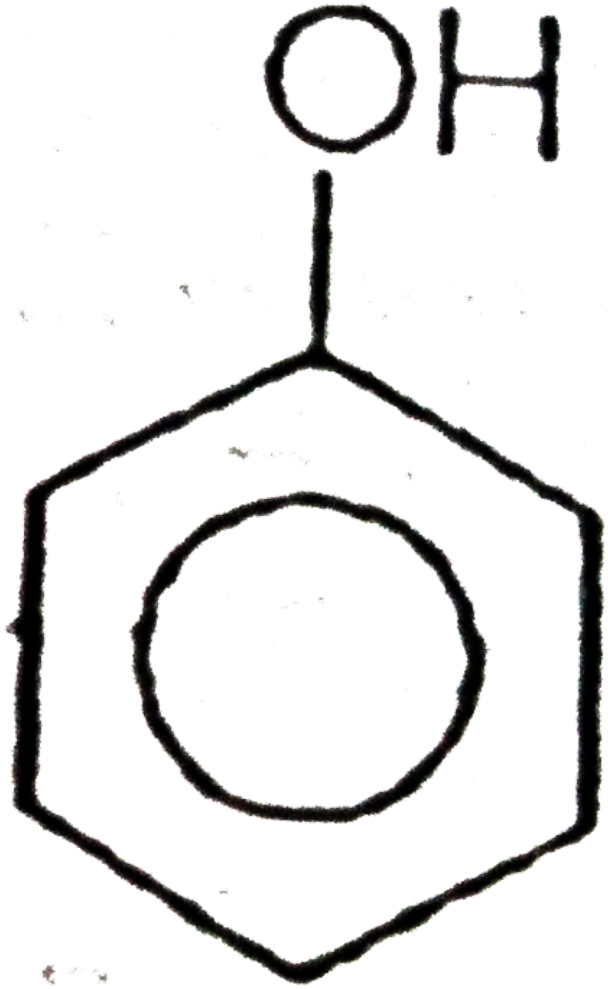
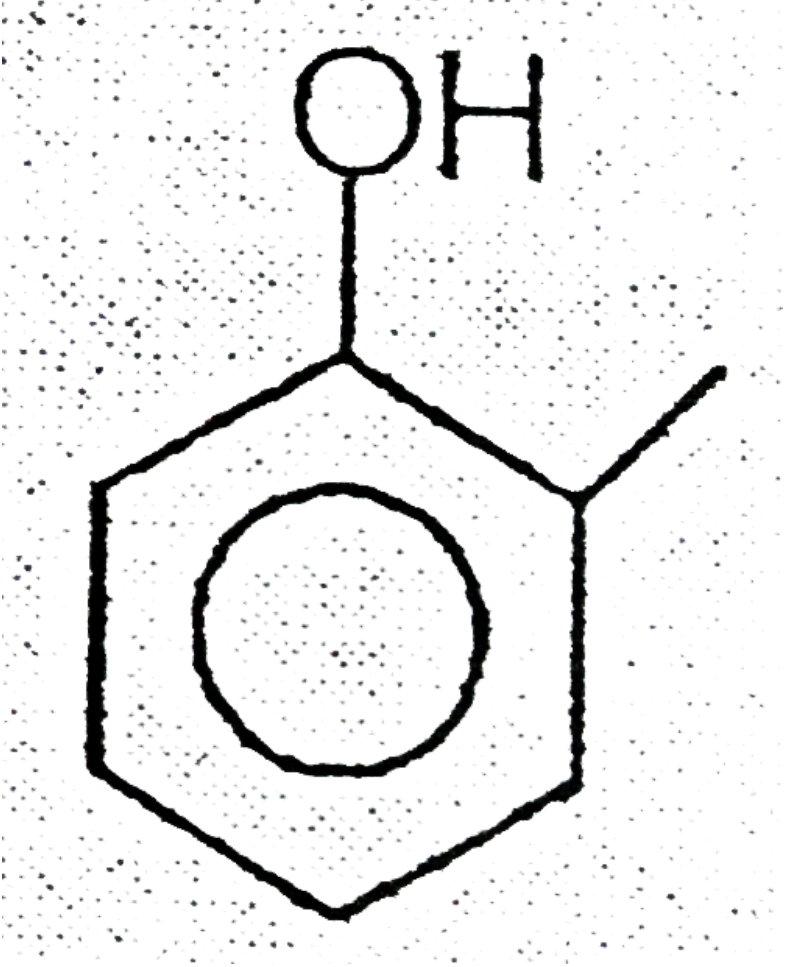
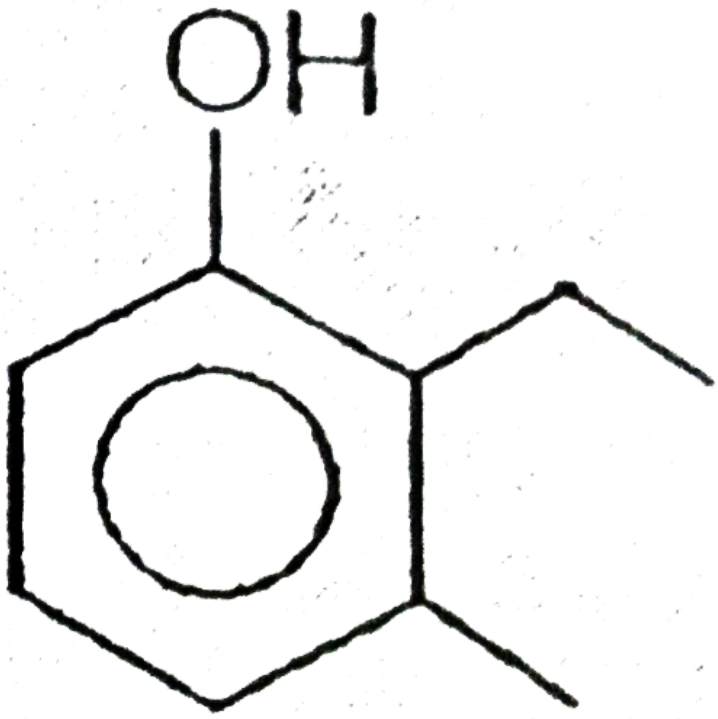
2. Arrange the following in increasing order of their

(i) Solubility and (ii) Boiling point


OH


OH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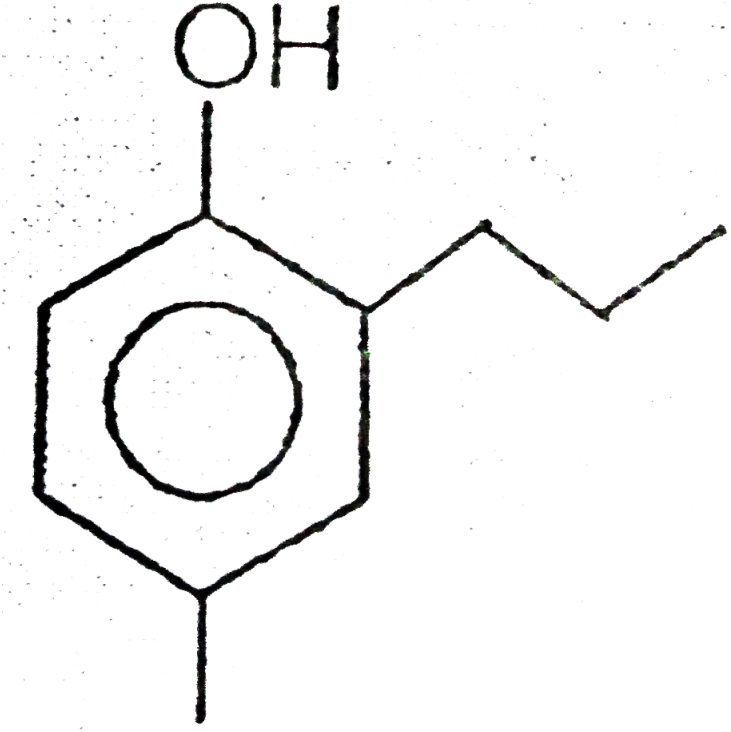

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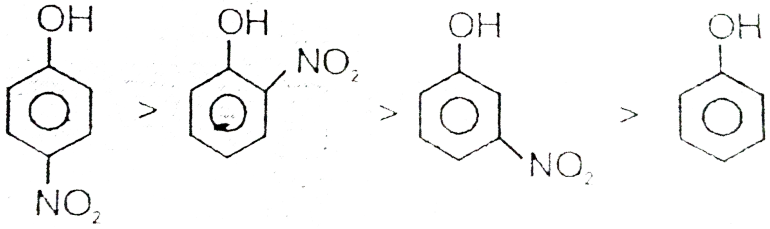
3. (a) Why acidic nature of alcohol and phenol increase with electron withdrawing substituent

(b) Explain the order of acidic nature of



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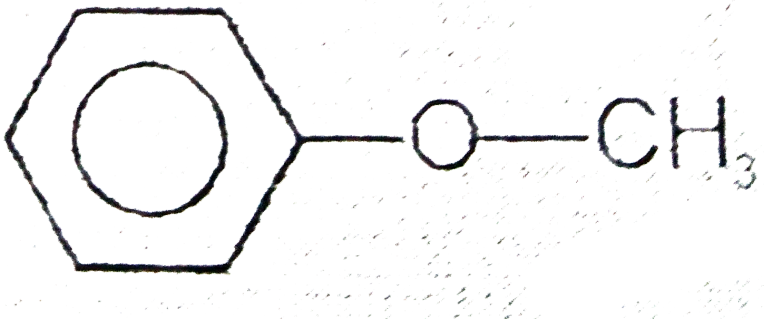
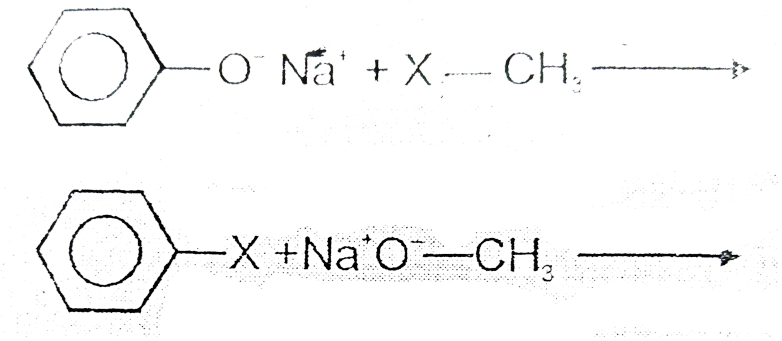
4. For the preparation of anisole



which

one is preferable reaction and why ?



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5. Consider an amylose chain of 4000 glucose unit. At how many cleavage require to lower the average length to 400 units.

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