



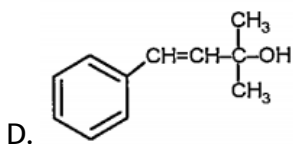
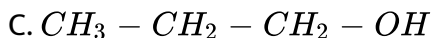
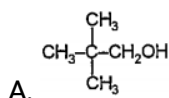
## CHEMISTRY

### BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

#### FG-1 (ALCOHOLS, PHENOLS & ETHERS)

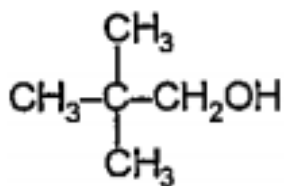
#### QUESTION BANK

1. Classify the following as primary and Secondary alcohols

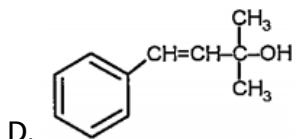
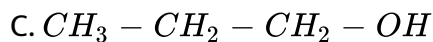


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2. Classify the following as Tertiary alcohols

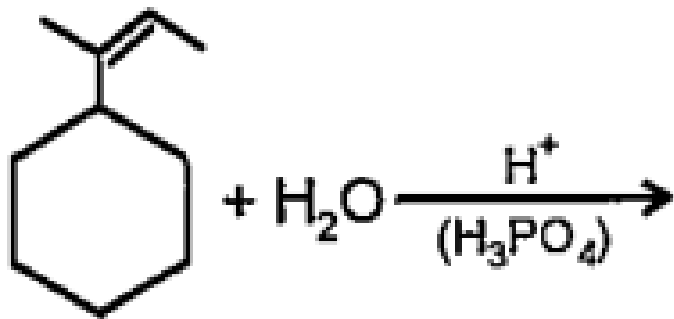


A.



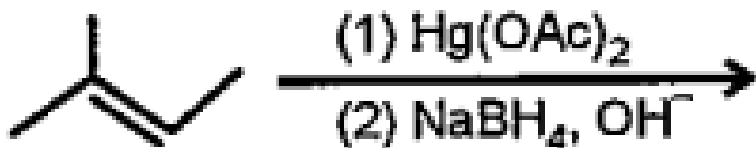
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3. Find the major product of reaction



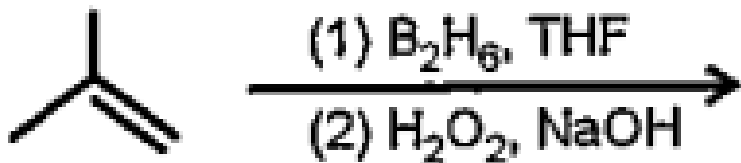
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4. Find the major product of reaction



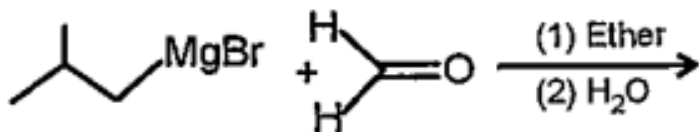
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5. Find the major product of reaction



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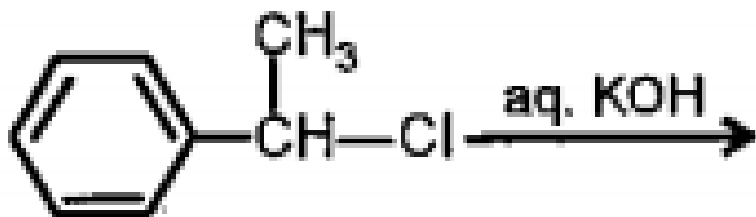
6. Find the major product of reaction



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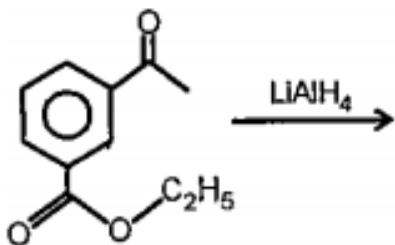


7. Find the major product of reaction



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8. Find the major product of reaction



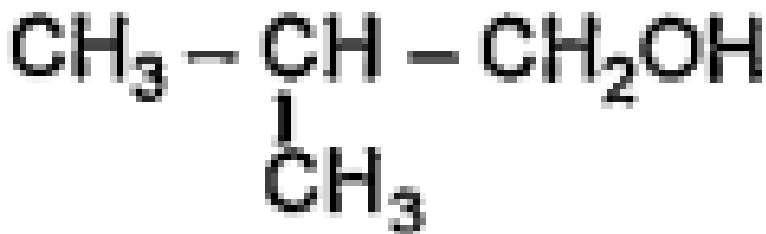
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9. Give one example of solid aerosol and one liquid aerosol.



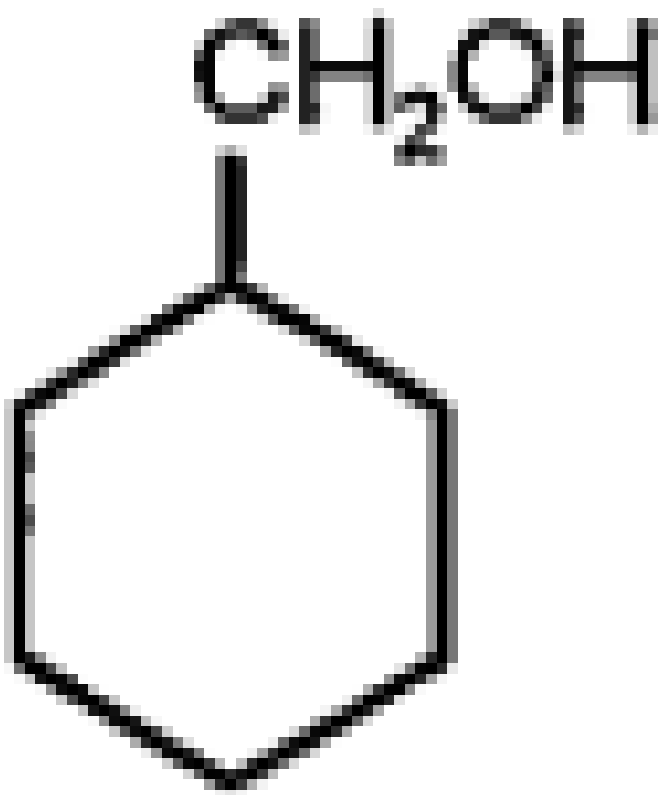
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10. Show how are alcohols prepared by the reaction of a suitable Grignard reagent on Methanal ?



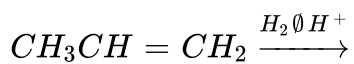
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11. Show how are alcohols prepared by the reaction of a suitable Grignard reagent on Methanal ?



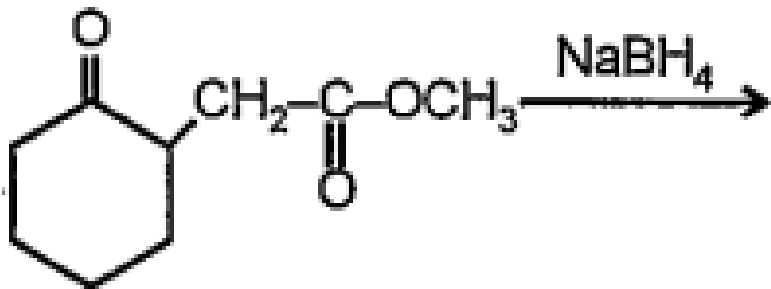
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12. Write structures of the products of the reaction



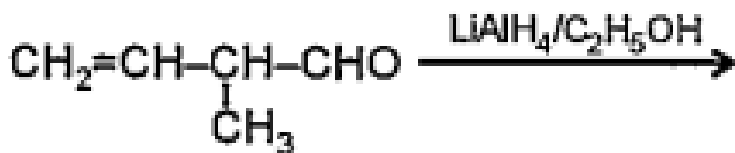
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13. Write structures of the products of the reaction



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14. Write structures of the products of the reaction



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15. Why is mobility of  $\text{H}^+$  ion in ice greater as compared to liquid water?

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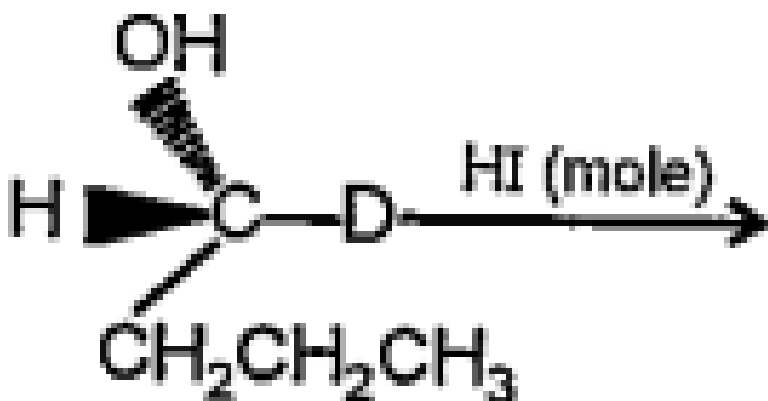
16. Why 2-chloroethanol is more acidic than ethanol ?

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17. 0.436 g of acetyl derivative of a polyhydric alcohol(molecular mass=92) requires 0.336 g of KOH for hydrolysis. Calculate the number of hydroxyl groups in the alcohol.

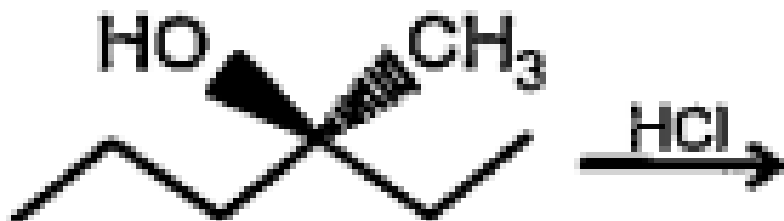
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18. Draw the product of each reaction:



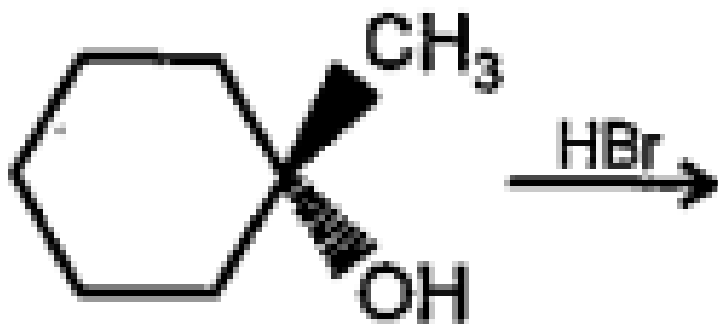
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19. Draw the product of each reaction:



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20. Draw the product of each reaction:



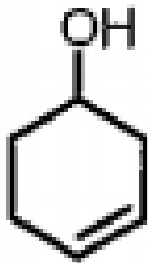
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21. Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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22. Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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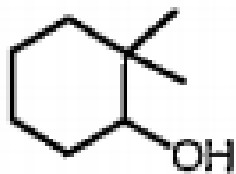
23. Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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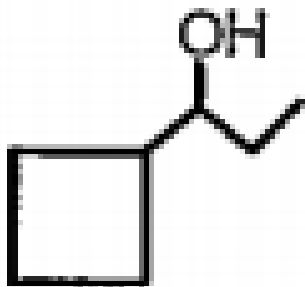
24. Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$





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25. Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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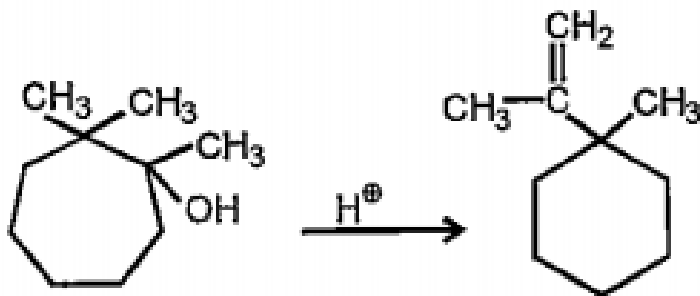
26. Predict the major product of acid catalysed dehydration of

(a) 1-methylcyclohexanol

(b) butan -2- ol

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27. Propose a mechanism for the following reaction.



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28. Classify alcohols as primary and secondary alcohols and write the structures of their first oxidation products:



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29. Classify alcohols as primary and secondary alcohols and write the structures of their first oxidation products:



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30. Starting with bromobenzene and any other needed reagents, outline a synthesis of the following ketone.



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31. Draw the organic products in each reaction:



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32. Draw the organic products in each reaction:



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33. Draw the organic products in each reaction:



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34. Draw the organic products in each reaction:





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35. Draw the organic products in each reaction:



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36. Phenol is a stronger acid than alcohol. Explain



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37. How would you obtain: Phenol  $\rightarrow$  Picric acid



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38. Convert: Phenol  $\rightarrow$  Benzophenone



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39. Explain p-nitrophenol boils at higher temperature than o-nitrophenol?

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40. Explain o-nitrophenol has much lower solubility in water than m-or p-isomers?

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41. What are the products (A),(B),(C),(D) and ( E ) ?



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42. How can you prepare 2-acetoxybenzoic acid and phenyl salicylate from salicylic acid?

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43. Give IUPAC name for following heterocyclic ethers.



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44. Give IUPAC name for following heterocyclic ethers.



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45. Give IUPAC name for following heterocyclic ethers.



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46. Give IUPAC name for following heterocyclic ethers.



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47. Write the reactions of Williamson of 2-ethoxy-3-methylpentane starting from ethanol and 3-methylpentan-2-ol.

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48. Explain the following observations:



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49. Identify the product A and B giving proper explanations:







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50. Phosgene is the common name for?



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51. What properties of tungsten make it suitable for use as filaments in light bulbs?



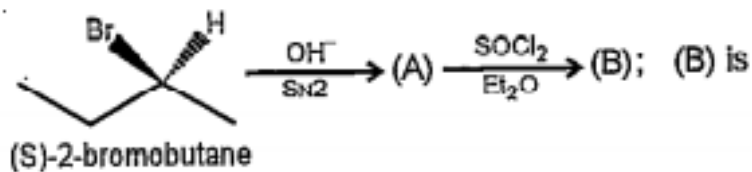
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52. Name two poisonous gas which can be prepared from chlorine gas.



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53. Consider the following reaction sequence

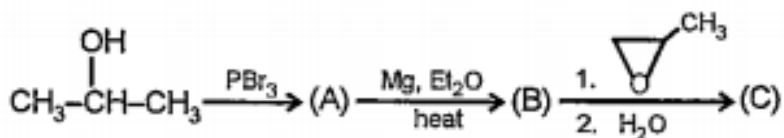


- A. ( R)-2-chlorobutane
- B. (S) -2-chlorobutane
- C. Both: ( R ) and ( S ) -2 chlorobutane
- D. none of these

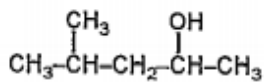
Answer: A

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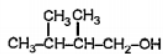
54. The following reactions are carried out



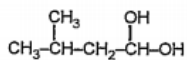
The final product ( C ) is



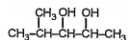
A.



B.



C.



D.

**Answer: A**

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**55. Why is ICl more reactive than  $I_2$ ?**

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56. Phenol is prepared industrially by heating chlorobenzene with aqueous NaOH at  $360^{\circ}\text{C}$  under high pressure.

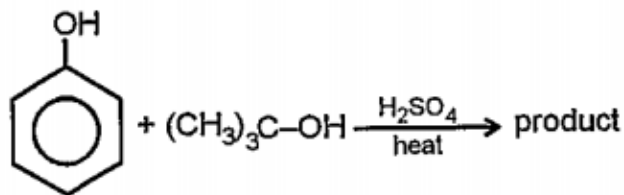
$\text{C}_6\text{H}_5\text{Cl} + \text{NaOH} \xrightarrow[2. \text{H}_3\text{O}^+]{360^{\circ}\text{C}, \text{pressure}}$  are  $\text{C}_6\text{H}_5\text{OH}$  The reaction involves

- A.  $\text{S}_{\text{N}}1$  mechanism
- B.  $\text{A}_{\text{r}}\text{S}_{\text{N}}2$  mechanism
- C.  $\text{A}_{\text{r}}\text{S}_{\text{E}}2$  mechanism
- D. addition mechanism

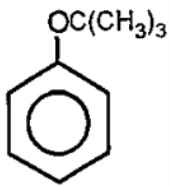
Answer: B

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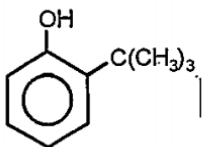
57. Consider the following reaction



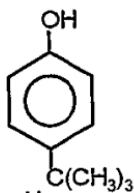
The major product formed is



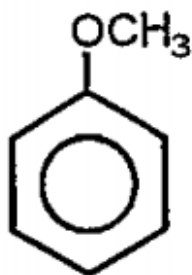
A.



B.



C.



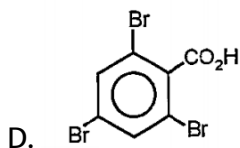
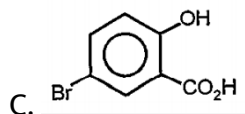
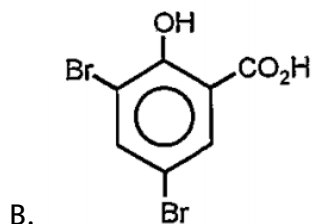
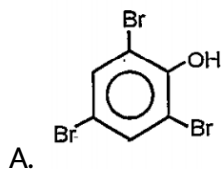
D.

Answer: C



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58. Salicylic acid is treated with excess bromine water. The product formed is

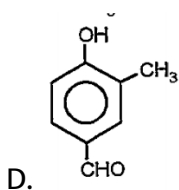
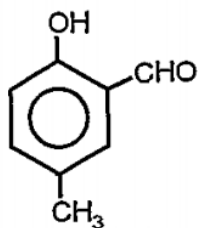
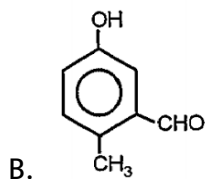
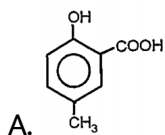
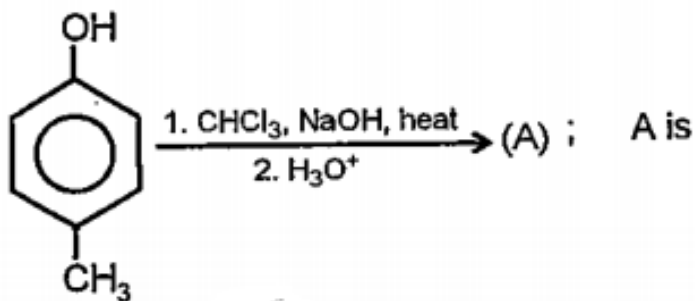


Answer: A



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59. Consider the following sequence of reaction



**Answer: C**

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**60.** A mixture of oxygen and helium gas is used in the diving apparatus.

Why?

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**61.** Why has it been difficult to study the chemistry of radon?

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**62.** Give the resonating structures of  $N_2O_5$

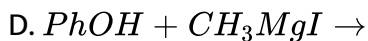
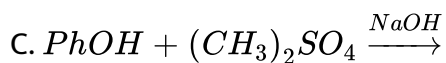
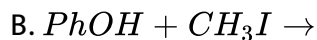
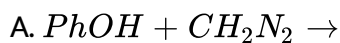
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63. Illustrate how copper metal can give different products on reaction with  $HNO_3$

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64. Which of the following reaction would not yield methoxybenzene(anisole)?



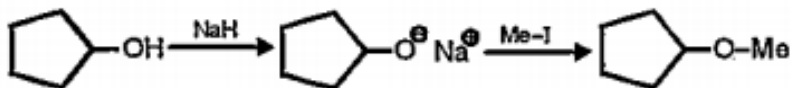
Answer: D

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65. Give two uses of  $ClO_2$

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66. The reaction



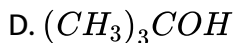
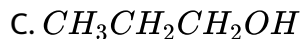
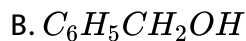
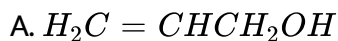
can be classified as

- A. Dehydration reaction
- B. Williamson alcohol synthesis reaction
- C. Williamson ether synthesis reaction
- D. Alcohol formation reaction

**Answer: C**

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



Answer: C

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68. Write the reactions of  $F_2$  and  $Cl_2$  with water.

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



C.  $-CHCl$

D.  $-CHO$

**Answer: D**

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70. How can you prepare  $Cl_2$  from HCl and HCl from  $Cl_2$ ? Write the reactions only.

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71. How are  $XeO_3$  and  $XeOF_4$  prepared?

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

A.  $CH_3CHO$ ,  $RMgX$

B.  $C_6H_5OH$ ,  $NaOH$ ,  $CH_3I$

C.  $C_6H_5OH$ , neutral  $FeCl_3$

D.  $C_6H_5 - CH_3$ :  $CH_3COOI$ ,  $AlCl_3$

**Answer: B**

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73. When  $CH_2 = CH - O - CH_2 - CH_3$  reacts with one mole of HI, one of the products formed is

A. ethane

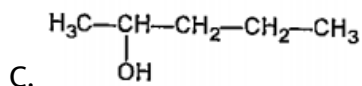
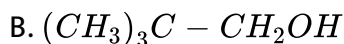
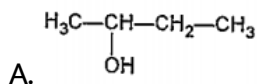
B. ethanol

C. iodoethane

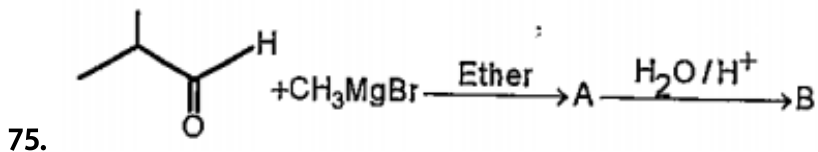
D. ethanal

**Answer: D**

74. 0.44g of a monohydric alcohol when added to methylmagnesium iodide in ether liberates at STP  $112\text{cm}^3$  of methane. With PCC, the same alcohol forms a carbonyl compound that answers silver mirror test. The monohydric alcohol is



Answer: B



The IUPAC name of 'B' is

- A. 3-methylbutan-2-ol
- B. 2-methylbutan-2-ol
- C. 2-methylbutan-3-ol
- D. pentan-2-ol

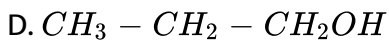
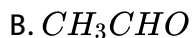
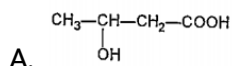
**Answer: A**

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76. Discuss Mond's Process for refining of nickel.

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77. Iodoform reaction is answered by all, except



Answer: D

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78. Which of the following alcohols has highest solubility in water ?

A. Tertiary butyl alcohol

B. Secondary butyl alcohol

C. Ethylene glycol

D. Glycerol



**Answer: D**

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

- A. Dehydration reaction of alcohol
- B. Oxidation reaction of alcohol
- C. Reduction reaction of alcohol
- D. Reduction of alcohol with phosphorus tribromide

**Answer: B**

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**80.** Write a balanced chemical equation for the reaction showing catalytic oxidation of  $NH_3$  by atmospheric oxygen.

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81. Reimer -tiemann reaction Involves

- A. carbonium ion intermediate
- B. carbene Intermediate
- C. carbanion intermediate
- D. free radical intermediate

**Answer: B**

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82. When ethylene glycol is heated with acidified potassium permanganate, the main organic compound obtained is

- A. oxalic acid
- B. glyoxal

C. formic acid

D. acetaldehyde

**Answer: C**

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**83.** The alcohol obtained by the hydrolysis of oils and fats is

A. glycol

B. glycerol

C. propanol

D. pentanol

**Answer: B**

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84. An organic acid without a carboxylic acid group is

- A. picric acid
- B. oxalic acid
- C. vinegar
- D. ascorbic acid

Answer: A



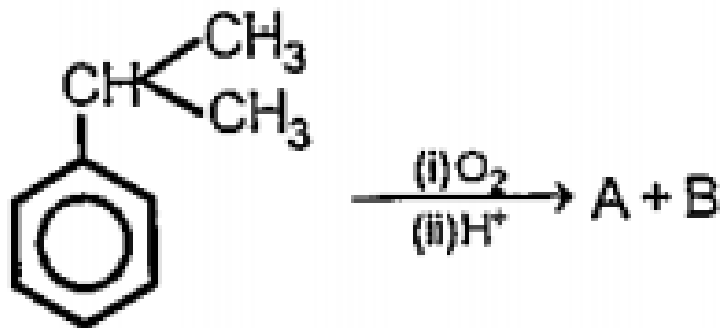
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85. The order of melting point of ortho, para, meta nitrophenol is

- A.  $o > m > p$
- B.  $p > m > o$
- C.  $m > p > o$
- D.  $p > o > m$

Answer: B

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86.

Identify A and B.

- A. Phenol, acetone
- B. phenylacetaldehyde
- C. Benzoic acid, acetone
- D. Benzaldehyde, ethanol

Answer: A





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87. Glycerol on oxidation with bismuth nitrate produce

- A. glyceric acid
- B. glyoxylic acid
- C. oxalic acid
- D. meso-oxalic acid

**Answer: D**



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88. Give the structure of pyrophosphoric acid.



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**89.** Assertion Glycerol is purified by distillation under reduced pressure.

Reason Glycerol is a trihydric alcohol.

- A. If both Assertion and Reason are true and reason is correct explanation of Assertion
- B. If both Assertion and Reason are true but reason is not the correct explanation of Assertion
- C. If Assertion is true but Reason is false
- D. If both Assertion and Reason are false

**Answer: B**



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**90.** Conversion of ethyl alcohol into acetaldehyde is an example of

- A. hydrolysis
- B. oxidation

C. reduction

D. molecular rearrangement

**Answer: B**

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**91.** Name three oxoacids of nitrogen. Write the disproportionation reaction of that oxoacid of nitrogen in which nitrogen is in +3 oxidation state.

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**92.** Phenol is treated with bromine water and shaken well. The white precipitate formed during the process is

A. m-bromophenol

B. 2,4,6-tribromophenol



C. 2-4 dibromophenol

D. a mixture of o-and p-bromophenols

**Answer: B**

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93. The main product obtained from phenol with  $PCl_5$  is

A. BHC

B. hexachlorobenzene

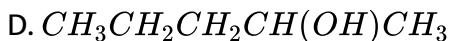
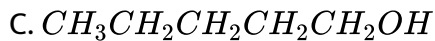
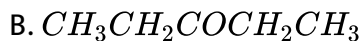
C. chlorobenzene

D. triphenyl phosphate

**Answer: D**

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94. Upon treatment with  $I_2$  and aqueous  $NaOH$  which of the following compounds will form iodoform?



Answer: D



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95. Which one of the following properties is exhibited by phenol?

A. It is soluble in aq. NaOH and evolves  $CO_2$  with aq.  $NaHCO_3$

B. It is soluble in aq. NaOH and does not evolve  $CO_2$  with aq.



C. It is not soluble in aq. NaOH but evolves  $CO_2$  with aq.  $NaHCO_3$

D. It is insoluble in aq. NaOH and does not evolve  $CO_2$  with aq.



**Answer: B**

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**96.** The reaction of phenol with excess of bromine water gives

- A. m-bromophenol
- B. o-and p-bromophenol
- C. 2,4-dibromophenol
- D. 2,4,6-tribromophenol

**Answer: D**

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97. Power alcohol is a mixture of

- A. 80 % petrol +20 % ethanol+small quantity of benzene
- B. 80 % ethanol +20 % benzene+small quantity of petrol
- C. 50 % petrol + 50 % ethanol+ small quantity of benzene
- D. 80 % petrol+20 % benzene+small quantity of ethanol

**Answer: A**



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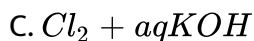
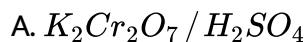
98. Which of the following alcohol is unable to turn orange colour of chromic acid to green?

- A.  $1^\circ$  alcohol
- B.  $2^\circ$  alcohol
- C.  $3^\circ$  alcohol
- D. Allyl alcohol

**Answer: C**

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**99.** In the conversion of ethanol into methanol which of the following reagents will be used?



D. All of these

**Answer: D**

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**100.** Which of the following compounds can be used as antifreeze in automobile radiators?

A. Methyl alcohol

B. Glycol

C. Nitrophenol

D. Ethyl alcohol

**Answer: B**

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**101.** HCHO was treated with reagent X. The product formed upon hydrolysis in the presence of an acid gave  $C_2H_5OH$ . The reagent X is

A. alcoholic KOH

B. alcoholic KCN

C.  $CH_3MgI$

D. aq.KOH

**Answer: C**

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102. The acid which do not contain carboxylic acid is

- A. glutaric acid
- B. picric acid
- C. stearic acid
- D. Terephthalic acid

**Answer: B**

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103. The most suitable reagent for the conversion of  $RCH_2OH \rightarrow RCHO$  is

- A.  $KMnO_4$
- B.  $K_2Cr_2O_7$

C. PCC

D.  $CrO_3$

**Answer: C**

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**104.** Why transition elements are less reactive than alkali and alkaline earth metals though they contain same number of electrons in the valence shell?

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**105.** The alcohol that produces turbidity immediately with Lucas reagent at room temperature is

A. 1-hydroxy butane

B. 2-hydroxy butane



C. 2-hydroxy-2- methyl propane

D. 1-hydroxy -2-methyl propane

**Answer: C**

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**106.** Of  $PH_3$  and  $H_2S$  which is more acidic and why?

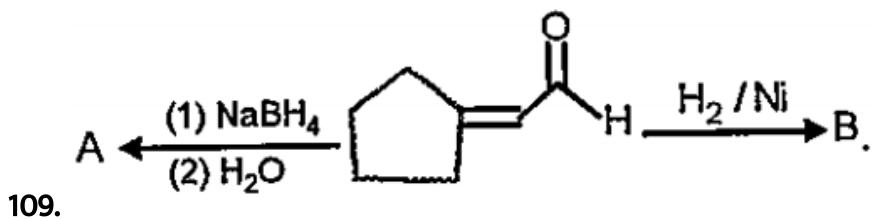
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**107.** Fluorine gas cannot be prepared by heating  $NaF$  and  $MnO_2$  with conc. $H_2SO_4$ . Why?

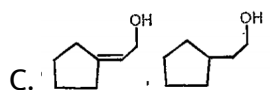
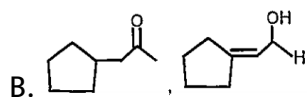
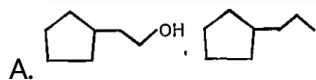
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**108.** What is Mischmetal?

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Compounds A and B are respectively.

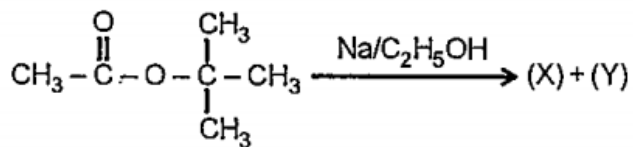


D. none of these

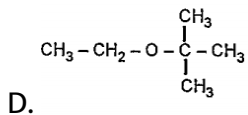
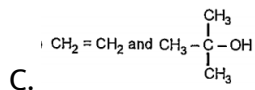
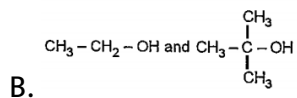
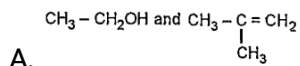
Answer: C

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110. In the given reaction



[X] and [Y] are

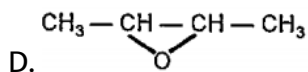
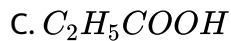
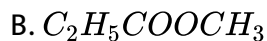
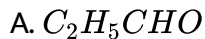


**Answer: B**



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111. Which of the following compounds on reaction with  $CH_3MgBr$  (excess) will give a tertiary alcohol?

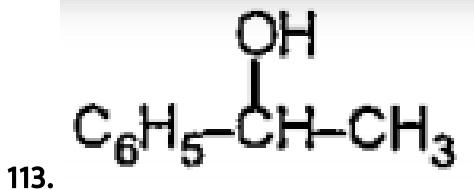


Answer: B

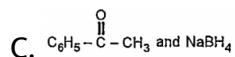
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112. Nitric acid forms an oxide of nitrogen on reaction with  $P_4O_{10}$ . Write the reaction involved.

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can be prepared from which of the following combinations?



D. All of these

**Answer: D**



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114. Explain why in spite of nearly the same electronegativity, oxygen forms hydrogen bonds while chlorine does not.

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115. Explain copolymerization with examples.

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116. Diphenyls are potential threat to the environment. How are these produced from aryl halides?

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117. Sodium hydroxide is manufactured by the electrolysis of brine solution. The reaction by-products are:

A. (a)  $Cl_2$  and  $H_2$

B. (b)  $Cl_2$  and Na-Hg

C. (c)  $Cl_2$  and NaCl

D. (d)  $Cl_2$  and  $O_2$

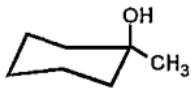
**Answer: A**

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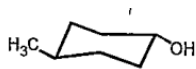
**118.** Which of the following reacts with HBr at faster rate?



A.



B.



C.

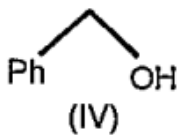
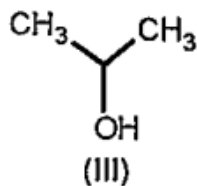
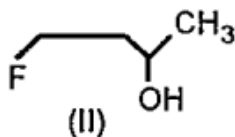
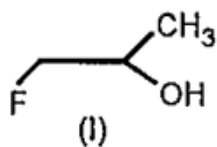


D.

Answer: B

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119. The order of reactivity of the following alcohols towards conc.HCl is



A.  $I > II > III > IV$

B.  $I > III > II > IV$

C.  $IV > III > II > I$

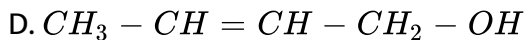
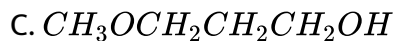
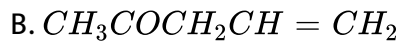
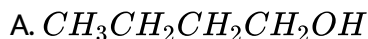


D.  $IV > III > II > I$

Answer: C

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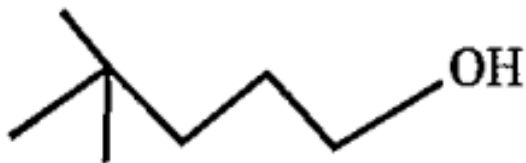
120. Which one of the following compounds decolourises aqueous bromine and also gives white fumes of HCl on reaction with  $PCl_5$ ?



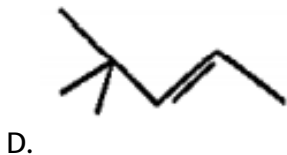
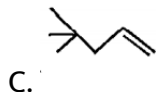
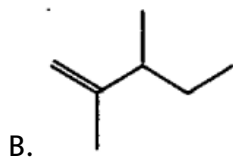
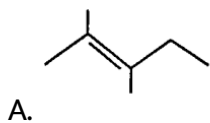
Answer: D

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121. When



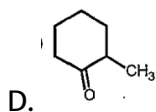
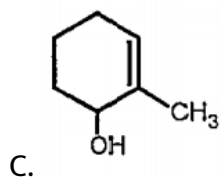
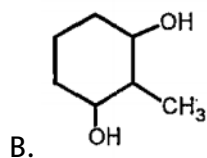
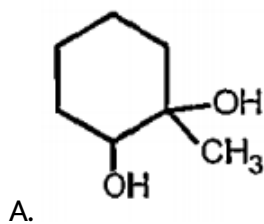
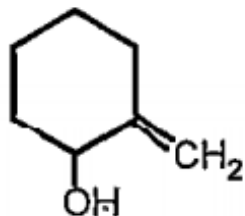
undergoes  $H_2SO_4$ , then what will be the major product?



Answer: C

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122. Which of the following will be the major product when



**Answer: D**

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**123.** The compound that reacts fastest with Lucas reagent (Conc.  $HCl + ZnCl_2$ ) at room temperature is

- A. butan-1-ol
- B. butan-2-ol
- C. 2 methyl propan -1-ol
- D. 2 methyl propan -2-ol

**Answer: D**

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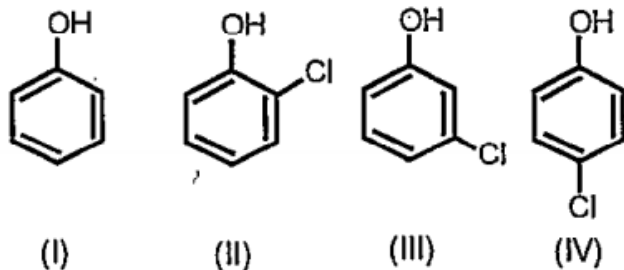
**124.** Which of the following statements is true regarding *Be*?

- A. (a)  $BeO$  and  $Be(OH)_2$  both are purely basic in nature.
- B. (b)  $Be$  can expand its covalency to six.
- C. (c)  $Be$  largely forms covalent compounds which get easily hydrolysed.
- D. (d)  $Be$  combines with hydrogen upon heating to form  $BeH_2$

Answer: A

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125. The decreasing order of acidic strength of the following



A.  $IV > III > II > I$

B.  $II > IV > III > I$

C.  $II > III > IV > I$

D.  $II > I > III > IV$

**Answer: C**

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**126.** Convert ethanol to but-1-yne.

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**127.** Equimolar quantities of ethanol and methanol are heated with conc  $H_2SO_4$ . The product(s) formed is/are

A.  $C_2H_5 - O - C_2H_5$

B.  $CH_3 - O - CH_3$

C.  $C_2H_5 - O - CH_3$

D. All of these

**Answer: D**

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**128.** Select the correct statement(s):

A. (a)  $CaCO_3$  is more soluble in a solution of  $CO_2$  than in  $H_2O$

B. (b)  $Na_2CO_3$  is converted to  $Na_2O$  and  $CO_2$  on heating

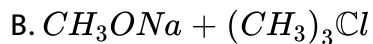
C. (c)  $Li_2CO_3$  is thermally unstable.

D. (d) Presence of  $CaCl_2$  or  $CaSO_4$  in water causes temporary hardness.

**Answer: B**

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129. When methyl t-butyl ether is formed ?



Answer: D



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130. Which of the following statement(s) is/are correct?

A. (a) Pure Sodium oxide is obtained by heating the mixture of sodium azide and sodium nitrite.

B. (b) Glauber's salt effloresces in moist air.



C. (c) Potassium superoxide on heating in an evacuated and sealed tube yields sodium thiosulphate.

D. (d) Gypsum dissolve in ammonium sulphate solution.

**Answer: C**

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**131.** Diethyl ether on heating with conc. HI gives two moles of

A. ethanol

B. iodoform

C. ethyl iodide

D. methyl iodide

**Answer: C**

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132. tert-butyl methyl ether on heating with HI (1 mol) gives a mixture of

A. tert-Butyl alcohol and methyl iodide

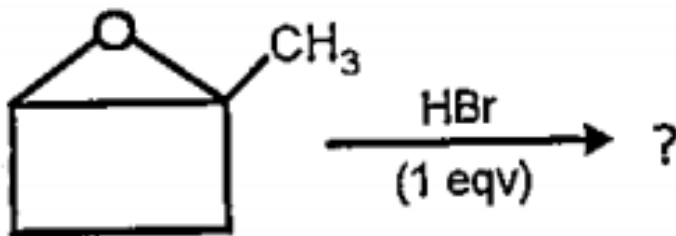
B. tert-Butyl iodide and methanol

C. Isobutylene and methyl iodide

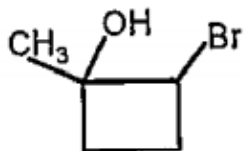
D. Isobutylene and methanol

Answer: B

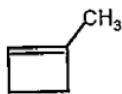
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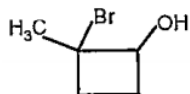
The product of the above reaction is



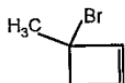
A.



B.



C.



D.

**Answer: C**

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**134.** THF is treated with excess of HBr at 373 K. The product is

A. 1,4-dibromobutane

B. 1-bromo-2-butene

C. 4-bromo-1 butanol

D. 4-bromo-1- butene

**Answer: A**

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**135.** Select the correct choice for alkali metal oxides:

A. (a) Metal oxides react with water forming only metal hydroxides.

B. (b) Metal peroxides react with hot water forming metal hydroxides and oxygen gas.

C. (c) Metal superoxides react with water forming metal hydroxides, hydrogen peroxide and  $O_2$  gas.

D. (d) All of these.

**Answer: D**

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136. The products formed when  $(CH_3)_3COC_2H_5$  is treated with HI

- A.  $(CH_3)_3CI$  and  $CH_3OH$
- B.  $(CH_3)_3CI$  and  $C_2H_5OH$
- C.  $(CH_3)_2C(C_2H_5)I$  and  $CH_3OH$
- D.  $C_2H_5I$  and  $(CH_3)_2C(C_2H_5)I$

**Answer: B**



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137. Phenyl isocyanides are prepared by which of the following methods?

- A. (a) Reimer-Tieman reaction
- B. (b) Carbylamine reaction
- C. (c) Rosenmund's reaction

D. (d) Wurtz reaction.

**Answer: B**

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**138.** Aniline is reacted with bromine water and the resulting product is treated with an aqueous solution of sodium nitrite in presence of dilute hydrochloric acid. The compound so formed is converted into a tetrafluoroborate which is subsequently heated dry. The final product is:

- A. (a) p-bromoaniline
- B. (b) p-bromofluorobenzene
- C. (c) 1,3, 5-tribromobenzene
- D. (d) 2, 4, 6-tribromofluorobenzene

**Answer: A**

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139. 0.36 g of an alcohol R-OH was added to  $CH_3MgBr$  and the gas evolved measured 112 mL at STP. The molar mass of R-OH will be

- A. 47
- B. 79
- C. 72
- D. 77

**Answer: C**



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140. 10 g of a mixture of hexane and ethanol are reacted with sodium to give 200 ml hydrogen at  $27^\circ$  and 760 mm pressure. What is the percentage of ethanol in the mixture?

- A. 4.6 %
- B. 8.13 %

C. 9.21 %

D. 7.48 %

**Answer: D**

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**141.** For carbylamine reaction, we need hot alcoholic  $KOH$  and:

A. (a) any primary amine and chloroform.

B. (b) chloroform and silver powder.

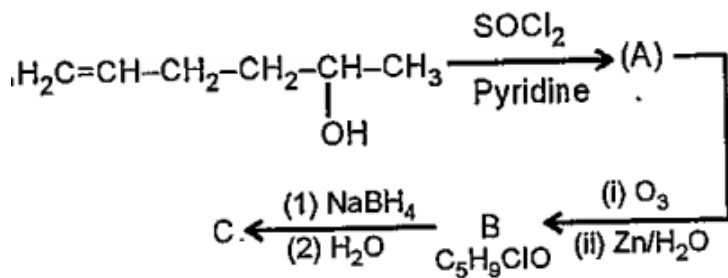
C. (c) a primary amine and an alkyl halide.

D. (d) a monoalkylamine and trichloromethane.

**Answer: C**

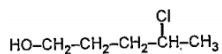
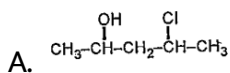
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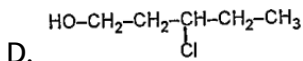


142.

Compound ( C ) is



C.



Answer: C

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143. A compound with molecular formula  $C_4H_{10}O_3$  is converted by the action of acetyl chloride to a compound with molecular weight 190. The original compound has

- A. One OH group
- B. Two OH groups
- C. Three OH groups
- D. No OH group

**Answer: B**



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144. The electrolytic reduction of nitrobenzene in strongly acidic medium produces:

- A. (a) azobenzene
- B. (b) aniline

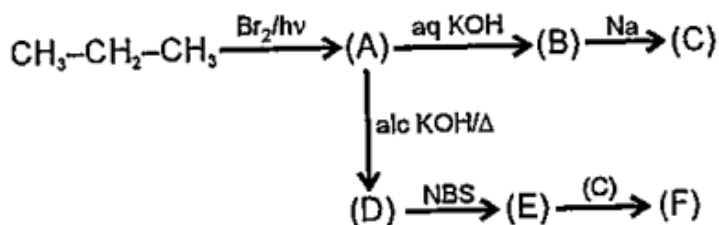
C. (c) p-aminophenol

D. (d) azoxybenzene

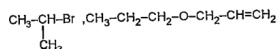
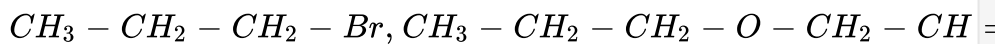
Answer: A

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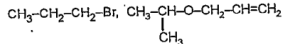
145. Identify compounds (A) & (F) in the following sequence of reactions.



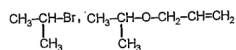
A.



B.



C.

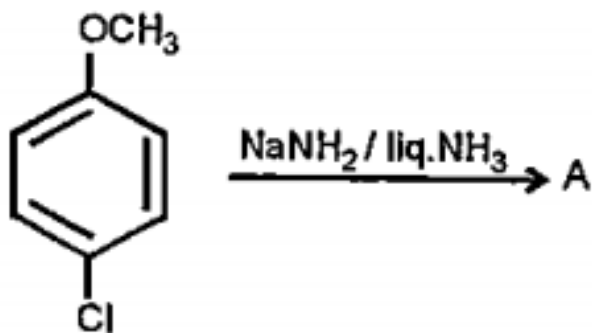


D.

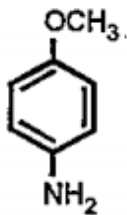
**Answer: D**

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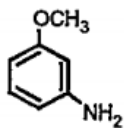
146. In the reaction



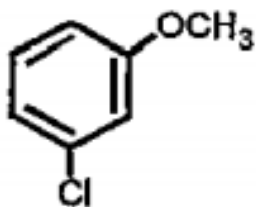
The major product A is



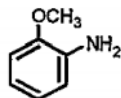
A.



B.



C.

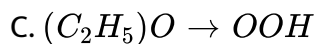
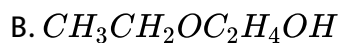
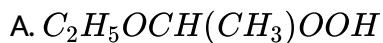


D.

**Answer: A**

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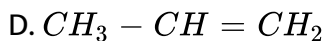
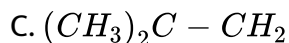
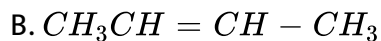
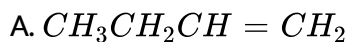
**147.** Which of the following will be obtained by keeping diethyl ether in contact with air for a long time?



**Answer: A**

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**148.** Among the alkenes which one produces tertiary butyl alcohol on acid hydration?



**Answer: C**

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149. The number of structural isomers possible from the molecular formula  $C_3H_9N$ .

A. (A) 5

B. (B) 2

C. (C) 3

D. (D) 4

**Answer: D**

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150. Method by which aniline cannot be prepared is:

A. (a) degradation of benzamide with bromine in alkaline solution

B. (b) reduction of nitrobenzene with  $H_2/Pd$  in ethanol

C. (c) potassium salt of phthalimide treated with chlorobenzene

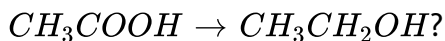
followed by hydrolysis with aqueous  $NaOH$  solution.

D. (d) hydrolysis of phenylisocyanide with acidic solution.

**Answer: B**

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151. Which of the following reagents can be used for the reduction of



A.  $LiAlH_4 / H_2O$

B.  $B_2H_6 / H^+$

C.  $H_2 / Pd$

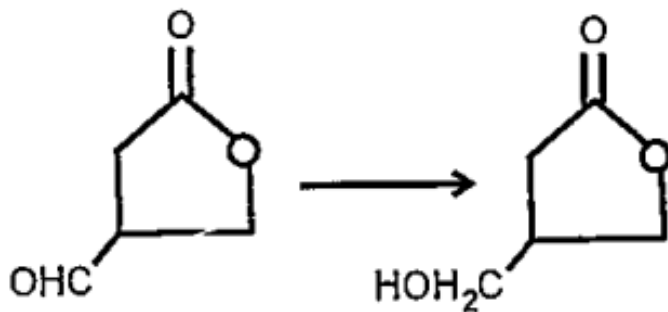
D.  $NaBH_4$

**Answer: D**

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152. Consider the following reduction and advise the best reagent.



A. HI/RedP

B.  $LiAlH_4 / H_2O$

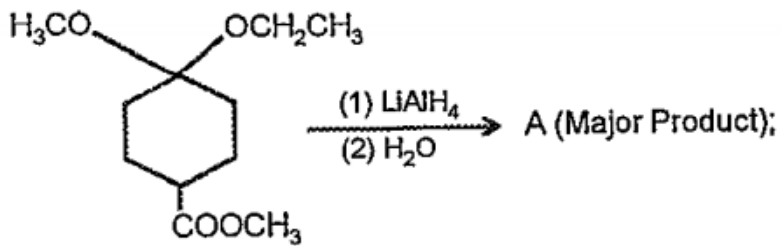
C.  $NaBH_4 / H_2O$

D. Zn-Hg/HCl

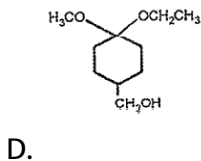
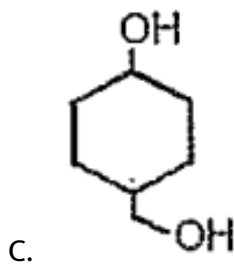
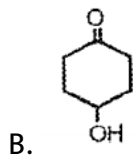
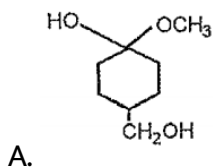
Answer: C



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(A) is



Answer: D

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154. The compound obtained by heating a mixture of ethyl amine and chloroform with ethanolic potassium hydroxide ( $KOH$ ) is?

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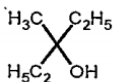
155. Convert Nitrobenzene to Benzoic acid.

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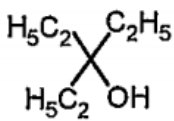
156. Ethyl acetate  $\xrightarrow[(2)H_3O^+]{(1)CH_3MgBr (excess)}$  P. The product P is



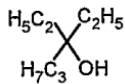
A.



B.



C.

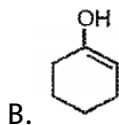
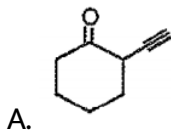
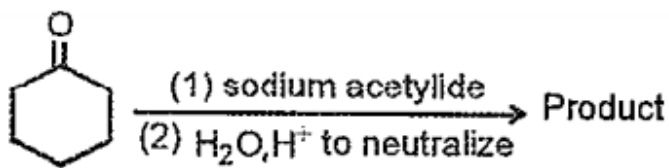


D.

Answer: A

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157. Give the major organic product of the following reaction.





C.



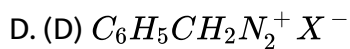
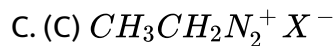
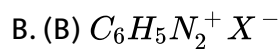
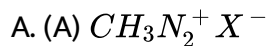
D.

**Answer: C**

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**158.** Which of the following will be most stable diazonium salt  $RN_2^+ X^-$

?



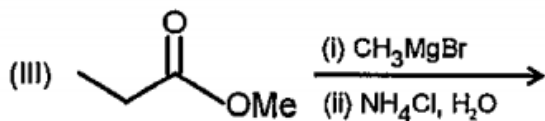
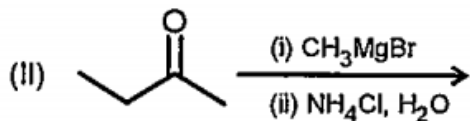
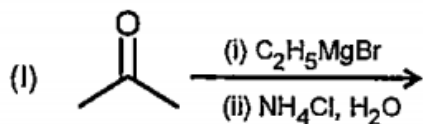
**Answer: A**

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159. Nitrobenzene on reaction with conc. $HNO_3/ H_2SO_4$  at 80-100 degree celcius forms what?

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160. Choose the reagent and reactant that would produce 2-methyl-2-butanol as a major product.



A. Only I

B. Only I, III

C. Only II and III

D. I ,II and III

**Answer: D**

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**161.** Convert Benzene to m-bromophenol.

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**162.** Convert Benzoic acid to Aniline.

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**163.** Among the following carboxylic acids, the one which undergoes acid catalysed esterification with  $CH_3OH$  at the slowest rate is

A.  $\text{HCOOH}$

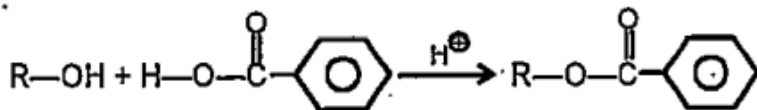
B.  $\text{CH}_3\text{COOH}$

C.  $(\text{CH}_3)_3\text{COOH}$

D.  $\text{CH}_3\text{CH}_2\text{COOH}$

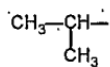
Answer: C

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164.

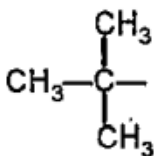
Rate of the reaction faster when R is



A.

B.  $\text{CH}_3-$





C.

D. equal in all case

**Answer: B**

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**165.** The order of reactivity of methyl alcohol (I) ,isopropyl alcohol (II) tertiary butyl alcohol (III) and ethyl alcohol (IV) for esterification in decreasing order will be

A.  $I > II > III > IV$

B.  $IV > III > II > I$

C.  $I > IV > II > III$

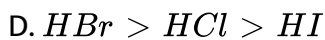
D.  $I > IV > III > II$

**Answer: C**



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166. In the given reaction correct order of reactivity of HX in decreasing order is  $ROH + HX \rightarrow RX + H_2O$



Answer: C



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167. An unknown polyhydroxy compound (A) (molar mass=180) on acylation gives a product (molar mass=390), then find the number of hydroxyl group present in compound (A)

A. 4

B. 5

C. 6

D. 10

**Answer: B**

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**168.** Convert Nitromethane to Dimethylamine.

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**169.** Convert Aniline to 2, 4, 6-Tribromofluorobenzene

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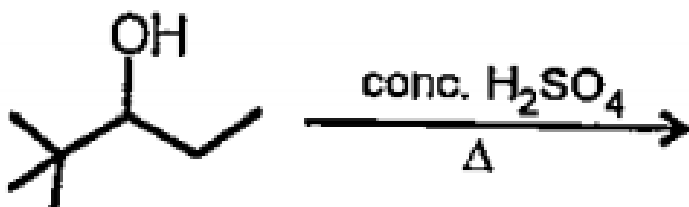
170. Convert Benzyl Chloride to 2-phenylethanamine

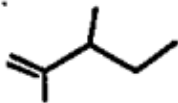
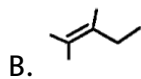
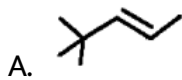
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171. Convert Aniline to p-bromoaniline

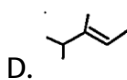
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172. Which alkenes would you expect to be the major product of the following dehydration?





C.

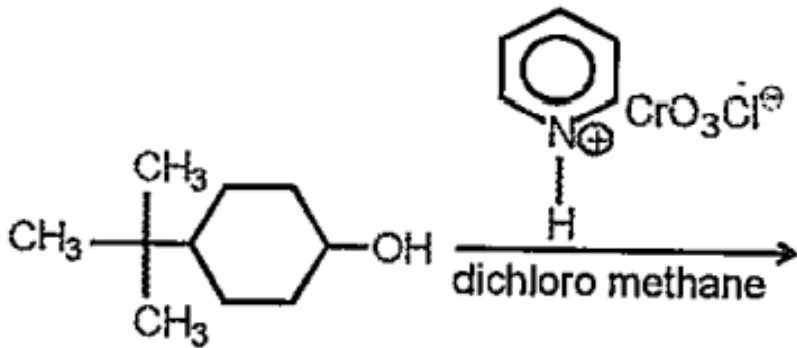


**Answer: B**

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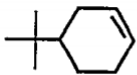
**173.** Convert Benzamide to toluene.

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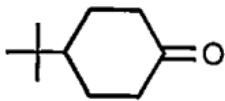


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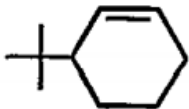
?



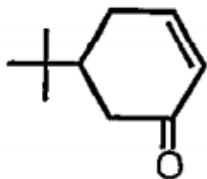
A.



B.



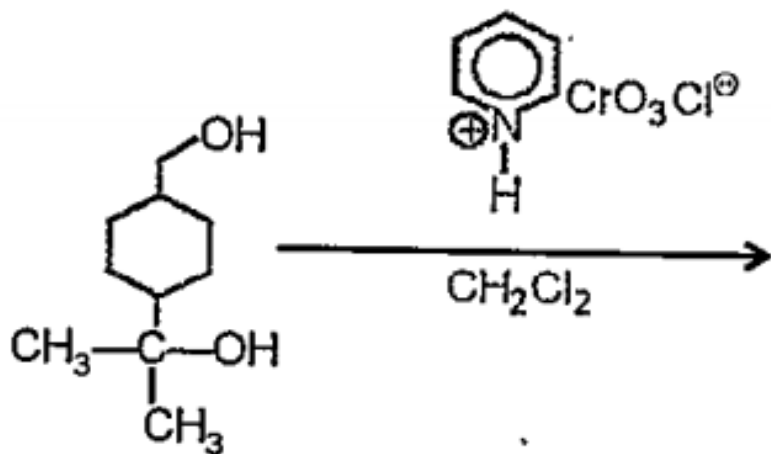
C.



D.

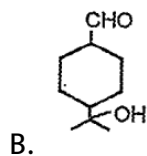
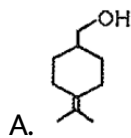
Answer: B

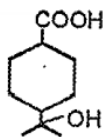
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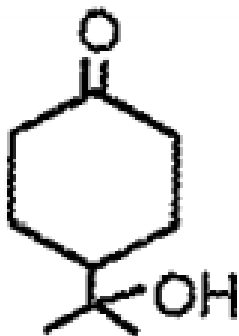
175.

?





C.



D.

**Answer: B**

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176. Convert Chlorobenzene to p-chloroaniline.

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177. Convert Aniline to Benzyl alcohol.

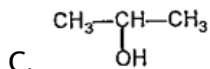
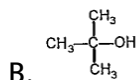
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178. Aniline is soluble in aqueous HCl. Why?

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179. Which of the following alcohols form white with Lucas reagent at warming condition?



D. all of these

Answer: D

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**180.** The Lucas test is used to distinguish  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols. The alcohol to be tested is added to a solution of anhydrous  $ZnCl_2$  in conc. HCl at room temperature. Which of the following statements is not correct?

A.  $1^\circ$  - alcohols dissolve, but do not react

B.  $3^\circ$  -alcohols react quickly to give an insoluble alkyl chloride

C.  $3^\circ$  -alcohols rapidly dehydrate and the gaseous alkene bubbles out of the test solution

D.  $2^\circ$  -alcohols dissolve and react slowly to give an insoluble alkyl chloride

**Answer: C**



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**181.** Convert 2-(2-Chloroethyl)-cyclohexan-1-one to 2-(3-Aminopropyl)-cyclohexan-1-one.



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**182.** Convert Propanoic acid to Ethanoic acid



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**183.** Convert Methanamine to ethanamine.



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**184.** Convert Ethanamine to Methanamine.



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**185.** The Conversion of m-nitrophenol to resorcinol involves respectively

A. hydrolysis, diazotization and reduction

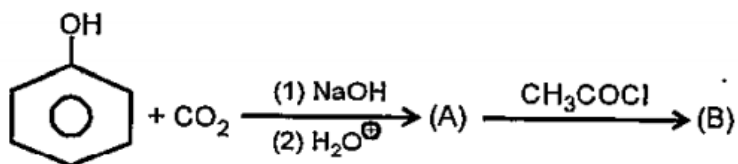
B. diazotization, reduction and hydrolysis

C. hydrolysis, reduction and diazotization

D. reduction, diazotization and hydrolysis

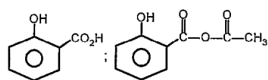
Answer: D

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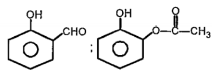


186.

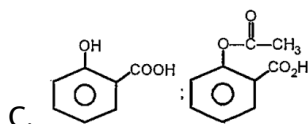
Products (A) and (B) are respectively



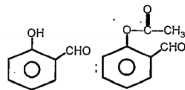
A.



B.



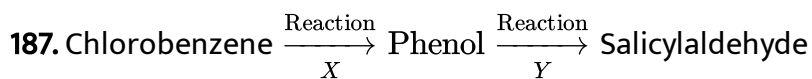
C.



D.

**Answer: C**

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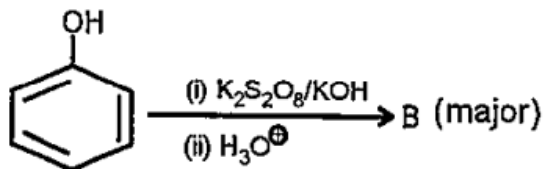
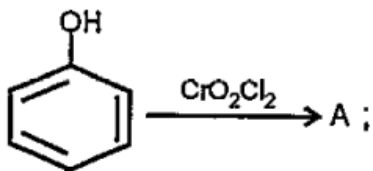


X and Y reactions are respectively

- A. Fries rearrangement and Kolbe-Schmitt
- B. Cumene and Reimer-Tiemann
- C. Dow and Reimer-Tiemann
- D. Dow and Friedel -Craft

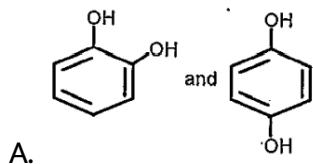
**Answer: C**

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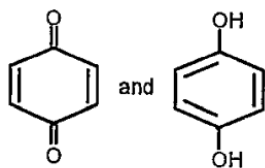


188.

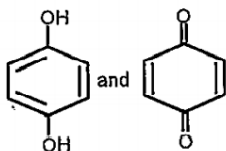
compound A and B are respectively



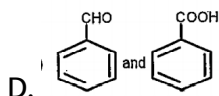
A.



B.



C.

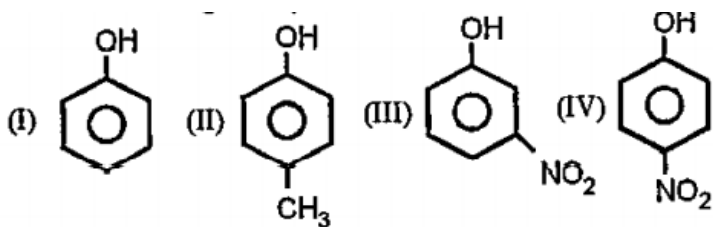


D.

Answer: B

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189. In the following , the order of acidity is



A.  $III > IV > I > II$

B.  $I > IV > III > II$

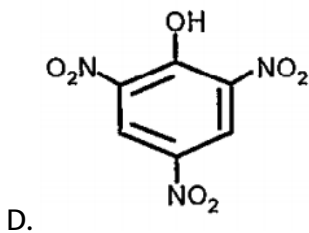
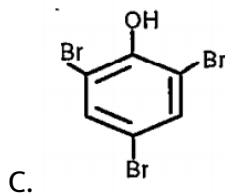
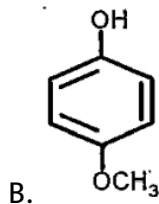
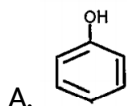
C.  $II > I > III > IV$

D.  $IV > III > I > II$

Answer: D

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190. Which of the following compounds released  $CO_2$  from  $NaHCO_3$  solution?



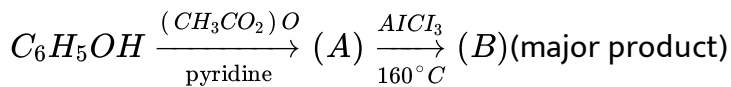
Answer: D



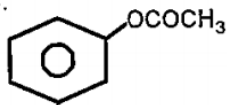
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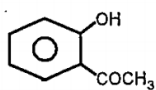
191. Consider the following sequence of reactions



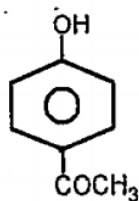
The product (B) is



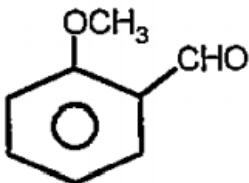
A.



B.



C.



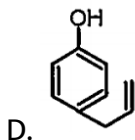
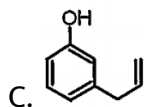
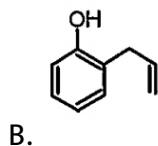
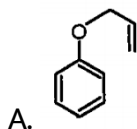
D.

Answer: B



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192. When phenol is refluxed with allyl bromide in acetone solution in the presence of anhydrous potassium carbonate a product may be isolated which, on heating to  $200^{\circ}\text{C}$  is converted mainly to



**Answer: B**

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193. Which of the following alcohols gives the best yield of dialkyl ether on being heated with a trace of sulphuric acid?

A. 2-pentanol

B. cyclopentanol

C. 2-methyl-2-butanol

D. 1-pentanol

**Answer: D**

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**194.** Williamson synthesis is an example of

A. Nucleophilic addition

B. Nucleophilic substitution

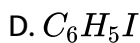
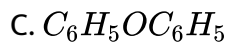
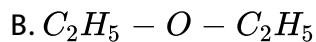
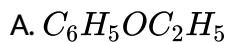
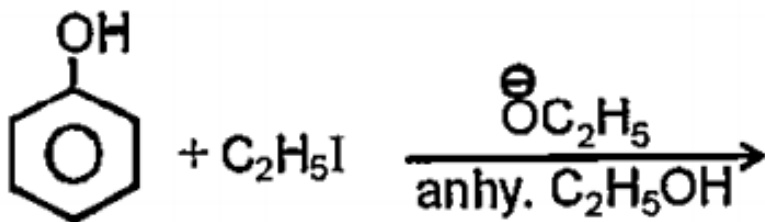
C. Electrophilic addition

D. Electrophilic substitution

**Answer: B**

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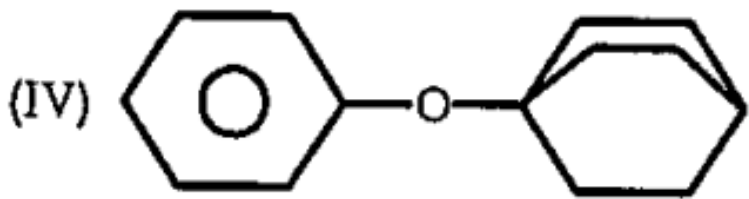
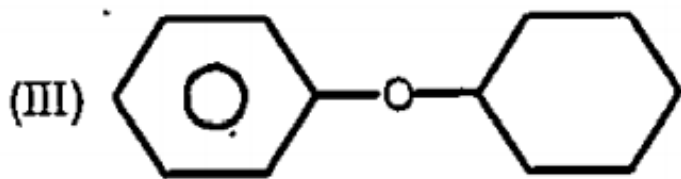
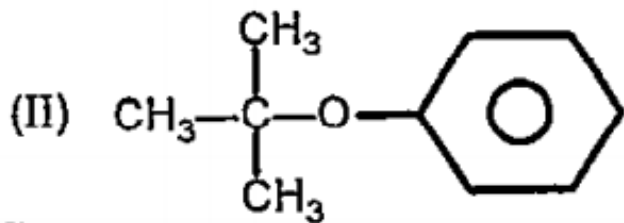
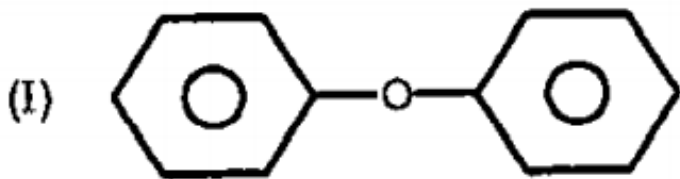
195. Complete the following reaction



Answer: A

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196. Which of the following ethers is/are not prepared by Williamson's synthesis ?



- A. only I and II
- B. only I, III and IV
- C. only I, II and III
- D. I, II, III and IV

**Answer: B**

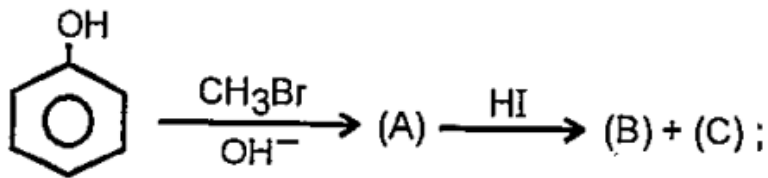
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**197.** Which of the following is correct about the ether?

- A. diethyl ether has zero dipole moment
- B. dimethyl ether is highly soluble in water
- C. dimethyl ether and ethyl methyl ether are yellow colour liquid at ordinary temperature
- D. The bond angle of C-O-C in ether is lower than the bond angle of H-O-H in water

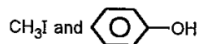
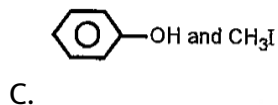
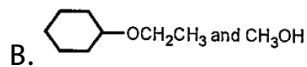
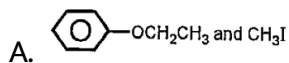
**Answer: B**

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198.

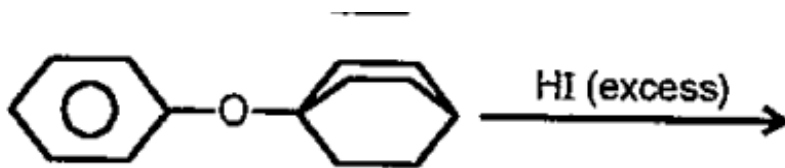
(B) turns neutral  $\text{FeCl}_3$  violet. (B) and (C) are respectively



Answer: C

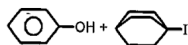


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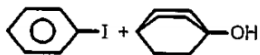


199.

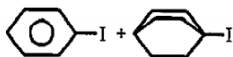
The products are respectively



A.



B.



C.

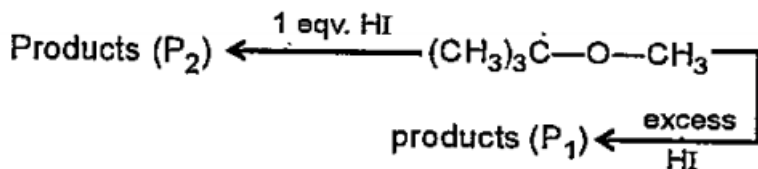
D. None of these

Answer: D



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200.

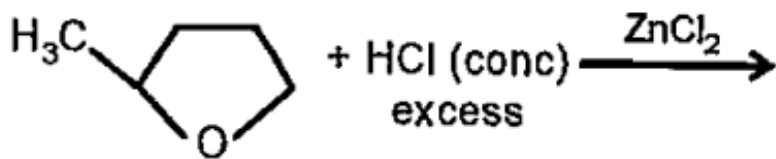
Products  $P_1$  and  $P_2$  respectively are

- A.  $(\text{CH}_3)_3\text{CI} + \text{CH}_3\text{OH}$  and  $(\text{CH}_3)_3\text{CI} + \text{CH}_3\text{I}$
- B.  $(\text{CH}_3)_3\text{CI} + \text{CH}_3\text{I}$  and  $(\text{CH}_3)_3\text{COH} + \text{CH}_3\text{I}$
- C.  $(\text{CH}_3)_3\text{CI} + \text{CH}_3\text{OH}$  in both the cases
- D.  $\text{CH}_3\text{I}$  and  $(\text{CH}_3)_3\text{CI}$  in both the cases

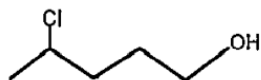
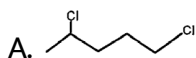
**Answer: A**

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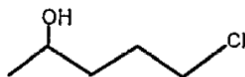
201. For the reaction



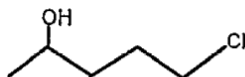
The product obtained is



B.



C.



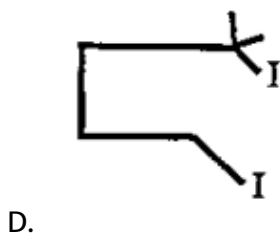
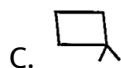
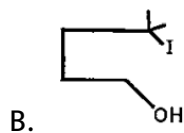
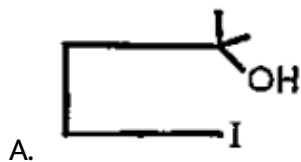
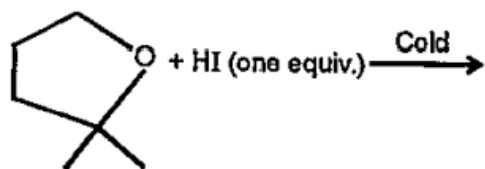
D.

**Answer: A**



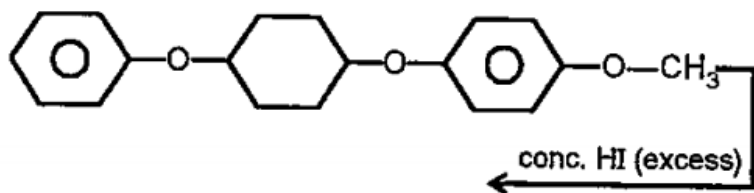
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202. The major product of the following reaction is



Answer: B

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203.

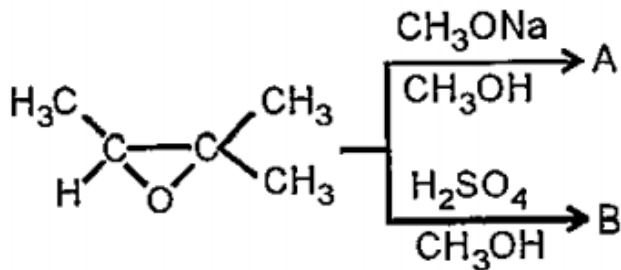
x moles of HI is consumed. The value of x is

- A. 2
- B. 3
- C. 5
- D. 6

**Answer: B**

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204. Consider the following reactions



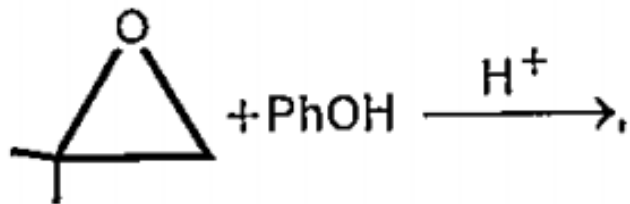
and choose the correct answer

- A. A and B are both 3-methoxy-3-methyl-butan-2-ol
- B. A and B both are 3-methoxy-2-methyl-butan-2-ol
- C. A is 3-methoxy-2-methyl-2-butan-2-ol and B is 3-methoxy-3-methyl-butan-2-ol
- D. A is 3-methoxy-3-methyl-butan-2-ol and B is 3-methoxy-2-methyl-butan-2-ol

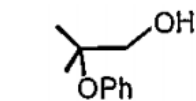
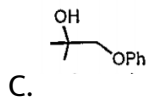
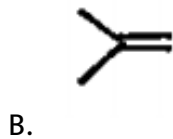
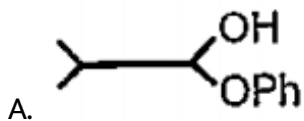
**Answer: C**

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205. In the reaction



the products is



D.

Answer: D

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206. Convert Ethanoic acid to propanoic acid.



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207. (I)1,2-dihydroxybenzene

(II)1,3-dihydroxybenzene

(III)1,4-hydroxybenzene

(IV)Hydroxybenzene

The increasing order of boiling points of the above mentioned compounds is

A.  $I < II < III < IV$

B.  $I < II < IV < III$

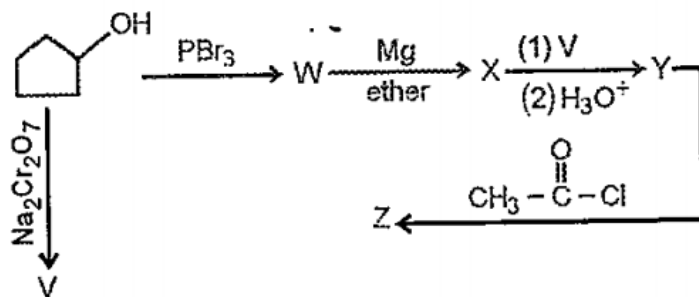
C.  $IV < I < II < III$

D.  $IV < II < I < III$

Answer: C

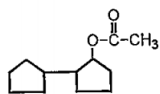


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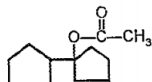


208.

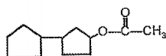
Product Z of above reaction is



A.



B.



C.



D.

Answer: B



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**209.** 0.092 g of a compound with the molecular formula  $C_3H_8O_3$  on reaction with an excess of  $CH_3MgI$  gives 67.00 mL Of methane at STP. The number of active hydrogen atoms present in a molecule of the compound

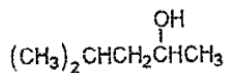
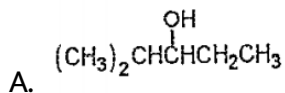
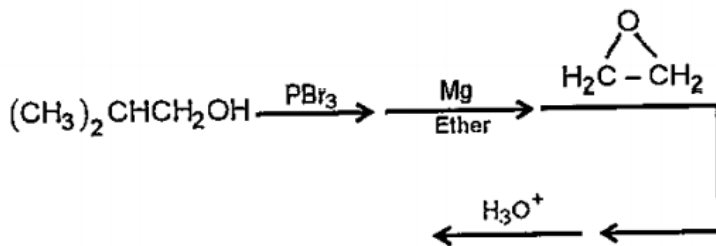
- A. one
- B. two
- C. three
- D. four

**Answer: C**



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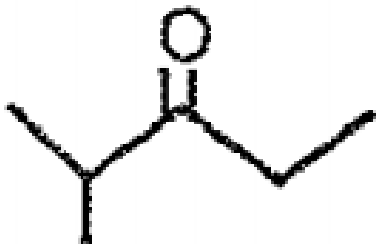
**210.** What is the major organic final product of the following sequence of reactions ?



Answer: D

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211. Which sequence of steps describes the best synthesis of 2-methyl-3-pentanone?



A. (a) 1-propanol +  $(CH_3)_2CHMgBr$ , diethyl ether

(b)  $H_3O^+$

(c) PCC,  $CH_2Cl_2$

B. (a) 1-propanol +  $Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$  heat

(b)  $SOCl_2$

(c)  $(CH_3)_2CHCl$ ,  $AlCl_3$

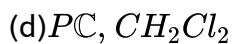
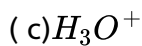
C. (a) 1-Propanol + PCC,  $CH_2Cl_2$

(b)  $(CH_3)_2CHLi$ , diethylether (c)  $H_3O^+$  (d)

$Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$ , heat

D. (a) 2-Propanol +  $Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$  heat

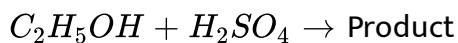
(b)  $CH_3CH_2CH_2Li$  diethyl ether



**Answer: C**

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**212.** Consider the following reaction,



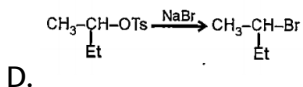
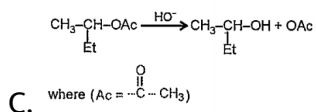
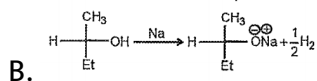
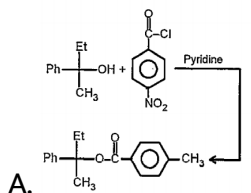
Among the following which one cannot be formed as a product under any conditions?

- A. Ethyl hydrogen sulphate
- B. Ethylene
- C. Acetylene
- D. Diethyl ether

**Answer: C**

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213. In which of the following reactions inversion of configuration takes place?

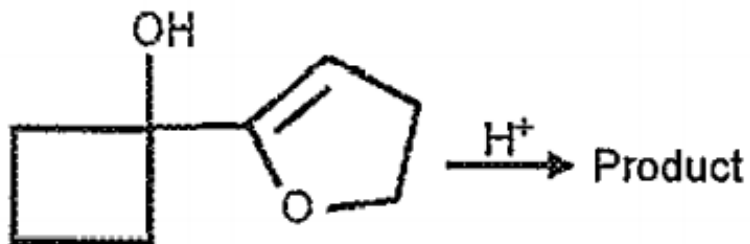


Answer: D

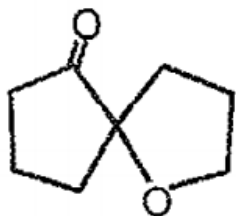


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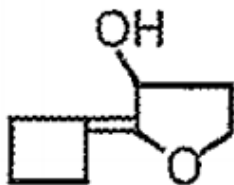
214. Identify the major product,



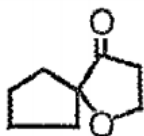
A.

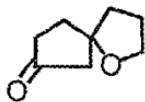


B.



C.

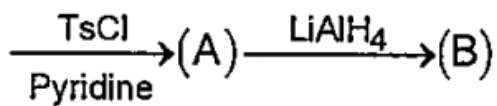
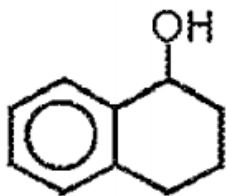




D.

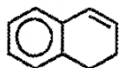
Answer: A

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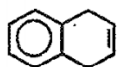


215.

Product (B) of the above reaction is



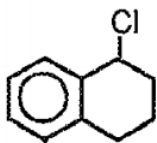
A.



B.



C.



D.

**Answer: C**

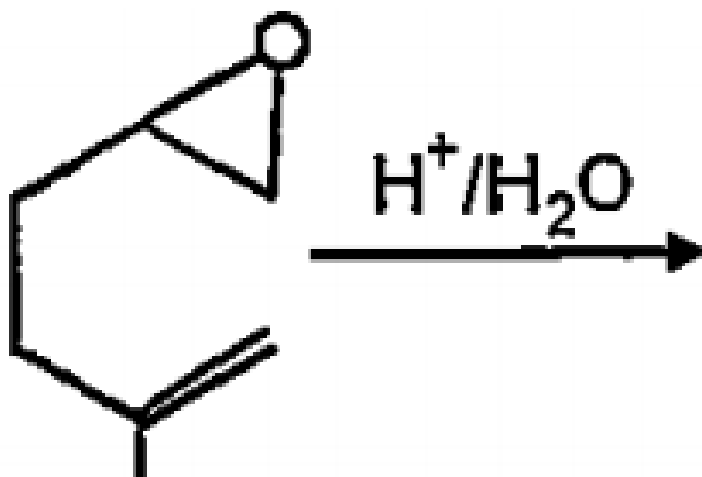
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**216.** Two aromatic compounds having formula  $C_7H_8O$  which are easily identifiable by  $FeCl_3$  solution test (Violet colouration ) are

- A. o-cresol and benzyl alcohol
- B. m-cresol and p-cresol
- C. o-cresol and p-cresol
- D. methyl phenyl ether and benzyl alcohol

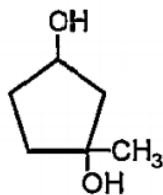
**Answer: A**



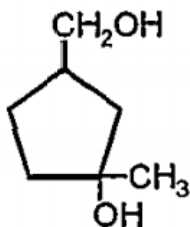


217.

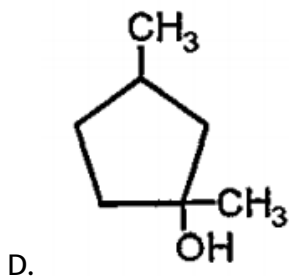
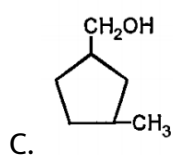
Here the major product is



A.

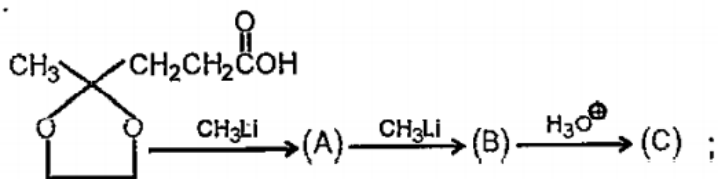


B.



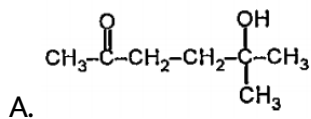
Answer: B

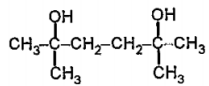
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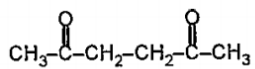
218.

Product (C) of the above reaction is

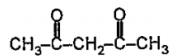




B.



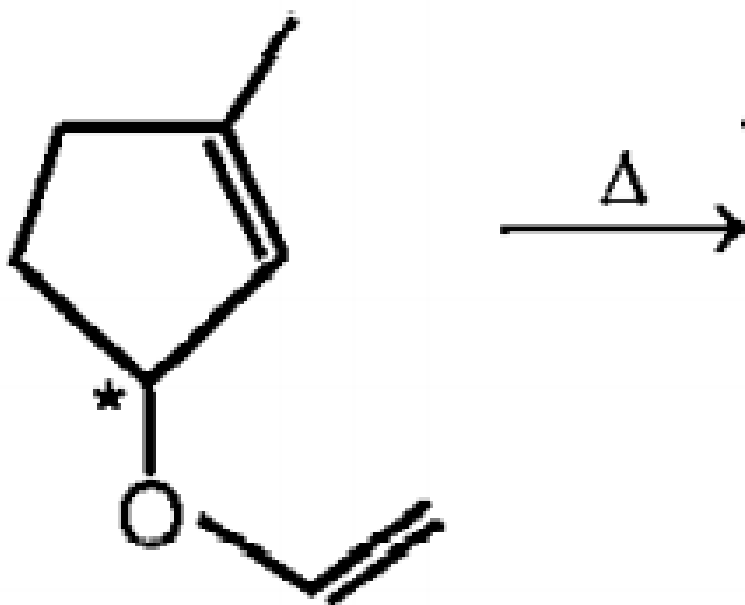
C.



D.

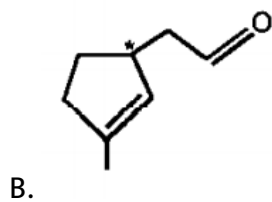
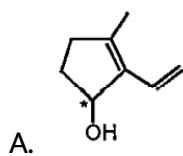
**Answer: C**

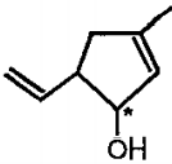
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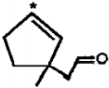
219.

Major product of the above rearrangement reaction is





C.

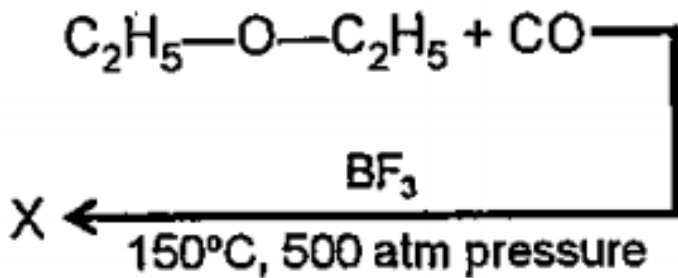


D.

Answer: D

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220. In the reaction,



What is (X)?

A. diethyl carbonate

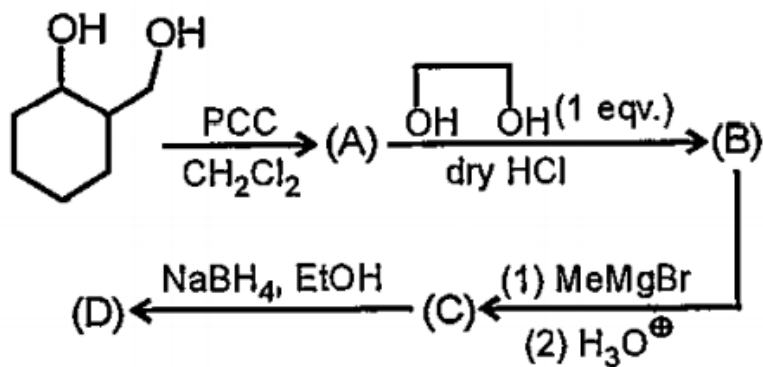
B. ethyl carbonate

C. diethyl peroxide

D. ethyl propionate

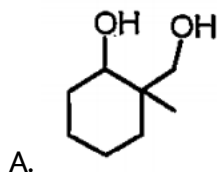
Answer: D

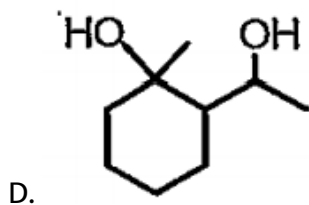
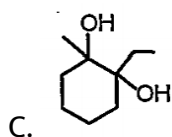
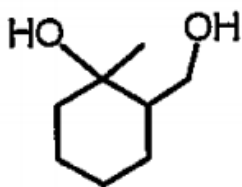
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221.

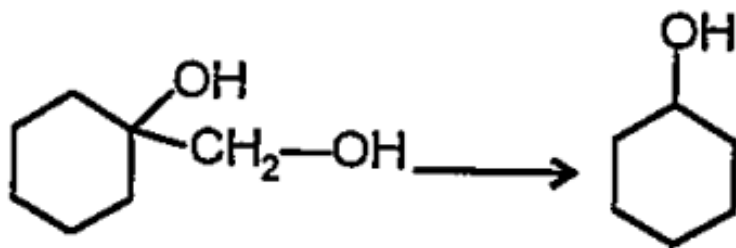
Here product D is



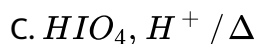
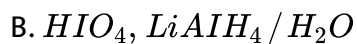
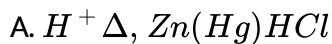


Answer: B

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This transformation can be carried out by



Answer: B

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223. Compound (A) molecular formula  $C_5H_{12}O$  is optically active and is oxidized by PCC in  $CH_2Cl_2$  to an optically active  $C_5H_{10}O$  product, which is racemized in acid or base. The compound (A) may be

A. 2-pentanol

B. 2-methoxybutane

C. 2-methyl-1-butanol

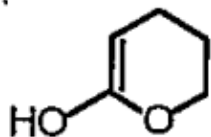
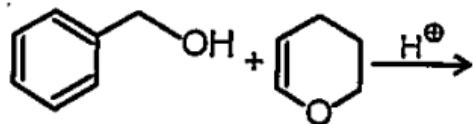
D. 3-methyl-1-butanol



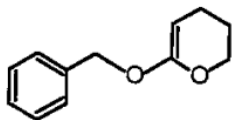
Answer: C

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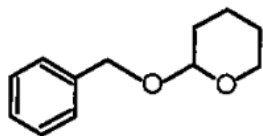
224. Predict the major product of the following reaction



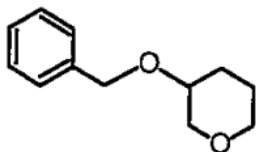
A.



B.



C.

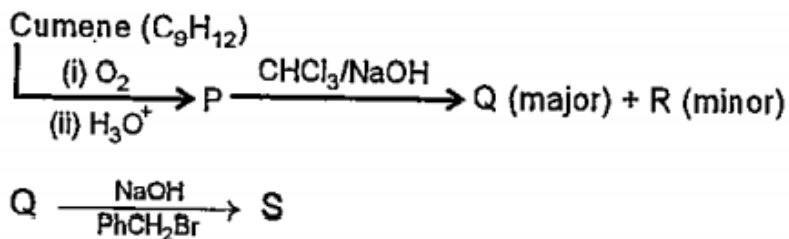


D.

Answer: C

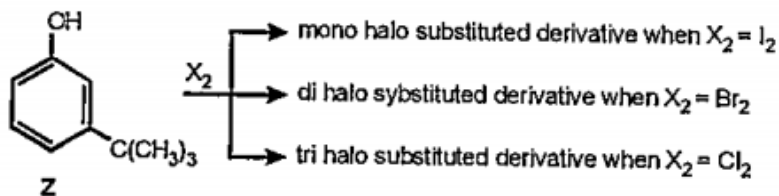
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225. The correct statement(s) about the following reaction sequence is (are)



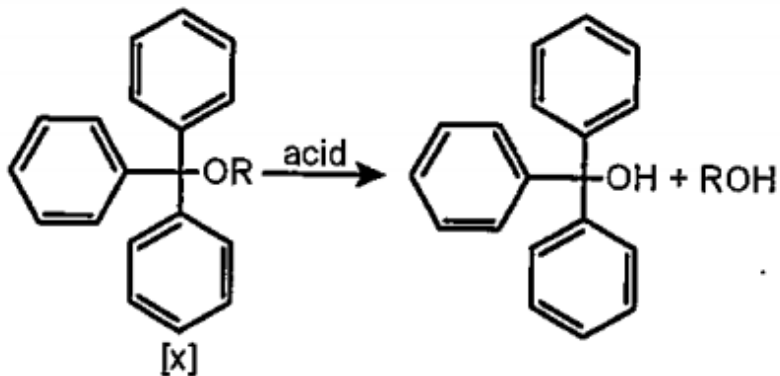
- (1) R is steam volatile
- (2) Q gives dark violet coloration with 1 % aqueous  $FeCl_3$  solution
- (3) S gives yellow precipitate with 2,4-dinitrophenylhydrazine
- (4) S gives dark violet coloration with 1 % aqueous  $FeCl_3$  solution

226. The reactivity of compound Z with different halogens under appropriate conditions is given below



- (1) the steric effect of the halogen
- (2) the steric effect of tert-butyl group
- (3) the electronic effect of the phenolic group
- (4) the electronic effect of the tert-butyl group

227. The acidic hydrolysis of ether (X) shown below is fastest when



- A. One phenyl group is replaced by a methyl group.
- B. One phenyl group is replaced by a para methoxyphenyl group.
- C. Two phenyl groups are replaced by two para methoxyphenyl groups.
- D. No structural change is made to X.

Answer: C

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**228.** For the identification of  $\beta$  naphthol using dye test, it is necessary to use

- A. dichloromethane solution of  $\beta$ -naphthol.
- B. acidic solution of  $\beta$ -naphthol.
- C. neutral solution of  $\beta$ -naphthol.
- D. alkaline solution of  $\beta$ -naphthol.

**Answer: D**

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**229.** Explain why aniline is not as basic as ammonia.

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**230.** An unknown alcohol is treated with the "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol

reacts fastest and by what mechanism?

A. Secondary alcohol by SN1

B. Tertiary alcohol by SN2

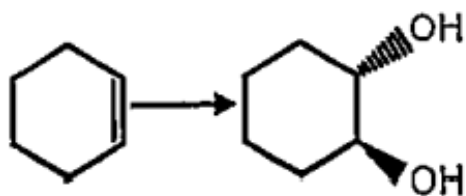
C. Secondary alcohol by SN2

D. Tertiary alcohol by SN1

**Answer: D**

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**231.** Which of the following reagents can be used to carry out the following transformation?



A.  $OsO_4 / NaHSO_3$

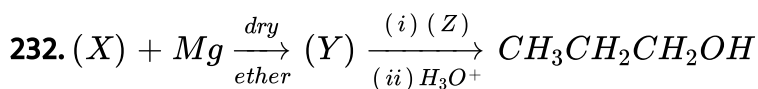
B. Cold aq  $KMnO_4$

C.  $CH_3COOH / H_2O_2 / H_3O^+$

D.  $m - CPBA / H_3O^+$

Answer: C::D

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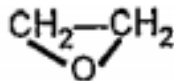


Identify (X) and (Z) in the above sequence of reaction

(1) (X) :  $CH_3CH_2Br$ ,

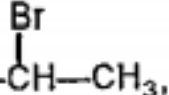
(Z) : HCHO

(2) (X) :  $CH_3Br$ ,

(Z) : 

(3) (X) :  $CH_3Br$ ,

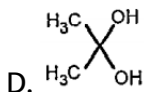
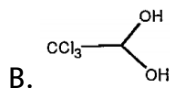
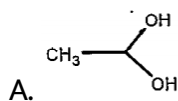
(Z) :  $CH_3CH_2CHO$

(4) (X) : 

(Z) :  $\dot{C}H_3CHO$

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233. Among the given geminal diols, which is/are stable with respect to their corresponding carbonyls?

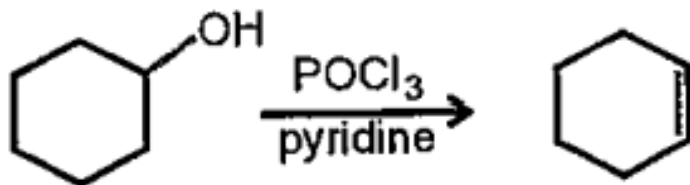


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234. Dehydration of alcohols take place more rapidly with  $\text{POCl}_3$  than with  $\text{H}_2\text{SO}_4$ . Select correct statement(s) about the following



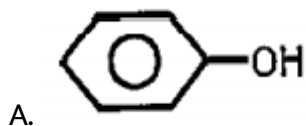
dehydration reaction

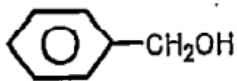


- A. It does not involve carbocation
- B. It involves  $R - \text{OPOCl}_2$  with  $-\text{OPOCl}_2$  as a better leaving group
- C. It involves E2 mechanism as pyridine base abstracts proton from the adjacent carbon at the same time at which  $-\text{OPOCl}_2$  is leaving
- D. It is E1 reaction without formation of carbocation

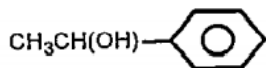
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235. Which of the following alcohols turn(s)  $\text{CrO}_3$  in  $\text{H}_2\text{SO}_4$  into green?

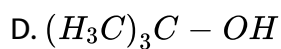




B.



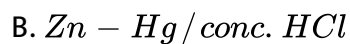
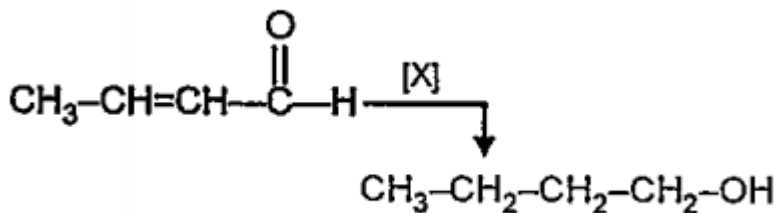
C.

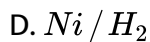


Answer: B::C

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236. Complete the following reaction

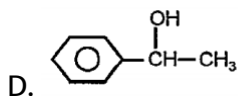
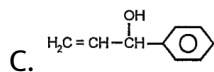
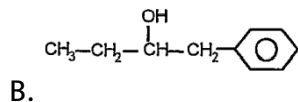
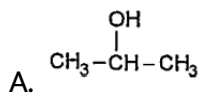




Answer: C::D

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237. Which of the following alcohols respond(s) to iodoform test?



Answer: A::D

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**238.** Ethanol is less acidic than

- A. Acetic acid
- B. Water
- C. Phenol
- D. p-nitrophenol

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



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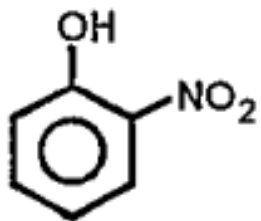
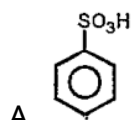
**239.** Phenol is less acidic than

- A. acetic acid
- B. p-methoxyphenol
- C. p-nitrophenol
- D. ethane

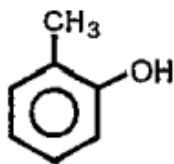
Answer: A::C

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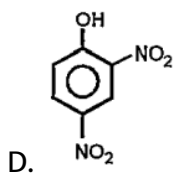
240. Which of the following compounds is/are soluble in  $\text{NaHCO}_3$ ?



B.



C.

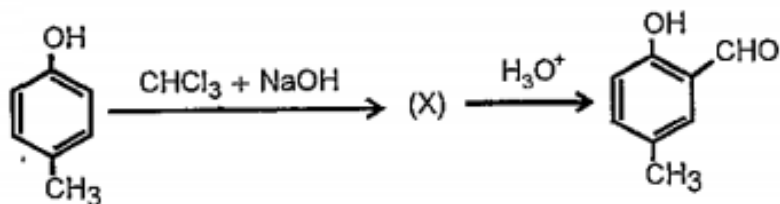


D.

Answer: A::D

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



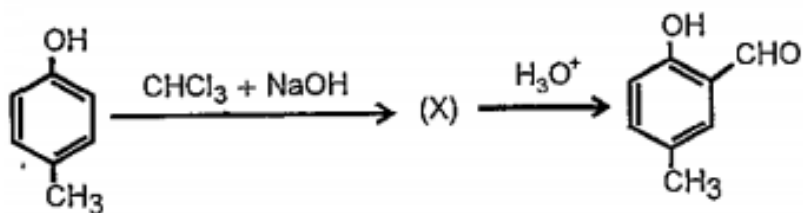
The electrophile in this reaction is

- A. :CHCl
- B. : + CHCl)<sub>2</sub>
- C. :CCl<sub>2</sub>'
- D. :CCl<sub>3</sub>'

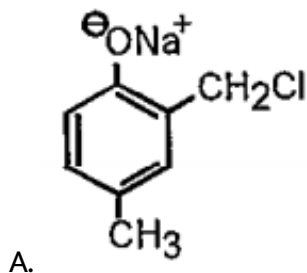
Answer: C

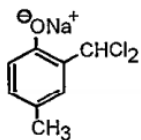
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242. Reimer Tiemann introduces an aldehyde group on to the aromatic ring of phenol, ortho to the hydroxyl group. This reaction involves electrophilic aromatic substitution. This is a general method for the synthesis of substituted salicylaldehydes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

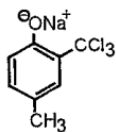


The structure of the intermediate (X) is

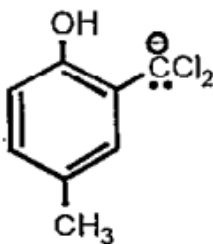




B.



C.



D.

**Answer: B**

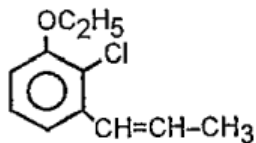
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**243.** Two isomeric forms of an organic compound A,  $C_{11}H_{13}OCl$  readily decolourise  $Br_2/H_2O$  and give same compound (B) on catalytic hydrogenation. Both the isomeric forms on vigorous oxidation give (c) which on treatment with soda lime gives 2-chloroethoxy benzene. However, (C) on treatment with Ni/Al alloy in alkaline medium gives 3-

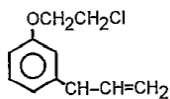


ethoxybenzoic acid. Only one of the isomers of (A) gives geometrical isomer D and E.

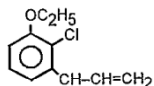
The structural formula of (A) is



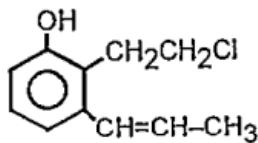
A.



B.



C.



D.

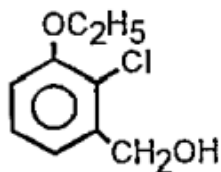
**Answer: A**



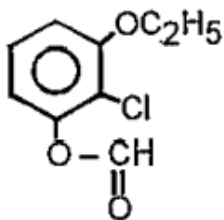
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244. Two isomeric forms of an organic compound A,  $C_{11}H_{13}OCl$  readily decolourise  $Br_2/H_2O$  and give same compound (B) on catalytic hydrogenation. Both the isomeric forms on vigorous oxidation give (C) which on treatment with soda lime gives 2-chloroethoxy benzene. However, (C) on treatment with Ni/Al alloy in alkaline medium gives 3-ethoxybenzoic acid. Only one of the isomers of (A) gives geometrical isomer D and E.

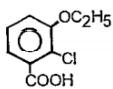
The structural formula of (A) is



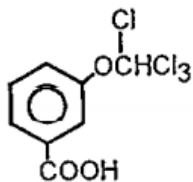
A.



B.



C.



D.

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245. Convert Methanol to Ethanoic acid.

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246. Convert Hexanenitrile into 1-aminopentane.

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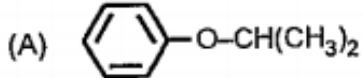
**247.** Arrange Propane, Ethanamine, and Ethyl alcohol in increasing order of dipole moment.

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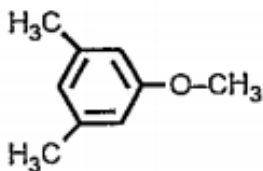
**248.** Write the reaction when phenol reacts with arenediazonium chloride in presence of a base.

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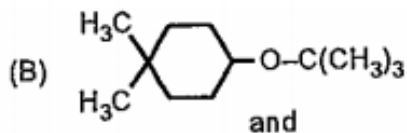
**249.** Consider the pairs of ethers A to F shown below. To The right of each pairs is a description of reaction conditions to be applied to each. One compound of the pair will react more rapidly than the other. Find out number of reactions in which first ether more rapidly cleaved than second.



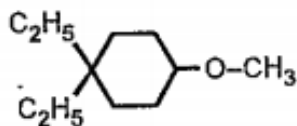
and



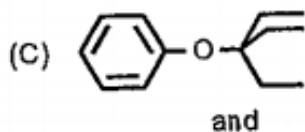
Treated with  
HBr in  
CH<sub>3</sub>CN,  
40°C



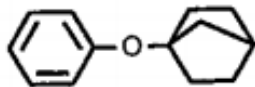
and



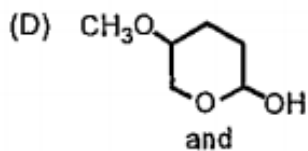
Treated with  
H<sub>2</sub>SO<sub>4</sub>  
in CH<sub>3</sub>CN,  
40°C



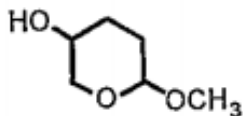
and



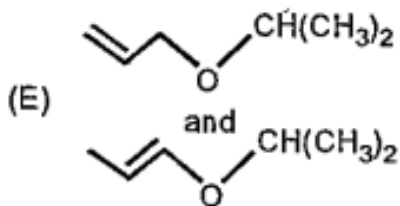
Treated with  
H<sub>2</sub>SO<sub>4</sub>  
in CH<sub>3</sub>CN,  
40°C



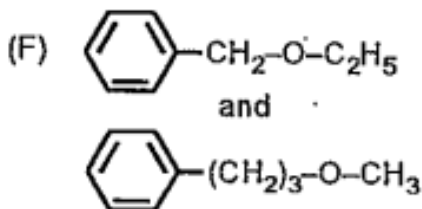
and



Treated with  
5% aqueous  
H<sub>2</sub>SO<sub>4</sub>, 25°C

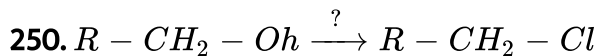


Treated with  
5% aqueous  
 $\text{H}_2\text{SO}_4$ ,  $25^\circ\text{C}$

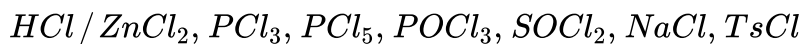


Treated with  
 $\text{H}^+$  /  $\text{H}_2\text{O}$

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Find out number of reagents that can be used for above conversion, from following.



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251. State the reaction when aniline reacts with acetic anhydride in presence of pyridine.



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**252.** How many moles of  $\text{HI}$  reacts with glycerol to give 2 iodopropane?



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**253.** Convert Aniline to Phenylazo-2-naphthol.



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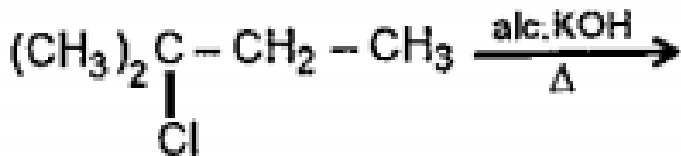
**254.** How the following transformation can be carried out (in not more than six steps)?

"Ethyl alcohol to vinyl acetate".



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255. Write the structure of the major organic product expected from each of the following reactions:



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256. Write the structure of the major organic product expected from each of the following reactions:  $\text{CH}_3\text{CH}_2\text{CHCl}_2 \xrightarrow{\text{aq. KOH}}$

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257. Indicate steps which would convert phenol to acetophenone

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258. Indicate steps which would convert acetic acid to tert-butyl alcohol

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259. Convert Acetic acid to Ethylene.

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260. Compound (A)  $C_7H_8O$  is insoluble in  $NaHCO_3$  solution but dissolves in sodium hydroxide and gives a characteristic violet colour with aqueous ferric chloride.

When treated with bromine water (A) forms a compound (B) of molecular  $C_7H_5OBr_3$ .

Give structural formulae of (A) and (B)

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261. An organic compound (A),  $C_7H_8O$  is insoluble in aqueous  $NaHCO_3$  but soluble in NaOH. (A), on treatment with bromine water rapidly forms compound (B),  $C_7H_5OBr_3$ . Give structures of (A) and (B). What will be (A), if it does not dissolve in NaOH solution but shows reactions given above?

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262. Why di-tert-butyl ether cannot be obtained by Williamson's synthesis?

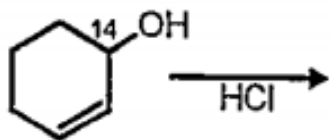
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263. 2,2 Dimethyl oxirane can be cleaved by acid ( $H^+$ ). Write mechanism.

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264. What is Rosenmund's reaction? What is the purpose of adding  $BaSO_4$  to it?

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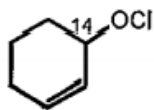


265.

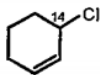
possible product (s) is /are



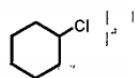
A.



B.



C.



D.

**Answer: A::C**

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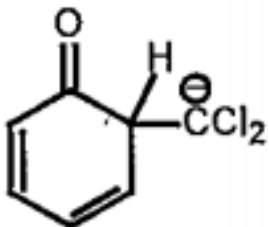
**266.** Distinguish between Secondary and Tertiary amines.

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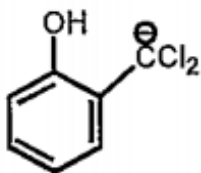
**267.** Convert p-Nitroaniline to 3, 4, 5-Tribromonitrobenzene.

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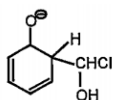
268. When phenol is reacted with  $CHCl_3$  and NaOH followed by acidification, salicylaldehyde is obtained. Which of the following species is/are involved in the above mentioned reaction as intermediate(s)?



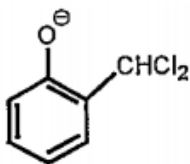
A.



B.



C.



D.

Answer: A:D

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269. Under what conditions (acidic/basic), the coupling reaction of aryldiazonium chloride with aniline is carried out?

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270. Convert n-propanol to isopropanol to n-propanol.

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271. State how chloral is obtained from ethyl alcohol.

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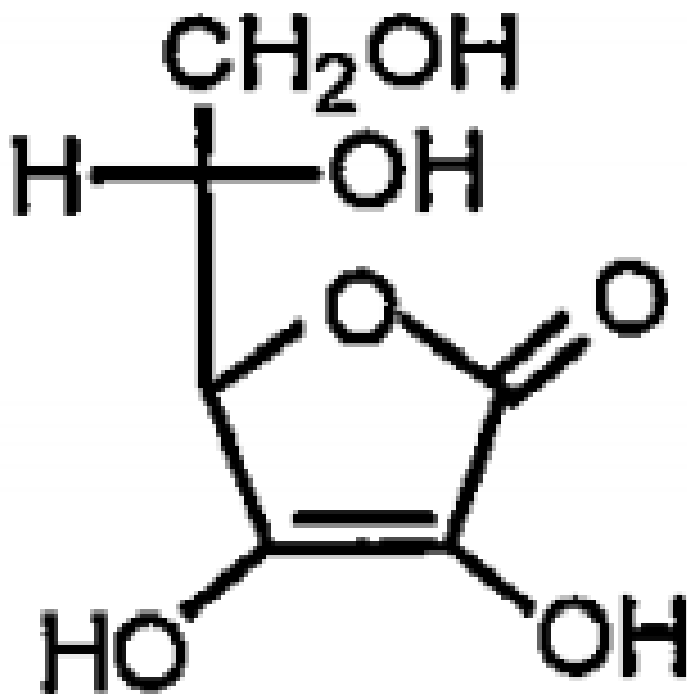
272. How will you prepare pentan-1-ol from 1-bromobutane?

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273. How will you obtain buta-1, 3-diene from ethanol?

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274. Humans, monkeys and guinea pigs do not have the enzymes necessary for the biosynthesis of vitamin C, so they

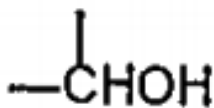


Must include  
the vitamin in their diets. It is also required for the synthesis of collagen,

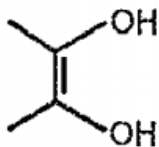
which is the structural protein of skin, tendons, connective tissue and bone.

Although vitamin C does not have a carboxylic acid group, it is an acidic compound. Acidic character is shown by

A.  $-CH_2OH$  group



B.



C.

D. all of these

**Answer: C**



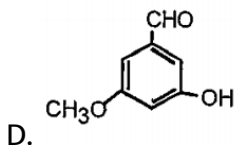
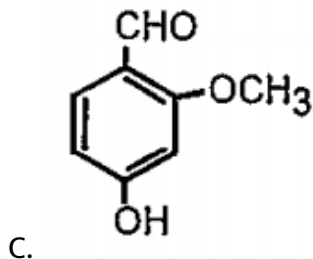
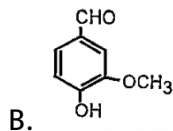
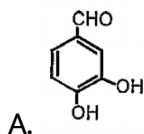
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**275.** Vanillin  $A[C_8H_8O_3]$  is isolated from vanilla beans. It gives intense blue colour with neutral  $FeCl_3$  and also gives +ve Tollen's test. It reacts



with conc. HBr to give a compound B. One mole of vanillin gave one mole of AgI with Zeise's active methoxy estimations. Compound B on oxidation with Tollen's reagent gave a catechol derivative. Compound B can be prepared from catechol by Gattermann Koch reaction.

Vanillin structure should be



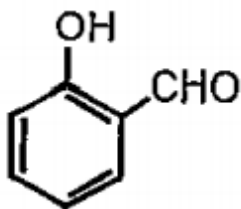
**Answer: B**



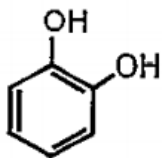
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276. Vanillin  $A[C_8H_8O_3]$  is isolated from vanilla beans. It gives intense blue colour with neutral  $FeCl_3$  and also gives +ve Tollen's test. It reacts with conc. HBr to give a compound B. One mole of vanillin gave one mole of AgI with Zeise's active methoxy estimations. Compound B on oxidation with Tollen's reagent gave a catechol derivative. Compound B can be prepared from catechol by Gattermann Koch reaction.

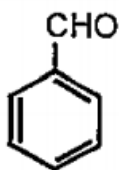
Compound B on heating with zinc dust will give



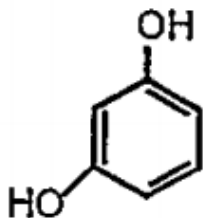
A.



B.



C.



D.

**Answer: C**

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**277.** Name the compound formed on treating glycerol with excess of HI.

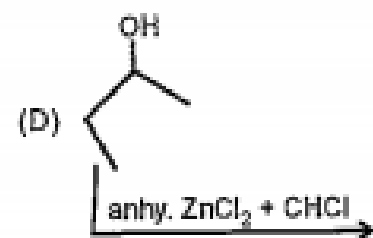
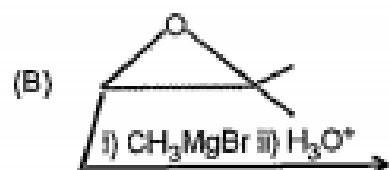
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**278.** Give chemical equation for: Oxidation of propan-1-ol with alkaline  $KMnO_4$  solution.

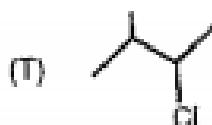
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279. Match Column -I with Column-II

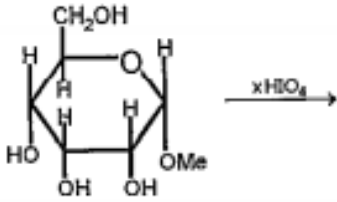
Column-I



Column-II



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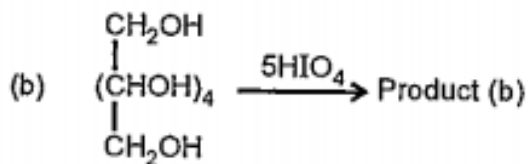
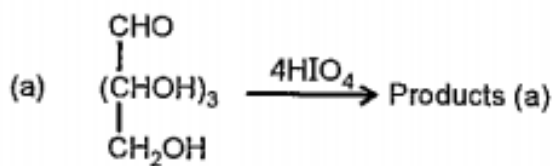


280.

What is the maximum value of  $x$ ?



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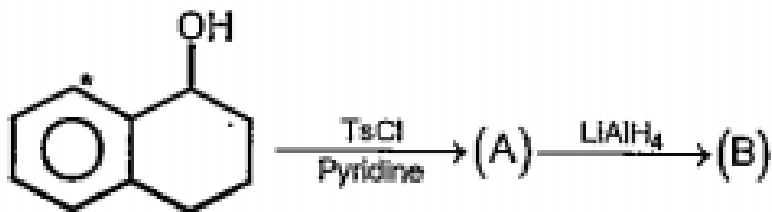


281.

What is the ratio of moles of formic acid obtained in reaction (a) and reaction (b)?



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282.

The degree of unsaturation of the final products is

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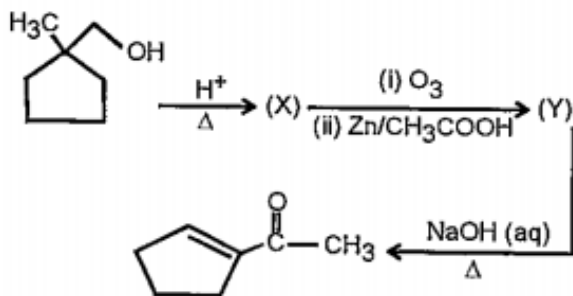
283. State the reaction: Methoxybenzene reacts with *HI*.

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284. 0.1 mole of a hydroxyl compound reacts with 62.5 g  $\text{PCl}_5$  (mol.wt.208.5) Determine the number of -OH groups

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285. Identify (X) and (Y) in the following reaction sequence.



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286. Compound X (Molecular formula,  $C_5H_8O$ ) does not react appreciably with Lucas reagent at room temperature but gives a precipitate with ammoniacal silver nitrate. With excess of  $MeMgBr$ , 0.42g of X gives 224 ml of  $CH_4$  at STP. Treatment of X with  $H_2$  in presence of Pt catalyst followed by boiling with excess  $HI$ , gives n-pentane. Suggest structure of X and write the equations involved.

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**287.** Compound (A)  $C_7H_8O$  is insoluble in  $NaHCO_3$  solution but dissolves in sodium hydroxide and gives a characteristic violet colour with aqueous ferric chloride.

When treated with bromine water (A) forms a compound (B) of molecular  $C_7H_5OBr_3$ .

Give structural formulae of (A) and (B)

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**288.** When t-butanol and n-butanol are separately treated with a few drops of dilute  $KMnO_4$  in one case only, the purple colour disappears and a brown precipitate is formed. Which of the two alcohols gives the above reaction and what is the brown precipitate?

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**289.** An optically active alcohol  $A(C_6H_{10}O)$  absorbs two mole of hydrogen molecule per mole of A upon catalytic hydrogenation and gives

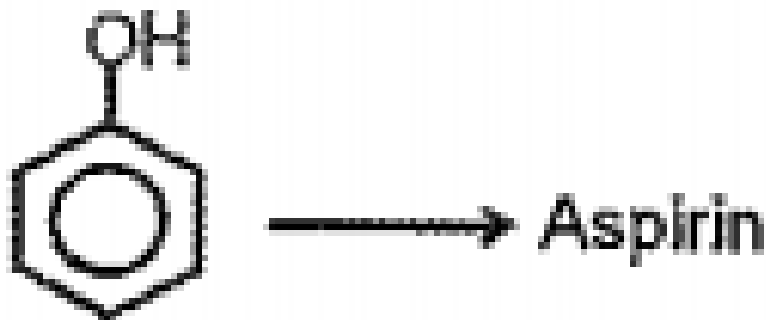
a product B. The compound B is resistant to oxidation by  $CrO_3$  and does not show any optical activity. Deduce the structure of A and B.

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290. Give reason for the following in one or two sentences. "Acid catalysed dehydration of t-butanol is faster than that of n-butanol".

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291. Convert,

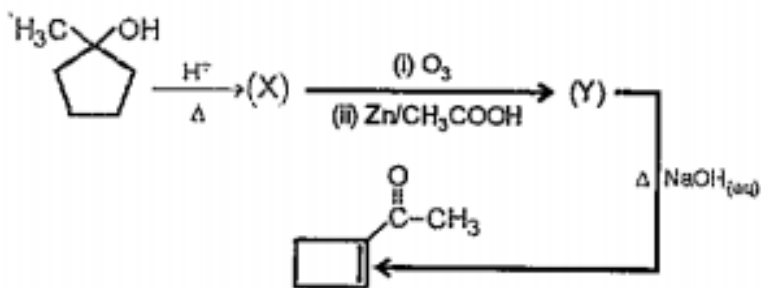


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292. An organic liquid (A) Having pleasant odour is hydrolysed to an acid (B) and alcohol (C). The acid (B) is ethanoic acid (C) on treating with HCl gives (D), oxidation of (C) yield benzoic acid. What are (A),(C) and (D)?

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293. Identify (X) and (Y) in the following reaction sequence.



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294. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

## Statements

Statement -I: The boiling point of ethanol is much higher than that of diethyl ether.

Statement-II: In ethanol, the molecules are associated due to intermolecular hydrogen bonding, whereas in diethyl ether it is not possible.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**295.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: The acidity of alcohols follows the order  $1^\circ > 2^\circ > 3^\circ$ .

Statement-II: The +I effect of alkyl groups ( $3^\circ > 2^\circ > 1^\circ$ ) favors the dissociation of -O-H group.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: C**



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296. Give Chemical equation for: Reaction of Bromine in  $CS_2$  with phenol.

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297. Give Chemical Equation when: Phenol reacts in presence of Dil.  $HNO_3$ .

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298. Give Chemical Equation for: Treating phenol with chloroform in presence of aqueous  $NaOH$

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299. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -1: Glycerol does not react with HI

Statement-II: 2-iodopropane can be produced by treatment of glycerol with excess HI

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: D**

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**300.** Convert: Propene to propan-2-ol

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**301.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I:  $CH_3OH$  is a nucleophile

Statement-II:  $CH_3OH$  forms sodium methoxide on treatment with Na

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**302.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Di-tert butyl ether cannot be prepared by Williams's ether synthesis.

Statement-II: Tert, butyl bromide on treatment with sodium tert. butoxide preferentially undergoes elimination to form isobutylene and tert. butyl alcohol.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**303.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Solubility of n-alcohol in water decreases with increase in molecular weight.

Statement-II: The relative proportion of the hydrocarbon part in alcohols increases with increasing molecular weight which permits enhanced hydrogen bonding with water.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: C**



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**304.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Primary and tertiary alcohols can be distinguished by using  $CrO_3, H_2SO_4$

Statement-II:  $3^\circ$  alcohol are not oxidised by Jones reagent.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**305.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Phenol on oxidation with fuming  $HNO_3$  gives picric acid.

Statement-II: Pure phenols are colourless but turn pink due to oxidation to benzoquinone.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**306.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Phenol is used in the manufacture of Bakelite.

Statement-II: Bakelite is heat resistant thermosetting plastic used for making electrical switches and switch board.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**307.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Dichloro carbene is active intermediate in Reimer Tiemann reaction.

Statement-II: Dichlorocarbene is an electrophile because its octet is not complete.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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308. Convert: Benzyl Chloride to Benzyl alcohol.



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309. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Ethers are slightly soluble in water but highly soluble in conc.  $H_2SO_4$

Statement-II: The oxygen of ether forms oxonium ion with acids but not with  $H_2O$ .

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.

D. Statement -I is false, Statement-II is true.

**Answer: A**

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**310.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: When phenyl acetate is heated with Lewis acid ortho and para hydroxy acetophenone are obtained.

Statement-II: Phenyl acetate undergoes rearrangement (like Fries migration) when heated with Lewis acid.

A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I

B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.



C. Statement-I is true, Statement -II is false.

D. Statement -I is false, Statement-II is true.

**Answer: A**

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**311.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Anisole is not obtained when  $MeO^-$  reacts with bromobenzene.

Statement-II: Aryl halides are less reactive towards nucleophilic substitution.

A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I

B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.

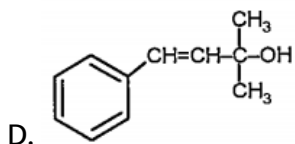
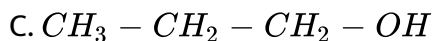
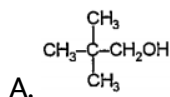
C. Statement-I is true, Statement -II is false.

D. Statement -I is false, Statement-II is true.

Answer: A

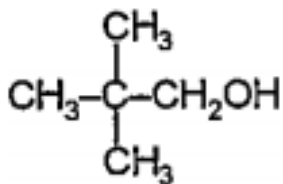
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312. Classify the following as primary and Secondary alcohols

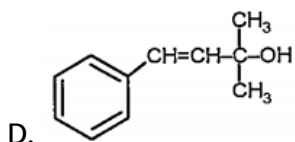
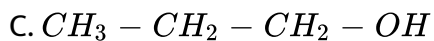


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313. Classify the following as Tertiary alcohols



A.

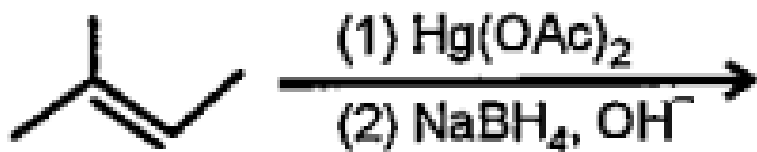


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314. Convert: Ethylmagnesium Chloride to Propan-1-ol.

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315. Find the major product of reaction

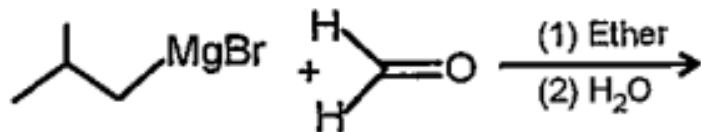


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316. Convert: Methylmagnesium bromide to 2-Methylpropan-2-ol.

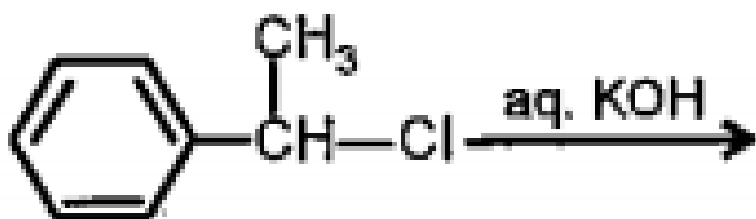
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317. Find the major product of reaction



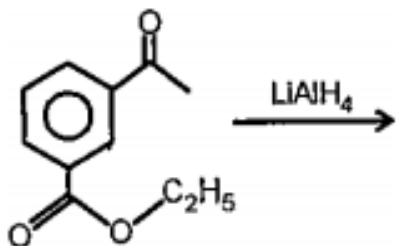
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318. Find the major product of reaction



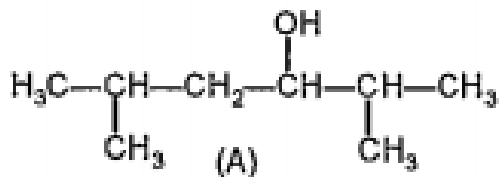
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319. Find the major product of reaction



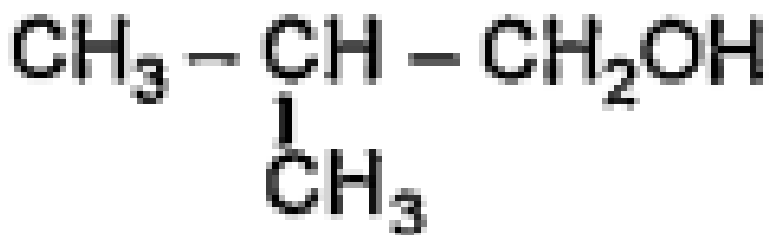
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320. Using compounds of not more than four carbon atoms as your only starting material, outline a synthesis



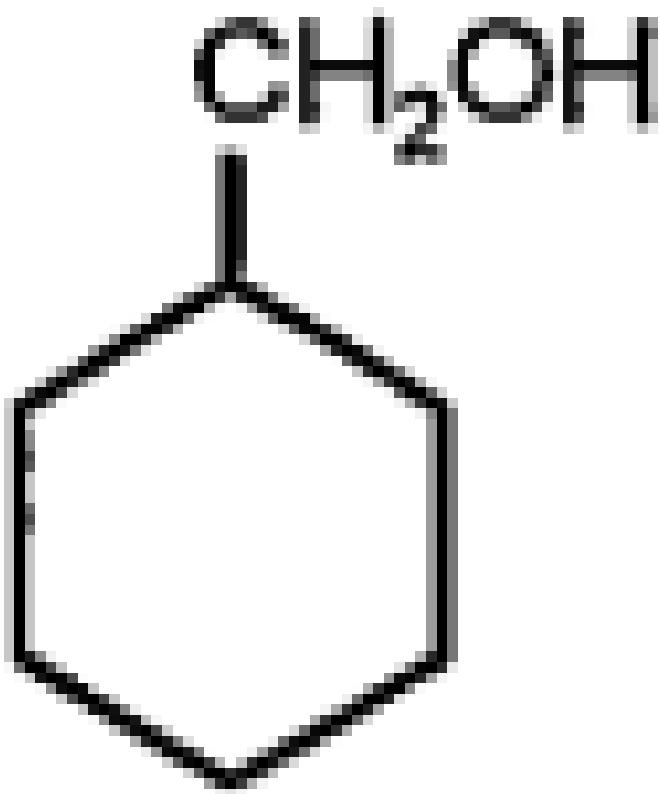
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321. Show how are alcohols prepared by the reaction of a suitable Grignard reagent on Methanal ?



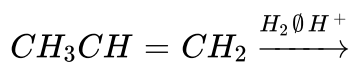
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**322.** Show how are alcohols prepared by the reaction of a suitable Grignard reagent on Methanal ?



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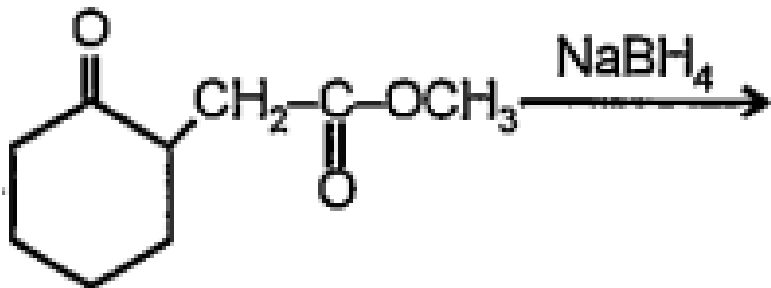
**323.** Write structures of the products of the reaction



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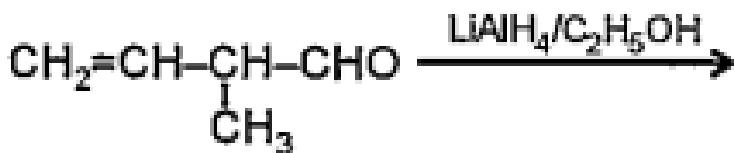


324. Write structures of the products of the reaction



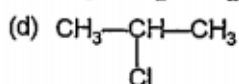
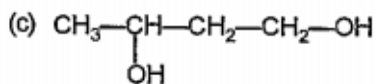
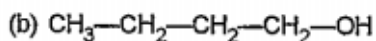
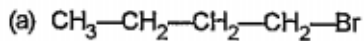
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325. Write structures of the products of the reaction



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326. Arrange the following in the order of increasing boiling points giving reasons:



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**327.** Why 2-chloroethanol is more acidic than ethanol ?

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**328.** 0.436 g of acetyl derivative of a polyhydric alcohol (molecular mass=92) requires 0.336 g of KOH for hydrolysis. Calculate the number of hydroxyl groups in the alcohol.

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**329.** State the reaction: Benzyl ethyl ether reacts with *HI*.

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**330.** Why is sulfuric acid not used during the reaction of alcohols with  $KI$  ?

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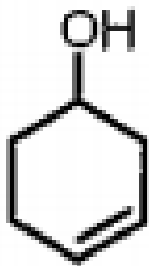
**331.** Write the isomers of compounds having molecular formula  $C_4H_9Br$ .

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**332.** Convert: Butan-1-ol to 1-iodobutane.

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**333.** Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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**334.** Give the major product formed when each alcohol in the presence of  $H_2SO_4$  or  $H_3PO_4$



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**335.** Give the major product formed when each alcohol in the presence of

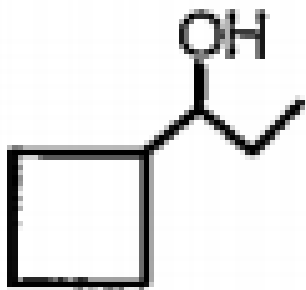
$H_2SO_4$  or  $H_3PO_4$



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**336.** Give the major product formed when each alcohol in the presence of

$H_2SO_4$  or  $H_3PO_4$



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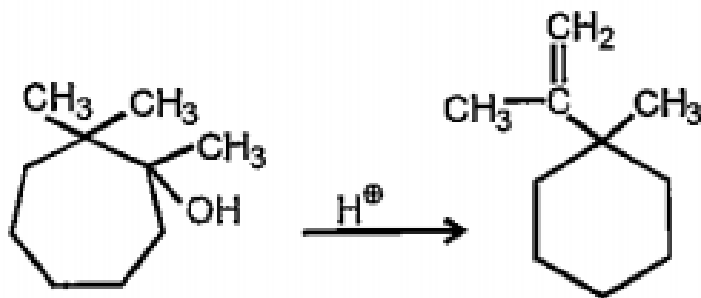
**337.** Predict the major product of acid catalysed dehydration of

(a) 1-methylcyclohexanol

(b) butan -2- ol

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338. Propose a mechanism for the following reaction.



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339. Classify alcohols as primary and secondary alcohols and write the structures of their first oxidation products:



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**340.** Classify alcohols as primary and secondary alcohols and write the structures of their first oxidation products:



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**341.** Starting with bromobenzene and any other needed reagents, outline a synthesis of the following ketone.



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**342.** Draw the organic products in each reaction:



 [View Text Solution](#)



343. Draw the organic products in each reaction:



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344. Draw the organic products in each reaction:



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345. Draw the organic products in each reaction:



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346. Draw the organic products in each reaction:



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**347.** Phenol is a stronger acid than alcohol. Explain

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**348.** How would you obtain: Phenol  $\rightarrow$  Picric acid

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**349.** Convert: Phenol  $\rightarrow$  Benzophenone

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**350.** Explain p-nitrophenol boils at higher temperature than o-nitrophenol?

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**351.** Why O-nitro phenol is less soluble than m or p nitro phenol?

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**352.** What are the products (A),(B),(C),(D) and ( E ) ?



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**353.** How can you prepare 2-acetoxybenzoic acid and phenyl salicylate from salicylic acid?

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**354.** Give IUPAC name for following heterocyclic ethers.



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[View Text Solution](#)

355. Give IUPAC name for following heterocyclic ethers.



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356. Give IUPAC name for following heterocyclic ethers.



[View Text Solution](#)

357. Give IUPAC name for following heterocyclic ethers.



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**358.** Write the reactions of Williamson of 2-ethoxy-3-methylpentane starting from ethanol and 3-methylpentan-2-ol.

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**359.** Explain the following observations:



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**360.** Identify the product A and B giving proper explanations:



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**361.** Convert: Ethane to Bromoethane

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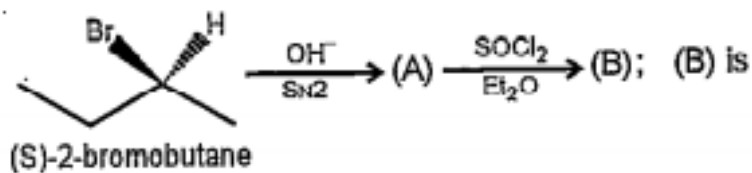
362. Convert: Propene to 1-nitropropane

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363. Convert: Toluene to Benzyl alcohol

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364. Consider the following reaction sequence



- A. ( R)-2-chlorobutane
- B. (S) -2-chlorobutane
- C. Both: ( R ) and (S) -2 chlorobutane
- D. none of these

**Answer: A**

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**365.** Convert: Propene to propyne.

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**366.** Convert: Ethanol to ethyl fluoride.

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**367.** Phenol is prepared industrially by heating chlorobenzene with aqueous NaOH at  $360^{\circ}C$  under high pressure.

$C_6H_5Cl + NaOH \xrightarrow[2.H_3O^+]{360^{\circ}C, \text{ pressure}} C_6H_5OH$  The reaction involves

A.  $SN_1$  mechanism

B.  $ArSN_2$  mechanism

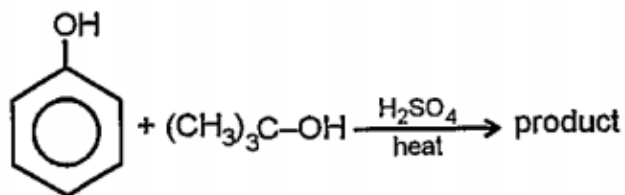
C. ArS E2 mechanism

D. addition mechanism

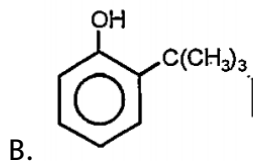
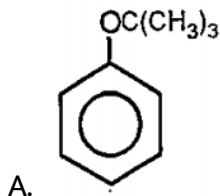
Answer: B

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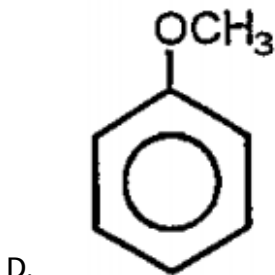
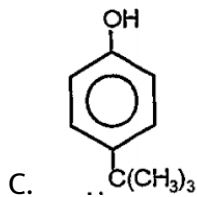
368. Consider the following reaction



The major product formed is



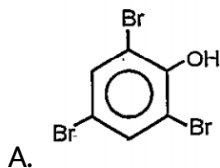


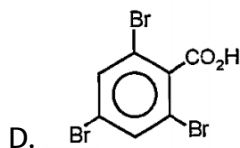
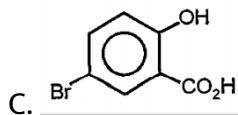
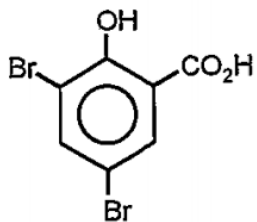


Answer: C

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369. Salicylic acid is treated with excess bromine water. The product formed is

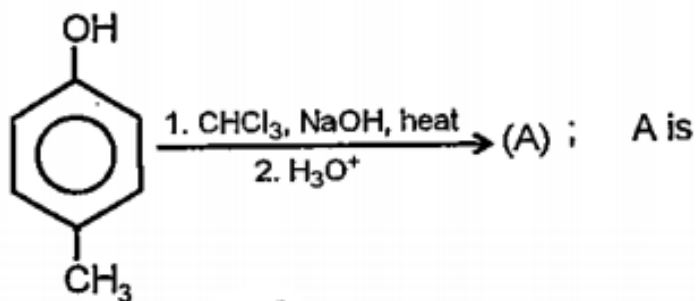


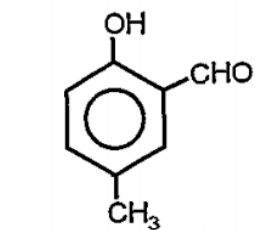
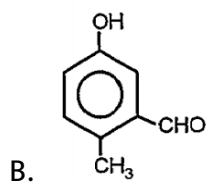
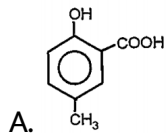


Answer: A

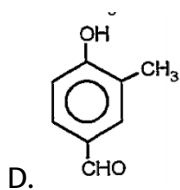
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370. Consider the following sequence of reaction





C.



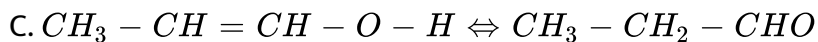
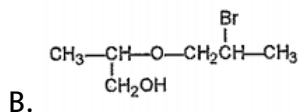
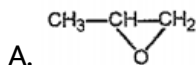
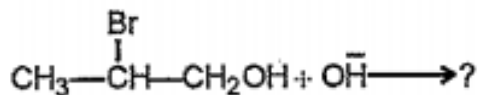
D.

**Answer: C**



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371. Which of the following products may be obtained in reaction?



D. All of these

Answer: D

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372. Convert: Bromomethane to Propanone.

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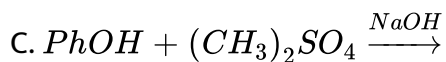
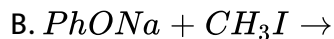
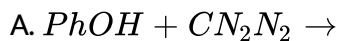
373. Convert: But-1-ene to But-2-ene.

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374. Convert: 1-Chlorobutane to n-octane.

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375. Which of the following reaction would not yield methoxybenzene(anisole)?



Answer: D

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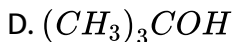
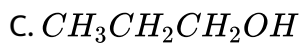
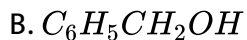
376. Convert: Benzene to Biphenyl.

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377. Convert: Propan-1-ol to 1-Chloropropane.

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



Answer: C



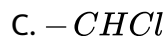
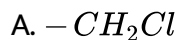
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**379.** Name the organic compound formed when a mixture of sodium methoxide and ethyl iodide is distilled and propose a name to this reaction.



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



Answer: D

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381. Write a test to detect the presence of double bond in a molecule.

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382. Convert: Anisole to 4-Methoxyacetophenone

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

A.  $CH_3CHO, RMgX$

B.  $C_6H_5OH, NaOH, CH_3I$

C.  $C_6H_5OH, \text{neutral } FeCl_3$



D.  $C_6H_5 - CH_3 : CH_3COOCl, AlCl_3$

**Answer: B**

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**384.** When  $CH_2 = CH - O - CH_2 - CH_3$  reacts with one mole of HI, one of the products formed is

A. ethane

B. ethanol

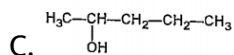
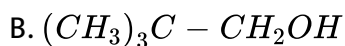
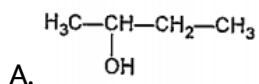
C. iodoethane

D. ethanal

**Answer: D**

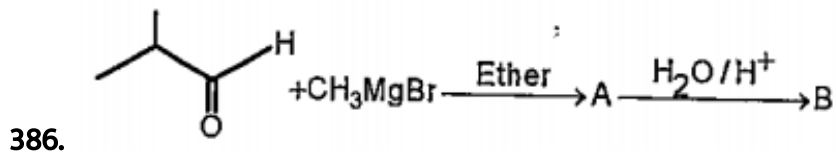
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385. 0.44g of a monohydric alcohol when added to methylmagnesium iodide in ether liberates at STP  $112\text{cm}^3$  of methane. With PCC, the same alcohol forms a carbonyl compound that answers silver mirror test. The monohydric alcohol is



Answer: B

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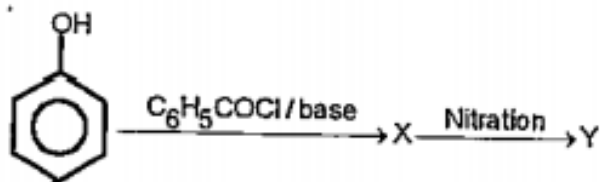


The IUPAC name of 'B' is

- A. 3-methylbutan-2-ol
- B. 2-methylbutan-2-ol
- C. 2-methylbutan-3-ol
- D. pentan-2-ol

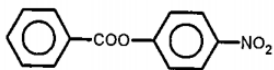
**Answer: A**

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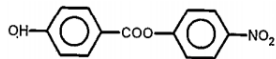


387.

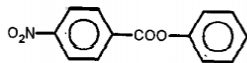
(major product). Y is



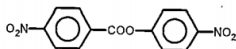
A.



B.



C.



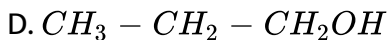
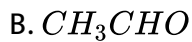
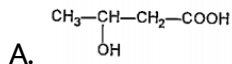
D.

**Answer: A**



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**388.** Iodoform reaction is answered by all, except



**Answer: D**

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**389.** Which of the following alcohols has highest solubility in water ?

- A. Tertiary butyl alcohol
- B. Secondary butyl alcohol
- C. Ethylene glycol
- D. Glycerol

**Answer: D**

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

- A. Dehydration reaction of alcohol
- B. Oxidation reaction of alcohol
- C. Reduction reaction of alcohol
- D. Reduction of alcohol with phosphorus tribromide

**Answer: B**

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**391.** Write the possible isomeric alcohols of:  $C_4H_{10}O$

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**392.** Reimer -tiemann reaction Involves

- A. carbonium ion intermediate
- B. carbene Intermediate
- C. carbanion intermediate

D. free radical intermediate

**Answer: B**

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**393.** When ethylene glycol is heated with acidified potassium permanganate, the main organic compound obtained is

A. oxalic acid

B. glyoxal

C. formic acid

D. acetaldehyde

**Answer: C**

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**394.** The alcohol obtained by the hydrolysis of oils and fats is

- A. glycol
- B. glycerol
- C. propanol
- D. pentanol

**Answer: B**



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**395.** An organic acid without a carboxylic acid group is

- A. picric acid
- B. oxalic acid
- C. vinegar
- D. ascorbic acid



**Answer: A**



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

A.  $o > m > p$

B.  $p > m > o$

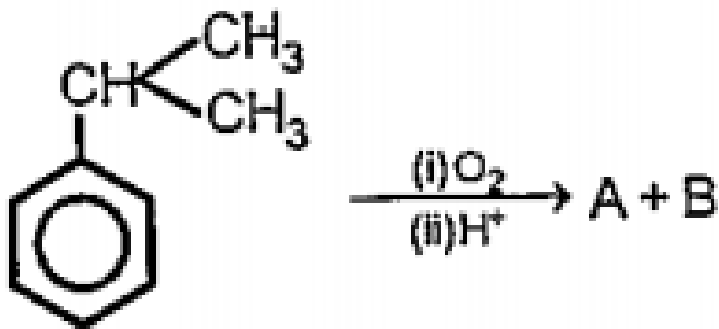
C.  $m > p > o$

D.  $p > o > m$

**Answer: B**



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397.

Identify A and B.

- A. Phenol, acetone
- B. phenylacetaldehyde
- C. Benzoic acid, acetone
- D. Benzaldehyde, ethanol

**Answer: A**

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398. Glycerol on oxidation with bismuth nitrate produce

A. glyceric acid

B. glyoxylic acid

C. oxalic acid

D. meso-oxalic acid

**Answer: D**

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**399.** Convert: 1-propoxypropane from propan-1-ol.

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**400.** Assertion Glycerol is purified by distillation under reduced pressure.

Reason Glycerol is a trihydric alcohol.

A. If both Assertion and Reason are true and reason is correct explanation of Assertion

- B. If both Assertion and Reason are true but reason is not the correct explanation of Assertion
- C. If Assertion is true but Reason is false
- D. If both Assertion and Reason are false

**Answer: B**

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**401.** Conversion of ethyl alcohol into acetaldehyde is an example of

- A. hydrolysis
- B. oxidation
- C. reduction
- D. molecular rearrangement

**Answer: B**

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**402.** You are given benzene, conc. $H_2SO_4$  and  $NaOH$  and dil. $HCl$ . Write the equations for the preparation of phenol using these reagents.

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**403.** Phenol is treated with bromine water and shaken well. The white precipitate formed during the process is

- A. m-bromophenol
- B. 2,4,6-tribromophenol
- C. 2-4 dibromophenol
- D. a mixture of o-and p-bromophenols

**Answer: B**

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404. The main product obtained from phenol with  $PCl_5$  is

- A. BHC
- B. hexachlorobenzene
- C. chlorobenzene
- D. triphenyl phosphate

Answer: D



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405. Upon treatment with  $I_2$  and aqueous  $NaOH$ , which of the following compounds will form iodoform?

- A.  $CH_3CH_2CH_2CH_2CHO$
- B.  $CH_3CH_2COCH_2CH_3$
- C.  $CH_3CH_2CH_2CH_2CH_2OH$
- D.  $CH_3CH_2CH_2CH(OH)CH_3$

Answer: D

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406. Which one of the following properties is exhibited by phenol?

- A. It is soluble in aq. NaOH and evolves  $CO_2$  with aq.  $NaHCO_3$
- B. It is soluble in aq. NaOH and does not evolve  $CO_2$  with aq.  $NaHCO_3$
- C. It is not soluble in aq. NaOH but evolves  $CO_2$  with aq.  $NaHCO_3$
- D. It is insoluble in aq. NaOH and does not evolve  $CO_2$  with aq.  $NaHCO_3$

Answer: B

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407. The reaction of phenol with excess of bromine water gives

- A. m-bromophenol
- B. o-and p-bromophenol
- C. 2,4-dibromophenol
- D. 2,4,6-tribromophenol

**Answer: D**

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**408.** Power alcohol is a mixture of

- A. 80 % petrol +20 % ethanol+small quantity of benzene
- B. 80 % ethanol +20 % benzene+small quantity of petrol
- C. 50 % petrol + 50 % ethanol+ small quantity of benzene
- D. 80 % petrol+20 % benzene+small quantity of ethanol

**Answer: A**

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409. Which of the following alcohol is unable to turn orange colour of chromic acid to green?

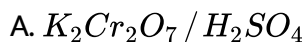
- A.  $1^\circ$  alcohol
- B.  $2^\circ$  alcohol
- C.  $3^\circ$  alcohol
- D. Allyl alcohol

Answer: C



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410. In the conversion of ethanol into methanol which of the following reagents will be used?



C.  $Cl_2 + aqKOH$

D. All of these

**Answer: D**

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**411.** Which of the following compounds can be used as antifreeze in automobile radiators?

A. Methyl alcohol

B. Glycol

C. Nitrophenol

D. Ethyl alcohol

**Answer: B**

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412. HCHO was treated with reagent X. The product formed upon hydrolysis in the presence of an acid gave  $C_2H_5OH$ . The reagent X is

- A. alcoholic KOH
- B. alcoholic KCN
- C.  $CH_3MgI$
- D. aq.KOH

Answer: C



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413. The acid which do not contain carboxylic acid is

- A. glutaric acid
- B. picric acid
- C. stearic acid
- D. Terephthalic acid

**Answer: B**

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**414.** The most suitable reagent for the conversion of  $RCH_2OH \rightarrow RCHO$  is

A.  $KMnO_4$

B.  $K_2Cr_2O_7$

C. PCC

D.  $CrO_3$

**Answer: C**

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**415.** The best reagent to convert pent -3-en-2-ol into pent -3-en-2-one is

- A. pyridinium chlorochromate
- B. chromic anhydride in glacial acetic acid
- C. acidic dichromate
- D. acidic permanganate

**Answer: A**

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**416.** The alcohol that produces turbidity immediately with Lucas reagent at room temperature is

- A. 1-hydroxy butane
- B. 2-hydroxy butane
- C. 2-hydroxy-2- methyl propane
- D. 1-hydroxy -2-methyl propane

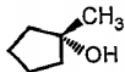
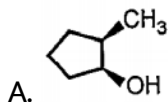
**Answer: C**

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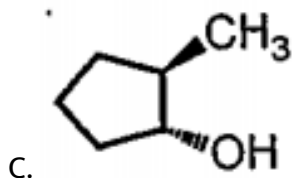
417. Give the structures and IUPAC names of monohydric phenols of molecular formula  $C_7H_8O$ .

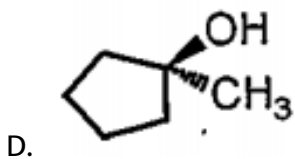
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418. The major product formed during hydroboration oxidation of 1-methyl cyclopentene is



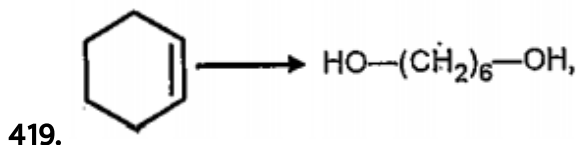
B.





Answer: C

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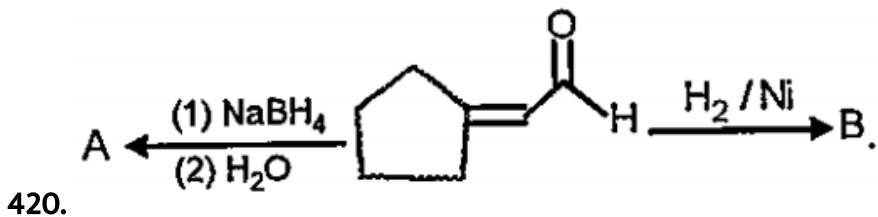


this conversion can be achieved by

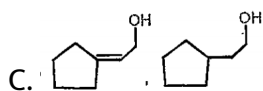
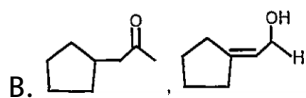
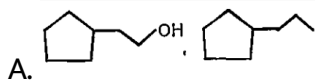
- A.  $O_3$ ,  $Zn$ , then  $LiAlH_4 / H_2O$
- B.  $O_3$ ,  $H_2O$ , then  $LiAlH_4 / H_2O$
- C. cold dil  $KMnO_4$ ,  $HIO_4$ , then  $LiAlH_4 / H_2O$
- D. All of these

Answer: D

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Compounds A and B are respectively.



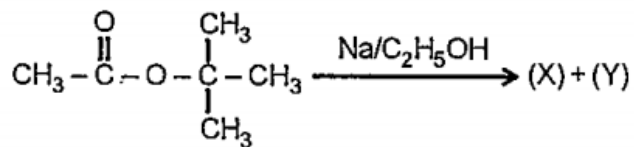
D. none of these

Answer: C

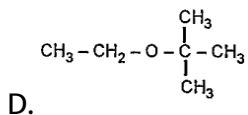
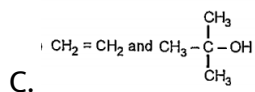
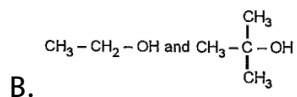
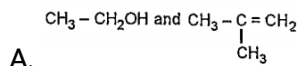
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421. In the given reaction



[X] and [Y] are

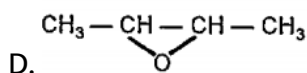
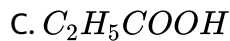
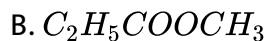
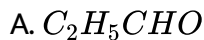


**Answer: B**



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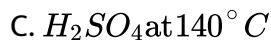
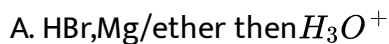
422. Which of the following compounds on reaction with  $CH_3MgBr$  (excess) will give a tertiary alcohol?




Answer: B

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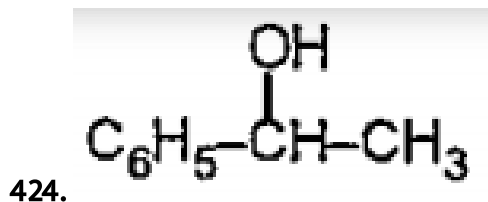
423. Which of the following could be employed to transform ethanol into 1-propanol?



D.  $\text{H}_2\text{SO}_4/180^\circ\text{C}$  then 

Answer: B

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can be prepared from which of the following combinations?

A.  $\text{C}_6\text{H}_5 - \text{CHO}$  and  $\text{CH}_3\text{MgCl}$

B.  $\text{C}_6\text{H}_5\text{MgBr}$  and  $\text{CH}_3\text{CHO}$

C.  $\text{C}_6\text{H}_5 - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_3$  and  $\text{NaBH}_4$

D. All of these

**Answer: D**

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**425.** Convert: 2-Methylbutanal to 2-Methylbutan-1-ol.

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**426.** Convert: Methyl (2-oxocyclohexyl) ethanoate to Methyl (2-hydroxycyclohexyl) ethanoate.

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**427.** Convert: Chlorobenzene to Phenol.

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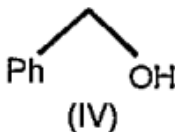
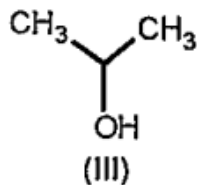
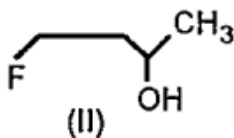
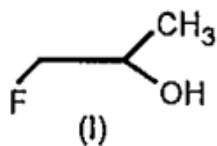
428. The molar conductivity of a  $0.5 \text{ mol} / \text{dm}^3$  solution of  $\text{AgNO}_3$  with electrolytic conductivity of  $5.76 \times 10^{-3} \text{ Scm}^{-1}$  at 298K is:

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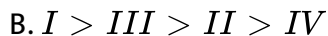
429. Write the reaction when: Ethoxybenzene reacts with  $\text{HBr}$ .

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430. The order of reactivity of the following alcohols towards conc.HCl is



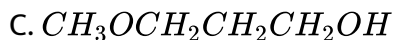
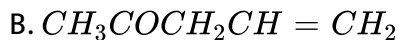
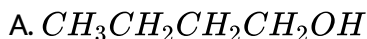
A.  $I > II > III > IV$



**Answer: C**

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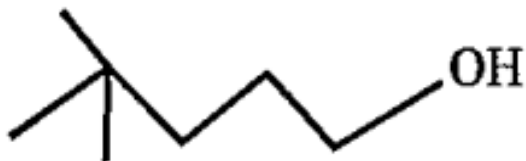
**431.** Which one of the following compounds decolourises aqueous bromine and also gives white fumes of HCl on reaction with  $PCl_5$ ?



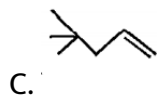
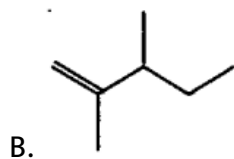
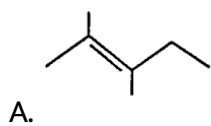
**Answer: D**

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432. When



undergoes  $H_2SO_4$ , then what will be the major product?

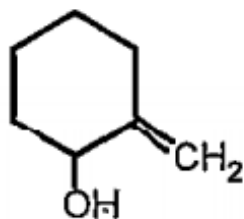


Answer: C

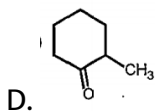
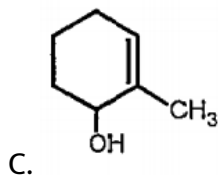
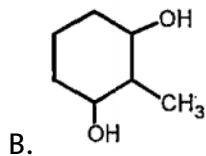
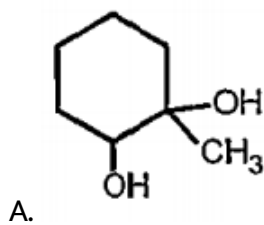


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433. Which of the following will be the major product when



is treated with dil. H<sub>2</sub>SO<sub>4</sub> ?





**Answer: D**



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**434.** The compound that reacts fastest with Lucas reagent (Conc.  $HCl + ZnCl_2$ ) at room temperature is

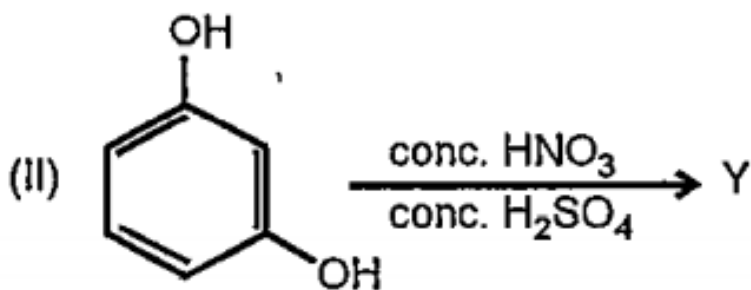
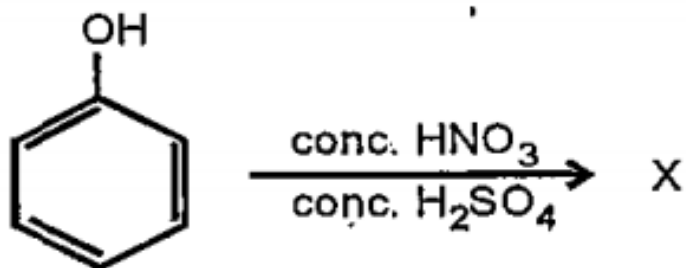
- A. butan-1-ol
- B. butan-2-ol
- C. 2 methyl propan -1-ol
- D. 2 methyl propan -2-ol

**Answer: D**



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435. Consider the following reaction I AND II



Product X and Y are respectively

A. picric acid, styphnic acid

B. styphnic acid, picric acid

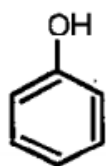
C. picric acid, benzoic acid

D. picric acid, salicylic acid

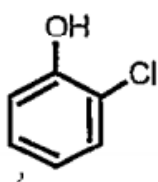
Answer: A

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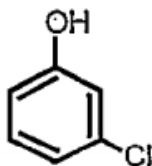
436. The decreasing order of acidic strength of the following



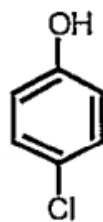
(I)



(II)



(III)



(IV)

A.  $IV > III > II > I$

B.  $II > IV > III > I$

C.  $II > III > IV > I$

D.  $II > I > III > IV$

Answer: C



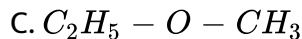
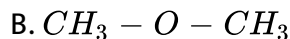
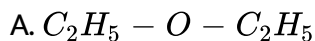
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437. During the electrolysis of molten sodium chloride, the time required to produce 0.10 mol of chloride gas using a current of 3 amperes is:



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438. Equimolar quantities of ethanol and methanol are heated with conc  $H_2SO_4$ . The product(s) formed is/are



D. All of these

Answer: D



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439. Which of the following will be the major product on reaction of 3,3-dimethylbut-1-ene with ethyl alcohol and conc.  $H_2SO_4$ ?

- A. 2-ethoxy-3,3-dimethylbutane
- B. 2-ethoxy-2,3-dimethylbutane
- C. 1-ethoxy-3,3-dimethylbutane
- D. None of these

Answer: B

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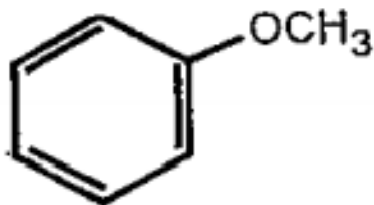
440. When methyl t-butyl ether is formed ?

- A.  $(C_2H_5)_3CONa + CH_3Cl$
- B.  $CH_3ONa + (CH_3)_3Cl$
- C.  $(CH_3)_3CONa + C_2H_5Cl$
- D.  $(CH_3)_3CONa + CH_3Cl$

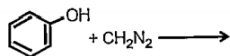
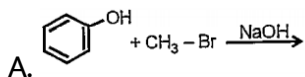
Answer: D

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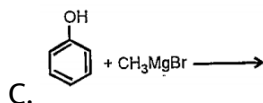
441. From which of the following



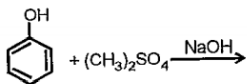
Will not be formed?



B.



C.



D.

**Answer: C**

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**442.** Diethyl ether on heating with conc. HI gives two moles of

- A. ethanol
- B. iodoform
- C. ethyl iodide
- D. methyl iodide

**Answer: C**

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**443.** tert-butyl methyl ether on heating with HI (1 mol) gives a mixture of

- A. tert-Butyl alcohol and methyl iodide

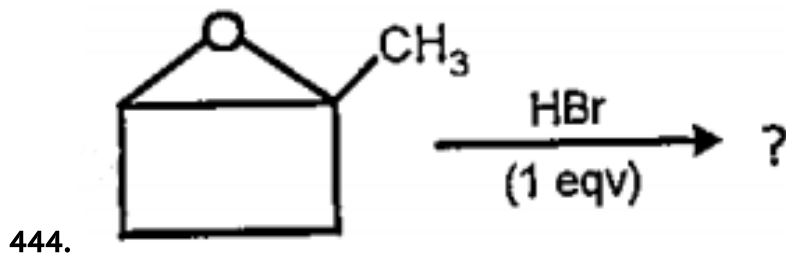
B. tert-Butyl Iodide and methanol

C. Isobutylene and methyl iodide

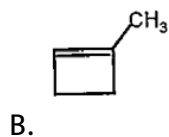
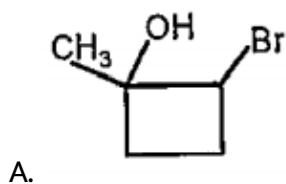
D. Isobutylene and methanol

Answer: B

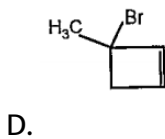
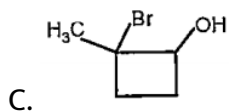
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The product of the above reaction is







**Answer: C**

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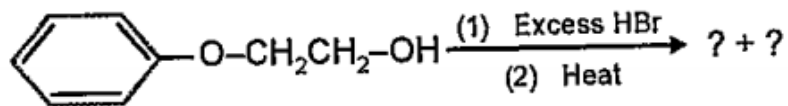
**445.** THF is treated with excess of HBr at 373 K. The product is

- A. 1,4-dibromobutane
- B. 1-bromo-2-butene
- C. 4-bromo-1 butanol
- D. 4-bromo-1- butene

**Answer: A**

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446. What are the products of the following reaction?



- A.  $p - \text{Br} - \text{C}_6\text{H}_4\text{OCH}_2\text{CH}_2\text{Br}$
- B.  $\text{Ph} - \text{Br} + \text{BrCH}_2\text{CH}_2\text{OH}$
- C.  $\text{Ph} - \text{Br} + \text{Br} - \text{CH}_2\text{CH}_2 - \text{Br}$
- D.  $\text{Ph} - \text{OH} + \text{CH}_2 - \text{CHBr}_2$

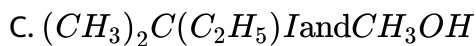
Answer: D



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447. The products formed when  $(\text{CH}_3)_3\text{COC}_2\text{H}_5$  is treated with HI

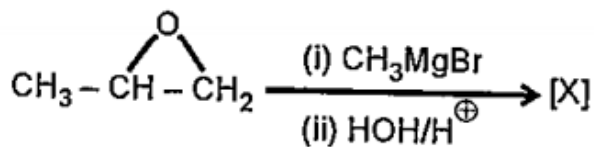
- A.  $(\text{CH}_3)_3\text{CI}$  and  $\text{CH}_3\text{OH}$



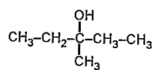
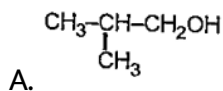
Answer: B

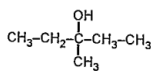
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448. In the given reaction

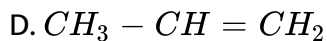


[X] will be





C.



**Answer: B**

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**449.** If the  $E_{cell}$  for a given reaction has a negative value, which of the following gives the correct relationships for the values of  $\delta G$  and  $K_{eq}$ ?

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**450.** 0.36 g of an alcohol R-OH was added to  $\text{CH}_3\text{MgBr}$  and the gas evolved measured 112 mL at STP. The molar mass of R-OH will be

A. 47

B. 79

C. 72

D. 77

**Answer: C**

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**451.** 10 g of a mixture of hexane and ethanol are reacted with sodium to give 200 ml hydrogen at  $27^\circ$  and 760 mm pressure. What is the percentage of ethanol into the mixture?

A. 4.6 %

B. 8.13 %

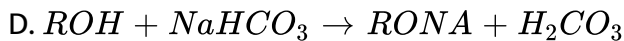
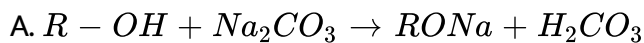
C. 9.21 %

D. 7.48 %

**Answer: D**

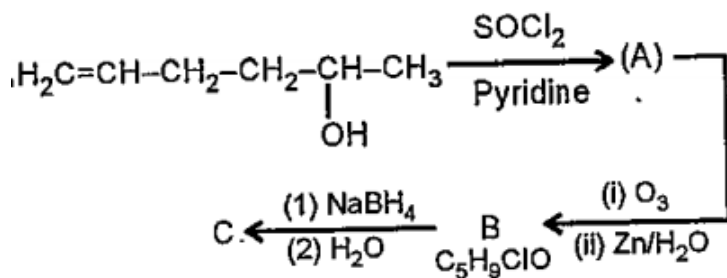
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452. Which one of the following reactions is correct?



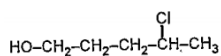
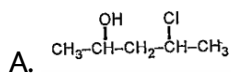
Answer: C

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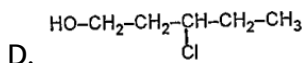


453.

Compound (C) is



C.



**Answer: C**

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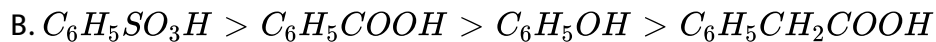
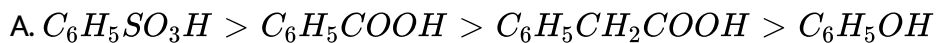
**454.** A compound with molecular formula  $C_4H_{10}O_3$  is converted by the action of acetyl chloride to a compound with molecular weight 190. The original compound has

- A. One OH group
- B. Two OH groups
- C. Three OH groups
- D. No OH group

**Answer: B**

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**455.** The correct order of decreasing of the following acid is

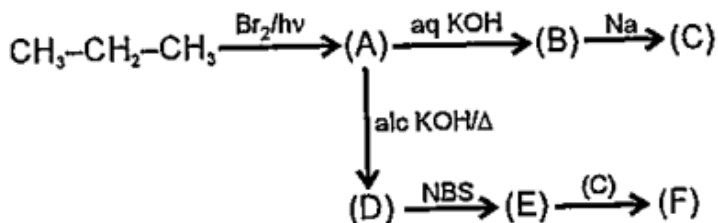


**Answer: A**

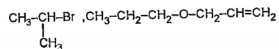
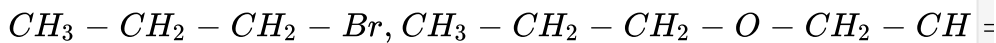
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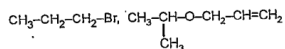
456. Identify compounds (A) & (F) in the following sequence of reactions.



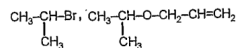
A.



B.



C.



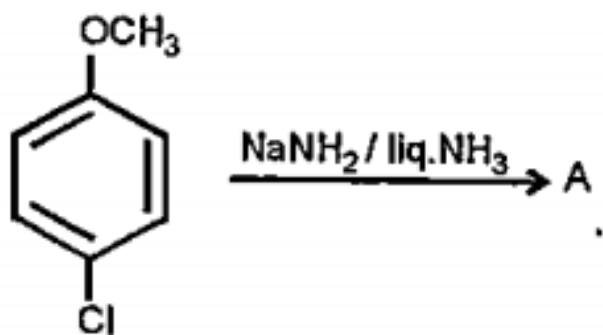
D.

Answer: D

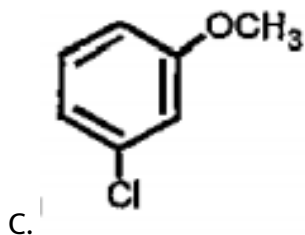
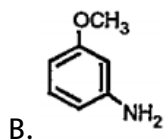
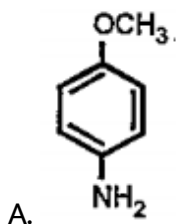


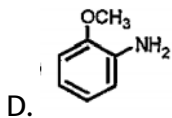
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457. In the reaction



The major product A is

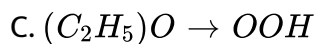
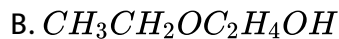
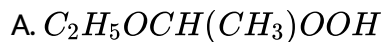




**Answer: A**

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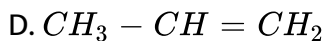
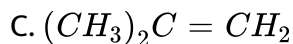
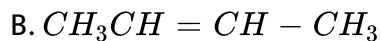
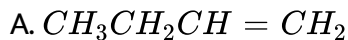
**458.** Which of the following will be obtained by keeping diethyl ether in contact with air for a long time?



**Answer: A**

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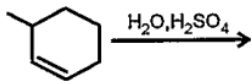
459. Among the alkenes which one produces tertiary butyl alcohol on acid hydration?



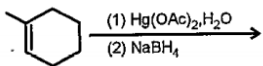
Answer: C

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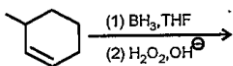
460. Choose the reaction sequence that would best accomplish the preparation of 2-methylcyclohexanol



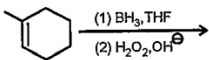
A.



B.



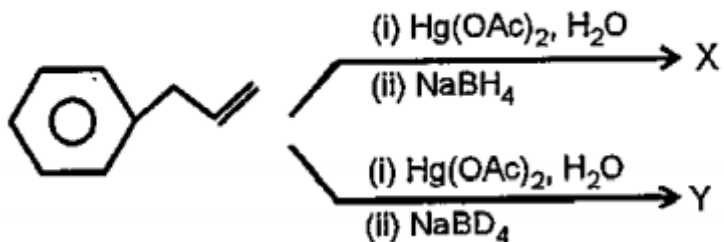
C.



D.

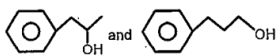
Answer: D

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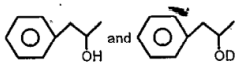
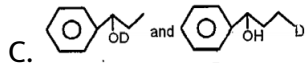
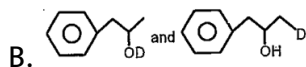


461.

Here product X And Y are respectively



A.



**Answer: B**



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**462.** Which of the following reagents can be used for the reduction of  $CH_3COOH \rightarrow CH_3CH_2OH$ ?

A.  $LiAlH_4 / H_2O$

B.  $B_2H_6 / H^+$

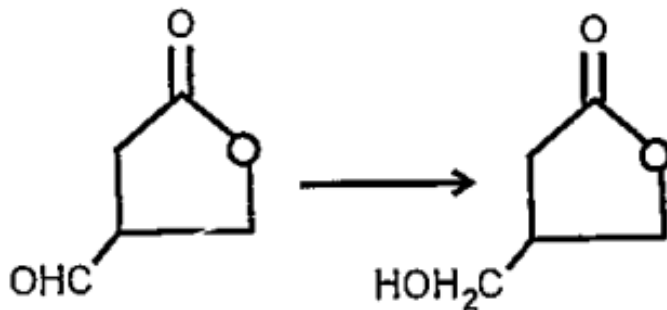
C.  $H_2 / Pd$

D.  $\text{NaBH}_4$

Answer: D

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463. Consider the following reduction and advise the best reagent.



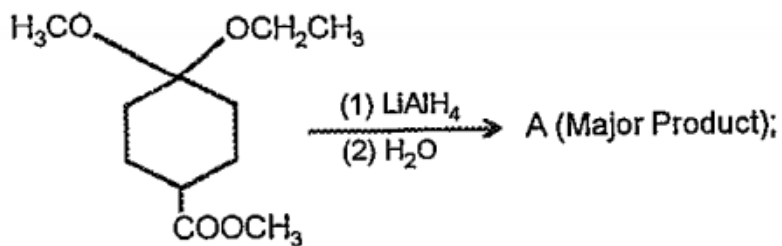
A.  $\text{HI}/\text{RedP}$

B.  $\text{LiAlH}_4 / \text{H}_2\text{O}$

C.  $\text{NaBH}_4 / \text{H}_2\text{O}$

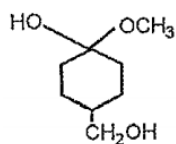
D.  $\text{Zn-Hg}/\text{HCl}$

Answer: C

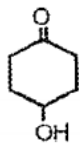


464.

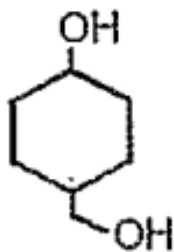
(A) is



A.

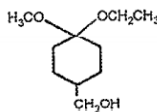


B.



C.

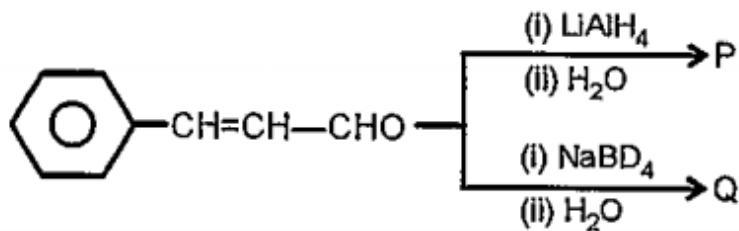




D.

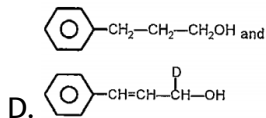
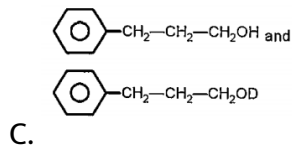
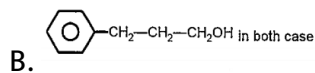
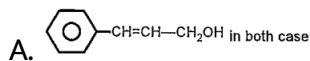
Answer: D

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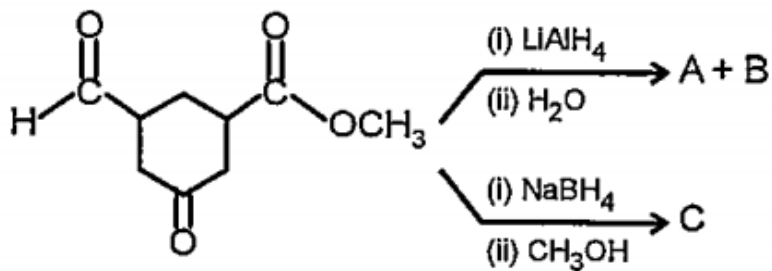
465.

P and Q are respectively



Answer: D

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466.

Number of  $1^\circ$  alcoholic groups present in (A+B+C) is

- A. 1
- B. 2
- C. 3
- D. 4

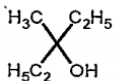
Answer: D

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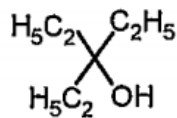
467. Ethyl acetate  $\xrightarrow[(2) H_3O^+]{(1) CH_3MgBr (excess)}$  P. The product P is



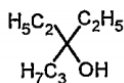
A.



B.



C.



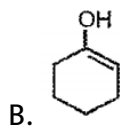
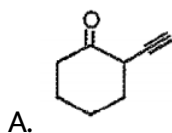
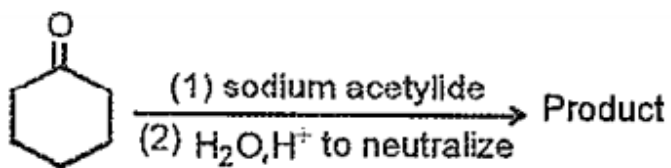
D.

Answer: A



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468. Give the major organic product of the following reaction.



C.



D.

Answer: C



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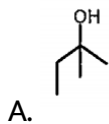
469. Which of the following compounds does not give a tertiary alcohol upon reaction with magnesium bromide /  $H_3O^{+}$ ?

- A. 3-methylpentanal
- B. ethyl benzoate
- C. 4,4-dimethyl cyclohexanone
- D. 4-heptanone

Answer: A

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470. Which of the following alcohols is not form when an ester reacts with Grignard reagent?

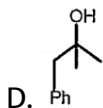




B.



C.



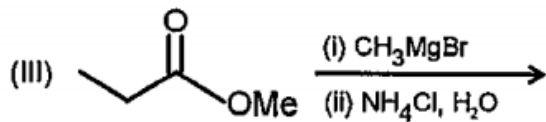
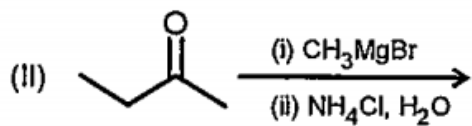
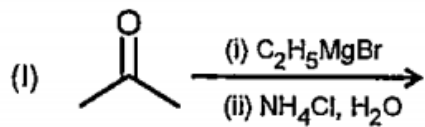
D.

**Answer: C**



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**471.** Choose the reagent and reactant that would produce 2-methyl-2-butanol as a major product.



A. Only I

B. Only I, III

C. Only II and III

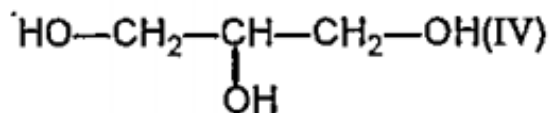
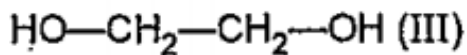
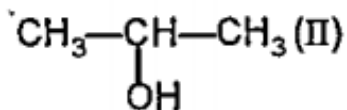
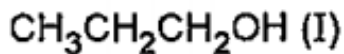
D. I, II and III

**Answer: D**



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472. The correct boiling point order of the following alcohols is



A.  $I > II > III > IV$

B.  $IV > III > II > I$

C.  $IV > III > I > II$

D.  $IV > II > III > I$

Answer: C

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473. Which of the following would be least soluble in water?



A. 1-propanol

B. 2-propanol

C. 1,5-pentanediol

D. 1-hexanol

**Answer: D**



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**474.** Among the following carboxylic acids, the one which undergoes acid catalysed esterification with  $CH_3OH$  at the slowest rate is

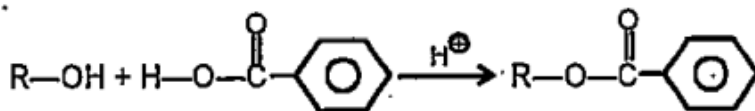
A.  $HCOOH$

B.  $CH_3COOH$

C.  $(CH_3)_3COOH$

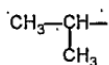
D.  $CH_3CH_2COOH$

**Answer: C**



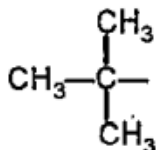
475.

Rate of the reaction faster when R is



A.

B.  $CH_3-$

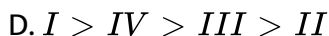
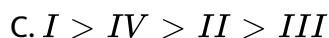
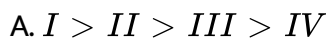


C.

D. equal in all case

Answer: B

476. The order of reactivity of methyl alcohol (I), isopropyl alcohol (II), tertiary butyl alcohol (III) and ethyl alcohol (IV) for esterification in decreasing order will be



Answer: C



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477. In the given reaction correct order of reactivity of HX in decreasing order is  $ROH + HX \rightarrow RX + H_2O$





**Answer: C**

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**478.** An unknown polyhydroxy compound (A) (molar mass=180) on acylation gives a product (molar mass=390), then find the number of hydroxyl group present in compound (A)

A. 4

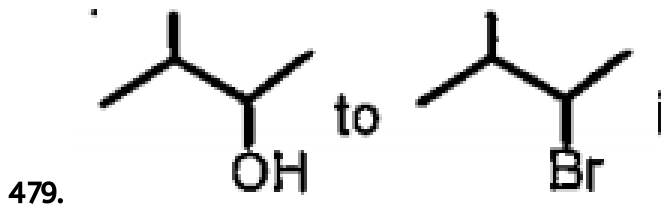
B. 5

C. 6

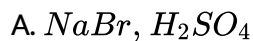
D. 10

**Answer: B**

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is best achieved through use of the reagent in a low temperature reaction



Answer: C



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480. The compound that undergoes dehydration very easily is

A. 2-methylpropan-2-ol

B. ethyl alcohol

C. 3-methyl-2-butanol

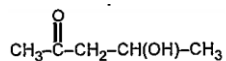
D. propyl alcohol

Answer: A

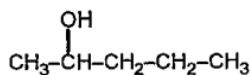


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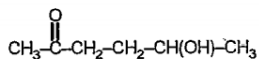
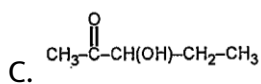
481. Which one of the following will readily be dehydrated in acidic medium?



A.



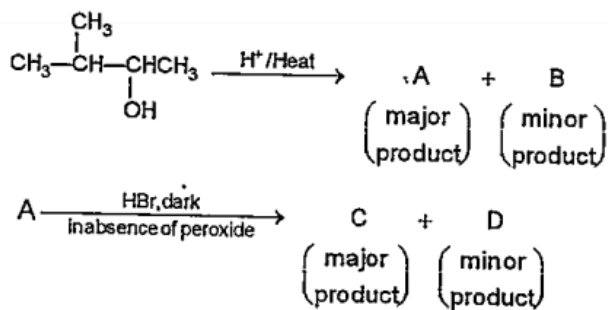
B.



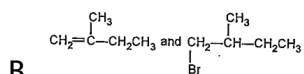
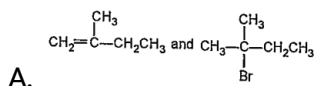
Answer: A

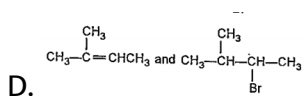
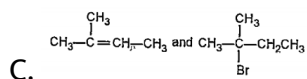
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482. In the following reactions,



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

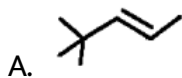
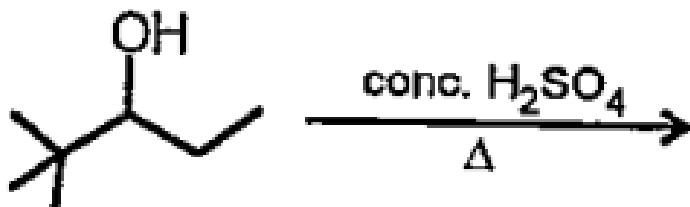




Answer: C

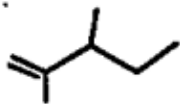
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483. Which alkenes would you expect to be the major product of the following dehydration ?

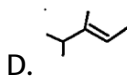




B.

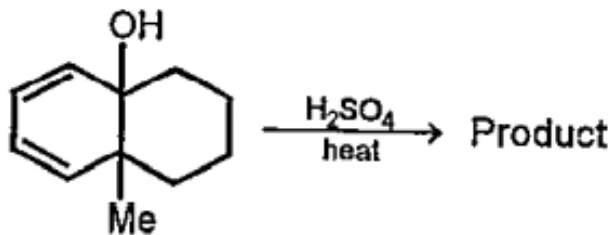


C.



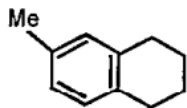
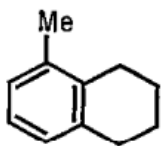
Answer: B

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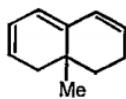


484.

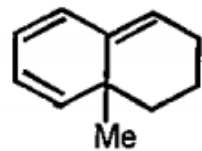
The expected major product may be



B.



C.

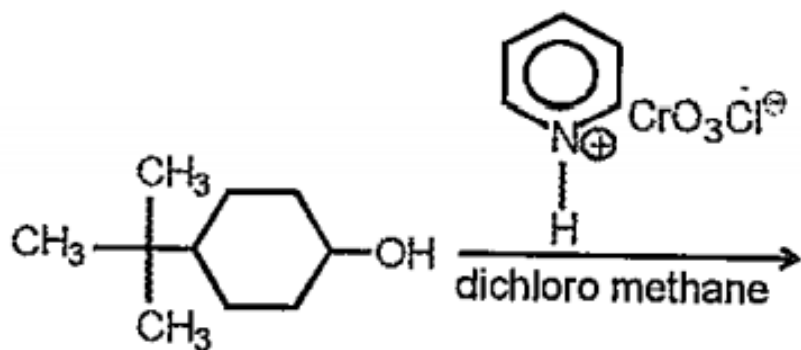


D.

**Answer: A**

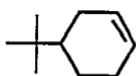


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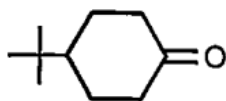


485.

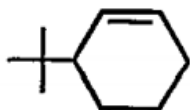
?



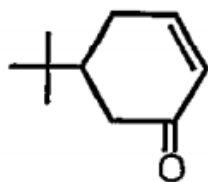
A.



B.



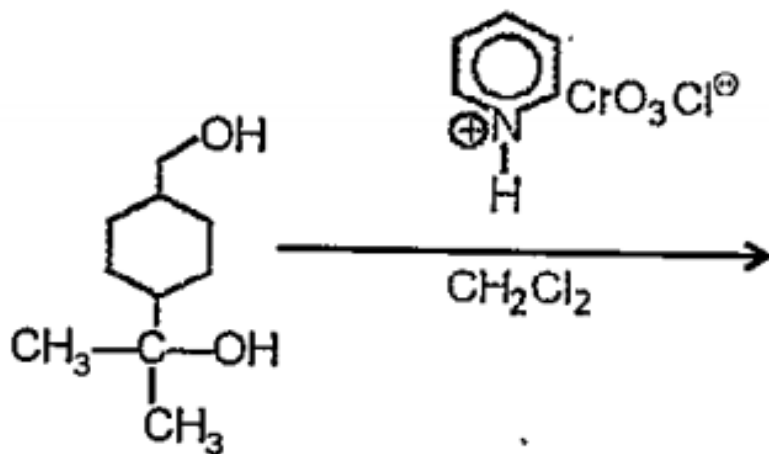
C.



D.

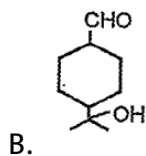
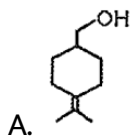
Answer: B

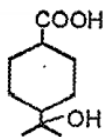
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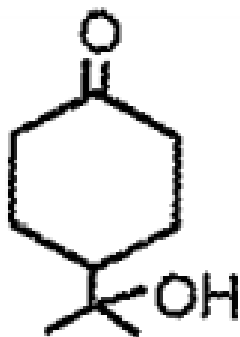
486.

?





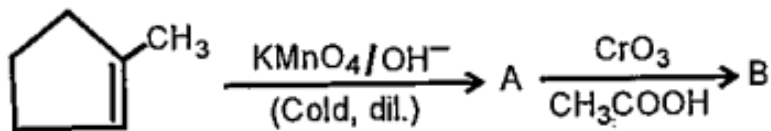
C.



D.

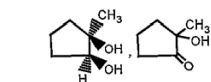
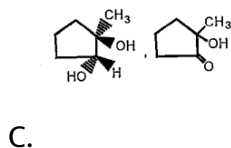
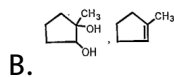
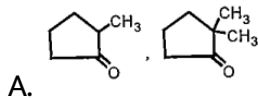
Answer: B

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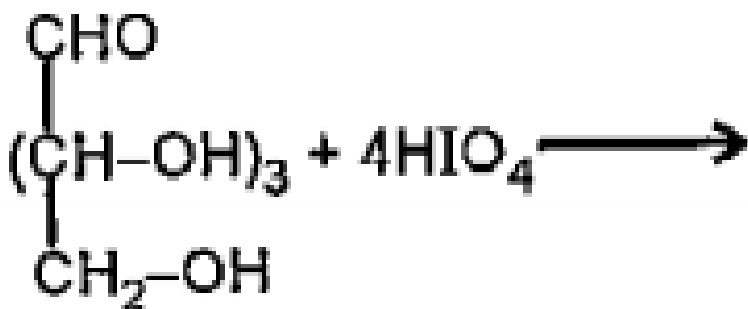
487.

Compound (A) and (B) are respectively



Answer: D

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488.

Products obtained are

A.  $4\text{HCO}_2\text{H}$ ,  $\text{HCHO}$

B.  $4\text{CH}_2\text{O}$ ,  $\text{HCO}_2\text{H}$

C.  $\text{CO}_2$ ,  $\text{HCHO}$

D.  $\text{CO}_2$ ,  $\text{HCO}_2\text{H}$ ,  $\text{HCHO}$

**Answer: A**

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**489.** One mole of glycerol is treated with an excess of  $\text{HIO}_4$ . The number of moles of  $\text{HIO}_4$  consumed and the product are respectively

A. 2 mol,  $\text{HCHO}$  (2 mol) and  $\text{HCOOH}$  (1 mol)

B. 3 mol,  $\text{HCHO}$  (3 mol)

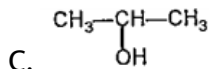
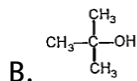
C. 2 mol,  $\text{HCHO}$  (1mol) and  $\text{HCOOH}$  (2 mol )

D. 3 mol,  $\text{HCOOH}$ (3 mol)

**Answer: A**

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490. Which of the following alcohols form white with Lucas reagent at warming condition?



D. all of these

Answer: D

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491. The Lucas test is used to distinguish  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols. The alcohol to be tested is added to a solution of anhydrous  $ZnCl_2$  in conc.



HCl at room temperature. Which of the following statements is not correct?

- A.  $1^\circ$  - alcohols dissolve, but do not react
- B.  $3^\circ$  -alcohols react quickly to give an insoluble alkyl chloride
- C.  $3^\circ$  -alcohols rapidly dehydrate and the gaseous alkene bubbles out of the test solution
- D.  $2^\circ$  -alcohols dissolve and react slowly to give an insoluble alkyl chloride

**Answer: C**



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492.  $R - OH \xrightarrow{P + I_2} \xrightarrow{AgNO_2} \xrightarrow[\text{(ii) alkali}]{\text{(i) } HNO_2}$  blue colour. Which of the following is R-OH?

- A. Primary

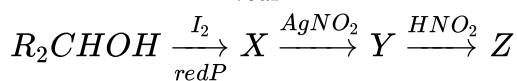
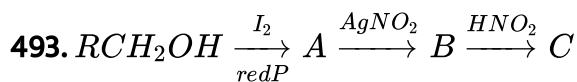
B. Secondary

C. Tertiary

D. Any of these

**Answer: B**

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A. red and blue

B. blue and red

C. blue in both case

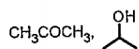
D. red in both case

**Answer: C**

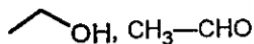
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494. An unknown organic compound [X] on treatment with  $K_2Cr_2O_7/H^+$  gives another unknown compound Y which has only C's, H's and oxygen. (X) given blue colour in Victor Meyer Test. [X] and [Y] are respectively

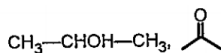
A.  $CH_3OH, HCOOH$



B.



C.



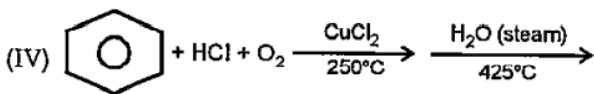
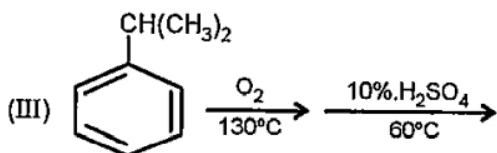
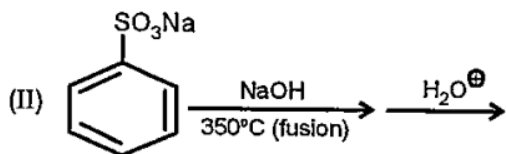
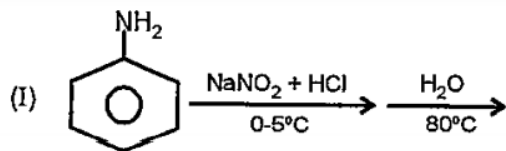
D.

Answer: D



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495. In which of the following reactions the final product is phenol?



A. I and III only

B. II and IV only

C. I, III and IV only

D. I, II, III and IV

Answer: D



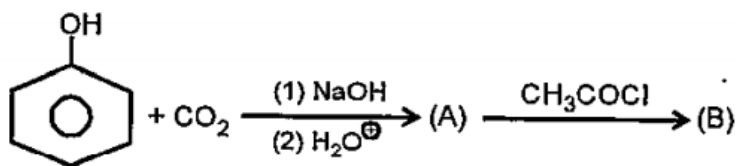
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496. The Conversion of m-nitrophenol to resorcinol involves respectively

- A. hydrolysis, diazotization and reduction
- B. diazotization, reduction and hydrolysis
- C. hydrolysis, reduction and diazotization
- D. reduction, diazotization and hydrolysis

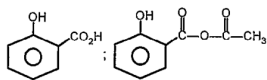
Answer: D

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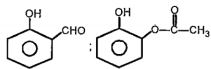


497.

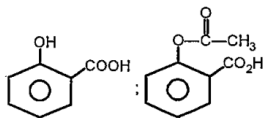
Products (A) and (B) are respectively



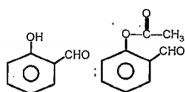
A.



B.



C.



D.

**Answer: C**

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498. Chlorobenzene  $\xrightarrow[X]{\text{Reaction}}$  Phenol  $\xrightarrow[Y]{\text{Reaction}}$  Salicylaldehyde

X and Y reactions are respectively

A. Fries rearrangement and Kolbe-Schmitt

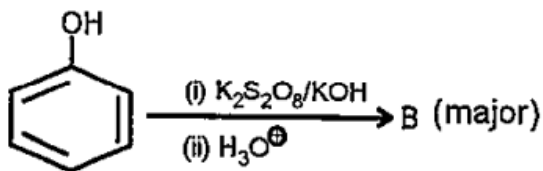
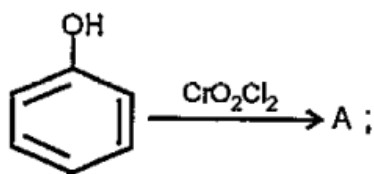
B. Cumene and Reimer-Tiemann

C. Dow and Reimer-Tiemann

D. Dow and Friedel -Craft

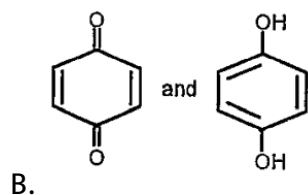
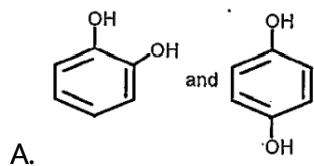
Answer: C

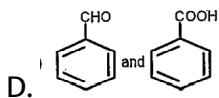
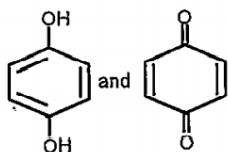
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499.

compound A and B are respectively

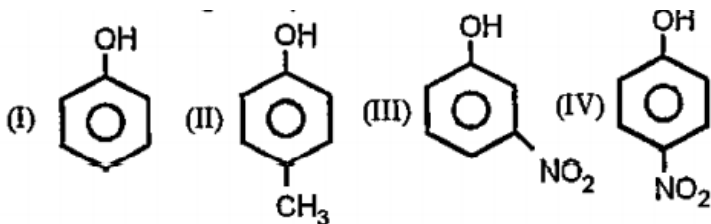




Answer: B

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500. In the following, the order of acidity is



A.  $III > IV > I > II$

B.  $I > IV > III > II$

C.  $II > I > III > IV$

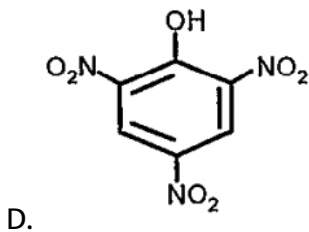
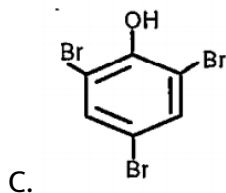
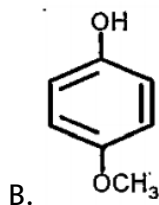
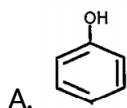
D.  $IV > III > I > II$



Answer: D

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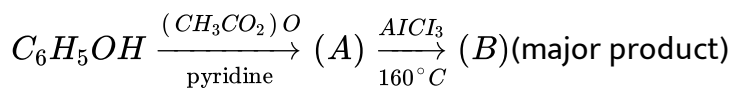
501. Which of the following compounds released  $CO_2$  from  $NaHCO_3$  solution?



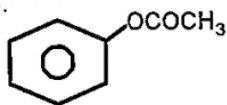
Answer: D

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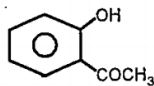
502. Consider the following sequence of reactions



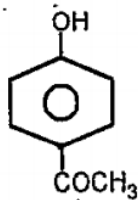
The product (B) is



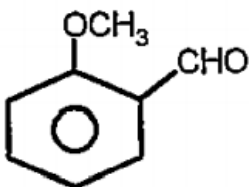
A.



B.



C.

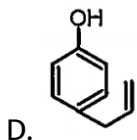
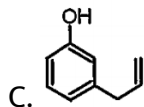
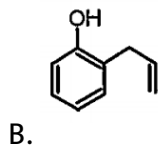
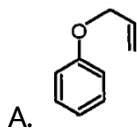


D.

Answer: B

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503. When phenol is refluxed with allyl bromide in acetone solution in the presence of anhydrous potassium carbonate a product may be isolated which, on heating to  $200^{\circ}\text{C}$  is converted mainly to



Answer: B

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**504.** Which of the following alcohols gives the best yield of dialkyl ether on being heated with a trace of sulphuric acid?

- A. 2-pentanol
- B. cyclopentanol
- C. 2-methyl-2-butanol
- D. 1-pentanol

**Answer: D**



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**505.** Williamson synthesis is an example of

- A. Nucleophilic addition
- B. Nucleophilic substitution

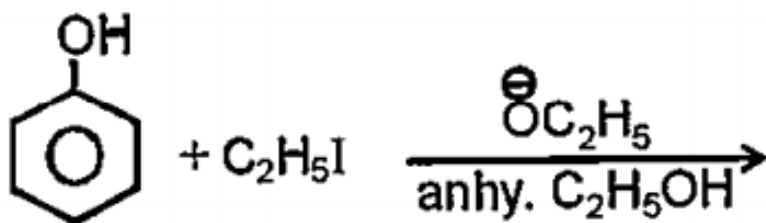
C. Electrophilic addition

D. Electrophilic substitution

Answer: B

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506. Complete the following reaction



A.  $C_6H_5OC_2H_5$

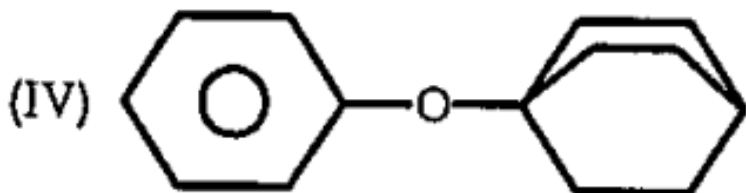
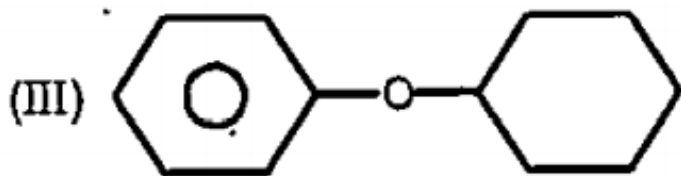
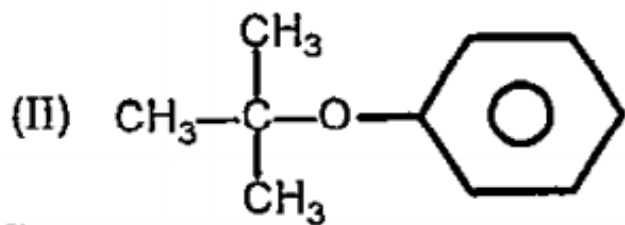
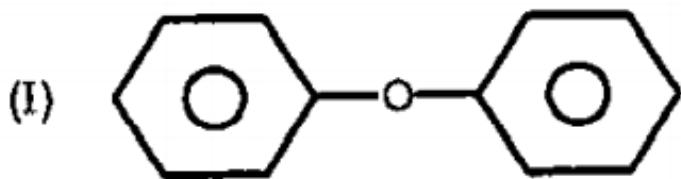
B.  $C_2H_5 - O - C_2H_5$

C.  $C_6H_5OC_6H_5$

D.  $C_6H_5I$

Answer: A

507. Which of the following ethers is/are not prepared by Williamson's synthesis ?



- A. only I and II
- B. only I, III and IV
- C. only I, II and III
- D. I, II, III and IV

**Answer: B**

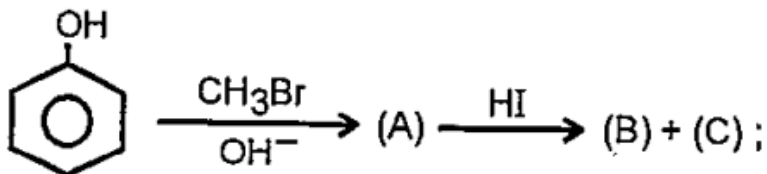
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**508.** Which of the following is correct about the ether?

- A. diethyl ether has zero dipole moment
- B. dimethyl ether is highly soluble in water
- C. dimethyl ether and ethyl methyl ether are yellow colour liquid at ordinary temperature
- D. The bond angle of C-O-C in ether is lower than the bond angle of H-O-H in water

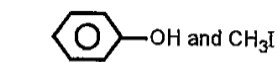
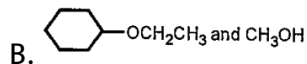
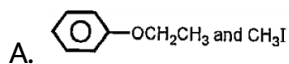
Answer: B

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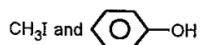


509.

(B) turns neutral  $\text{FeCl}_3$  violet. (B) and (C) are respectively



C.

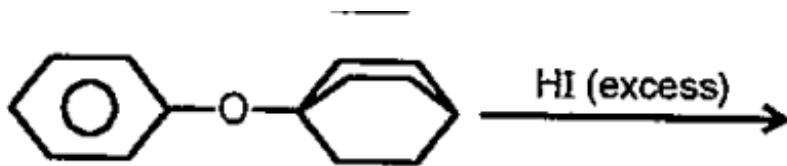


D.

Answer: C

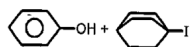
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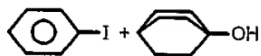


510.

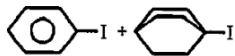
The products are respectively



A.



B.



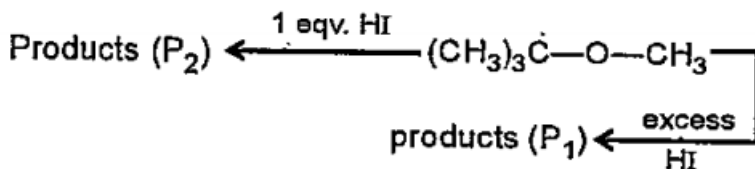
C.

D. None of these

**Answer: D**

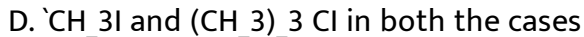
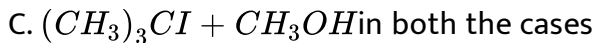


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511.

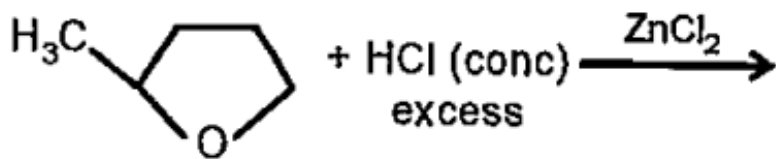
Products  $P_1$  and  $P_2$  respectively are



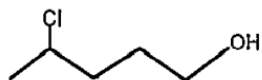
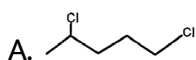
**Answer: A**

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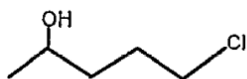
512. For the reaction



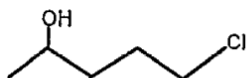
The product obtained is



B.



C.



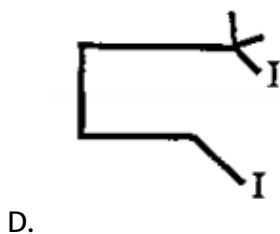
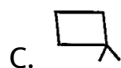
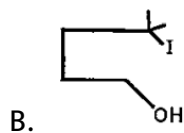
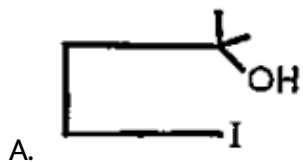
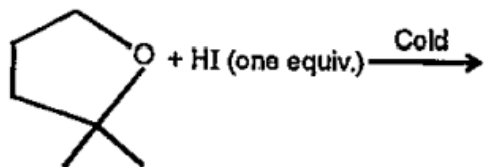
D.

**Answer: A**



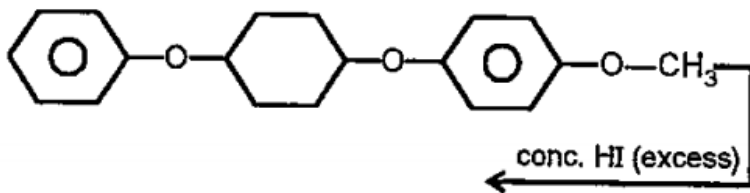
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513. The major product of the following reaction is is



Answer: B

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x moles of of HI is consumed. The value of x is

A. 2

B. 3

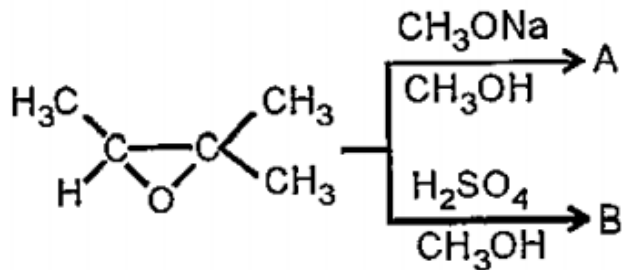
C. 5

D. 6

**Answer: B**

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515. Consider the following reactions



and choose the correct answer

A. A and B are both 3-methoxy-3-methyl-butan-2-ol

B. A and B both are 3-methoxy-2-methyl-butan-2-ol

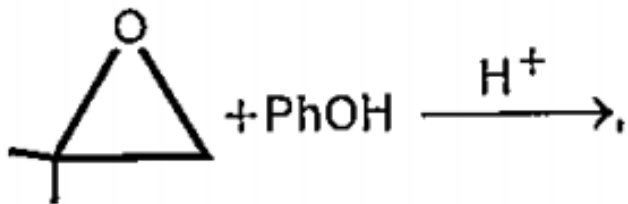
C. A is 3-methoxy-2-methyl-2-butan-2-ol and B is 3-methoxy-3-methyl-butan-2-ol

D. A is 3-methoxy-3-methyl-butan-2-ol and B is 3-methoxy-2-methyl-butan-2-ol

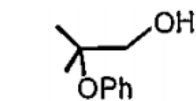
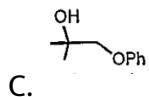
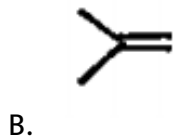
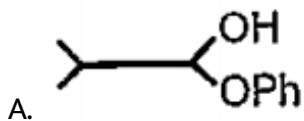
**Answer: C**

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516. In the reaction



the products is



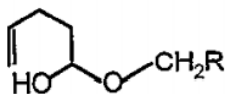
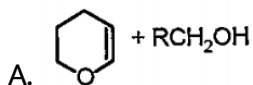
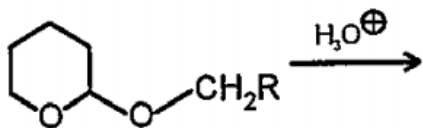
D.

Answer: D

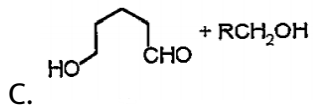


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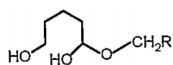
517. The major product formed in the reaction is



B.



C.



D.

Answer: C



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518. (I)1,2-dihydroxybenzene

(II)1,3-dihydroxybenzene

(III)1,4-dihydroxybenzene

(IV)Hydroxybenzene

The increasing order of boiling points of the above mentioned compounds is

A.  $I < II < III < IV$

B.  $I < II < IV < III$

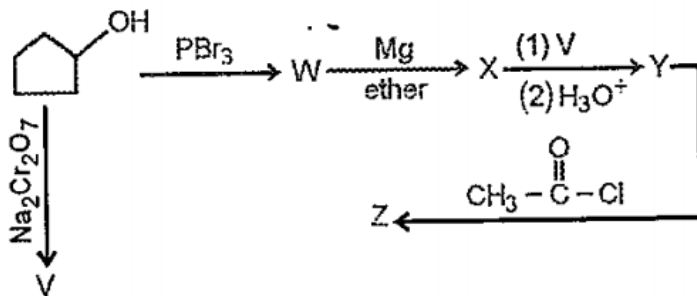
C.  $IV < I < II < III$

D.  $IV < II < I < III$

**Answer: C**

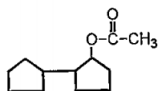


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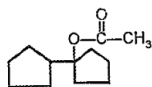


519.

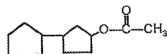
Product Z of above reaction is



A.



B.



C.



D.

Answer: B



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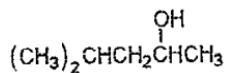
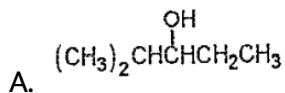
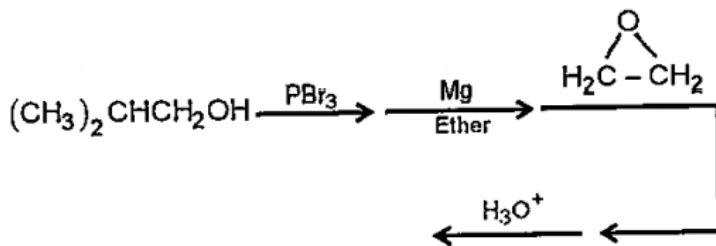
520. 0.092 g of a compound with the molecular formula  $C_3H_8O_3$  on reaction with an excess of  $CH_3MgI$  gives 67.00 mL Of methane at STP. The number of active hydrogen atoms present in a molecule of the compound

- A. one
- B. two
- C. three
- D. four

**Answer: C**

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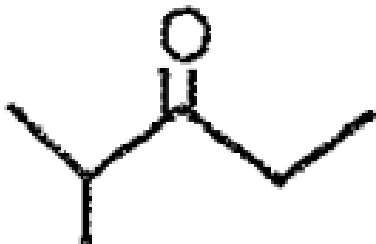
521. What is the major organic final product of the following sequence of reactions ?



Answer: D

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522. Which sequence of steps describes the best synthesis of 2-methyl-3-pentanone?



A. (a) 1-propanol +  $(CH_3)_2CHMgBr$ , diethyl ether

(b)  $H_3O^+$

(c)  $PCl_5$ ,  $CH_2Cl_2$

B. (a) 1-propanol +  $Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$  heat

(b)  $SOCl_2$

(c)  $(CH_3)_2CHCl$ ,  $AlCl_3$

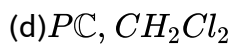
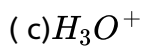
C. (a) 1-Propanol +  $PCC$ ,  $CH_2Cl_2$

(b)  $(CH_3)_2CHLi$ , diethylether (c)  $H_3O^+$  (d)

$Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$ , heat

D. (a) 2-Propanol +  $Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$  heat

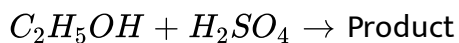
(b)  $CH_3CH_2CH_2Li$  diethyl ether



**Answer: C**

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**523.** Consider the following reaction,



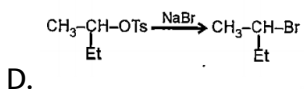
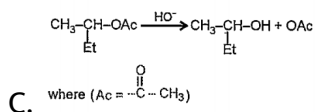
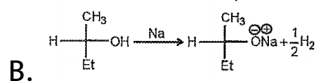
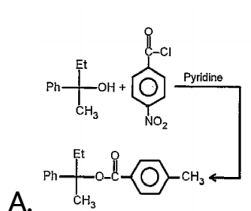
Among the following which one cannot be formed as a product under any conditions?

- A. Ethyl hydrogen sulphate
- B. Ethylene
- C. Acetylene
- D. Diethyl ether

**Answer: C**

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524. In which of the following reactions inversion of configuration takes place?

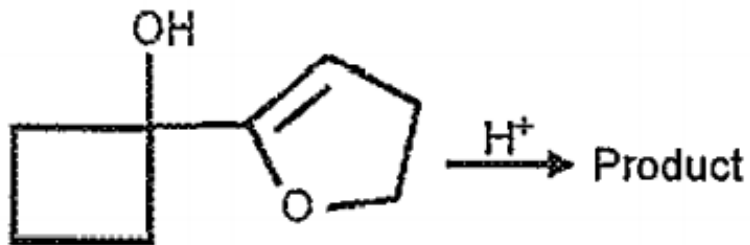


Answer: D

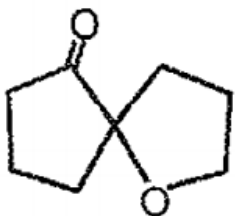


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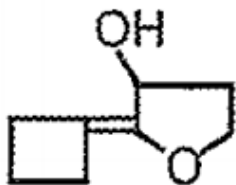
525. Identify the major product,



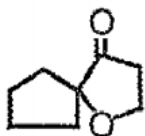
A.



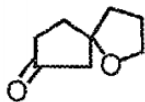
B.



C.



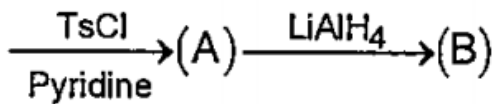
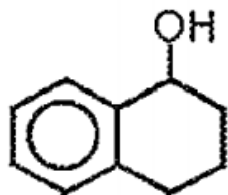




D.

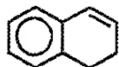
Answer: A

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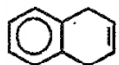


526.

Product (B) of the above reaction is



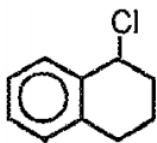
A.



B.



C.



D.

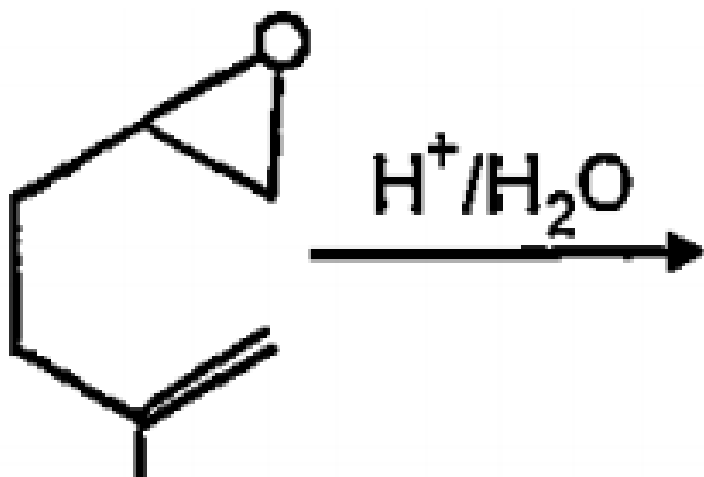
**Answer: C**

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527. Two aromatic compounds having formula  $C_7H_8O$  which are easily identifiable by  $FeCl_3$  solution test (Violet colouration) are

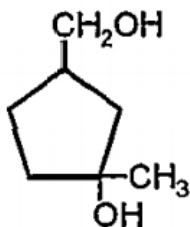
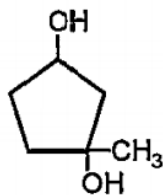
- A. o-cresol and benzyl alcohol
- B. m-cresol and p-cresol
- C. o-cresol and p-cresol
- D. methyl phenyl ether and benzyl alcohol

**Answer: A**

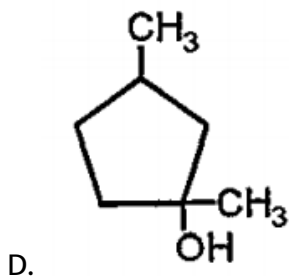
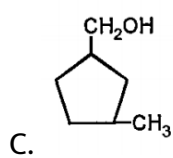


528.

Here the major product is

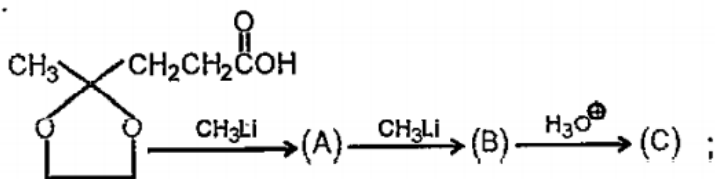


B.



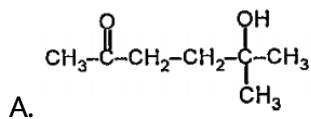
Answer: B

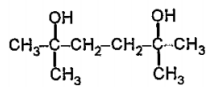
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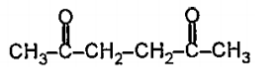
529.

Product (C) of the above reaction is

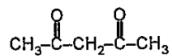




B.



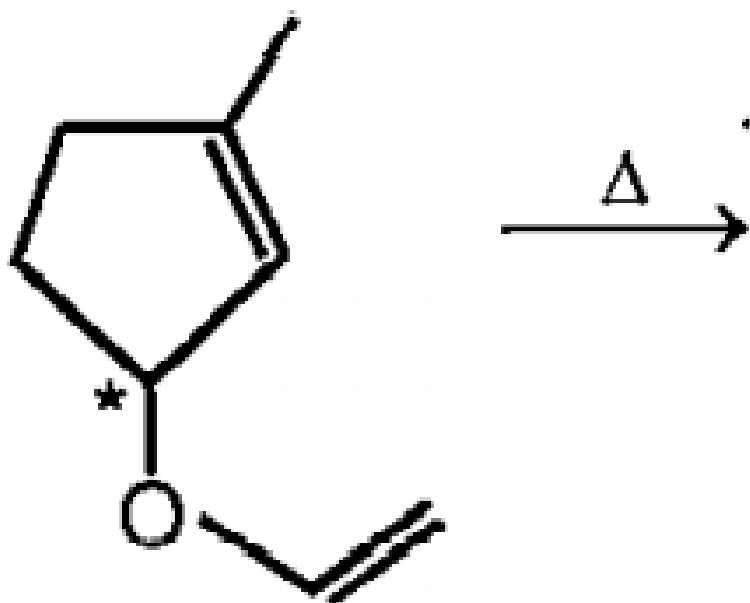
C.



D.

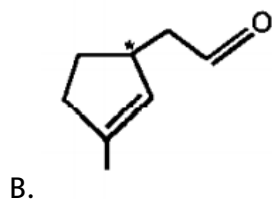
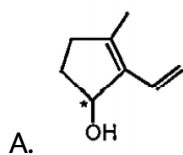
**Answer: C**

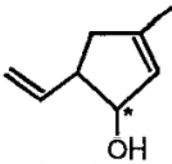
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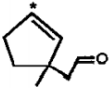
530.

Major product of the above rearrangement reaction is





C.

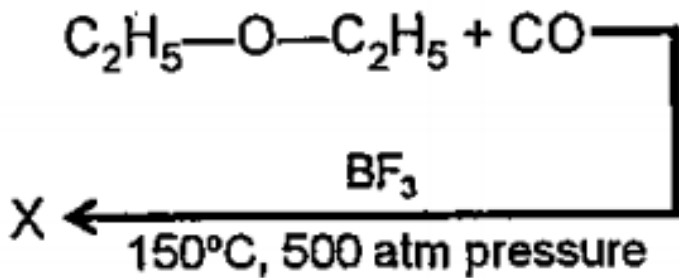


D.

Answer: D

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531. In the reaction,



What is (X)?

A. diethyl carbonate

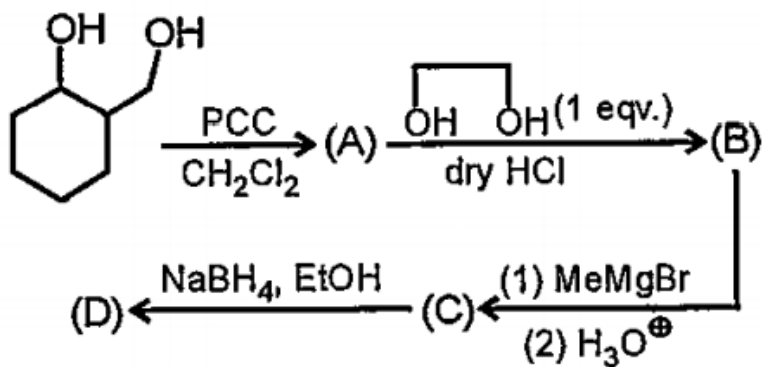
B. ethyl carbonate

C. diethyl peroxide

D. ethyl propionate

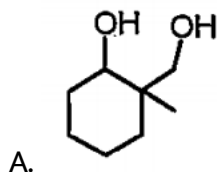
Answer: D

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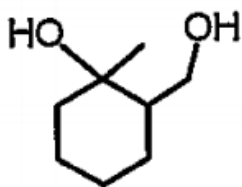


532.

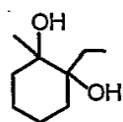
Here product D is



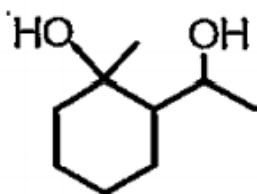




B.



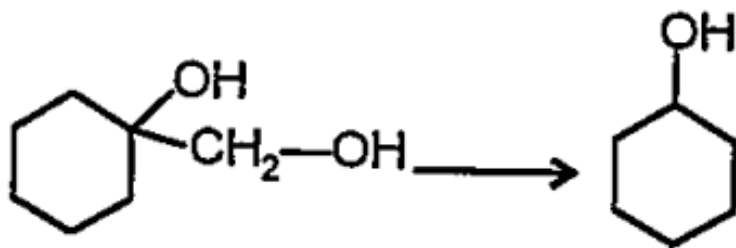
C.



D.

Answer: B

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533.

This transformation can be carried out by

A.  $H^+ \Delta, Zn(Hg)HCl$

B.  $HIO_4, LiAlH_4 / H_2O$

C.  $HIO_4, H^+ / \Delta$

D.  $H^+ / \Delta, HIO_4$

**Answer: B**

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**534.** Compound (A) molecular formula  $C_5H_{12}O$  is optically active and is oxidized by PCC in  $CH_2Cl_2$  to an optically active  $C_5H_{10}O$  product, which is racemized in acid or base. The compound (A) may be

A. 2-pentanol

B. 2-methoxybutane

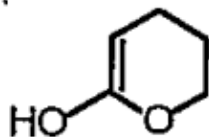
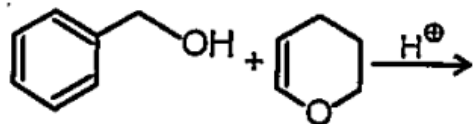
C. 2-methyl-1-butanol

D. 3-methyl-1-butanol

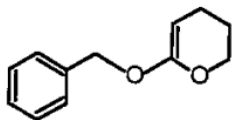
Answer: C

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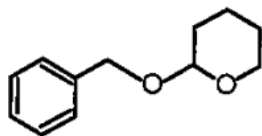
535. Predict the major product of the following reaction



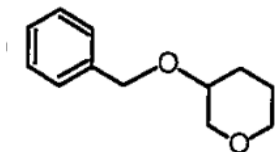
A.



B.



C.

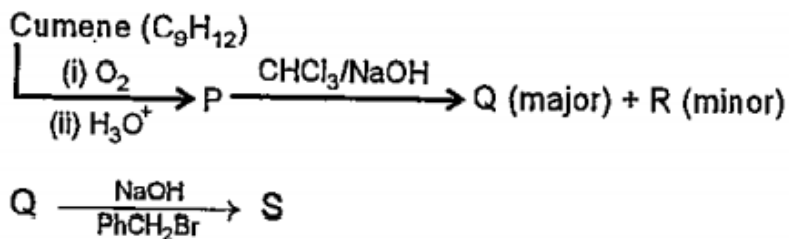


D.

Answer: C

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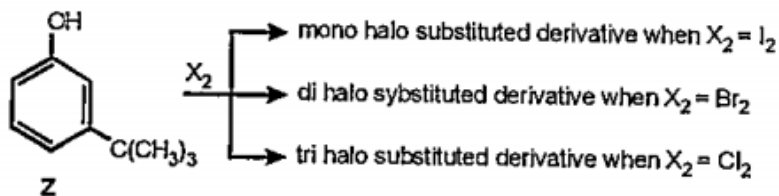
536. The correct statement(s) about the following reaction sequence is (are)



- (1) R is steam volatile
- (2) Q gives dark violet coloration with 1 % aqueous  $FeCl_3$  solution
- (3) S gives yellow precipitate with 2,4-dinitrophenylhydrazine
- (4) S gives dark violet coloration with 1 % aqueous  $FeCl_3$  solution

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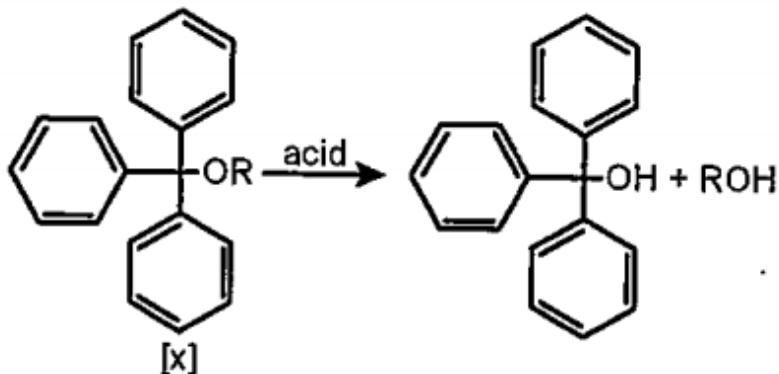
537. The reactivity of compound Z with different halogens under appropriate conditions is given below



- (1) the steric effect of the halogen
- (2) the steric effect of tert-butyl group
- (3) the electronic effect of the phenolic group
- (4) the electronic effect of the tert-butyl group

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538. The acidic hydrolysis of ether (X) shown below is fastest when



- A. One phenyl group is replaced by a methyl group.
- B. One phenyl group is replaced by a para methoxyphenyl group.
- C. Two phenyl groups are replaced by two para methoxyphenyl groups.
- D. No structural change is made to X.

Answer: C

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539. For the identification of  $\beta$  naphthol using dye test, it is necessary to use

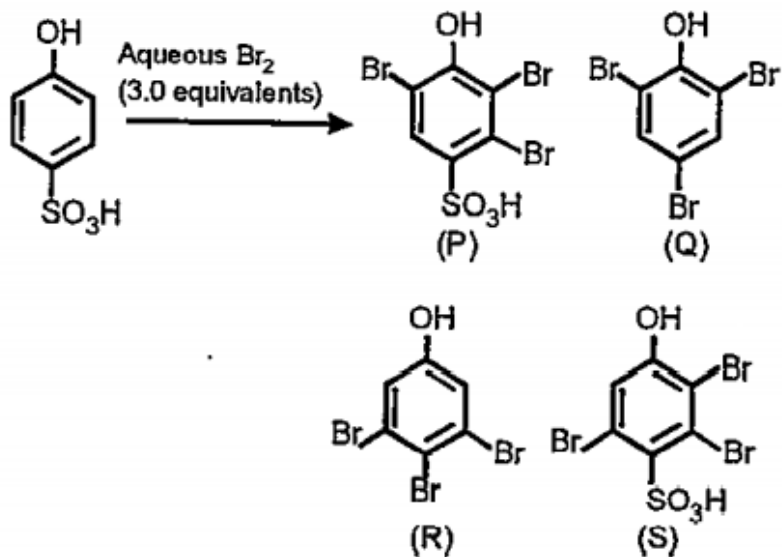
- A. dichloromethane solution of  $\beta$  -naphthol.
- B. acidic solution of  $\beta$ -naphthol.
- C. neutral solution of  $\beta$ -naphthol.
- D. alkaline solution of  $\beta$ -naphthol.

**Answer: D**



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540. The major product(s) of the following reaction is (are)



A. P

B. Q

C. R

D. S

Answer: B

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**541.** An unknown alcohol is treated with the "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest and by what mechanism?

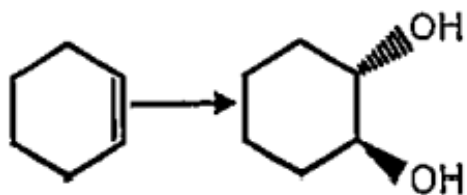
- A. Secondary alcohol by SN1
- B. Tertiary alcohol by SN2
- C. Secondary alcohol by SN2
- D. Tertiary alcohol by SN1

**Answer: D**



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**542.** Which of the following reagents can be used to carry out the following transformation?



A.  $OsO_4 / NaHSO_3$

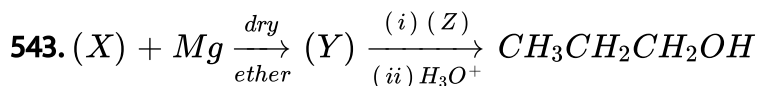
B. Cold aq  $KMnO_4$

C.  $CH_3COOH / H_2O_2 / H_3O^+$

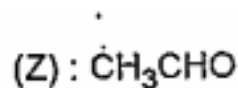
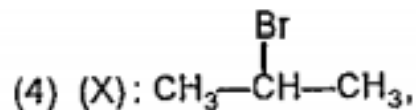
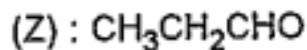
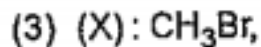
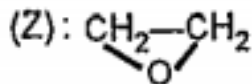
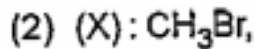
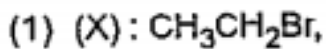
D. *m* - CPBA /  $H_3O^+$

Answer: C::D

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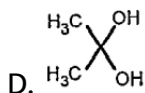
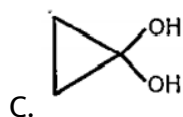
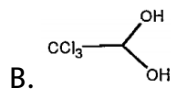
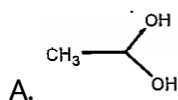


Identify (X) and (Z) in the above sequence of reaction



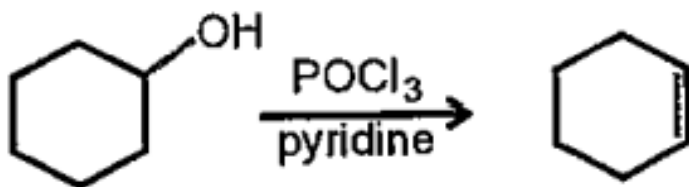
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544. Among the given geminal diols, which is/are stable with respect to their corresponding carbonyls?



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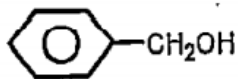
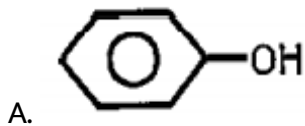
545. Dehydration of alcohols take place more rapidly with  $\text{POCl}_3$  than with  $\text{H}_2\text{SO}_4$ . Select correct statement(s) about the following dehydration reaction



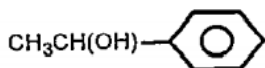
- A. It does not involve carbocation
- B. It involves  $R - \text{OPOCl}_2$  with  $-\text{OPOCl}_2$  as a better leaving group
- C. It involves E2 mechanism as pyridine base abstracts proton from the adjacent carbon at the same time at which  $-\text{OPOCl}_2$  is leaving
- D. It is E1 reaction without formation of carbocation

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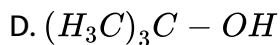
546. Which of the following alcohols turn(s)  $CrO_3$  in  $H_2SO_4$  into green?



B.



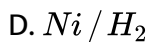
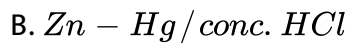
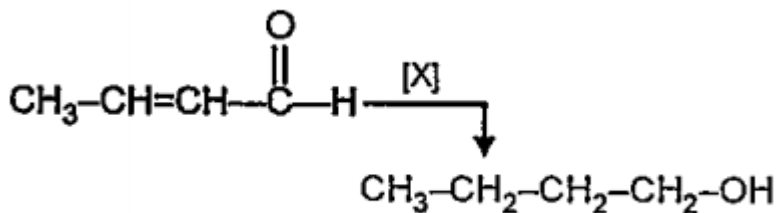
C.



Answer: B::C

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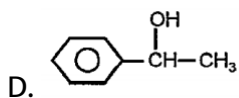
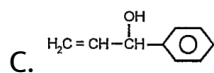
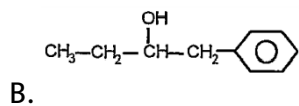
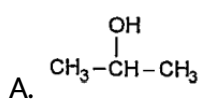
547. Complete the following reaction



Answer: C::D

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548. Which of the following alcohols respond(s) to iodoform test?



Answer: A:D

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549. Ethanol is less acidic than

A. Acetic acid

B. Water

C. Phenol

D. p-nitrophenol

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



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**550.** Phenol is less acidic than

- A. acetic acid
- B. p-methoxyphenol
- C. p-nitrophenol
- D. ethane

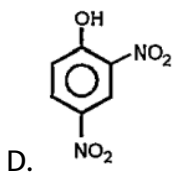
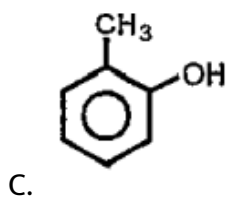
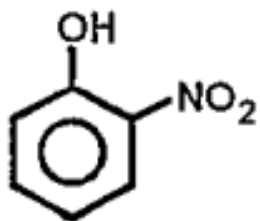
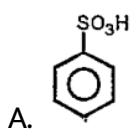
**Answer: A::C**



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**551.** Which of the following compounds is/are soluble in  $NaHCO_3$ ?



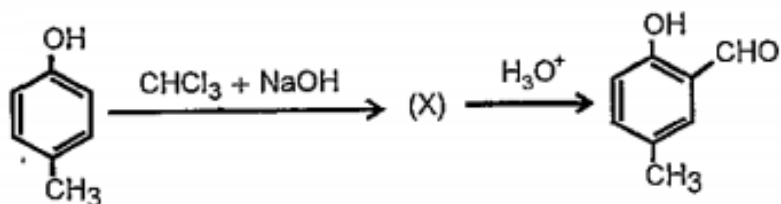


**Answer: A::D**

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**552.** Reimer Tiemann introduces an aldehyde group on to the aromatic ring of phenol, ortho to the hydroxyl group. This reaction involves

electrophilic aromatic substitution. This is a general method for the synthesis of substituted salicylaldehydes as depicted below.



The electrophile in this reaction is

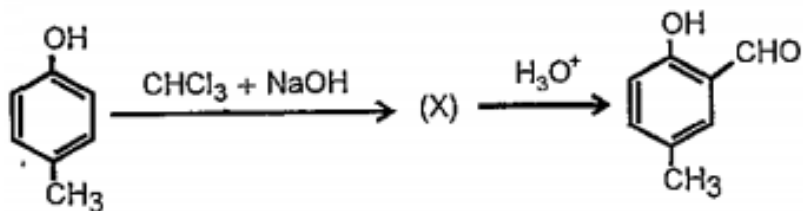
- A.  $:\text{CHCl}$
- B.  $:\text{ }^+(\text{CHCl})_2$
- C.  $:\text{CCl}_2$
- D.  $:\text{CCl}_3$

**Answer: C**

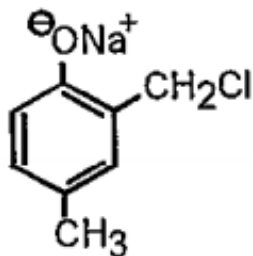
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**553.** Reimer Tiemann introduces an aldehyde group on to the aromatic ring of phenol, ortho to the hydroxyl group. This reaction involves

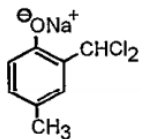
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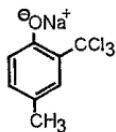
The structure of the intermediate (X) is



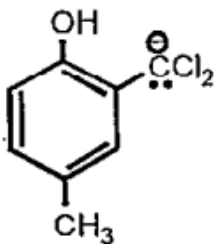
A.



B.



C.



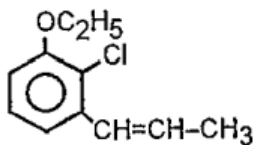
D.

**Answer: B**

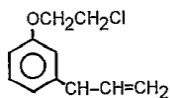
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**554.** Two isomeric forms of an organic compound A,  $C_{11}H_{13}OCl$  readily decolourise  $Br_2/H_2O$  and give same compound (B) on catalytic hydrogenation. Both the isomeric forms on vigorous oxidation give (c) which on treatment with soda lime gives 2-chloroethoxy benzene. However, (C) on treatment with Ni/Al alloy in alkaline medium gives 3-ethoxybenzoic acid. Only one of the isomers of (A) gives geometrical isomer D and E.

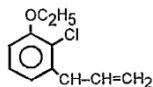
The structural formula of (A) is



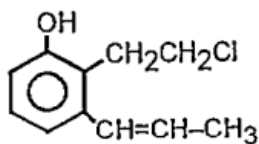
A.



B.



C.



D.

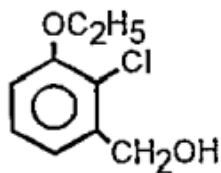
**Answer: A**

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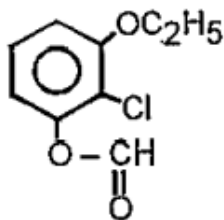
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However, (C) on treatment with Ni/Al alloy in alkaline medium gives 3-ethoxybenzoic acid. Only one of the isomers of (A) gives geometrical isomer D and E.

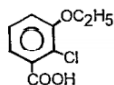
The structural formula of (A) is



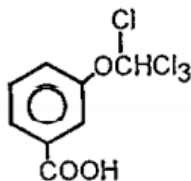
A.



B.



C.

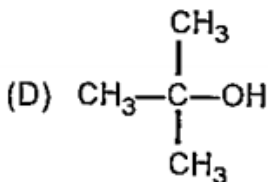
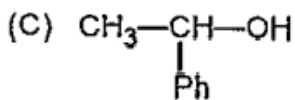
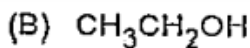
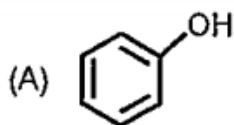


D.

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556. Match column-1 with Column-II

Column - I



Column - II

(P) White turbidity with  
 $\text{HCl}/\text{ZnCl}_2$  at room temp

(Q) Violet colour with  $\text{FeCl}_3$

(R) Colour change of  
 $\text{Na}_2\text{Cr}_2\text{O}_7, \text{H}^+$

(S) No colour change of  
of  $\text{Cr}_2\text{O}_7^{2-} / \text{H}^+$

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557. A solution of sucrose (molar mass = 342g/mol) has been prepared by dissolving 68.5g of sucrose in 1000g of water. The freezing point of the solution obtained will be ( $K_f$  for water = 1.86 K kg/mol)

A. (a) -0.372 degree celcius

B. (b) -0.520 degree celcius

C. (c) +0.372 degree celcius

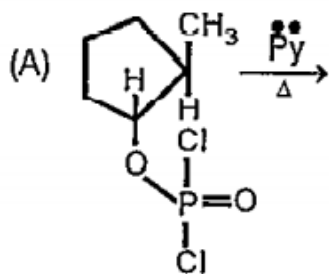
D. (d) -0.570 degree celcius

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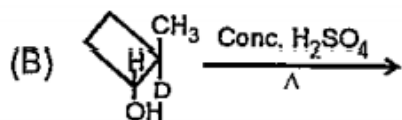
558. Match column-1 with Column-II

Column - I

Column - II

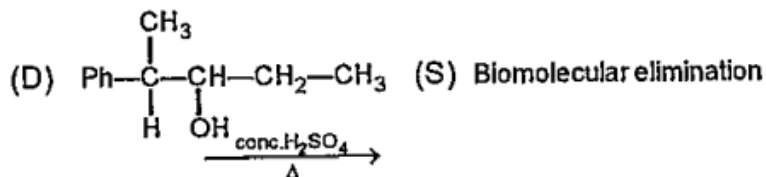
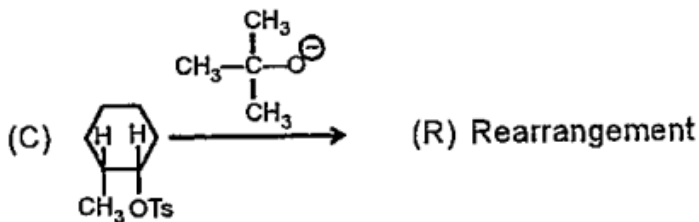


(P) Hofmann product



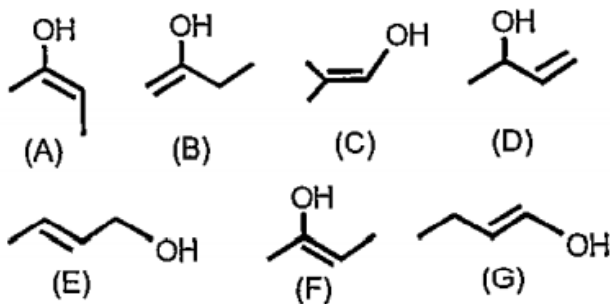
(Q) Saytzeff product





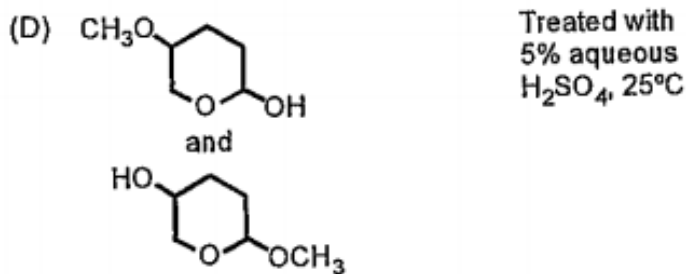
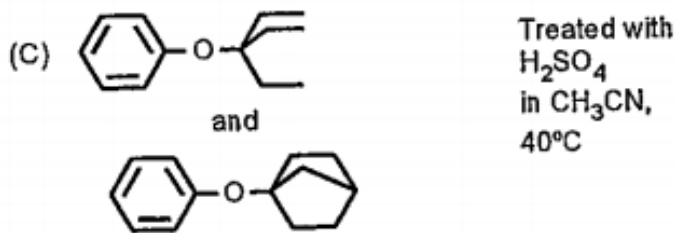
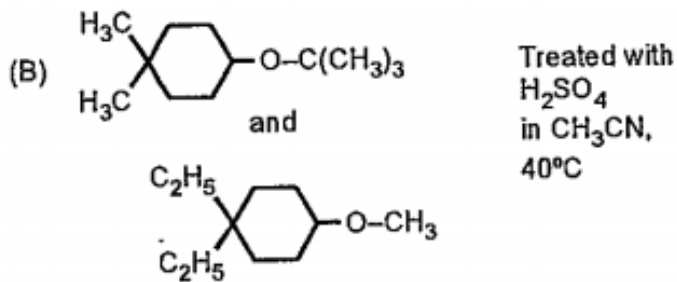
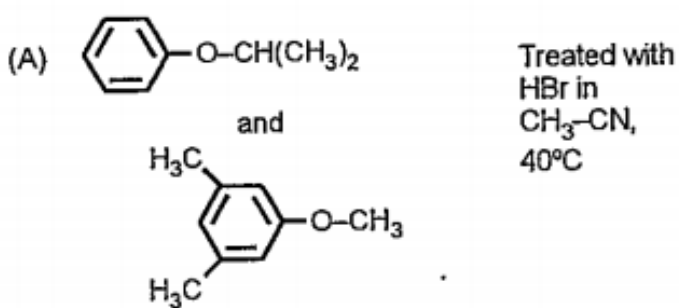
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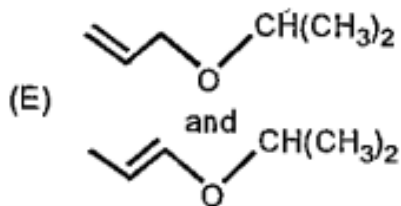
559. How many compounds A through G are enol tautomers of 2-butanone?



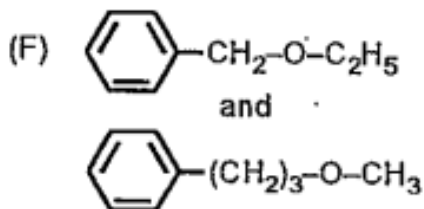
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**560.** Consider the pairs of ethers A to F shown below. To the right of each pair is a description of reaction conditions to be applied to each. One compound of the pair will react more rapidly than the other. Find out number of reactions in which first ether more rapidly cleaved than second.



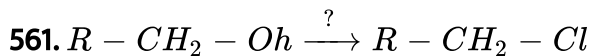


Treated with  
5% aqueous  
 $\text{H}_2\text{SO}_4$ ,  $25^\circ\text{C}$

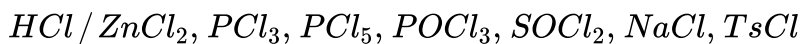


Treated with  
 $\text{H}^+ / \text{H}_2\text{O}$

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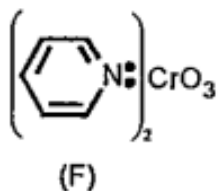
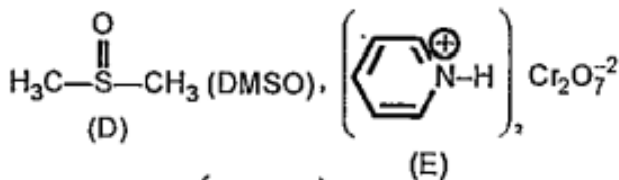
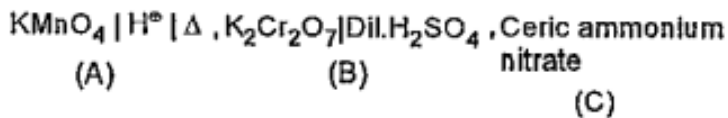


Find out number of reagents that can be used for above conversion, from following.



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562. Find out number of reagents that converts  $1^\circ$  alcohol to aldehyde.



---

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563. How many moles of  $\text{HI}$  reacts with glycerol to give 2 iodopropane?

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564. Compound X (Molecular formula,  $\text{C}_5\text{H}_8\text{O}$ ) does not react appreciably with Lucas reagent at room temperature but gives a precipitate with

ammoniacal silver nitrate. With excess of  $\text{MeMgBr}$ , 0.42g of X gives 224 ml of  $\text{CH}_4$  at STP. Treatment of X with  $\text{H}_2$  in presence of Pt catalyst followed by boiling with excess  $\text{HI}$ , gives n-pentane. Suggest structure of X and write the equations involved.

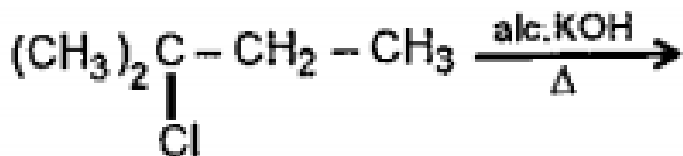
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565. How the following transformation can be carried out (in not more than six steps)?

"Ethyl alcohol to vinyl acetate".

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566. Write the structure of the major organic product expected from each of the following reactions:



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567. Write the structure of the major organic product expected from each of the following reactions:  $CH_3CH_2CHCl_2 \xrightarrow{aq. KOH}$

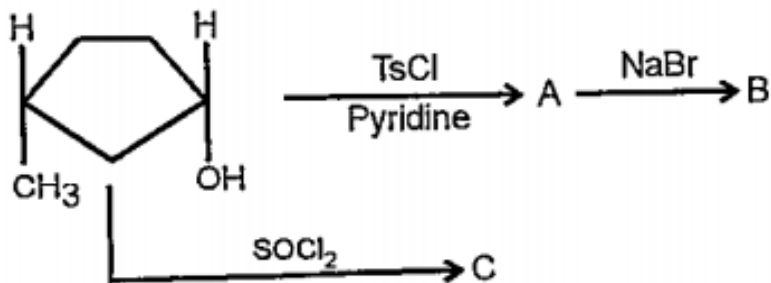
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568. Indicate steps which would convert :phenol to acetophenone

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569. Indicate steps which would convert :acetic acid to tert-butyl alcohol

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570.

What are A, B, and C compounds?

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571. Compound (A)  $C_7H_8O$  is insoluble in  $NaHCO_3$  solution but dissolves in sodium hydroxide and gives a characteristic violet colour with aqueous ferric chloride.

When treated with bromine water (A) forms a compound (B) of molecular  $C_7H_5OBr_3$ .

Give structural formulae of (A) and (B)

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572. Compound (A)  $C_7H_8O$  is insoluble in  $NaHCO_3$  solution but dissolves in sodium hydroxide and gives a characteristic violet colour with aqueous ferric chloride.

When treated with bromine water (A) forms a compound (B) of molecular  $C_7H_5OBr_3$ .

Give structural formulae of (A) and (B)

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573. Why di-tert-butyl ether cannot be obtained by Williamson's synthesis ?

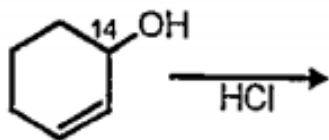
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574. 2,2 Dimethyl oxirane can be cleaved by acid ( $H^+$ ). Write mechanism.

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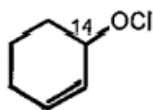
575. How many grams of concentrated nitric acid solution should be used to prepare 200 mL of 2.0 M  $HNO_3$ ? The acid is 70% concentrated.

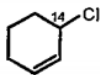
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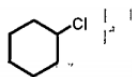
576.

possible product (s) is /are





C.

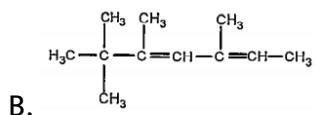
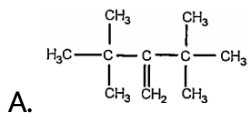
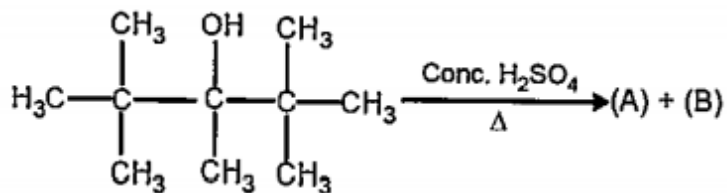


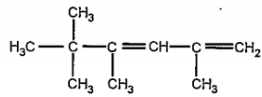
D.

Answer: A::C

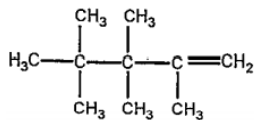
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577. Predict the products (A) and (B) in the following reaction .





C.



D.

Answer: A::D

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578. Of the following 0.10 m aqueous solutions, which one will exhibit the largest freezing point depression?

A. (a)  $KCl$

B. (b)  $C_6H_{12}O_6$

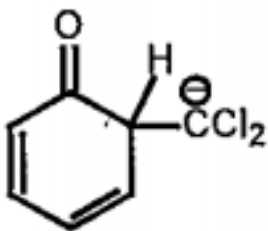
C. (c)  $K_4[Fe(CN)_6]$

D. (d)  $K_2SO_4$

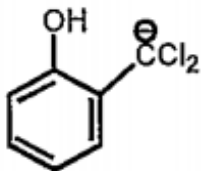
Answer: B::C



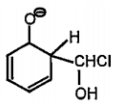
579. When phenol is reacted with  $CHCl_3$  and NaOH followed by acidification, salicylaldehyde is obtained. Which of the following species is/are involved in the above mentioned reaction as intermediate(s)?



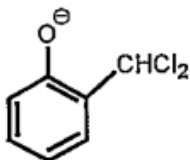
A.



B.



C.



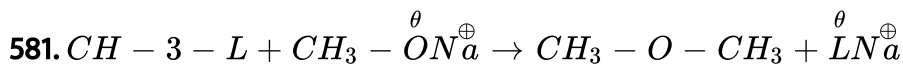
D.

Answer: A::D

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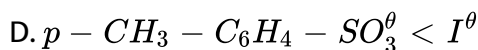
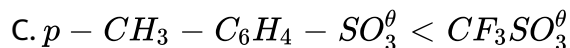
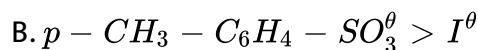
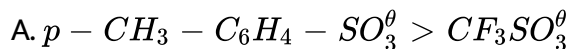
580. The number of electrons delivered at the cathode during electrolysis by a current of 1A in 60s is? (charge on electron= $1.60 \times 10^{-19}$  C)

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Where L is a leaving group.

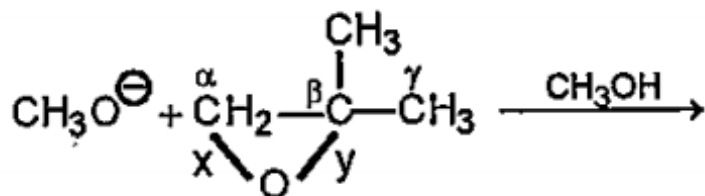
Which of the following statement(s) is /are true regarding the leaving tendency of the leaving group (L)?



Answer: B::C

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582. Select correct statement(s) for the following reaction:

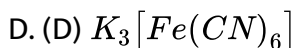
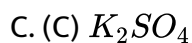
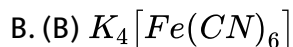
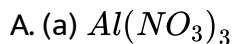


- A. Nucleophile attacks at  $\alpha$ -carbon and x -bond is cleaved
- B. Nucleophile attacks at  $\beta$ -carbon and y-bond is cleaved
- C. Nucleophile attacks at  $\alpha$ -carbon and y- bond is cleaved
- D. Nucleophile attacks  $\beta$ -carbon and x-bond is cleaved

Answer: A

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583. Which one of the following electrolytes has the same value of vant Hoff factor ( $i$ ) as that of  $Al_2(SO_4)_3$  (if all are 100% ionised)?



Answer: B::C

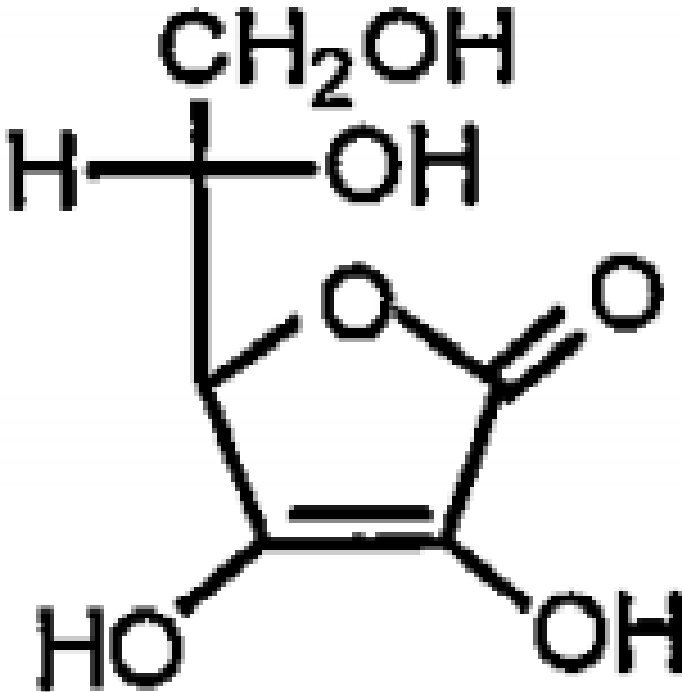
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584. 1.00 g of a non-electrolyte solute (molar mass 250g/mol) was dissolved in 51.2g of benzene. If the freezing point depression constant ,  $K_f$  of benzene is 5.12 K kg/mol, the freezing point of benzene will be lowered by:

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585. Humans, monkeys and guinea pigs do not have the enzymes necessary for the biosynthesis of vitamin C, so they

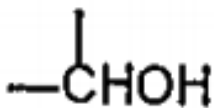


Must include

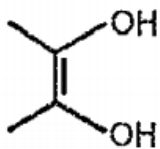
the vitamin in their diets. It is also required for the synthesis of collagen, which is the structural protein of skin, tendons, connective tissue and bone.

Although vitamin C does not have a carboxylic acid group, it is an acidic compound. Acidic character is shown by

A.  $-CH_2OH$  group



B.



C.

D. all of these

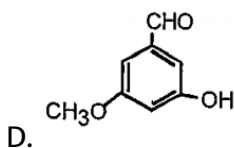
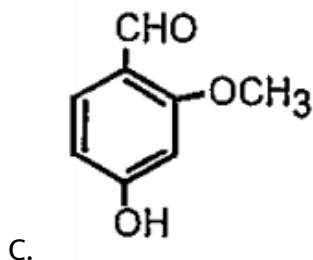
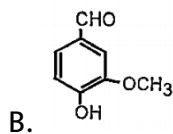
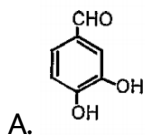
**Answer: C**



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**586.** Vanillin  $A[C_8H_8O_3]$  is isolated from vanilla beans. It gives intense blue colour with neutral  $FeCl_3$  and also gives +ve Tollen's test. It reacts with conc. HBr to give a compound B. One mole of vanillin gave one mole of AgI with Zeise's active methoxy estimations. Compound B on oxidation with Tollen's reagent gave a catechol derivative. Compound B can be prepared from catechol by Gattermann Koch reaction.

Vanillin structure should be



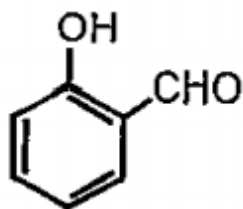
**Answer: B**

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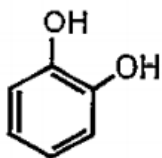
**587.** Vanillin  $A[C_8H_8O_3]$  is isolated from vanilla beans. It gives intense blue colour with neutral  $FeCl_3$  and also gives +ve Tollen's test. It reacts with conc. HBr to give a compound B. One mole of vanillin gave one mole

of AgI with Zeise's active methoxy estimations. Compound B on oxidation with Tollen's reagent gave a catechol derivative. Compound B can be prepared from catechol by Gattermann Koch reaction.

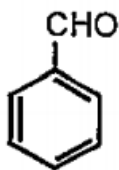
Compound B on heating with zinc dust will give



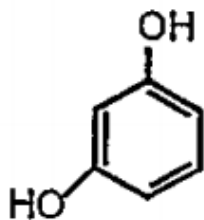
A.



B.



C.



D.

**Answer: C**



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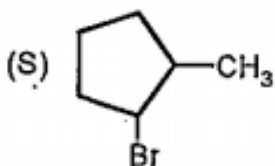
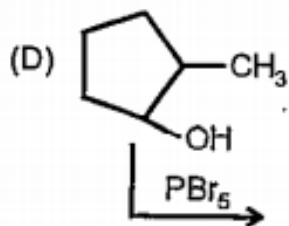
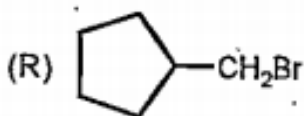
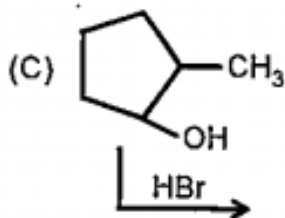
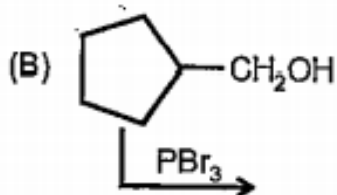
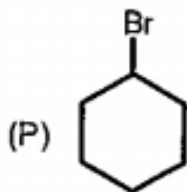
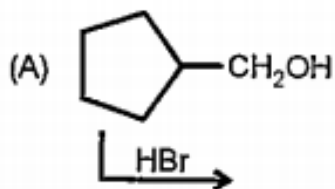
588. Match Column -1 with Column-11

Column-I

(Reaction)

Column-II

(Major product )



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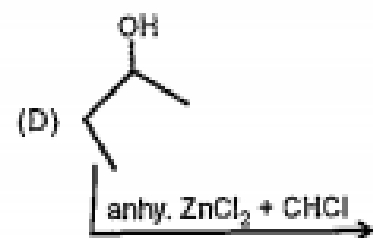
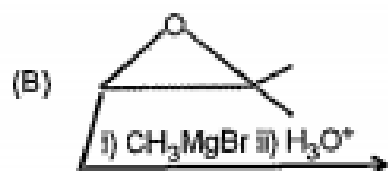
**589.** Suppose the elements  $X$  and  $Y$  combine to form two compounds  $XY_2$  and  $X_3Y_2$ . When 0.1 mole of  $XY_2$  weighs 10g and 0.05 mole of the other weighs 9g, the atomic weights of  $X$  and  $Y$  are.



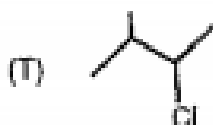
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590. Match Column -1 with Column-II

Column-I

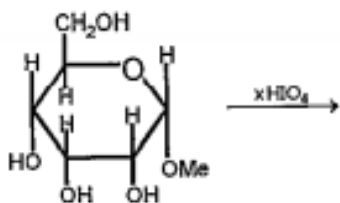


Column-II



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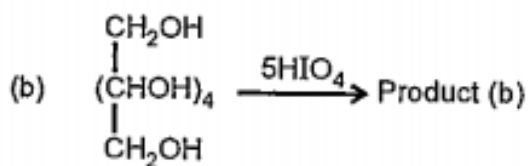
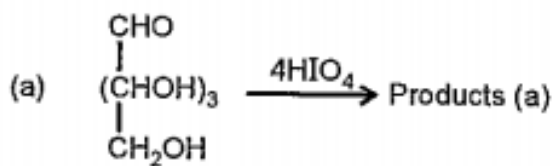


591.

What is the maximum value of  $x$ ?



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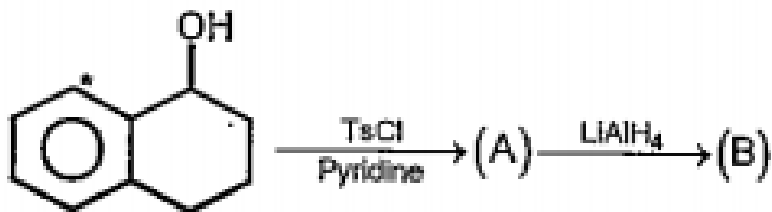


592.

What is the ratio of moles of formic acid obtained in reaction (a) and reaction (b)?



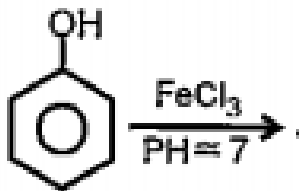
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593.

The degree of unsaturation of the final products is

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594.

A violet coloured complex of Fe(III) in which number of phenyl group(s) = x.

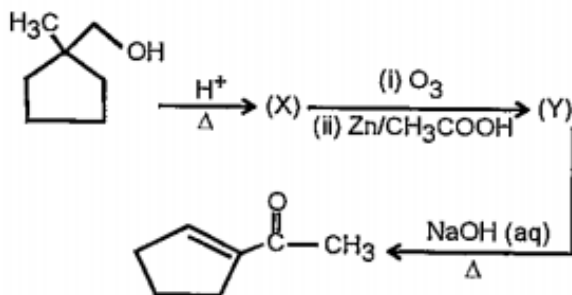
The value of x is

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595. 0.1 mole of a hydroxyl compound reacts with 62.5 g  $PCl_5$  (mol.wt.208.5) Determine the number of -OH groups

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596. Identify (X) and (Y) in the following reaction sequence.



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597. Compound X (Molecular formula,  $C_5H_8O$ ) does not react appreciably with Lucas reagent at room temperature but gives a precipitate with ammoniacal silver nitrate. With excess of  $MeMgBr$ , 0.42g of X gives 224 ml of  $CH_4$  at STP. Treatment of X with  $H_2$  in presence of Pt catalyst followed

by boiling with excess  $\text{HI}$ , gives n-pentane. Suggest structure of X and write the equations involved.

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**598.** Compound (A)  $\text{C}_7\text{H}_8\text{O}$  is insoluble in  $\text{NaHCO}_3$  solution but dissolves in sodium hydroxide and gives a characteristic violet colour with aqueous ferric chloride.

When treated with bromine water (A) forms a compound (B) of molecular  $\text{C}_7\text{H}_5\text{OBr}_3$ .

Give structural formulae of (A) and (B)

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**599.** When t-butanol and n-butanol are separately treated with a few drops of dilute  $\text{KMnO}_4$  in one case only, the purple colour disappears and a brown precipitate is formed. Which of the two alcohols gives the above reaction and what is the brown precipitate?

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**600.** An optically active alcohol  $A(C_6H_{10}O)$  absorbs two mole of hydrogen molecule per mole of A upon catalytic hydrogenation and gives a product B. The compound B is resistant to oxidation by  $CrO_3$  and does not show any optical activity. Deduce the structure of A and B.



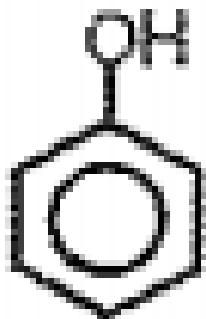
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**601.** Give reason for the following in one or two sentences. "Acid catalysed dehydration of t-butanol is faster than that of n-butanol".



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602. Convert



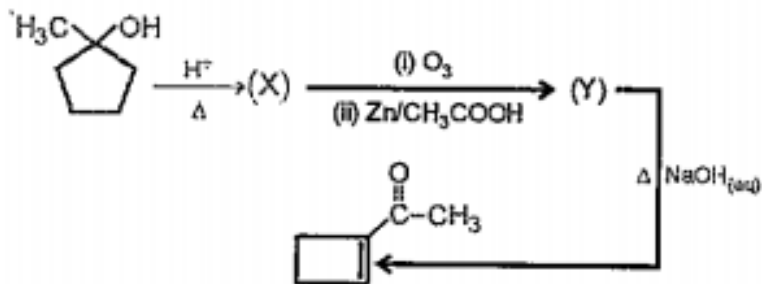
→ Aspirin

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603. An organic liquid (A) Having pleasant odour is hydrolysed to an acid (B) and alcohol (C). The acid (B) is ethanoic acid (C) on treating with HCl gives (D), oxidation of (C) yield benzoic acid. What are (A), (C) and (D)?

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604. Identify (X) and (Y) in the following reaction sequence.



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605. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: The boiling point of ethanol is much higher than that of diethyl ether.

Statement-II: In ethanol, the molecules are associated due to intermolecular hydrogen bonding, whereas in diethyl ether it is not possible.



- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**606.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: The acidity of alcohols follows the order  $1^\circ > 2^\circ > 3^\circ$ .

Statement-II: The +I effect of alkyl groups ( $3^\circ > 2^\circ > 1^\circ$ ) favors the dissociation of -O-H group.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: C**

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**607.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I:  $HIO_4$  decomposes, 1,2-glycols but not 1,3-or higher glycols.

Statement-II: Only 1,2-glycols from cyclic esters which subsequently undergo cleavage to form carbonyl compounds.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**608.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I:  $3^\circ$  alcohols show turbidity within 5 minutes, when treated with Lucas reagent.

Statement-II: Conc. HCl and anhydrous  $ZnCl_2$  in 1:1 mixture is called Lucas reagent.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: D**



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**609.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Grignard reagent reacts with aldehydes and ketones to form alcohols.

Statement-II: Alcohols have acidic hydrogen

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**610.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Glycerol does not react with HI

Statement-II: 2-iodopropane can be produced by treatment of glycerol with excess HI

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: D**



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**611.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Glycol  $\begin{pmatrix} CH_2OH \\ I \\ CH_2OH \end{pmatrix}$  reacts with HI to give ethylene.

Statement-II: In Italy ethylene di-iodide is formed which being unstable loses a molecule of  $I_2$  and forms ethylene.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**612.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I:  $CH_3OH$  is a nucleophile

Statement-II:  $CH_3OH$  forms sodium methoxide on treatment with Na

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**613.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Di-tert butyl ether cannot be prepared by Williams's ether synthesis.

Statement-II: Tert, butyl bromide on treatment with sodium tert. butoxide



preferentially undergoes elimination to form isobutylene and tert. butyl alcohol.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**614.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Solubility of n-alcohol in water decreases with increase in

molecular weight.

Statement-II: The relative proportion of the hydrocarbon part in alcohols increases with increasing molecular weight which permits enhanced hydrogen bonding with water.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: C**

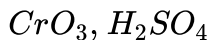


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**615.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

## Statements

Statement -I: Primary and tertiary alcohols can be distinguished by using



Statement-II:  $3^\circ$  alcohol are not oxidised by Jones reagent.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**616.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

## Statements

Statement -I: Phenol on oxidation with fuming  $HNO_3$  gives picric acid.

Statement-II: Pure phenols are colourless but turn pink due to oxidation to benzoquinone.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**617.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

## Statements

Statement -I:Phenol is used in the manufacture of Bakelite.

Statement-II:Bakelite is heat resistant thermosetting plastic used for making electrical switches and switch board.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: B**



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**618.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

## Statements

Statement -I: Dichloro carbene is active intermediate in Reimer Tiemann reaction.

Statement-II: Dichlorocarbene is an electrophile because its octet is not complete.

A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I

B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.

C. Statement-I is true, Statement -II is false.

D. Statement -I is false, Statement-II is true.

**Answer: B**



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**619.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Oxiranes can be deoxygenated to alkenes with inverted stereochemistry by reaction with trivalent phosphorus compounds.

Statement-II: Oxiranes are highly strained.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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620. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Ethers are slightly soluble in water but highly soluble in conc.  $H_2SO_4$

Statement-II: The oxygen of ether forms oxonium ion with acids but not with  $H_2O$ .

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**621.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: When phenyl acetate is heated with Lewis acid ortho and para hydroxy acetophenone are obtained.

Statement-II: Phenyl acetate undergoes rearrangement (like Fries migration) when heated with Lewis acid.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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**622.** This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements

Statement -I: Anisole is not obtained when  $MeO^-$  reacts with bromobenzene.

Statement-II: Aryl halides are less reactive towards nucleophilic substitution.

- A. Statement-I is true, Statement-II is true, Statement-II is a correct explanation of Statement-I
- B. Statement -I is true, Statement-II is true, Statement-II is not a correct explanation of Statement-I.
- C. Statement-I is true, Statement -II is false.
- D. Statement -I is false, Statement-II is true.

**Answer: A**



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