



CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

ALCOHOLS, PHENOLS AND ETHERS

PROBLEMS

1. How many structural isomers exist with the formula $C_4H_{10}O$?

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2. Identify the most stable conformer of glycol.

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3. How many amyl alcohol structures are possible ?



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4. How acetylene is converted to ethyl alcohol ?



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5. How benzyl alcohol is obtained from benzyl chloride ?



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6. How is n-propyl alcohol prepared from propene ?

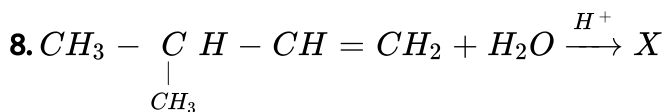


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7. Suggest a method for the conversion of $CH_3 - CH_2 - NH_3$ into ethyl alcohol.



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What is X ? Suggest the mechanism.



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9. How is methyl alcohol converted to ethyl alcohol?



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10. tert-Butyl alcohol is much more soluble in water than n-butyl alcohol. Explain.



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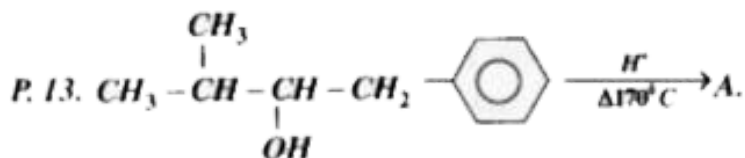
11. Identify the stronger acid among the following: Butanol-1, butan-2-ol, isobutyl alcohol and tert-butyl alcohol. Give Reason.

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12. Write the structure of the product and mechanism of the following reaction: $(CH_3)_3C - CH_2OH \xrightarrow{HBr}$

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13.



A is the major product. What is 'A'?

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14. How do you distinguish between methyl alcohol and ethyl alcohol ?



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15. What happens when ethyl alcohol is treated with HI and red phosphorous ?



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16. What happens when one drinks ethanol mixed with methanol? Why?



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17. Phenol is treated with CCl_4 in presence of NaOH. What happens ?



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18. What is the reason for the formation of tribromo phenol when phenol is treated with aqueous bromine?



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19. Write the electrophile and intermediate in Reimer-Tiemann reaction.



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20. Write the decreasing order of acidic strengths of the following:

A : Phenol, B:p-nitrophenol, C: p-chlorophenol, D: p-cresol and E: p-methoxy phenol.



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21. Arrange the following compounds in decreasing order of their acidic strength : Propan-1-ol, 3,5-Dinitrophenol, phenol, 2,4,6- Trinitrophenol, 3-

Nitrophenol and 4-methylphenol.



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22. Write the structures of the major products expected from the following reactions:

- a) 3-methyl phenol is mononitrated
- b) Phenyl methanoate is mononitrated
- c) 3-Methyl phenol is dinitrated



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23. Predict the major products formed from the following reactions :

- a) Dinitration of 3-methylphenol
- b) Mononitration of phenylmethanoate
- c) Mononitration of 3-methylphenol



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24. How is ethyl iso-propyl ether prepared ?



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25. Chloroethane, 2-chloropropane and chloroethene are treated with methoxide. Which is more reactive towards Williamson's synthesis ?



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26. Give one example of an ether which cannot be decomposed by HI.



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27. Ether can be dried over sodium, but not alcohol. Why?



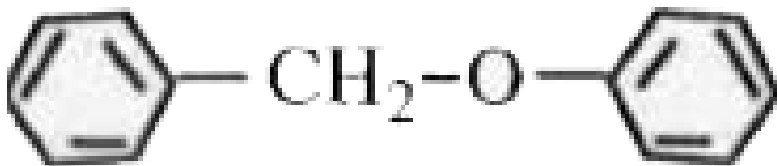
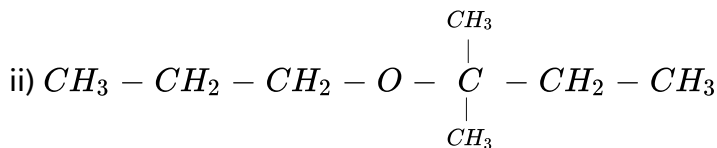
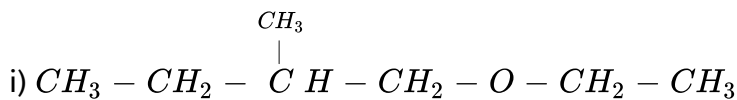
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28. How is ether distinguished from ethanol using iodine and alkali ?



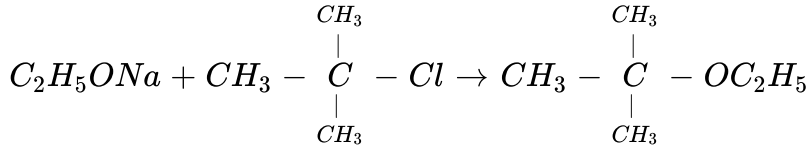
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29. Give the major products that are formed by heating each of the following ethers with HI.



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30. The following is not an appropriate reaction for the preparation of t-butyl ethyl ether.



- i) What would be the major product of this reaction ?
- ii) Write a suitable reaction for the preparation of t-butylethyl ether



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31. What product is expected when tertiary butyl bromide is reacted with sodium ethoxide? Why that product is not formed and how that product can be obtained?



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SUBJECTIVE EXERCISE-1(LONG ANSWER QUESTIONS)

1. Write any one method for the preparation of ethyl alcohol.



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2. Explain how ethyl alcohol is obtained by fermentation process.



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3. What happens when ethyl alcohol reacts with i) Metallic Na

ii) acetic acid iii) CH_3MgBr iv) Conc. H_2SO_4 , $140^\circ C$



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SUBJECTIVE EXERCISE-1(SHORT ANSWER QUESTIONS)

1. Explain the formation of ethyl alcohol from ethylene, ethyl acetate, acetaldehyde and formaldehyde.



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2. Write the equations of the reactions of ethyl alcohol with the following reagents :

- a) conc. H_2SO_4 at $170^\circ C$,
- b) Thionyl chloride,
- c) Bleaching powder, water
- d) Methyl magnesium bromide.



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3. How is ethyl alcohol converted to :

- a) acetaldehyde b) ethyl acetate
- c) iodoform d) ethane ?



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4. Write the mechanism of dehydration of ethyl alcohol.



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5. Explain how the three types of alcohols, primary, secondary and tertiary can be distinguished ?



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6. How does ethyl alcohol react with metallic sodium, acetic acid and conc. H_2SO_4 at $140^\circ C$?



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7. How is methylalcohol prepared commercially?



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8. Write the uses of methyl alcohol and ethyl alcohol.



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SUBJECTIVE EXERCISE-1(VERY SHORT ANSWER QUESTIONS)

1. What are dihydric and trihydric alcohols ? Give one example each.



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2. What are secondary and tertiary alcohols ?



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3. How is rectified spirit converted to absolute alcohol ?



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4. Give the equations for the reaction of ethyl alcohol with PCI_5 and PCl_3 .



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5. Give the equations for the reaction of ethanol with conc. H_2SO_4 at different temperatures.



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6. Write the common & IUPAC name of $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - OH$



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7. Explain the action of Al_2O_3 on ethyl alcohol at $260^\circ C$ and $350^\circ C$.



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8. How does ethyl alcohol react with Cu metal at $300^\circ C$. Name that reaction.



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9. 'X' reacts with PCI_5 to give 'Y'. 'Y' reacts with aqueous KOH to give back 'X'. If the molecular formula of 'X' is C_2H_6O what are 'X' and 'Y'?



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SUBJECTIVE EXERCISE-2 (LONG ANSWER QUESTIONS)

1. How is phenol prepared? Write the properties of phenol.



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SUBJECTIVE EXERCISE-2 (SHORT ANSWER QUESTIONS)

1. Explain the acidic nature of phenol.



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2. Discuss the acidic nature of phenols compared to alcohols.



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3. Compare the acidic character of nitrophenols, phenol and cresols.



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4. Compare the acidic character of nitrophenols, phenol and cresols.



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5. Explain the electrophilic substitution reactions of phenol. Write two uses of phenol.



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6. Write short notes on the following: (a) Reimer-Tiemann reaction and (b) Kolbe's reaction.



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7. Arrange the following in the increasing order of acidic nature and discuss the reason :

(a) Phenol, (b) p-nitrophenol and (c) p-cresol



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8. Why phenol molecule is less stable than phenoxide ion ?



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9. Discuss the bromination of phenol in aqueous solution and CS_2 or $CHCl_3$ as solvent.



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SUBJECTIVE EXERCISE-3 (LONG ANSWER QUESTIONS)

1. Write three preparations and three properties of diethyl ether.



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2. How are the following converted to diethyl ether ?

i) C_2H_5OH ii) C_2H_5Br iii) C_2H_5ONa



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SUBJECTIVE EXERCISE-3 (SHORT ANSWER QUESTIONS)

1. By Williamson's method, how a tertiary alkyl and primary alkyl ether are formed ?



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2. Compare the physical properties of an alcohol and ether of comparable molecular mass.

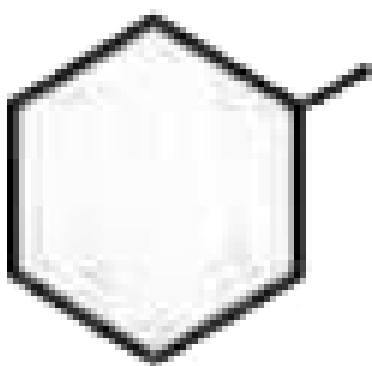


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3. By the reaction of a suitable Grignard reagent on formaldehyde, how



and



are prepared?



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4. Explain the action of HI on diethyl ether.



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



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6. Draw the structure of all isomeric alcohols of molecular formula $C_5H_{12}O$ and give their IUPAC names and classify them as primary, secondary and tertiary alcohols.



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7. Give the structures and IUPAC names of monohydric phenols of molecular formula, C_7H_8O .

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8. Explain why ortho nitrophenol is more acidic than ortho methoxyphenol?

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SUBJECTIVE EXERCISE-3 (VERY SHORT ANSWER QUESTIONS)

1. Metallic sodium reacts with 'X' to form 'Y'. Ethyl chloride and 'Y' react together to give diethyl ether. What are 'X' and 'Y'?

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2. Two compounds A and B when heated sperately with Al_2O_3 at $360^\circ C$, the product formed is ethylene, What are A and B ?

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3. Write the action of HI on $C_2H_5OC_2H_5$ in cold and hot conditions.



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4. Write the common and IUPAC names of $CH_3 - O - C_3H_7$

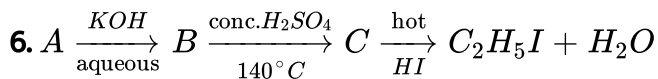


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5. Explain Williamson's method of preparation of diethyl ether.



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what are A, B and C ?



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7. How methyl magnesium bromide is converted to 2-methyl-2-propanol ?



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8. From ethyl magnesium iodide how propanol-1 is formed ?



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CONVERSIONS

1. Primary alcohol to aldehyde



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2. Write the reagents for the following conversions :

Primary alcohol $\rightarrow$ Benzoic acid



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3. Write the reagents for the following conversions :

Primary alcohol $\rightarrow$ Benzoic acid



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4. Butan-2-one to butan-2-ol



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5. Write the reagents for the following conversions :

Benzene to m-bromophenol



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6. Bromobenzene to 1-phenylethanol



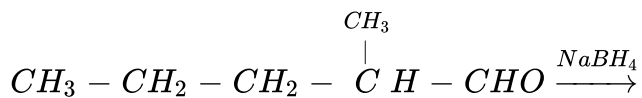
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7. Write the products in the following:



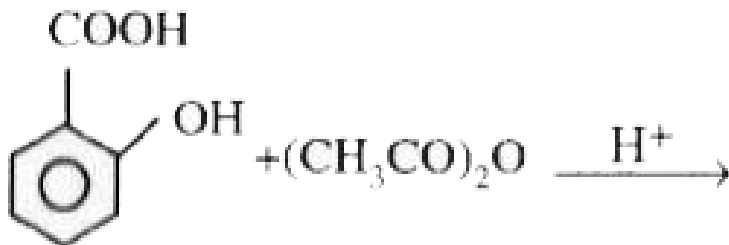
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8. Write the products in the following:



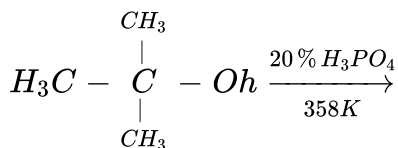
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9. Write the products in the following:



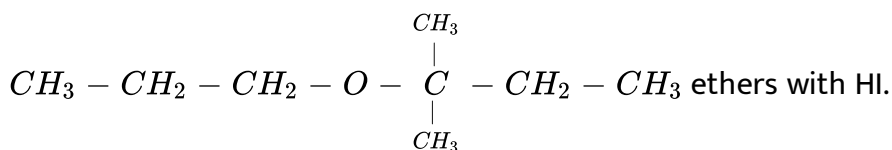
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10. Write the products in the following:



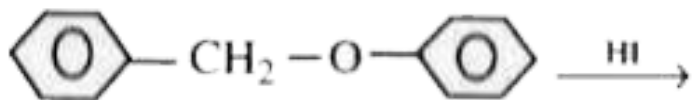
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11. Give the major products that are formed by heating of the



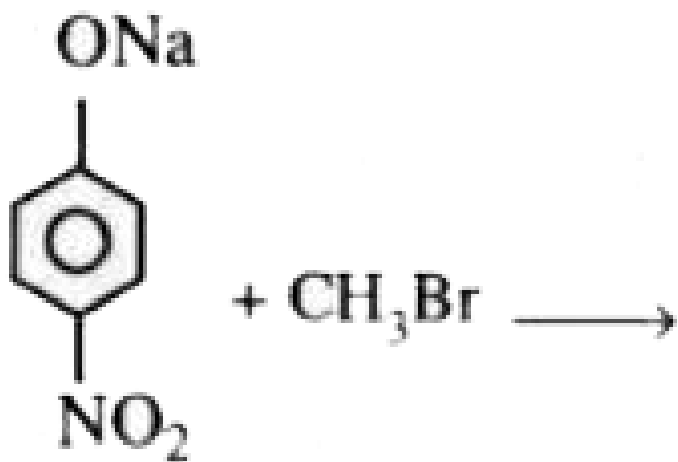
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12. Write the products in the following:



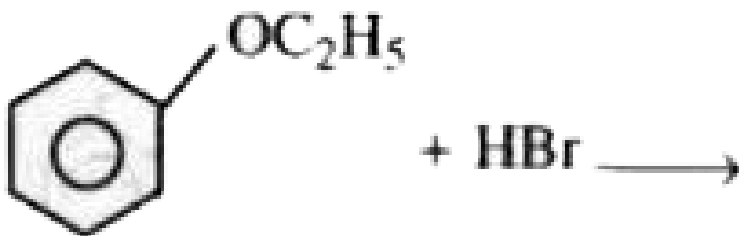
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13. Write the products in the following:



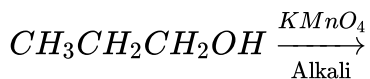
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14. Write the products in the following:



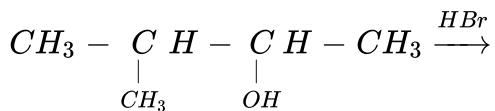
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15. Write the products in the following:



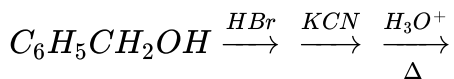
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16. Write the products in the following:



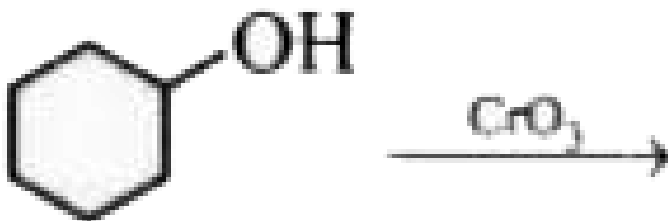
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17. Write the products in the following:



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18. Write the products in the following:



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19. Name Reactions :

Kolbe's reaction



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20. Write the equations involved in the following reactions:

(i) Reimer - Tiemann reaction (ii) Kolbe's reaction



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21. Name Reactions :

Fischer esterification



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22. What is Williamson's synthesis ? Give an example.



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23. Name Reactions :

Lucas's test



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24. Name Reactions :

Haloform reaction



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25. Primary alcohol to aldehyde



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26. Primary alcohol to carboxylic acid



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27. Benzyl alcohol to benzoic acid



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28. Butan-2-one to butan-2-ol



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29. Benzene to m-bromophenol



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30. Bromobenzene to 1-phenylethanol



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31. Primary alcohol to aldehyde



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32. Write the reagents for the conversions :

Primary alcohol $\rightarrow$ Carboxylic acid



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33. Write the reagents for the following conversions :

Primary alcohol $\rightarrow$ Benzoic acid



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34. Butan-2-one to butan-2-ol



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35. Benzene to m-bromophenol

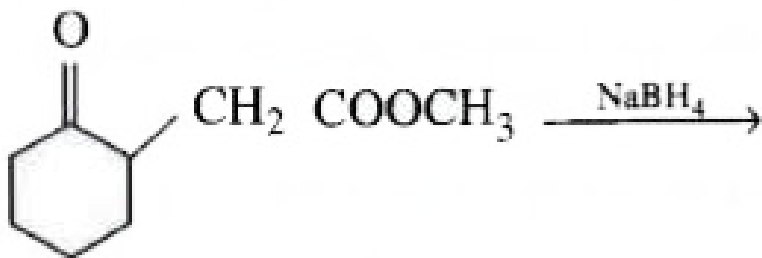


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36. Bromobenzene to 1-phenylethanol

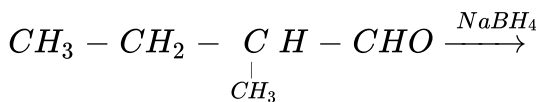
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37. Write the products



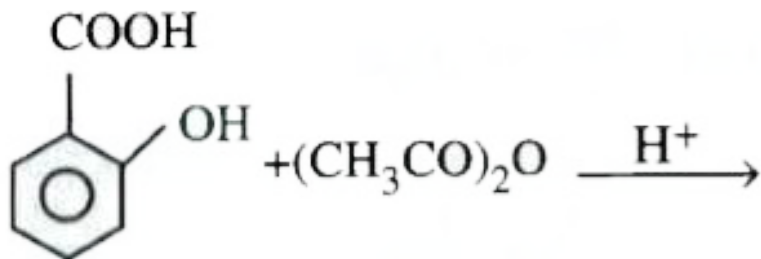
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38. Write structures of the products of the following reactions :



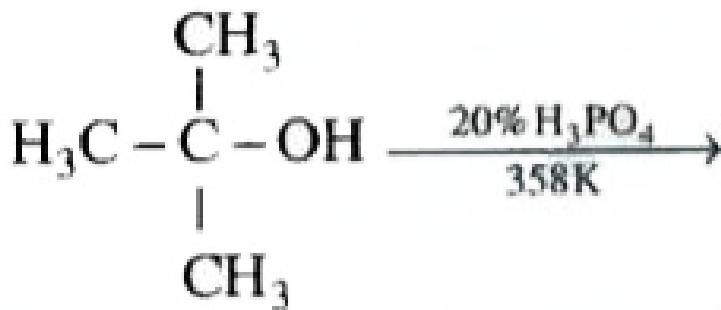
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39. Write the products



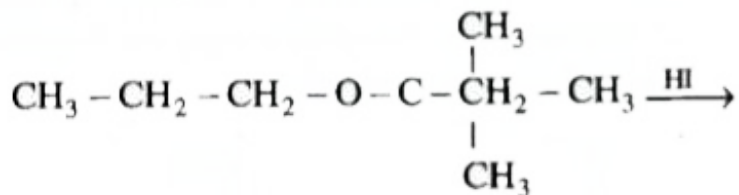
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40. Write the products



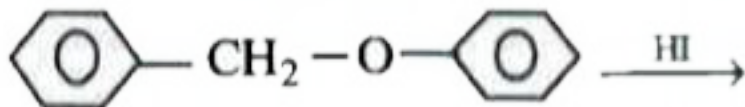
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41. Write the products



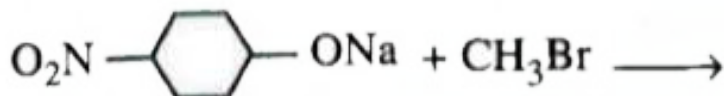
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42. Write the products



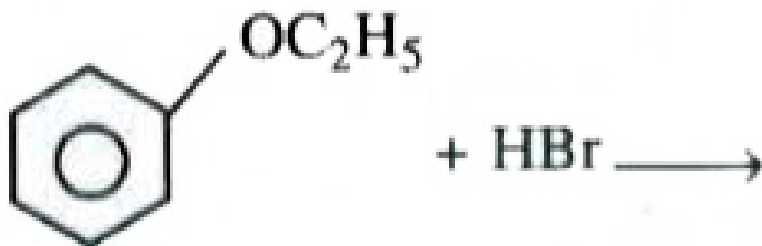
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43. Write the products



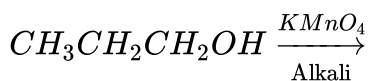
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44. Write the products



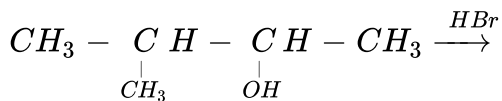
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45. Write the products in the following:



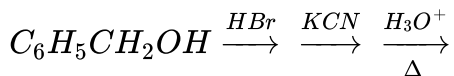
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46. Write the products



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47. Write the products in the following:

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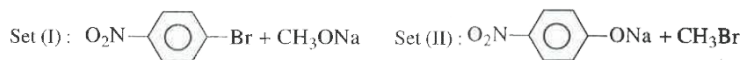
48. Write the products

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

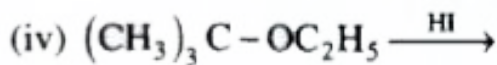
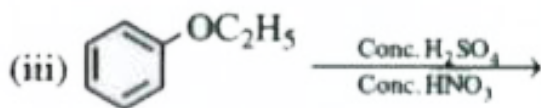
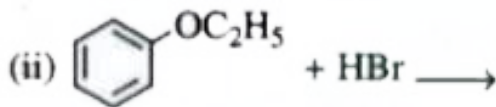
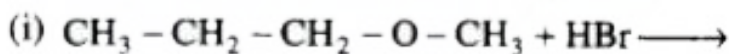
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50. Which of the following is an appropriate set of reactants for the preparation of 1-methoxy-4 nitrobenzene. Why?



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51. Predict the product of the following reactions:



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1. The number of 1° , 2° and 3° alcoholic groups in Mannitol or Sorbitol are respectively

A. 2, 4 and 0

B. 1, 4 and 0

C. 2, 2 and 0

D. 2, 1 and 1

Answer: A



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2. The common name of 2-methyl-1-propanol

A. 2-methyl-2-propanol

B. Secondary butyl alcohol

C. Isobutyl alcohol

D. Tertiary butyl alcohol

Answer: C



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3. An isomer of ethanol is

- A. Methanol
- B. Dimethyl ether
- C. Diethyl ether
- D. Ethylene glycol

Answer: B



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4. Which one of the following is a secondary alcohol?

- A. 2 - Methyl - 1 - propanol

B. 2 - Methyl - 2 - propanol

C. 2 - Butanol

D. 1 - Butanol

Answer: C



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5. If the boiling point of ethanol (molecular weight = 46) is 78°C , the boiling point of diethyl ether (molecular weight = 74) is

A. 100°C

B. 78°C

C. 86°C

D. 34°C

Answer: D



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6. Which of the following alcohols has the lowest solubility in water ?

A. Methanol

B. Ethanol

C. 1-Propanol

D. 1-Butanol

Answer: D



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7. The enzyme that is not associated in the preparation of C_2H_5OH from starch is

A. maltase

B. diastase

C. invertase

D. zymase

Answer: C



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8. Glucose is converted into ethyl alcohol by

A. maltase

B. zymase

C. invertase

D. diastase

Answer: B



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9. The percentage of C_2H_5OH in wash is

A. 0.95

B. 0.1

C. 0.5

D. 0.75

Answer: B



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10. Rectified spirit can be converted into absolute alcohol by distilling with

A. Na_2CO_3

B. Na

C. conc. H_2SO_4

D. CaO

Answer: D



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11. The solution of starch formed by passing steam is called as

- A. malt
- B. mash
- C. wash
- D. absolute alcohol

Answer: B



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12. The enzyme produced by malt is

- A. maltase
- B. diastase
- C. invertase

D. zymase

Answer: B



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13. The enzyme maltase converts maltose into

- A. Glucose and Fructose
- B. Fructose only
- C. Glucose only
- D. Glucose and ethyl alcohol

Answer: C



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14. Rectified spirit is made unsuitable for drinking by adding

A. CH_3OH

B. 1-propanol

C. Water

D. 2-propanol

Answer: A



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15. Which of the following alkenes when passed through conc. H_2SO_4 followed by hydrolysis with boiling water would give tert-butyl alcohol ?

A. Ethylene

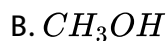
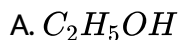
B. Isobutylene

C. Propylene

D. 1-Butene.

Answer: B

16. When equal weights of methyl alcohol and ethyl alcohol react with excess of sodium metal, the volume of H_2 liberated is more in the case of



C. Equal in both

D. H_2 is not liberated

Answer: B

17. The reaction of ethylmagnesium iodide with acetaldehyde gives after acidification

A. 2-Butanol

B. 1-Butanol

C. 2-Methyl-2-propanol

D. 2-Methylpropanol

Answer: A



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18. To prepare 2-propanol from methyl-magnesium bromide, the other chemical required is

A. HCHO

B. CH_3CHO

C. $\text{C}_2\text{H}_5\text{OH}$

D. CH_3COCH_3

Answer: B



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19. Slow decomposition of complex organic compounds into simpler ones by enzymes is known as

- A. Condensation
- B. Fermentation
- C. Dehydration
- D. Polymerization

Answer: B



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20. In the conversion of starch to ethyl alcohol, the following enzymes are used

- A. Invertase, Zymase, Emulsin
- B. Maltase, Zymase, Emulsin

C. Diastase, Maltase, Zymase

D. Invertase, Diastase, Zymase.

Answer: C



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21. Which one of the following gases is liberated when ethyl alcohol is heated with methyl magnesium iodide?

A. Methane

B. Ethane

C. Carbondioxide

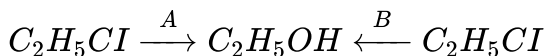
D. Propane

Answer: A



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22. Identify A and B in the following reaction



A. A = aqueous KOH, B = AgOH

B. A = alcoholic KOH, B = aqueous NaOH

C. A = aqueous NaOH, B = $AgNO_2$

D. A = $AgNO_2$, B = KNO_2

Answer: A



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23. The reaction $2ROH + 2Na \rightarrow RONa + H_2$ suggests that alcohols are

A. Acidic

B. Basic

C. Amphoteric

D. Neutral in character

Answer: A



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24. 23 g of sodium will react with methanol to give

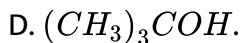
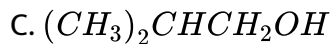
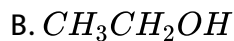
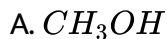
- A. One mole of oxygen
- B. $1/2$ Mole of hydrogen
- C. One mole of hydrogen
- D. $1/4$ Mole of oxygen.

Answer: B



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25. Which of the following compounds is the strongest acid ?

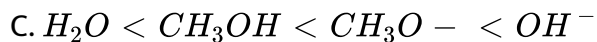
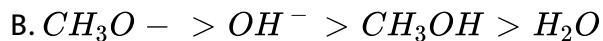
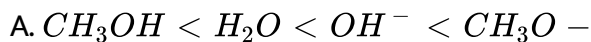
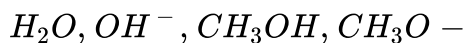


Answer: A



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26. The correct order of decreasing basicity of the following species is :



Answer: B

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27. Which of the following alcohols is expected to have the lowest pK_a value ?

- A. Ethanol
- B. 2-Fluoro ethanol
- C. 2,2,2-Trifluoroethanol
- D. 2-Chloroethanol

Answer: C

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28. When 2-butanol is heated with an excess of concentrated sulphuric acid, the main product is

- A. 1-Butene

B. 2-Butene

C. 2-Methyl propene

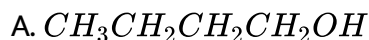
D. 2-Methyl-2-butene

Answer: B



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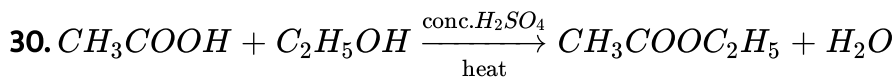
29. The structural formula of alcohol that on dehydration would give 2-methylpropene as the major product is



Answer: B



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The above reaction is known as

- A. Hydrolysis
- B. Esterification
- C. Saponification
- D. Dehydration

Answer: B



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31. C_2H_5OH can be converted in to C_2H_5Cl by reacting with

- A. PCl_3
- B. PCl_5
- C. $SOCl_2 + \text{Pyridine}$

D. All the above

Answer: D



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32. A mixture of anhydrous $ZnCl_2$ + conc. HCl is known as

A. Fehling's reagent

B. Lucas reagent

C. Tollen's reagent

D. Benedict's reagent

Answer: B



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33. When C_2H_5OH reacts with sodium metal, gas released is

- A. Oxygen
- B. Chlorine
- C. Hydrogen
- D. Nitrogen

Answer: C



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34. Action of caustic soda and chlorine on ethyl alcohol gives

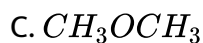
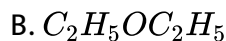
- A. Chloroform
- B. Dichloromethane
- C. Trichloroethane
- D. Ethylenechloride

Answer: A



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35. Which of the following compound is formed when ethanol reacts with acetic acid in the presence of concentrated H_2SO_4 .

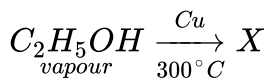


Answer: A



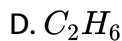
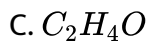
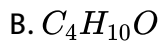
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36. In the reaction,



The molecular formula of X is



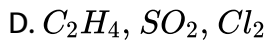
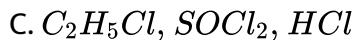
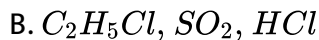
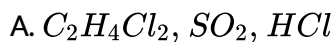


Answer: C



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37. $C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} X + Y + Z$. In this reaction X, Y & Z are

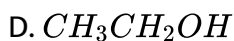
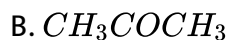
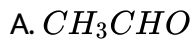


Answer: B



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38. The compound that reacts with CH_3MgBr to yield methane as one of the products is

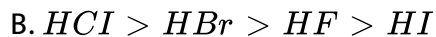
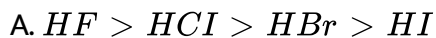


Answer: D



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



D. $HI > HBr > HCl > HF$

Answer: D



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40. What is the hybridisation state(s) of the atoms in X formed in the following reaction?

$$C_2H_5OH \xrightarrow[200^\circ C]{Al_2O_3} X$$

(Vapours)

A. sp^3 only

B. sp^2 and sp^3

C. sp^2 only

D. sp only

Answer: A



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41. (A): Alcoholic fermentation involves conversion of sugar into ethanol by the action of yeast.

(R): Fermentation involves the liberation of CO_2 gas.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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42. (A): Ethanol is miscible in all proportions with water.

(R): Hydrogen bonds are formed between water and alcohol molecules.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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43. (A) Sodium can't be used for drying ethyl alcohol.

(R) Sodium displaces hydrogen from ethyl alcohol.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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44. (A) Ethyl alcohol is soluble in organic solvents

(R) Ethyl alcohol is having non polar ethyl group.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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45. (A): Dehydration of alcohols can be carried out with conc H_2SO_4 but not with conc. HCl.

(R): H_2SO_4 is dibasic while HCl is monobasic.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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46. (A): Alcohols on dehydration can produce ether as well as alkene under different conditions.

(R): Dehydration of alcohol takes place with conc. H_2SO_4 or Al_2O_3 .

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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47. (A): Oxidation of tertiary alcohols requires strong oxidising agent and elevated temperature.

(R): Oxidation of tertiary alcohols involves cleavage of C - C bond.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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ALCOHOLS (Objective exercise-2)

1. Which is the most favourable condition for the alcoholic fermentation of sugar?

- A. High concentration of sugar solution, low temperature, plenty of air
- B. Low concentration of sugar solution, high temperature, plenty of air
- C. Low concentraion of sugar solution, low temperature, absence of air
- D. None of the above

Answer: C



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2. Wood spirit is the common name of

- A. Methyl alcohol
- B. Ethyl alcohol
- C. Amyl alcohol
- D. Benzyl alcohol

Answer: A



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3. Consider the following sequence of reactions: $A \xrightarrow{C_2H_5MgI} X \xrightarrow{H^+ / H_2O}$ tert - amyl alcohol. The compound A in the above sequence of reactions is

A. 2-Butanone

B. Acetaldehyde

C. Acetone

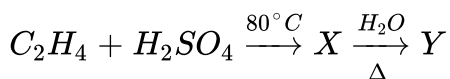
D. Propanal

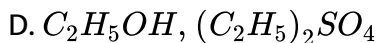
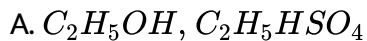
Answer: C



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4. What are X and Y in the reaction?



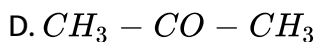
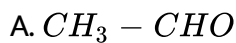


Answer: C



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5. $A + CH_3MgI \rightarrow$ Addition product $\xrightarrow{H-OH} CH_3CH_2OH$. What is 'A' ?

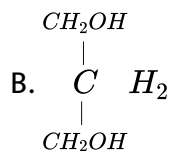
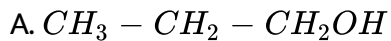


Answer: B

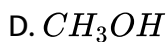


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6. Which of the following is most volatile



C. Glycerol



Answer: D



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7. $CH_3CHO + 2[H] \xrightarrow{Ni: \Delta} B$. A dibasic acid is formed when "B" reacts with



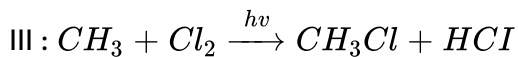
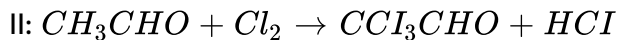
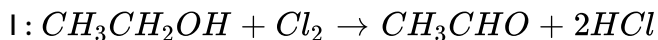


Answer: C



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8. In which of the following reactions, chlorine acts as an oxidizing agent ?



The correct answer is :

A. only I

B. only II

C. I and II

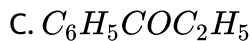
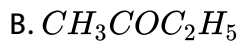
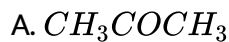
D. I, II and III

Answer: D



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9. Haloform reaction is not given by

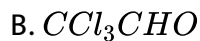


Answer: C



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10. What is the product obtained when chlorine reacts with ethyl alcohol in KOH?



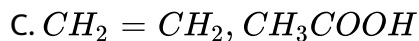
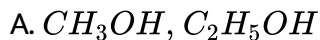
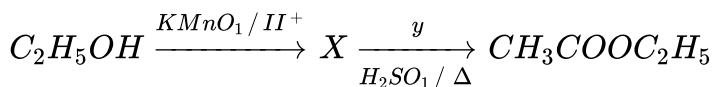
D. none

Answer: A



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11. In the following reaction, X and Y respectively are



Answer: D

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12. Hydrolysis of an ester gives acid A and alcohol B. The acid reduces Fehling's solution. Oxidation of alcohol B gives acid, A. The ester is

- A. Methyl formate
- B. Ethyl formate
- C. Methyl acetate
- D. Ethyl acetate

Answer: A

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13. $R - OH + HX \rightarrow R - X + H_2O$. In this reaction, the reactivity of alcohols is

- A. Tertiary > secondary > Primary

B. Tertiary < secondary < Primary

C. Tertiary > Primary > secondary

D. secondary > Primary > Tertiary

Answer: A

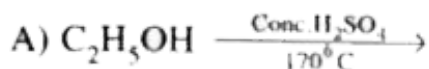


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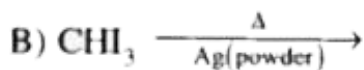
14. Match the following:

Set - I

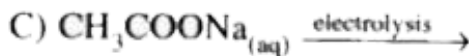
Set - II



1) Methane



2) Ethylene



3) Benzene



4) Acetylene

5) Ethane

A. A-2, B - 4, C -5, D - 1

B. A -2, B - 4, C - 5, D - 3

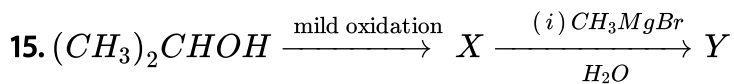
C. A-4, B-2, C-5, D - 1

D. A - 4, B-2, C-5, D - 3

Answer: A



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Here Y is

A. Iso butyl alcohol

B. Iso butylene

C. sec. Butyl alcohol

D. tert. Butyl alcohol

Answer: D



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16. Match the following lists

List - I

- A) Ethylene
- B) Acetylene
- C) Ethanol
- D) Diethyl ether

List - II

- 1) Solvent
- 2) Preservative
- 3) Hawker's lamp
- 4) Drug
- 5) Polyethylene

Correct

match is

	A	B	C	D		A	B	C	D
1)	3	2	1	5	2)	5	1	2	3
3)	5	3	2	1	4)	5	1	4	2



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ALCOHOLS (Practice exercise)

1. Which of the following alcohols cannot be prepared by the action of a suitable Grignard reagent on an aldehyde or a ketone followed by acid hydrolysis ?

- A. Ethyl alcohol
- B. n- Propyl alcohol
- C. Isopropyl alcohol
- D. Methyl alcohol

Answer: D



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2. Basic hydrolysis of ethyl acetate gives acetate ion and

- A. Ethyl alcohol
- B. Ethoxide ion
- C. Acetaldehyde
- D. Acetone

Answer: A



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3. $C_2H_5OH \xrightarrow{K_2Cr_2O_7 / H_2SO_4} A \xrightarrow{K_2Cr_2O_7 / H_2SO_4} B$ A and B in the above reaction are

- A. acetone and acetaldehyde
- B. acetaldehyde and acetone
- C. acetic acid and acetaldehyde
- D. acetaldehyde and acetic acid

Answer: D



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4. Glycerol does not contain the alcoholic group

- A. 1°
- B. 2°
- C. 3°

D. none

Answer: C



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5. $X \xrightarrow[AlCl_3]{HCl} Y \xrightarrow{KOH(aq)} C_2H_5OH$ In the above reaction reactant 'X' is

A. C_2H_5Cl

B. C_2H_2

C. C_2H_4

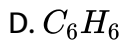
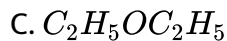
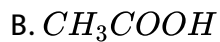
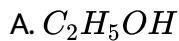
D. C_2H_5Br

Answer: C



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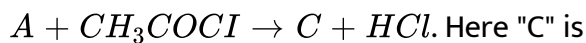
6. Which is a more volatile liquid ?



Answer: C



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A. Ethyl acetate

B. Methyl acetate

C. Butanone

D. Propanone

Answer: A

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8. $C_2H_5OH + HONO_2 \rightarrow A + H_2O$. "A" is

- A. Ester
- B. Ether
- C. Alcohol
- D. Alkane

Answer: A

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9. Ethyl alcohol forms $CaCl_2 \cdot XC_2H_5OH$, $MgCl_2 \cdot YC_2H_5OH$ and $CuSO_4 \cdot ZC_2H_5OH$ when C_2H_5OH reacts with respective anhydrous salts. Then

- A. $X = 3, Y = 3, Z = 6$

B. $X = 3, Y = 6, Z = 3$

C. $X = 3, Y = 7, Z = 4$

D. $X = 4, Y = 4, Z = 4$

Answer: B



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10. $2C_2H_5OH \xrightarrow{X} B \xrightarrow{Y} C_2H_4 + H_2O$. Then X and Y are respectively

A. $X = Al_2O_3$ at $260^\circ C$, $Y = AlCl_3$

B. $X = Conc. H_2SO_4$ at $170^\circ C$, $Y = Conc. H_2SO_4$ at $140^\circ C$

C. $X = Al_2O_3$ at $360^\circ C$, $Y = Conc. H_2SO_4$ at $140^\circ C$

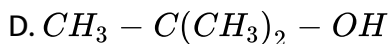
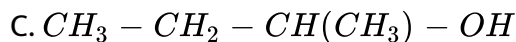
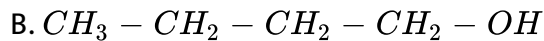
D. $X = Al_2O_3$ at $260^\circ C$, $Y = Al_2O_3$ at $360^\circ C$

Answer: D



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11. Which of the following is a tertiary alcohol?

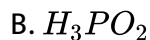
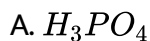


Answer: D



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12. 3 moles of ethanol react with one mole of phosphorus tribromide to form 3 moles of bromoethane and one mole of X. Which of the following is X?



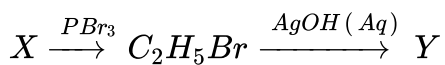
D. H_3PO_3

Answer: D



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13. What are X and Y respectively in the following reaction?



A. CH_3OH , C_2H_6

B. C_2H_5OH , C_2H_5Br

C. CH_3COOH , CH_3CH_2OH

D. C_2H_5OH , C_2H_5OH

Answer: D



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

- A. Heating with Na metal
- B. Passing dry HCl through it
- C. Distilling it with CaO
- D. Reacting with Mg

Answer: C



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15. Which statement is not correct about alcohol?

- A. Ethyl alcohol is heavier than water
- B. Ethyl alcohol evaporates more quickly than water
- C. Alcohols with less number of carbon atoms are more soluble in water

D. Alcohol produces H_2 by reaction with sodium metal

Answer: A



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16. Which of the following compound gives ethylmethyl ketone on oxidation?

A. Propan-2-ol

B. Butan-1-ol

C. Butan-2-ol

D. 2-Methyl butan-2-ol

Answer: C



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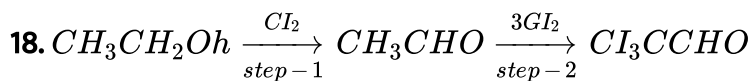
17. In C_2H_5OH , the bond that undergoes heterolytic cleavage most readily is

- A. C-C
- B. O-H
- C. C-H
- D. C-O

Answer: B



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In above reactions the role of Cl_2 in step-1 and step-2 respectively is

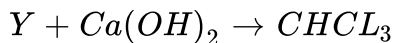
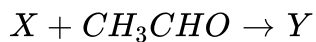
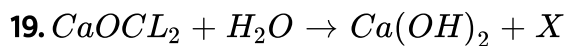
- A. Oxidation, chlorination
- B. Reduction, chlorination
- C. Oxidation, addition

D. Reduction, substitution

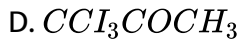
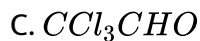
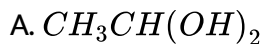
Answer: A



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What is 'Y'?

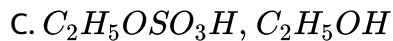
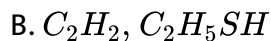
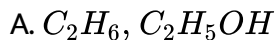
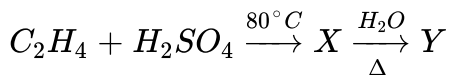


Answer: C



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20. What are X and Y in the reaction?



Answer: C



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21. Which one of the following contains $C_{sp^2} - OH$ bond ?

A. tert-butyl alcohol

B. allyl alcohol

C. benzyl alcohol

D. carbolic acid

Answer: A



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22. 2-Methylpropene upon hydroboration-oxidation gives

A. 2-Methyl-1 propanol

B. 2-Methyl-2-propanol

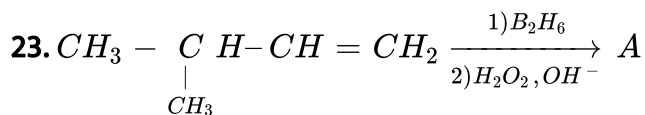
C. 2-Propanol

D. 1-Propanol

Answer: A



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Here 'A' is

A. 3 - methyl - 2 - butanol

B. 3 - methyl - 1 - butanol

C. 2 - methyl - 2 - butanol

D. 2 - methyl - 1 - butanol

Answer: B



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PHENOLS(Objective exercise-1)

1. Phenol can be prepared by the reaction between

A. Benzene diazonium chloride

B. Chlorobenzene

C. Sodium benzene sulfonate

D. All

Answer: D



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2. Benzene diazonium chloride on boiling with dilute H_2SO_4 gives

- A. Cresol
- B. Xylene
- C. Phenol
- D. Toulene

Answer: C



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3. Sodium salt of benzene sulphonic acid on fusion with caustic soda followed by acidification gives

- A. Benzene
- B. Phenol
- C. Thiophenol
- D. Benzenesulfonic acid

Answer: B



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4. On heating with soda-lime, salicylic acid gives

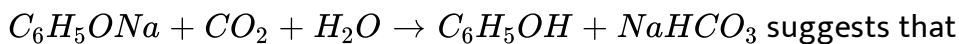
- A. Phenol
- B. Benzoic acid
- C. Sodium salicylate
- D. Benzene

Answer: A



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5. The reaction,



- A. Phenol is a stronger acid than carbonic acid
- B. Carbonic acid is a stronger acid than phenol
- C. Water is a stronger acid than phenol
- D. None of the above

Answer: B



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6. Phenol can be prepared by the reaction between

- A. Aniline and HNO_3 at 373 K
- B. C_6H_5MgBr and CO_2 followed by hydrolysis
- C. C_6H_5Cl and NaOH at 373 K

D. $C_6H_5SO_3Na$ and NaOH at 573-623K followed by acidification

Answer: D



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7. Phenol is prepared commercially from

A. Ethylbenzene

B. Isopropylbenzene

C. n- Propylbenzene

D. Toluene

Answer: B



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8. Phenol is converted to 2,4,6-trinitrophenol using

A. Dilute HNO_3

B. Conc. HNO_3

C. $NaNO_2$, $25^\circ C$

D. $NaNO_2$, $5^\circ C$

Answer: B



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9. The acidic character of phenol is due to

A. Greater resonance stabilization of phenoxide ion over phenol

B. Greater resonance stabilization of phenol over phenoxide ion

C. Because of tautomerism occurring in phenol

D. Because oxygen is more electronegative than hydrogen

Answer: A



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10. The correct order of relative acidic strength of phenol, ethyl alcohol and water is

- A. Phenol > Water > Ethyl alcohol
- B. Ethyl alcohol > Water > Phenol
- C. Ethyl alcohol > Phenol > Water
- D. Water > Phenol > Ethyl alcohol

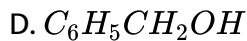
Answer: A



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11. Which of the following compounds will react with sodium hydroxide?

- A. CH_3OH
- B. CH_3CH_2OH
- C. C_6H_5OH

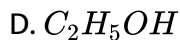
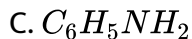
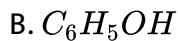
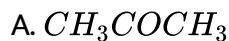


Answer: C



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12. Which of the following compounds when dissolved in water, gives a solution with pH less than seven?



Answer: B



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13. (A) In methanol C-O bond length is $1.42\text{\AA}$, but in phenol, it is $1.36\text{\AA}$.

(R) In methanol carbon atom is sp^3 hybridised and in phenol, carbon atom bearing the hydroxyl group is sp^2 hybridised.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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14. (A) : Phenols are more acidic than alcohols.

(R): Phenoxide ion is more stable than alkoxide ion due to resonance.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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15. (A): Phenols react with sodium hydroxide but not alcohols.

(R) : Phenols are more acidic than alcohols.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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1. Increasing pK_a values of o-, and p- cresols is

A. $o < p < m$

B. $m < p = o$

C. $m < o < p$

D. $p < o < m$

Answer: B



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2. Which of the following compounds would not evolve CO_2 when treated with aq. $NaHCO_3$ solution?

A. Phenol

B. Benzoic acid

C. 2,4- Dinitrophenol

D. 2,4,6-Trinitrophenol

Answer: A



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3. Phenol is

A. Kolbe's reaction

B. Cannizaro reaction

C. Reimer - Tiemann reaction

D. Kolbe Schmidt reaction

Answer: C



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4. Rate of electrophilic substitution reaction in phenol is

- A. Equal to that to benzene
- B. Faster than that of benzene
- C. Slower than that of benzene
- D. Very slower than that of nitrobenzene

Answer: B



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5. m-Dihydroxybenzene is called as

- A. Resorcinol
- B. Catechol
- C. Quinol
- D. Cresol

Answer: A



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6.2 - Methyl phenol is

A. m - cresol

B. o- cresol

C. m - xylene

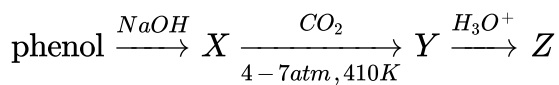
D. o- xylene

Answer: B



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



- A. Aspirin
- B. Salicylaldehyde
- C. Benzoic acid
- D. Salicylic acid

Answer: D



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8. Phenol on heating with aq. KOH and chloroform undergoes

- A. Kolbe reaction
- B. Rosenmund reaction
- C. Reimer Tiemann reaction
- D. Cannizzaro reaction

Answer: C



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9. Electrophilic substitution in phenol takes place at

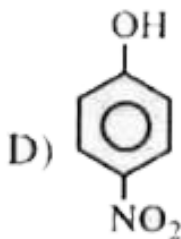
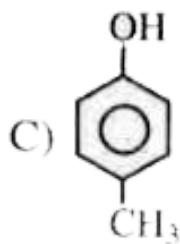
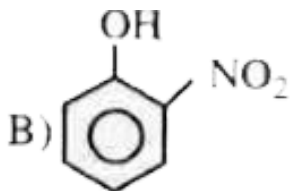
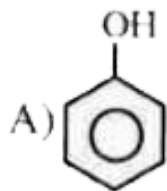
- A. ortho and para-positions
- B. meta-position
- C. ortho-position only
- D. para-position only

Answer: A



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10. Which of the following has the least value of pK_a ?



A. A

B. B

C. C

D. D

Answer: D



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11. Ethyl alcohol can be distinguished from phenol by

- A. Action of HCl
- B. Action of ammonia
- C. Action of aq, $FeCl_3$ solution
- D. Action of acetic acid

Answer: C



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12. Which of the following is the major product formed when phenol is treated with dilute nitric acid at 293 K?

- A. m-Nitrophenol
- B. p-Nitrophenol
- C. 2,4,6-Trinitrophenol
- D. o-Nitrobenzene

Answer: B

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13. Br_2 dissolved in CS_2 reacts with phenol at 273K to give as the major product

- A. o - Bromophenol
- B. m - Bromophenol
- C. P - Bromophenol
- D. 2, 4, 6 - Tribromophenol

Answer: C

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PHENOLS(Practice exercise)

1. What will be the product when C_6H_5MgBr is treated with water?

A. CH_4

B. Phenol

C. Benzene

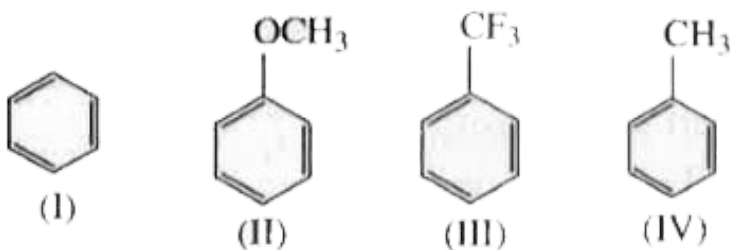
D. Diphenyl

Answer: C



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2. The order of reactivity of following towards electrophilic substitution is



A. $I > II > III > IV$

B. $II > III > I > IV$

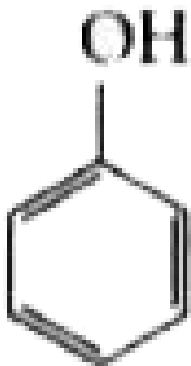
C. $III > I > IV > II$

D. $II > IV > I > III$

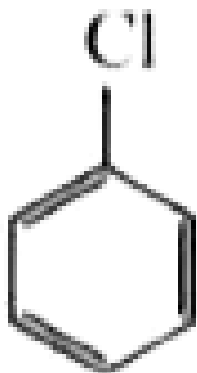
Answer: D

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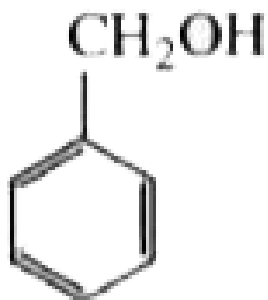
3. Which of the following is the most reactive towards electrophilic attack?



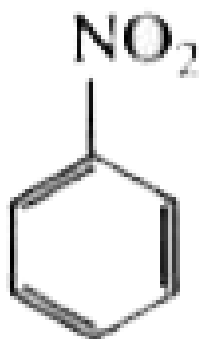
A.



B.



C.



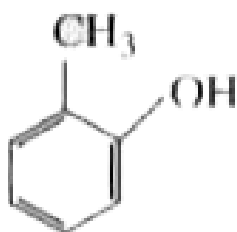
D.

Answer: A

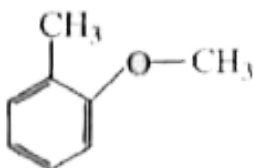
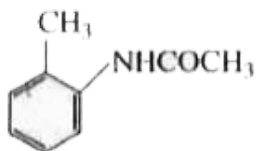
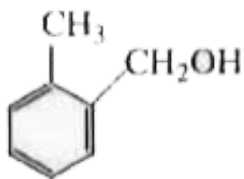


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4. Which is most reactive towards electrophilic reagent?



A.



Answer: A



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5. Phenol is heated with a mixture of KBr and $KBrO_3$. The major product obtained in the above reaction is:

A. 2-Bromophenol

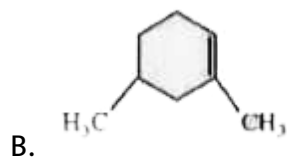
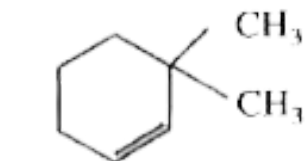
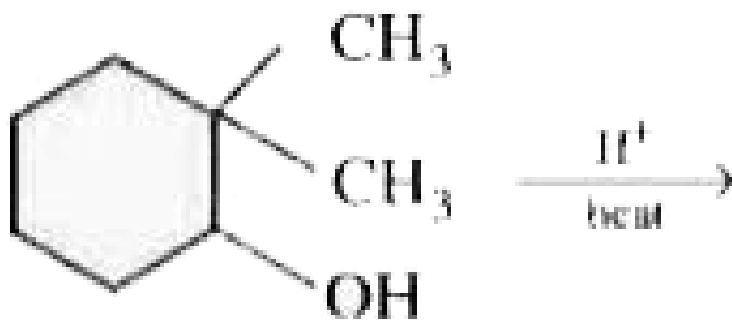
B. 3-Bromophenol

C. 4-Bromophenol

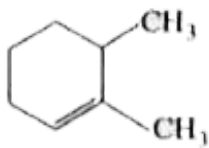
Answer: D

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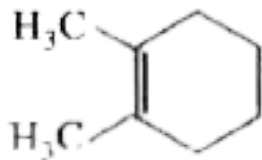
6. Which is the product of the following reaction?



C.



D.

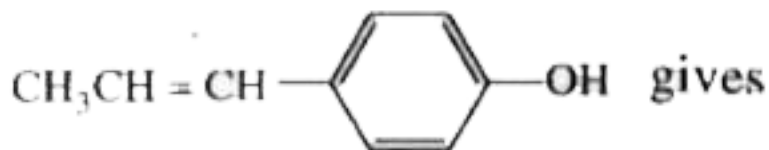


Answer: D

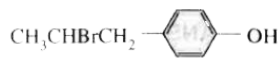


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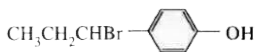
7. The reaction of HBr with



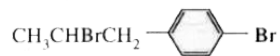
A.



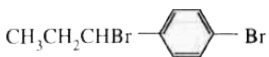
B.



C.



D.

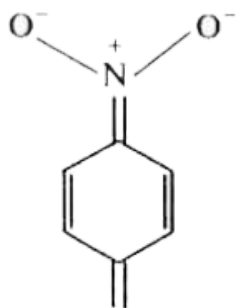
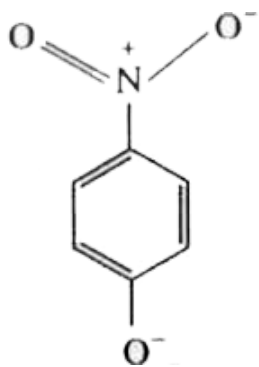


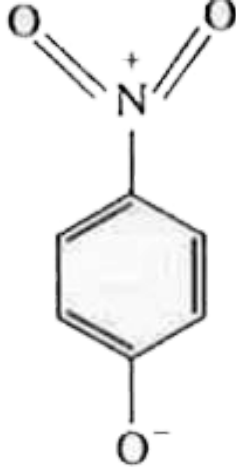
Answer: B



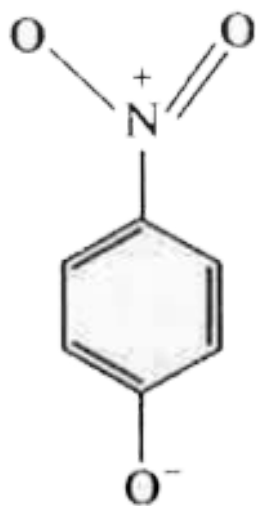
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8. The most unlikely representation of resonance structure of P-nitrophenoxide .





C.



D.

Answer: C



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9. Match the following columns

Column I

- A) Ethyl alcohol
- B) *o*- Nitrophenol
- C) *p*-Nitrophenol
- D) Salicylic acid

p q r s

- 1) A C D B
- 3) A B D C

Column II

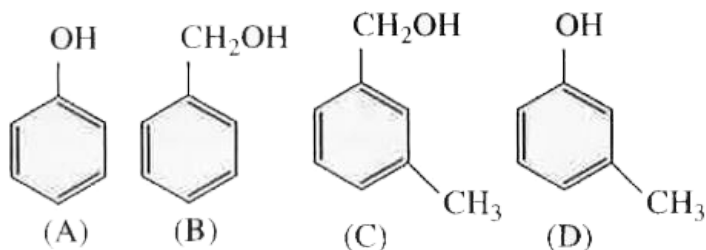
- p) hydrogen bonded
- q) steam volatile
- r) strongly acidic
- s) aspirin

p q r s

- 2) A B C D
- 4) A D C B

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10. Which of the following compounds is aromatic alcohol?



A. A, B, C, D

B. A, D

C. B, C

D. A only

Answer: C



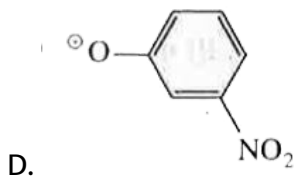
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11. Which of the following species can act as strongest base

A. $^{\ominus}OH$

B. $^{\ominus}OR$

C. $^{\ominus}OC_6H_5$



Answer: B



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12. Phenol is

- A. Slightly acidic
- B. Strongly acidic
- C. Strongly basic
- D. slightly basic

Answer: A



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13. Phenol do not react with

- A. Potassium hydroxide
- B. Sodium carbonate
- C. Sodium hydroxide
- D. Sodium bicarbonate

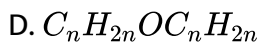
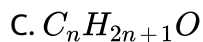
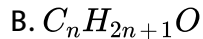
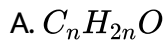
Answer: D



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ETHERS(Objective exercise-1)

1. The general formula of ethers is



Answer: C



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2. The IUPAC name of an unsymmetrical ether with the molecular formula, $C_4H_{10}O$ is

- A. Ethoxypropane
- B. Methoxyethane
- C. Ethoxyethane
- D. Methoxypropane

Answer: D



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3. Hybridisation of oxygen in diethyl ether is

- A. sp
- B. sp^2
- C. sp^3
- D. sp^3d

Answer: C



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4. The reaction, $RX + R - ONa \rightarrow R - O - R + NaX$ is called

- A. Wurtz reaction
- B. Williamson's synthesis
- C. Kolbe's reaction
- D. Hofmann bromamide reaction

Answer: B



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5. Williamson synthesis is an example of

- A. Nucleophilic addition

- B. Electrophillic addition
- C. Electrophillic substitution
- D. Nucleophilic substitution reaction

Answer: D



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6. Ethyl chloride reacts with sodium ethoxide to form a compound A. Which of the following reactions also yields A?

- A. C_2H_5Cl , $KOH(alc)$, Δ
- B. $2C_2H_5OH$, *conc.* H_2SO_4 , $140^\circ C$
- C. C_2H_5Cl , Mg (dry ether)
- D. C_2H_2 , *dil.* H_2SO_4 , $HgSO_4$

Answer: B



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7. When vapours of ethyl alcohol are passed over Al_2O_3 , at 533 K, it forms

- A. 1,2-Ethanediol
- B. Etene
- C. Ethoxyethane
- D. Ethanal

Answer: C



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8. Consider the following reaction $C_2H_5I \xrightarrow[X]{\Delta}$ (Pleasant smelling liqluid),

X is

- A. Sodium
- B. Dry silver oxide
- C. Ethyl chloride

D. Dry silver powder

Answer: B



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9. The IUPAC name of $C_2H_5 - O - CH(CH_3)_2$

A. Ethoxy propane

B. 1,1-dimethyl ether

C. 2-Ethoxy isopropane

D. 2-Ethoxy propane

Answer: D



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10. Which of the following is the strongest Lewis base ?

A. H_2O

B. CH_3OH

C. CH_3OCH_3

D. C_6H_5OH

Answer: C



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11. Grignard reagents are prepared in

A. Benzene

B. Chloroform

C. Alcohol

D. Ether

Answer: D



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12. An unknown compound dissolves in conc. sulphuric acid, but does not decolourise bromine water and does not react with sodium. Which of the following classes of molecules would behave in this manner ?

A. Alkene

B. Alcohol

C. Ether

D. Phenol

Answer: C



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13. Boiling point of diethyl ether is less than that of

A. Ethane

B. Butane

C. Ethyl alcohol

D. Dimethyl ether

Answer: C



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14. $C_2H_5 - O - C_2H_5 + HI \xrightarrow{\Delta} X + Y$. Here X and Y are (if excess HI is used)

A. C_2H_5I and C_2H_5OH

B. C_2H_5I and H_2O

C. $C_2H_5OH + H_2O$

D. $C_2H_4 + H_2O$

Answer: B



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15. $C_6H_5 - O - R$ when treated with hydrogen halide gives

A. $R - OX$ and $C_6H_5 - X$

B. $R-X$ and $C_6H_5 - X$

C. $R - OX$ and $C_6H_5 - OH$

D. $R-X$ and $C_6H_5 - OH$

Answer: D



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16. The organic compound which evaporates easily on exposure to atmospheric air

A. $C_2H_5OC_2H_5$

B. $CHCl_3$

C. CH_3CH_2OH

D. CH_3CHO

Answer: A



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17. (A): Ethers behave as bases in the presence of mineral acids.

(R): Oxygen atom in ether is having lone pair electrons.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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18. (A): Ethers are relatively inert when compared to C_2H_5OH .

(R): In ethyl alcohol both carbon and oxygen undergo sp^3 hybridisation.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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19. (A): $(CH_3)_3C - ONa$ and CH_3Br react together to form $(CH_3)_3C - O - CH_3$

(R): Good yields are obtained when sodium tert.alkoxide is treated with 1° alkyl halide

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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ETHERS(Objective exercise-2)

1. Regarding diethyl ether, the wrong statement is

- A. It is slightly soluble in water
- B. In cold condition, it does not react with alkali and dilute acids
- C. It has active hydrogen
- D. It does not react with Na metal

Answer: C



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2. Alcohols can be distinguished from ethers by

- A. Sodium metal
- B. Ester formation
- C. Iodoform test
- D. All the above

Answer: A



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3. Which of the following can not form oxonium salts with diethyl ether?

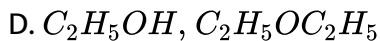
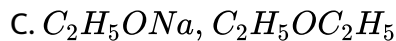
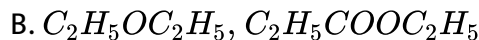
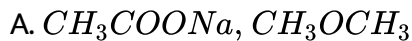
- A. HCl
- B. HBr
- C. H_2SO_4
- D. HCN

Answer: D



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4. 'A' reacts with C_2H_5I giving 'B' and NaI . Here 'A' and 'B' respectively are

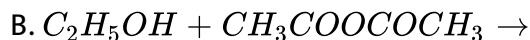
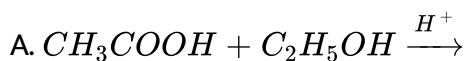


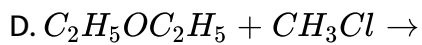
Answer: C



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5. Ester is not formed in the following reaction. Identify the suitable reaction



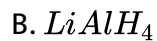


Answer: D



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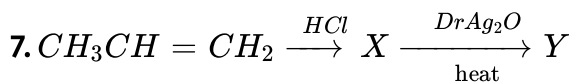
6. C-O-C bond in ethers can be cleaved by



Answer: D



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the product Y in the above sequence is

- A. Di isopropyl ether
- B. Di n - propyl ether
- C. 2 - Propanol
- D. 1, 2 -Epoxypropane

Answer: A



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8. When ethyl hydrogen sulphate is heated with excess alcohol at 410 K, the product obtained is

- A. Ethane
- B. Ethylene
- C. Diethyl ether

D. Diethyl sulphate

Answer: C



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9. The major product obtained on interaction of phenol with sodium hydroxide and carbon dioxide is :

A. salicylaldehyde

B. salicylic acid

C. phthalic acid

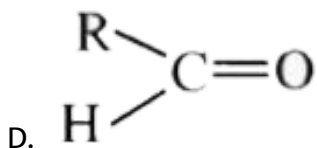
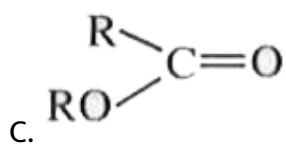
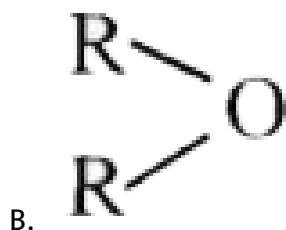
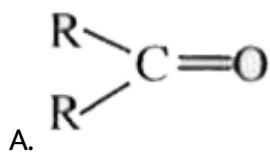
D. benzoic acid

Answer: B



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1. Ether is



Answer: B



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2. Oxygen atom in ether is

- A. very active
- B. replaceable
- C. active
- D. comparatively inert

Answer: D



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3. Formation of methyl tertiary butyl ether by the reaction of sodium tertiary butoxide and methyl bromide involves

- A. elimination reaction
- B. electrophilic addition reaction
- C. nucleophilic addition reaction
- D. nucleophilic substitution reaction

Answer: B



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4. Ethers in air forms

- A. Oxide
- B. Per-oxide
- C. Alkenes
- D. Alkanes

Answer: B



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5. Ethers are obtained by

- A. reacting alkyl halide with dry ZnO
- B. reacting alkyl halide with moist ZnO
- C. reacting alkyl halide with dry Ag_2O

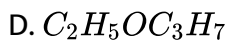
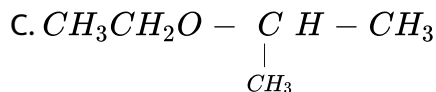
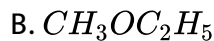
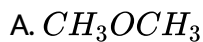
D. reacting alkyl halide with moist Ag_2O

Answer: C



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6. Which of the following is a simple ether?



Answer: A



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7. When methyl iodide reacts with sodium ethoxide it forms

A. Methyl ethyl ether

B. Dimethyl ether

C. Ethyl iodide

D. Diethyl ether

Answer: A



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8. When diethyl ether is heated with HI, which is formed

A. Ethyl alcohol and Ethyl iodine

B. Ethyl iodide only

C. Ethyl alcohol only

D. Ethyl iodine & Amine

Answer: B



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9. Ethers are isomeric with

A. aldehydes

B. acids

C. alcohols

D. Iodoform

Answer: C



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10. The heating together of sodium ethoxide and ethyl chloride will give

A. Acetaldehyde

B. Ether

C. Ethanol

D. Acetic acid

Answer: B



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11. The compound which is not isomeric with diethyl ether is

A. Butanone

B. n-propyl methyl ether

C. 2-methyl propane-2-ol

D. butanal-1

Answer: A



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12. Excess of C_2H_5OH is heated at $140^\circ C$ with conc. H_2SO_4 . The compound that distills is

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

Answer: A



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13. Which is the most favourable condition for the alcoholic fermentation of sugar?

- A. Low concentration of sugar solution, high temperature, absence of air

B. High concentration of solution, low temperature, plenty of air supply

C. High concentration of sugar solution, low temperature and absence of air

D. Low concentration of sugar solution, low temperature, plenty of air

Answer: B



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EXAMPLES

1. How many amyl alcohol structures are possible ?



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2. Identify the most stable conformer of glycol.



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3. Write two examples of cycloalkanols and their IUPAC names.



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4. Write the structures of the alcohols with the molecular formula, $C_5H_{12}O$ which exhibit enantiomorphism.



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5. How is methanol prepared, now-a-days, commercially?



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6. How acetylene is converted to ethyl alcohol ?

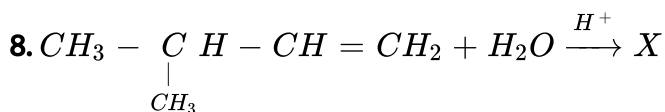


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7. How is n-propyl alcohol prepared from propene ?



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What is X ? Suggest the mechanism.



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9. Suggest a method for the conversion of $\text{CH}_3 - \text{CH}_2 - \text{NH}_3$ into ethyl alcohol.



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10. How is methyl alcohol converted to ethyl alcohol?



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11. Write the order of reactivity of

$CH_3OH(I)$, $C_2H_5OH(II)$, $CH_3CHCH_3(III)$ towards metallic sodium.



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12. tert-Butyl alcohol is much more soluble in water than n-butyl alcohol.

Explain.



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13. What happens when one drinks ethanol mixed with methanol? Why?



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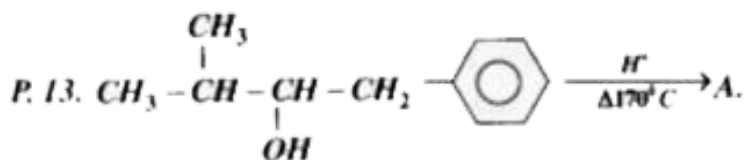
14. Write the structure of the product and mechanism of the following

reaction: $(CH_3)_3C - CH_2OH \xrightarrow{HBr}$

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15. Identify the stronger acid among the following: Butanol-1, butan-2-ol, isobutyl alcohol and tert-butyl alcohol. Give Reason.

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16.

A is the major product. What is 'A' ?

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17. How do you distinguish between methyl alcohol and ethyl alcohol?

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18. What happens when ethyl alcohol is treated with HI and red phosphorous ?



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19. Give the structures and IUPAC names of the products expected from the following reactions.

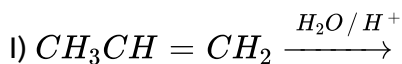
a) Catalytic reduction of butanal

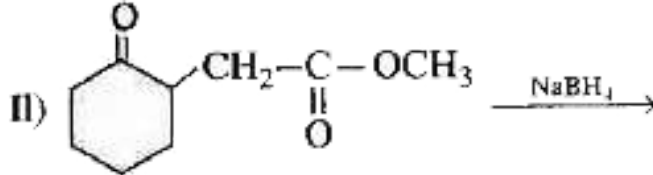
b) Reaction of propanone with methylmagnesium bromide followed by hydrolysis.



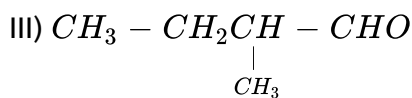
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20. Write structures of products of the following reactions :





II)

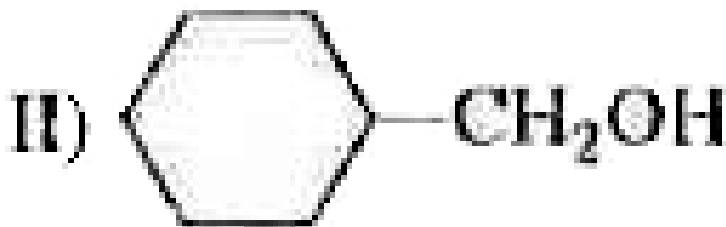


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21. Show how are the following alcohols are prepared by the reaction of a suitable Grignard reagent on methanal?



II)



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22. Arrange the following sets of compounds in order of their increasing boiling points.

I) (a) Pentanol-1: (b) Butanol-1, (c) Butanol-2, (d) Ethanol, (e) Propanol and (f) Methanol

II) (p) Pentanol - 1 , (q) n - Butane , (r) Pentanoil and (s) ethoxyethane.



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23. Write the aromatic structures of all isomers with the formula C_7H_8O .



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24. What is the tautomer of phenol ? Which is more stable ?



View Text Solution

25. How is salicylic acid converted to phenol?



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26. Explain the method of preparation of resorcinol from benzene.



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27. Phenol decolourises reddish brown colour of bromine, though it is not unsaturated compound. Explain.



[View Text Solution](#)

28. Write the decreasing order of acidic strengths of the following:

A : Phenol, B: p-nitrophenol, C: p-chlorophenol, D: p-cresol and E: p-methoxy phenol.



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29. Write the electrophile and intermediate in Reimer-Tiemann reaction.



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30. What is the reason for the formation of tribromo phenol when phenol is treated with aqueous bromine?



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31. Phenol is treated with CCl_4 in presence of NaOH. What happens ?



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32. Write the structures of the major products expected from the following reactions.

a) Mononitration of 3-methylphenol

b) Dinitration of 3-methyl phenol

c) Mononitration of phenyl methanate



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33. Dehydration of alcohols is suitable for preparing ethers having primary alkyl groups only. Comment



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34. Give one example of an ether which cannot be decomposed by HI.



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35. Ether can be dried over sodium, but not alcohol. Why?



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36. Chloroethane, 2-chloropropane and chloroethene are treated with methoxide. Which is more reactive towards Williamson's synthesis ?



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37. Diphenyl ether cannot be cleaved by treatment with HI. Why?



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38. How is ether distinguished from ethanol using iodine and alkali ?



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39. What product is expected when tertiary butyl bromide is reacted with sodium ethoxide? Why that product is not formed and how that product can be obtained?

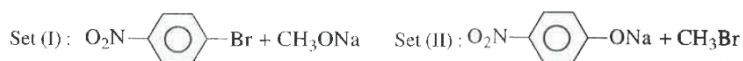


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40. Write the reactions involved in Williamson synthesis of 2-ethoxy-3-methylpentane, starting from ethanol

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41. Which of the following is an appropriate set of eactants for the preparation of 1-methoxy-4 nitrobenzene. Why?



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EXERCISE - 2.1.1

1. What are 2° and 3° alcohols? Give examples.

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2. Write any four methods of preparation of ethyl alcohol and four properties of ethyl alcohol.

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3. Write the equations of the reactions of ethyl alcohol with the following reagents :

- a) conc. H_2SO_4 at $170^\circ C$,
- b) Thionyl chloride,
- c) Bleaching powder, water
- d) Methyl magnesium bromide.

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4. What are dihydric and trihydric alcohols ? Give one example each.

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5. Give the equations for the reaction of ethanol with conc. H_2SO_4 at different temperatures.



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6. Explain the action of Al_2O_3 on ethyl alcohol at $260^\circ C$ and $350^\circ C$.



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7. How does ethanol react with copper at $300^\circ C$? Name the reaction



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8. Give the equations for the reaction of ethyl alcohol with PCl_5 and PCl_3 .



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9. Explain how the three types of alcohols, primary, secondary and tertiary can be distinguished ?



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EXERCISE - 2.1.2

1. How is phenol prepared? Write the properties of phenol.



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2. Explain the electrophilic substitution reactions of phenol. Write two uses of phenol.



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3. Write short notes on the following: (a) Reimer-Tiemann reaction and (b) Kolbe's reaction.



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4. Discuss the acidic nature of phenols compared to alcohols.



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5. Compare the acidic character of nitrophenols, phenol and cresols.



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6. Why phenol molecule is less stable than phenoxide ion ?



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7. Arrange the following in the increasing order of acidic nature and discuss the reason :

(a) Phenol, (b) p-nitrophenol and (c) p-cresol



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8. Discuss the bromination of phenol in aqueous solution and CS_2 or $CHCl_3$ as solvent.



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EXERCISE - 2.1.3

1. Compare the physical properties of an alcohol and ether of comparable molecular mass.



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2. Explain Williamson's method of preparation of diethyl ether.



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3. Explain the action of HI on diethyl ether.



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4. Give the structures and IUPAC names of monohydric phenols of molecular formula, C_7H_8O .



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5. What is the action of dil. H_2SO_4 and conc. H_2SO_4 on diethyl ether?



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6. Explain why ortho nitrophenol is more acidic than ortho methoxyphenol?



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7. Metallic sodium reacts with 'X' to form 'Y'. Ethyl chloride and 'Y' react together to give diethyl ether. What are 'X' and 'Y'?



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8. How methyl magnesium bromide is converted to 2-methyl-2-propanol ?



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EXERCISE - 2.2

1. How the three types of alcohols are distinguished?



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2. Write short notes on the following: (a) Reimer-Tiemann reaction and (b) Kolbe's reaction.



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3. Differentiate between an alcohol from a phenol, though both contain same functional group



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4. What evidence that you can give to say that oxygen atom in phenol is sp^2 hybridised.



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5. Why phenols are stronger acids than alcohols?



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6. Can phenols react with $NaHCO_3$ to liberate CO_2 ?



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7. tert-Butyl alcohol is much more soluble in water than n-butyl alcohol. Explain.



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8. Give the sequence of reactions to prepare 2-butanol starting from 1-butene.



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9. Discuss on the relative reactivity of different alcohols with a given carboxylic acid towards esterification



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10. Among isomeric alcohols which reacts fastest with metallic sodium? Why?



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11. Write the importance of isotopic oxygen (O^{18}) in the mechanism of esterification. Give suitable examples.



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12. Arrange the following in the increasing acidic strength:

Phenol, o-chlorophenol, m-chlorophenol and p-chlorophenol.



[Watch Video Solution](#)

13. What are the products formed when $(CH_3)_3C - CH = CH_2$ is subjected to (a) hydration in presence an acid, (b) hydroboration oxidation and (c) oxymercuration-demercuration.

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14. Explain how -OH group in phenol is ortho- and para- orienting?

[Watch Video Solution](#)

15. Why tribromophenol is formed when phenol is treated with bromine water?

[Watch Video Solution](#)

16. Williamson's synthesis cannot be carried out with tertiary alkyl chloride. Why?



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17. Reaction of 2-pentanol or 3-pentanol on reaction with HCl give both 2-chloropentane and 3-chloropentane. Explain.



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18. What happens when phenol is treated with carbontetrachloride, in the presence of NaOH?



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19. Give the sequence of reactions to convert benzene into p-hydroxyacetophenone.



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20. What is dichlorocarbene? Write the reaction in which dichlorocarbene is involved.



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21. An alkoxy group connected to benzene ring is ortho- and para-orienting. Explain.



[Watch Video Solution](#)

22. How is benzene converted to phenol via Friedel-Crafts reaction?

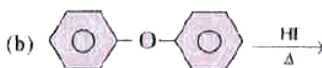
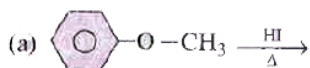


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23. Tertiary alkyl halides are not suitable for preparation of ethers by Williamson's synthesis, Explain.

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24. Write the product(s) of the following reactions :



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25. How a mixture of phenol and ethyl alcohol can chemically be separated?

 Watch Video Solution

26. Write the phenolic isomer of the compound $C_6H_5CH_2OH$.

 Watch Video Solution

27. Williamson's method is not useful for preparation of diphenyl ether. Why?



Watch Video Solution

28. Salicylaldehyde $\leftarrow$ Phenol $\rightarrow$ Salicylic acid. How are these conversions made?



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29. 'X' reacts with PCl_5 to give 'Y'. 'Y' reacts with aqueous KOH to give back 'X'. If the molecular formula of 'X' is C_2H_6O what are 'X' and 'Y'?



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30. $C_2H_4 + HCl \xrightarrow{AlCl_3} A \xrightarrow{H_2O.OH^-} B \xrightarrow{H_2SO_4.140^\circ} C \xrightarrow{\text{Steam}} B$.Discuss the reactions.

 Watch Video Solution

31. $A \xrightarrow[\text{aqueous}]{KOH} B \xrightarrow[140^\circ C]{conc. H_2SO_4} C \xrightarrow[HI]{hot} C_2H_5I + H_2O$ what are A, B and C?

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32. $C_2H_5OH \xrightarrow{Na} X, C_2H_5OH \xrightarrow{PCl_5} Y$. Organic products, X and Y react together to give another organic compound Z. Write the normal chain functional isomer of Z.

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33. $C_6H_5NH_2 \xrightarrow{HNO_2, HCl, 0^\circ C} A \xrightarrow{\text{steam}} B(Zn, \Delta) \rightarrow C$. What is compound 'C'?



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34. $C_2H_5CHOHCH_3 \xrightarrow[-H_2O]{H_2SO_4} X \xrightarrow{O_3, H_2O, Zn} Y + Z$ Y+Z. Are the organic products Y and Z different?



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PROBLEM

1. How many structural isomers exist with the formula $C_4H_{10}O$?



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2. Identify the most stable conformer of glycol.



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3. How many amyl alcohol structures are possible ?



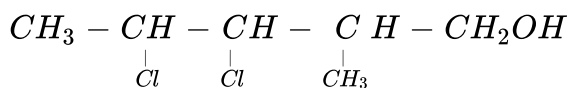
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4. Arrange the following set of compounds in order of their increasing boiling points Pentan-1-ol, butan-1-ol, butan-2-ol, ethanol propan-1-ol and methanol



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5. Give IUPAC names of the following

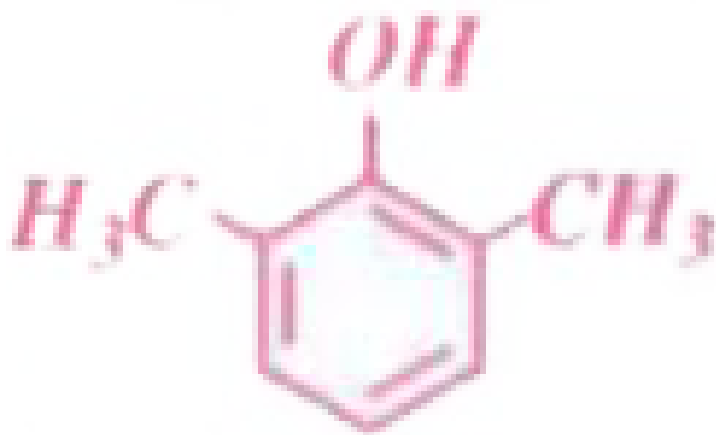


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6. Give IUPAC names of the $\text{CH}_3 - \underset{\text{CH}_3}{\underset{|}{\text{C}}} \text{H} - \text{O} - \text{CH}_2\text{CH}_3$

 Watch Video Solution

7. Give IUPAC names of the following



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8. How acetylene is converted to ethyl alcohol ?

 Watch Video Solution

9. How benzyl alcohol is obtained from benzyl chloride ?



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10. How is n-propyl alcohol prepared from propene ?

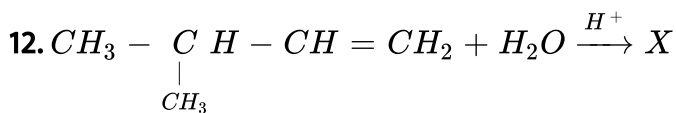


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11. Suggest a method for the conversion of $CH_3 - CH_2 - NH_3$ into ethyl alcohol.



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What is X ? Suggest the mechanism.



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13. How is methyl alcohol converted to ethyl alcohol?



[Watch Video Solution](#)

14. Give the structures and IUPAC names of the products expected from the following reactions:

(a) Catalytic reduction of butanal.

(b) Hydration of propene in the presence of dilute sulphuric acid.

(c) Reaction of propanone with methylmagnesium bromide followed by hydrolysis.



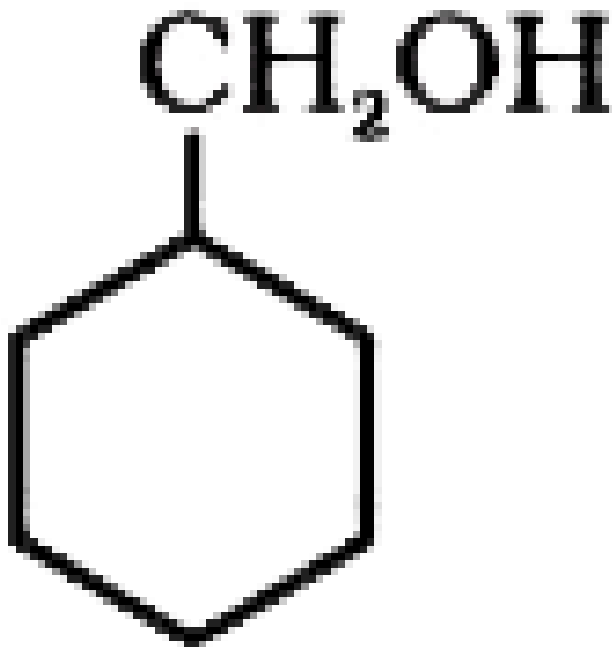
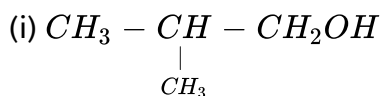
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15. Propane is treated with methyl magnesium bromide and then subjected to hydrolysis. Write the final product.



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16. Show how are the following alcohols prepared by the reaction of a suitable Grignard reagent on methanal ?

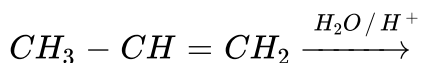


(ii)



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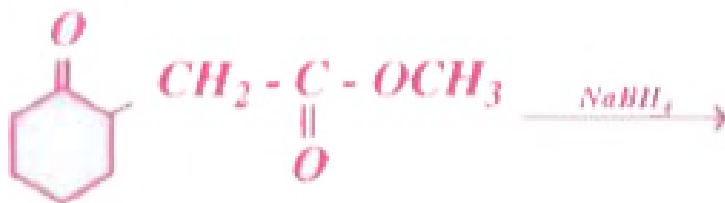
17. Write structures of the products of the following reactions :





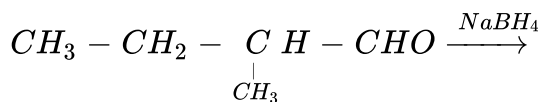
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18. Write structures of the products of the following reactions :



Watch Video Solution

19. Write structures of the products of the following reactions :



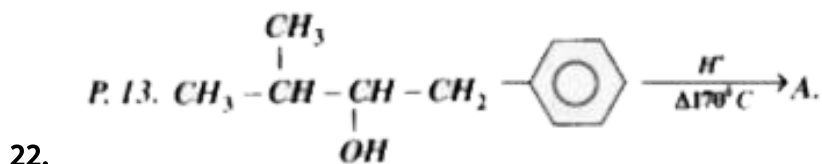
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20. tert-Butyl alcohol is much more soluble in water than n-butyl alcohol. Explain.

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21. Identify the stronger acid among the following: Butanol-1, butan-2-ol, isobutyl alcohol and tert-butyl alcohol. Give Reason.

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A is the major product. What is 'A' ?

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23. Write the structure of the product and mechanism of the following reaction: $(CH_3)_3C - CH_2OH \xrightarrow{HBr}$



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24. How do you distinguish between methyl alcohol and ethyl alcohol ?



Watch Video Solution

25. What happens when ethyl alcohol is treated with HI and red phosphorous ?



Watch Video Solution

26. What happens when one drinks ethanol mixed with methanol? Why?



Watch Video Solution

27. Phenol is treated with CCl_4 in presence of NaOH. What happens ?



Watch Video Solution

28. What is the reason for the formation of tribromo phenol when phenol is treated with aqueous bromine?



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29. Write the electrophile and intermediate in Reimer-Tiemann reaction.



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30. Write the decreasing order of acidic strengths of the following:

A : Phenol, B: p-nitrophenol, C: p-chlorophenol, D: p-cresol and E: p-methoxy phenol.



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31. Write the structures of the major products expected from the following reactions:

- a) 3-methyl phenol is mononitrated
- b) Phenyl methanoate is mononitrated
- c) 3-Methyl phenol is dinitrated



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32. Predict the major products formed from the following reactions :

- a) Dinitration of 3-methylphenol
- b) Mononitration of phenylmethanoate
- c) Mononitration of 3-methylphenol



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33. Arrange the following compounds in decreasing order of their acidic strength : Propan-1-ol, 3,5-Dinitrophenol, phenol, 2,4,6- Trinitrophenol, 3-

Nitrophenol and 4-methylphenol.



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34. What is the weight of bromine required to give 0.1 mole of a white precipitate with phenol ?



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35. Chloroethane, 2-chloropropane and chloroethene are treated with methoxide. Which is more reactive towards Williamson's synthesis ?



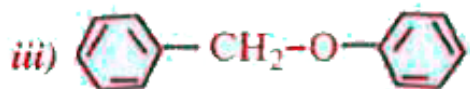
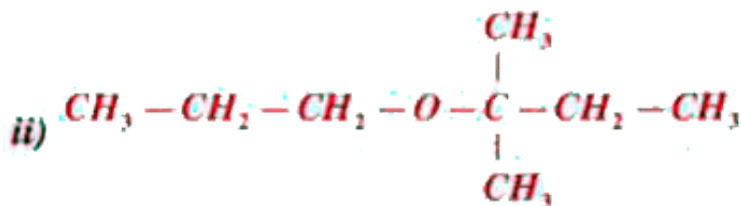
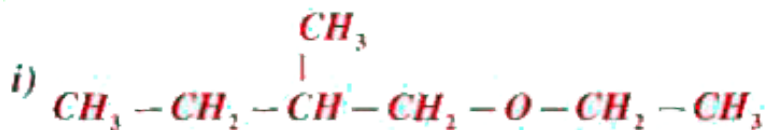
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36. Give one example of an ether which cannot be decomposed by HI.



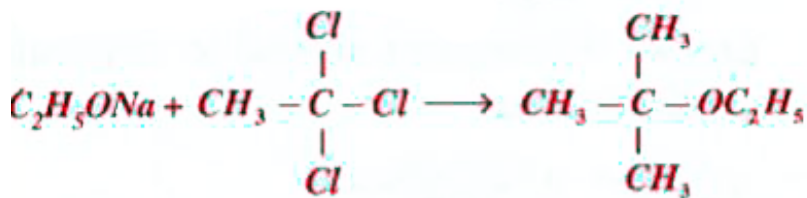
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37. Give the major products that are formed by heating each of the following ethers with HI.



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38. The following is not an appropriate reaction for the preparation of t-butyl ethyl ether.



i) What would be the major product of this reaction ? ii) Write a suitable reaction for the preparation of t-butylethyl ether



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39. Ether can be dried over sodium, but not alcohol. Why?



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40. How is ethyl iso-propyl ether prepared ?



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41. What product is expected when tertiary butyl bromide is reacted with sodium ethoxide? Why that product is not formed and how that product can be obtained?



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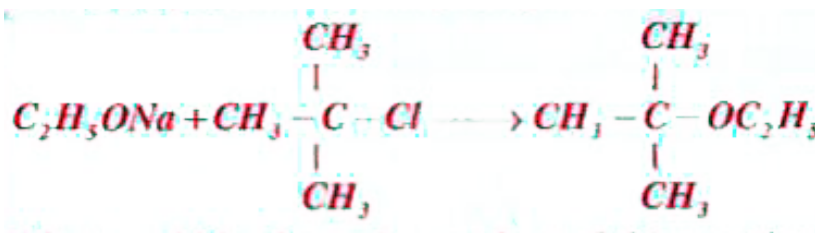
42. How is ether distinguished from ethanol using iodine and alkali ?

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43. Why anisole does not give iodobenzene with excess HI ?

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44. The following is not an appropriate reaction for the preparation of t-butyl ethyl ether.



What would be the major product of this reaction? Write a suitable reaction for the preparation of t-butyethyl ether.

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SUBJECTIVE EXERCISE - 1 (Long answer questions)

1. Explain how ethyl alcohol is obtained by fermentation process.



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2. What happens when ethyl alcohol reacts with i) Metallic Na
ii) acetic acid iii) CH_3MgBr iv) Conc. H_2SO_4 , $140^\circ C$



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SUBJECTIVE EXERCISE - 1 (Short answer questions)

1. Explain the formation of ethyl alcohol from ethylene, ethyl acetate, acetaldehyde and formaldehyde.



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2. Write the equations of the reactions of ethyl alcohol with the following reagents :

- a) conc. H_2SO_4 at $170^\circ C$,
- b) Thionyl chloride,
- c) Bleaching powder, water
- d) Methyl magnesium bromide.



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3. How is ethyl alcohol converted to :

- a) acetaldehyde b) ethyl acetate
- c) iodoform d) ethane ?



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4. Write the mechanism of dehydration of ethyl alcohol.



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5. Explain how the three types of alcohols, primary, secondary and tertiary can be distinguished ?



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6. How does ethyl alcohol react with metallic sodium, acetic acid and conc. H_2SO_4 at $140^\circ C$?



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7. How is methyl alcohol prepared commercially?



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8. Write the uses of methyl alcohol and ethyl alcohol.



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SUBJECTIVE EXERCISE - 1 (Very short answer questions)

1. What are dihydric and trihydric alcohols ? Give one example each.



Watch Video Solution

2. What are secondary and tertiary alcohols ?



Watch Video Solution

3. How is rectified spirit converted to absolute alcohol ?



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4. Give the equations for the reaction of ethyl alcohol with PCI_5 and PCl_3 .



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5. Give the equations for the reaction of ethanol with conc. H_2SO_4 at different temperatures.



Watch Video Solution

6. Explain the action of Al_2O_3 on ethyl alcohol at $260^\circ C$ and $350^\circ C$.



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7. How does ethyl alcohol react with Cu metal at $300^\circ C$. Name that reaction.



Watch Video Solution

8. 'X' reacts with PCl_5 to give 'Y'. 'Y' reacts with aqueous KOH to give back 'X'. If the molecular formula of 'X' is C_2H_6O what are 'X' and 'Y'?



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SUBJECTIVE EXERCISE - 2 (Long answer questions)

1. How is phenol prepared? Write the properties of phenol.



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SUBJECTIVE EXERCISE - 2 (Short answer questions)

1. Discuss the acidic nature of phenols compared to alcohols.



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2. Compare the acidic character of nitrophenols, phenol and cresols.



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3. Explain the electrophilic substitution reactions of phenol. Write two uses of phenol.



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4. Arrange the following in the increasing order of acidic nature and discuss the reason :

(a) Phenol, (b) p-nitrophenol and (c) p-cresol



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5. Why phenol molecule is less stable than phenoxide ion ?



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6. Discuss the bromination of phenol in aqueous solution and CS_2 or $CHCl_3$ as solvent.



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SUBJECTIVE EXERCISE - 3 (Long answer questions)

1. Write three preparations and three properties of diethyl ether.



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2. How are the following converted to diethyl ether ?

i) C_2H_5OH ii) C_2H_5Br iii) C_2H_5ONa



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SUBJECTIVE EXERCISE - 3 (Short answer questions)

1. By Williamson's method, how a tertiary alkyl and primary alkyl ether are formed ?





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2. Compare the physical properties of an alcohol and ether of comparable molecular mass.



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3. Explain the action of HI on diethyl ether.



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4. Starting from ethanol and 3-methyl pentanone2-ol, write the reactions of Williamson synthesis for 2-ethoxy-3-methyl pentane.



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5. Give the structures and IUPAC names of monohydric phenols of molecular formula, C_7H_8O .



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6. Draw the structure of all isomeric alcohols of molecular formula $C_5H_{12}O$ and give their IUPAC names and classify them as primary, secondary and tertiary alcohols.



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7. Explain why ortho nitrophenol is more acidic than ortho methoxyphenol?



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SUBJECTIVE EXERCISE - 3 (Very short answer questions)

1. Metallic sodium reacts with 'X' to form 'Y'. Ethyl chloride and 'Y' react together to give diethyl ether. What are 'X' and 'Y'?



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2. Two compounds A and B when heated sperately with Al_2O_3 at $360^\circ C$, the product formed is ethylene, What are A and B ?



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3. Write the action of HI on $C_2H_5OC_2H_5$ in cold and hot conditions.



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4. Write the common and IUPAC names of $CH_3 - O - C_3H_7$

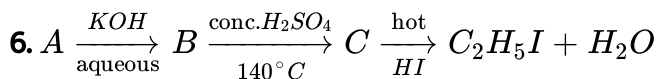


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5. Explain Williamson's method of preparation of diethyl ether.



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what are A, B and C ?



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7. How methyl magnesium bromide is converted to 2-methyl-2-propanol ?



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8. From ethyl magnesium iodide how propanol-1 is formed ?



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ALCOHOL (OBJECTIVE EXERCISE-1 (NOMENCLATURE AND PREPARATIONS))

1. The number of 1° alcoholic groups in glycol

A. 1

B. 2

C. 3

D. zero

Answer: B



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2. The common name of 2-methyl-1-propanol

A. 2-methyl-2-propanol

B. secondary butyl alcohol

C. isobutyl alcohol

D. tertiary butyl alcohol

Answer: C



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3. An isomer of ethanol is

- A. Methanol
- B. Dimethyl ether
- C. Diethyl ether
- D. Ethylene glycol

Answer: A



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4. Which one of the following is a secondary alcohol?

- A. 2 - Methyl - 1 - propanol
- B. 2 - Methyl - 2 - propanol
- C. 2 - Butanol

D. 1 - Butanol

Answer: C



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5. If the boiling point of ethanol (molecular weight = 46) is $78^{\circ}C$, the boiling point of diethyl ether (molecular weight = 74) is

A. $100^{\circ}C$

B. $78^{\circ}C$

C. $86^{\circ}C$

D. $34^{\circ}C$

Answer: D



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6. Which of the following alcohols has the lowest solubility in water ?

- A. Methanol
- B. Ethanol
- C. 1-Propanol
- D. 1-Butanol

Answer: C



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7. One mole of ethyl acetate on treatment with an excess of $LiAlH_4$ in dry ether and subsequent acidification produces

- A. 1 mol acetic acid + 1 mol ethyl alcohol
- B. 1 mol ethyl alcohol + 1 mol methyl alcohol
- C. 2 moles of ethyl alcohol
- D. 1 mol of 2 - butanol.

Answer: D



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8. Glucose is converted into ethyl alcohol by

A. maltase

B. zymase

C. invertase

D. diastase

Answer: B



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9. Rectified spirit can be converted into absolute alcohol by distilling with

A. Na_2CO_3

B. Na

C. *conc.* H_2SO_4

D. CaO

Answer: D



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10. Rectified spirit is made unsuitable for drinking by adding

A. CH_3OH

B. 1-propanol

C. Water

D. 2-propanol

Answer: A



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11. Which of the following alkenes when passed through conc. H_2SO_4 followed by hydrolysis with boiling water would give tert-butyl alcohol ?

- A. Ethylene
- B. Isobutylene
- C. Propylene
- D. 1-Butene.

Answer: B



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12. When equal weights of methyl alcohol and ethyl alcohol react with excess of sodium metal, the volume of H_2 liberated is more in the case of

- A. C_2H_5OH
- B. CH_3OH
- C. equal in both

D. H_2 is not liberated

Answer: B



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13. The reaction of ethylmagnesium iodide with acetaldehyde gives after acidification

A. 2-Butanol

B. 1-Butanol

C. 2-Methyl-2-propanol

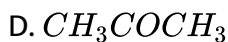
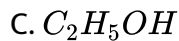
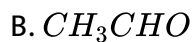
D. 2-Methylpropanol

Answer: A



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14. To prepare 2-propanol from methyl-magnesium bromide, the other chemical required is



Answer: B



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15. Slow decomposition of complex organic compounds into simpler ones by enzymes is known as

A. Condensation

B. Fermentation

C. Dehydration

D. Polymerization

Answer: B



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16. In the conversion of starch to ethyl alcohol, the following enzymes are used

- A. Invertase, Zymase, Emulsin
- B. Maltase, Zymase, Emulsin
- C. Diastase, Maltase, Zymase
- D. Invertase, Diastase, Zymase.

Answer: C



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17. Which one of the following gases is liberated when ethyl alcohol is heated with methyl magnesium iodide?

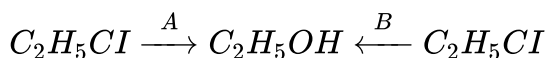
- A. Methane
- B. Ethane
- C. Carbondioxide
- D. Propane

Answer: A



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18. Identify A and B in the following reaction



- A. A = aqueous KOH, B = AgOH
- B. A = alcoholic KOH , B = aqueous NaOH
- C. A = aqueous NaOH , B = $AgNO_2$

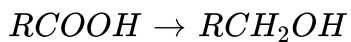
D. $A = AgNO_2$, $B = KNO_2$

Answer: A



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19. Which reducing agent is used for the following conversion ?



A. $LiAlH_4$

B. $NaBH_4$

C. $K_2Cr_2O_7$

D. $KMnO_4$

Answer: A



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20. In India, ethyl alcohol is mainly manufactured by

- A. Destructive distillation of wood
- B. Hydrogenation of oils
- C. Fermentation of molasses
- D. Catalytic oxidation of ethane

Answer: C



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21. In the Lucas test, turbidity is not shown by

- A. 1° alcohol
- B. 2° alcohol
- C. 3° alcohol
- D. all of these

Answer: A



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22. Ethyl alcohol acts as nucleophile when it reacts with

A. Conc.HCl/ $ZnCl_2$

B. PCl_3

C. *conc.* H_2SO_4

D. CH_3COOH / H^+

Answer: D



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23. $CH_3CH_2CH_2OH \xrightarrow{x} CH_3CH=CH_2$, The reagent 'X' is

A. 5 % H_2SO_4 at 50°

B. 75 % H_2SO_4 at $100^\circ C$

C. 95 % H_2SO_4 at $170^\circ C$

D. Al_2O_3 , $170^\circ C$

Answer: C



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24. The final product in the fermentation of riped grapes in aerobic conditions is

A. Ethanoic acid

B. Ethanal

C. Ethanol

D. Ethane

Answer: A



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ALCOHOL (OBJECTIVE EXERCISE-1 (PROPERTIES AND USES))

1. The reaction $2ROH + 2Na \rightarrow RONa + H_2$ suggests that alcohols are

- A. Acidic
- B. Basic
- C. Amphoteric
- D. Neutral in character

Answer: A



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2. Which of the following reagent cannot be used to oxidize primary alcohols to aldehydes ?

- A. CrO_3 in anhydrous medium.
- B. $KMnO_4$ in acidic medium
- C. Pyridinium chlorochromate.
- D. Heat in the presence of Cu at 573K.

Answer: B



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3. 23 g of sodium will react with methanol to give

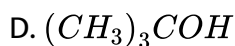
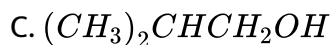
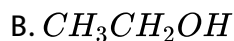
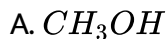
- A. One mole of oxygen
- B. $1/2$ Mole of hydrogen
- C. One mole of hydrogen
- D. $1/4$ Mole of oxygen.

Answer: B



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4. Which of the following alcohols is the strongest acid ?

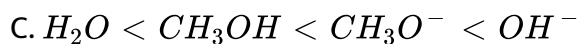
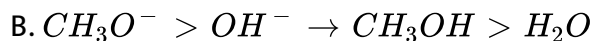
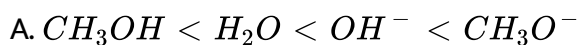
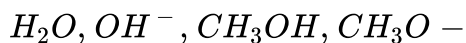


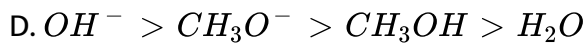
Answer: A



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5. The correct order of decreasing basicity of the following species is :





Answer: B



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6. Which of the following alcohols is expected to have the lowest pK_a value ?

A. Ethanol

B. 2-Fluoro ethanol

C. 2,2,2-Trifluoroethanol

D. 2-Chloroethanol

Answer: C



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7. When 2-butanol is heated with an excess of concentrated sulphuric acid, the main product is

- A. 1-Butene
- B. 2-Butene
- C. 2-Methyl propene
- D. 2-Methyl-2-butene

Answer: B



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8. When a mixture, containing PCl_3 and PCl_5 is heated with ethyl alcohol, a total of 4 moles of ethyl chloride is formed. Mole ratio of PCl_3 and PCl_5 in the mixture is

- A. 3:1
- B. 1:1

C. 1:3

D. 2:1

Answer: B



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9. When vapour of an alcohol are passed over hot reduced copper, it gives an alkene. The alcohol is

A. Primary

B. Secondary

C. Tertiary

D. None of these

Answer: C



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10. Acid catalyzed hydration of alkenes except ethene leads to the formation of

- A. Electrophilic addition and intermediate is carbanion
- B. Electrophilic addition and intermediate is carbonium ion
- C. Nucleophilic addition and intermediate is carbonium ion
- D. Free radical addition

Answer: B



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11. The bond cleavages during esterification reaction between

(A) = CH_3COOH and (B) C_2H_5OH

- A. C-O in B and O-H in A
- B. C-O in A and O-H in B
- C. C - O in A and O-H in A

D. O - H in B and O-H in A

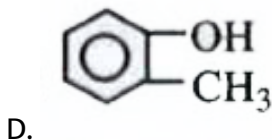
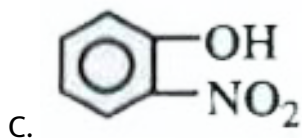
Answer: B



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12. Which one of the following compounds is most acidic?

A. $Cl - CH_2 - CH_2 - OH$



Answer: C



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13. Order of esterification of alcohols is

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

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

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

D. None of these

Answer: C



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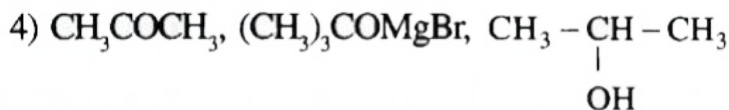
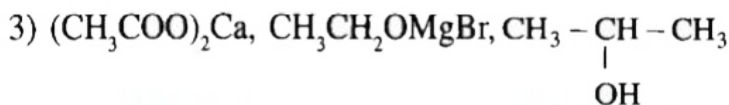
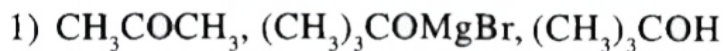
14. Complete the missing links.



A

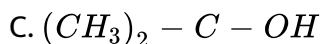
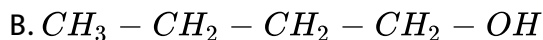
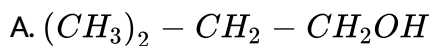
B

C



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15. The alcohol which easily reacts with con HCl is



Answer: C



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16. $CH_3CH_2OH \xrightarrow{P + I_1} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$. The compound D is

A. propanal

B. butanal

C. n-butyl alcohol

D. n-propyl alcohol

Answer: D



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17. correct order of 1° , 2° and 3° reactivity of and alcohols towards sodium metal is

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

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

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

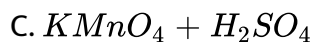
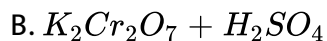
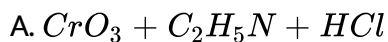
D. $2^\circ > 1^\circ > 3^\circ$

Answer: A



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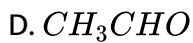
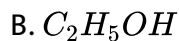
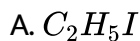
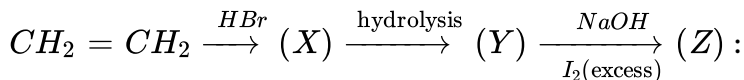
18. A better reagent for oxidation of primary alcohols to aldehydes in good yield is



Answer: A

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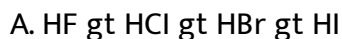
19. Identity (Z) in the reaction series,



Answer: C

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



B. $\text{HCl} > \text{HBr} > \text{HF} > \text{HI}$

C. $\text{HBr} > \text{HCl} > \text{HI} > \text{HF}$

D. $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$

Answer: D



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21. What is the hybridisation state(s) of the atoms in X formed in the following reaction?

$$\underset{\text{(Vapours)}}{C_2H_5OH} \xrightarrow[200^\circ C]{Al_2O_3} X$$

A. sp^3 only

B. sp^2 and sp^3

C. sp^2 only

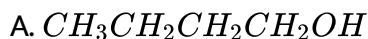
D. sp only

Answer: A



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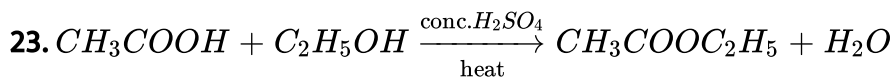
22. The structural formula of alcohol that on dehydration would give 2-methylpropene as the major product is



Answer: B



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The above reaction is known as

A. Hydrolysis

B. Esterification

C. Saponification

D. Dehydration

Answer: B



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24. C_2H_5OH can be converted in to C_2H_5Cl by reacting with

A. PCl_3

B. PCl_5

C. $SOCl_2$ + pyridine

D. all the above

Answer: D



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25. A mixture of anhydrous $ZnCl_2$ + conc. HCl is known as

- A. Fehling's reagent
- B. Lucas reagent
- C. Tollen's reagent
- D. Benedict's reagent

Answer: B



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26. When C_2H_5OH reacts with sodium metal, gas released is

- A. Oxygen
- B. Chlorine
- C. Hydrogen
- D. Nitrogen

Answer: C



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27. Action of caustic soda and chlorine on ethyl alcohol gives

- A. Chloroform
- B. Dichloromethane
- C. Trichloroethane
- D. Ethylenechloride

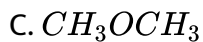
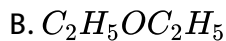
Answer: A



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28. Which is formed when ethanol reacts with acetic acid

- A. $CH_3COOC_2H_5$

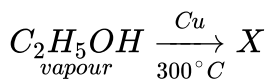


Answer: A

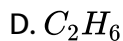
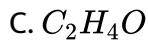


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29. In the reaction,



The molecular formula of X is



Answer: C

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30. $C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} X + Y + Z$. In this reaction X, Y & Z are

A. $C_2H_4Cl_2, SO_2, HCl$

B. $C_2H_5Cl, SO_2 + HCl$

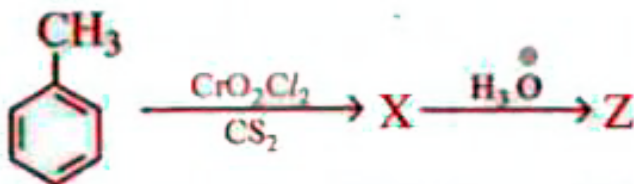
C. $C_2H_5Cl, SOCl_2, HCl$

D. $C_2H_4, SO_2 + Cl_2$

Answer: B

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31. In the following reaction



the compound Z is

- A. Benzoic acid
- B. Benzaldehyde
- C. Acetophenone
- D. Benzene

Answer: B



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ALCOHOL (OBJECTIVE EXERCISE-2A)

1. Which is the most favourable condition for the alcoholic fermentation of sugar?

- A. High concentration of sugar solution, low temperature, plenty of air
- B. Low concentration of sugar solution, high temperature , plenty of air

- C. Low concentration of sugar solution, low temperature, absence of air
- D. None of these

Answer: C



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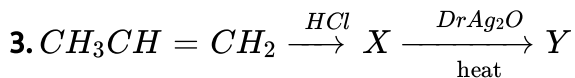
2. Consider the following sequence of reactions: $A \xrightarrow{C_2H_5MgI} X \xrightarrow{H^+ / H_2O}$ tert - amyl alcohol. The compound A in the above sequence of reactions is

- A. 2- Butanone
- B. Acetaldehyde
- C. Acetone
- D. Propanal

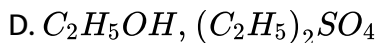
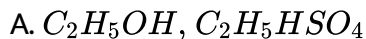
Answer: C



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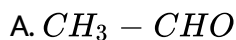
the product Y in the above sequence is

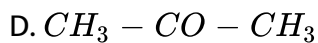


Answer: C



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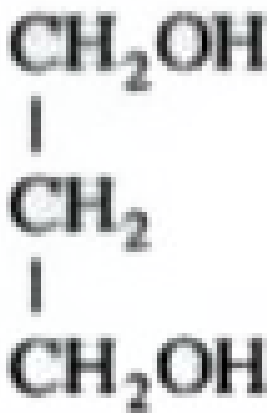
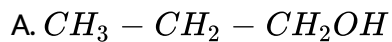


Answer: B



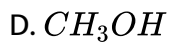
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5. Which of the following is more volatile ?



B.

C. glycerol



Answer: D

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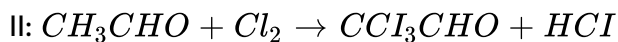
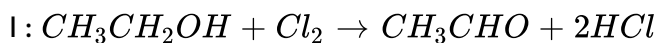
6. $CH_3CHO + 2[H] \xrightarrow{Ni: \Delta} B$. A dibasic acid is formed when "B" reacts with

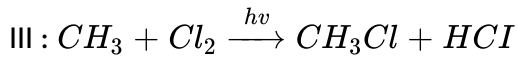


Answer: C

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7. In which of the following reactions, chlorine acts as an oxidizing agent ?





The correct answer is :

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

Answer: D



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8. What is the product obtained when chlorine reacts with ethyl alcohol in KOH?

- A. $CHCl_3$
- B. CCl_3CHO
- C. CH_3Cl

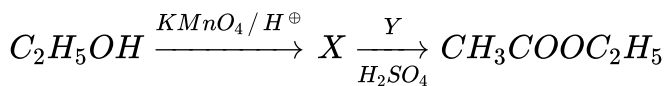
D. none

Answer: A



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9. In the following reaction X and Y respectively are



A. CH_3OH , C_2H_5OH

B. CH_3CHO , CH_3OH

C. $CH_2 = CH_2$, CH_3COOH

D. CH_3COOH , C_2H_5OH

Answer: D



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10. Hydrolysis of an ester gives acid A and alcohol B. The acid reduces Fehling's solution. Oxidation of alcohol B gives acid, A. The ester is

- A. Methyl formate
- B. Ethyl formate
- C. Propyl acetate
- D. Ethyl acetate

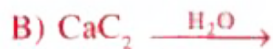
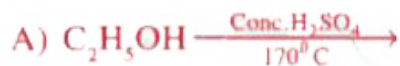
Answer: A



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11. Match the following

Set - I



Set - II

1) Methane

2) Ethylene

3) Benzene

4) Acetylene

5) Ethane

1) A - 2, B - 4, C - 5, D - 1

2) A - 2, B - 4, C - 5, D - 3

3) A - 4, B - 2, C - 5, D - 1

4) A - 4, B - 2, C - 5, D - 3



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12. $R - OH + HX \rightarrow R - X + H_2O$. In this reaction, the reactivity of alcohols is

A. Tertiary gt Secondary gt Primary

B. Tertiary lt Secondary lt Primary

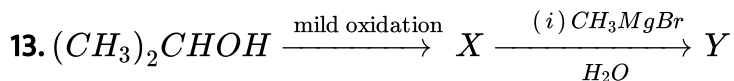
C. Tertiary gt Priamry gt Secondary

D. Secondary gt Primary gt Tertiary

Answer: A



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Here Y is

A. Iso butyl alcohol

B. Iso butylene

C. sec. Butyl alcohol

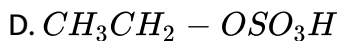
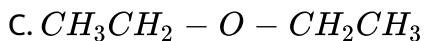
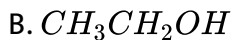
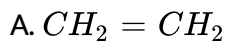
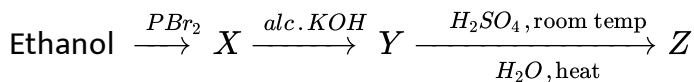
D. tert. Butyl alcohol

Answer: D



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14. Identify (z) in the following reaction series

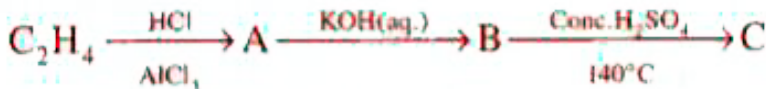


Answer: B

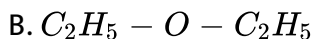


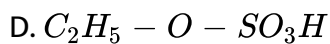
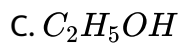
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15.



What is the final product?





Answer: B



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16. The compound with formula $C_4H_{10}O$ yields a compound C_4H_8O on oxidation, the compound $C_4H_{10}O$ is

A. an aldehyde

B. an alcohol

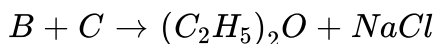
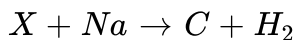
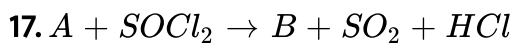
C. a ketone

D. an anhydride

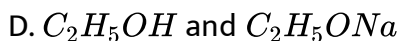
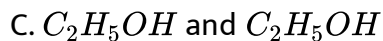
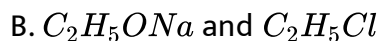
Answer: B



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Then A and X are respectively



Answer: C



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18. There are four alcohols P, Q, R and S which have 3, 2, 1 and zero α hydrogen atom (s) respectively. Which one of the following will give an alkene when heated with copper

A. P

B. Q

C. R

D. S

Answer: D



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19. Which of the following alcohols will not be easily oxidised by $K_2Cr_2O_7$ in dil. H_2SO_4 ?

A. CH_3OH

B. CH_3CH_2OH

C. $(CH_3)_3COH$

D. $CH_3CHOHCH_3$

Answer: C



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20. A convenient reagent to distinguish ethyl alcohol from n-propyl alcohol is

- A. Lucas reagent
- B. Tollen's reagent
- C. Schiff's reagent
- D. Iodine with aq. NaOH solution

Answer: D



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21. $R - CH_2 - CH_2OH$ can be converted into RCH_2CH_2COOH . The correct sequence of reagents is :

- A. PBr_3, KCN, H_3O^+
- B. $PBr_3, KCN, H_2 / Pt$

C. KCN, H_3O

D. HCN, PBr_3, H_2O^+

Answer: A



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22. When ethyl hydrogen sulphate is heated with excess alcohol at 410 K, the product obtained is

A. Ethane

B. Ethylene

C. Diethyl ether

D. Diethyl sulphate

Answer: C



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23. Maximum number of active hydrogens are present in

A. Acetic acid

B. Methane

C. Glycerol

D. Methanol

Answer: C



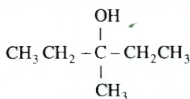
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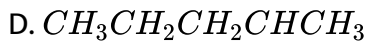
24. Among the following compounds which can be dehydrated very easily?

A. $CH_3CH_2CH_2CH_2CH_2OH$

B. $CH_3 - CH_2 - OH$

C.





Answer: D



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25. Methanol is industrially prepared by

A. Oxidation of CH_4 by steam at $900^\circ C$

B. Reduction of HCHO using $LiAlH_4$

C. Reaction HCHO with a solution of NaOH

D. Reduction of CO using H_2 and $ZnO - Cr_2O_3$

Answer: C



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26. Acid catalyzed hydration of alkenes except ethene leads to the formation of

- A. primary alcohol
- B. secondary or tertiary alcohol
- C. mixture of primary and secondary alcohols
- D. mixture of secondary and tertiary alcohols

Answer: B



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27. When a mixture, containing PCl_3 and PCl_5 is heated with ethyl alcohol, a total of 4 moles of ethyl chloride is formed. Mole ratio of PCl_3 and PCl_5 in the mixture is

- A. 3 : 1
- B. 1 : 1

C. 1:3

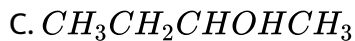
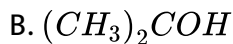
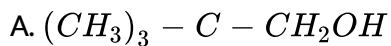
D. 2:1

Answer: B



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28. Which of the following alcohols on oxidation give carboxylic acid with lesser number of carbon atoms?



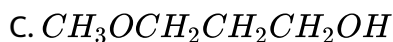
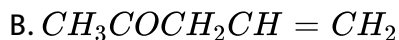
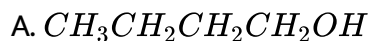
D. both (2) and (3)

Answer: D



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29. Which of the following compounds decolourises aqueous bromine and gives white fumes of HCl on reaction with PCl_5 ?



Answer: D



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30. Tertiary butyl alcohol heated with conc. H_2SO_4 and the alkene thus formed is subjected to ozonolysis. The products of ozonolysis are reduced with $LiAlH_4$. The final products are/ are

A. 2-Methylpropan-2-ol

B. Mixture of methanol + ethanol

C. Mixture of 2-propanol + methanol

D. Mixture of ethanol + formic acid

Answer: C



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31. How many primary structural alcohols isomers are possible for $C_5H_{11}OH$?

A. 5

B. 4

C. 2

D. 3

Answer: B



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32. An organic compounds 'A' with the molecular formula $C_4H_{10}O$ on oxidation with acidified $K_2Cr_2O_7$ gives compounds 'B' with the formula C_3H_6O . Again 'B' on oxidation with acidified $K_2Cr_2O_7$ gives, 'C' with the molecular formula $C_2H_4O_2$. IUPAC name of 'A' is

- A. 1-Butanol
- B. 2-Butanol
- C. 2-Methyl-2-propanol
- D. 2-Methylbutanol-1

Answer: C



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33. The final product in the fermentation of riped grapes in aerobic conditions is

- A. Ethanoic acid

B. Ethanal

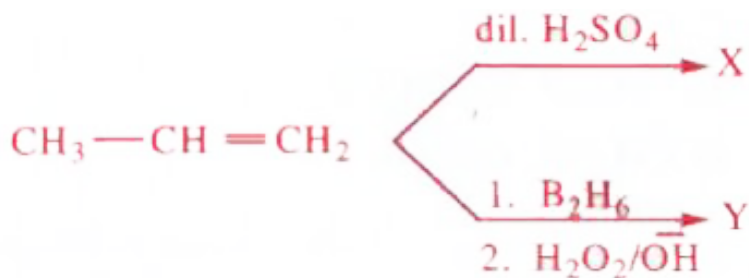
C. Ethanol

D. Ethane

Answer: A



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Here, the products X and Y are

X

Y

- | | |
|-------------------------|--------------------|
| 1) n - propyl alcohol | n - propyl alcohol |
| 2) iso - propyl alcohol | iso-propyl alcohol |
| 3) n-propyl alcohol | iso-propyl alcohol |
| 4) iso-propyl alcohol | n-propyl alcohol |

34.



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35. $CH_3CH_2OH \xrightarrow{P+I_1} A \xrightarrow{Mg} B \xrightarrow{HCHO} C \xrightarrow{H_2O} D$. The compound D is

- A. n-butyl alcohol
- B. n-propyl alcohol
- C. propanal
- D. butanal

Answer: B



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36. When phenyl magnesium bromide reacts with ter- butyl alcohol, which of the following is formed ?

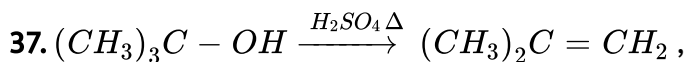
- A. Tert-butyl methyl ether
- B. Benzene
- C. Tert-butyl benzene

D. Phenol

Answer: B



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This reaction takes place through

A. SN^1 mechanism

B. SN^2 mechanism

C. E_1 mechanism

D. E_2 mechanism

Answer: C



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38. Denaturation of ethyl alcohol is made by adding

- A. methanol only
- B. pyridine only
- C. methanol and pyridine
- D. zinc sulphate

Answer: C

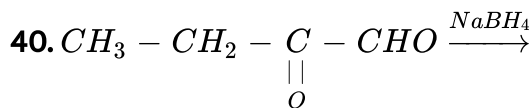


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39. An organic compounds 'X' with the molecular formula C_3H_6O , reacts with CH_3MgBr and then hydrolysed to give 'Y', Y gives turbidity immediately with Lucas reagent. Structural formula of compounds X and Y are :



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Product (s) in the above reaction is (are)

- A. $CH_3CH_2COOH + CO_2$
- B. $CH_3CH_2COCH_2OH$
- C. $CH_3CH_2CH(OH)CH_2OH$
- D. $CH_3CH_2CH(OH)CHO$

Answer: C



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41. Hydration of 3- phenylbut -1- ene with dil , H_2SO_4 mainly gives

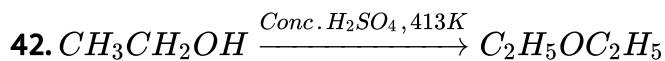
- A. 3-Phenlbutan-1-ol
- B. 3-Phenylbutan-2-ol
- C. 2-Phenylbutan-1-ol

D. 2-Phenylbutan-2-ol

Answer: D



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It follows which mechanism ?

A. SN^1

B. SN^2

C. E_1

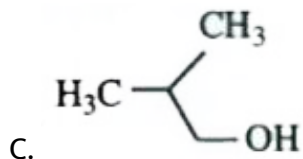
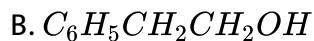
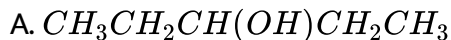
D. E_2

Answer: B



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43. Among the following the one that gives positive iodoform test upon reaction with I_2 and NaOH

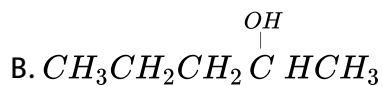
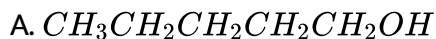


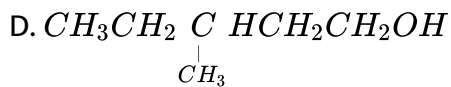
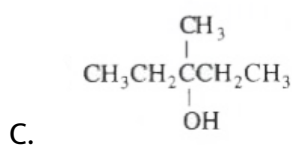
Answer: D



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44. Among the following compounds which can be dehydrated very easily?





Answer: C

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45. HB reacts fastest with

A. 2-Methylpropan-1-ol

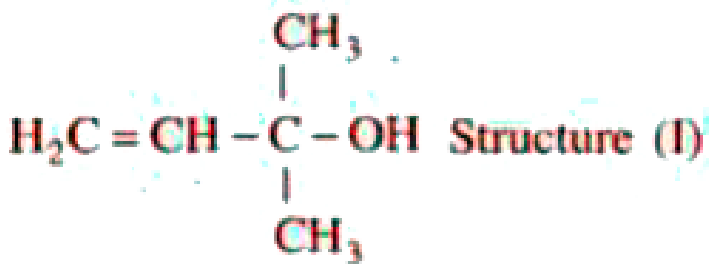
B. 2-Methylpropan-2-ol

C. Propan-2-ol

D. Propan-1-ol

Answer: B

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46.

The above

structure (I) is an example ofalcohol.

- A. Allylic tertiary
- B. Secondary
- C. Allylic secondary
- D. Allylic primary

Answer: A



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47. Which of the following statement is not correct?

- A. Phenols are stronger acids than alcohols

B. Carboxylic acids are stronger acids than phenols

C. Alcohols are stronger acids than water

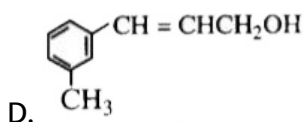
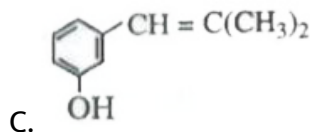
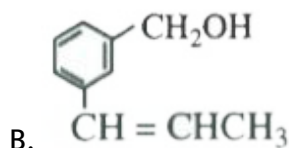
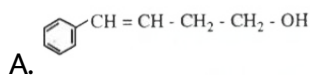
D. Carboxylic acids are stronger acids than alcohols

Answer: C



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48. Which of the following compound is an allylic alcohol ?

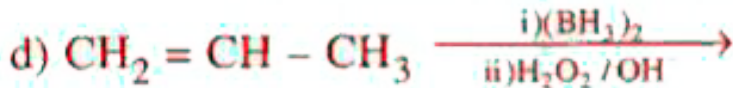
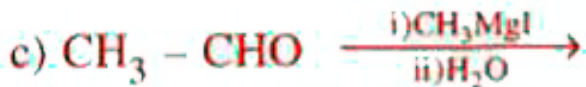
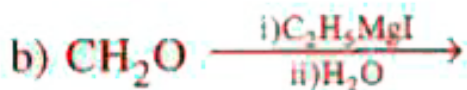


Answer: D



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49. Which one of the following reactions will yield 2-propanol ?



A. a,b

B. b,c

C. a,c

D. c,d

Answer: C



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50. Which of the following compounds give a yellow precipitate with iodine and aqueous NaOH solution ?

- A. 2-hydroxy propane
- B. Acetophenone
- C. Methyl acetate
- D. Acetamide

Answer: D



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ALCOHOL (OBJECTIVE EXERCISE-2B)

1. Ortho cresol and benzyl alcohol are

- A. Chain isomers

B. Positional isomers

C. Functional isomers

D. Metamers

Answer: C



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2. Consider the following groups attached to benzene ring and how many of these show "-I" effect only

$-NH_2$, $-NH_3$, $-F$, $-CH_2OH$, $-CH_3$, $-NHCOR$, $-OCH_3$, $-C$

A. 2

B. 4

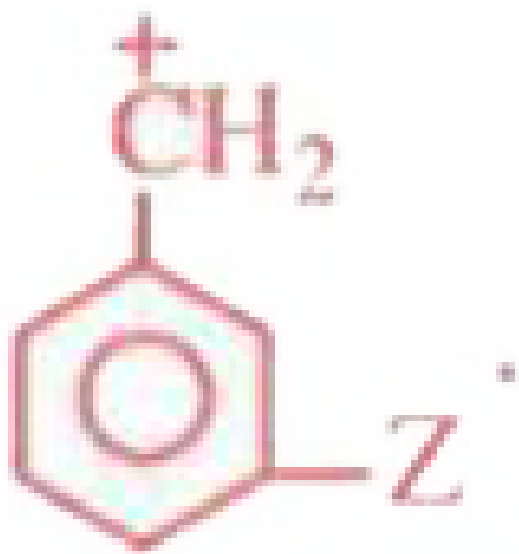
C. 3

D. 5

Answer: A

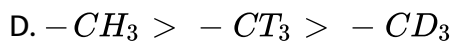
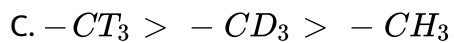
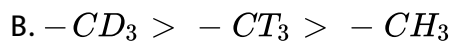


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3.

Correct order of stability when 'Z' is

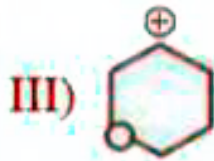
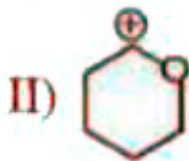


Answer: C



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4. Which of the is the correct order of stability



A. $I > II > III$

B. $II > III > I$

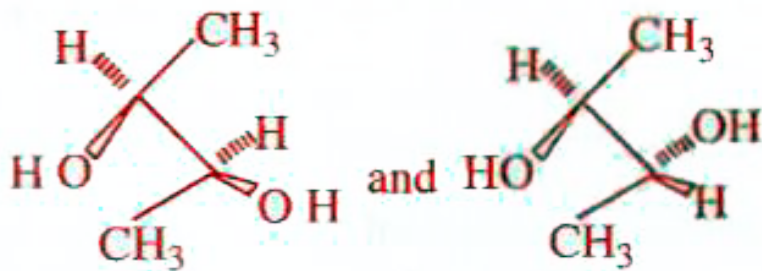
C. $III > II > I$

D. $II > I > III$

Answer: D



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5.

are a pair of

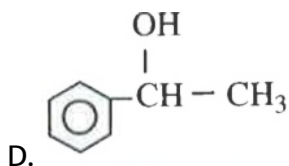
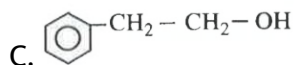
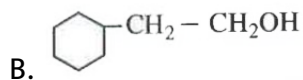
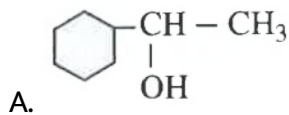
- A. Enantiomers
- B. Identical compounds
- C. Dia stereo isomers
- D. Positional isomers

Answer: C



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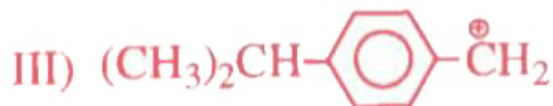
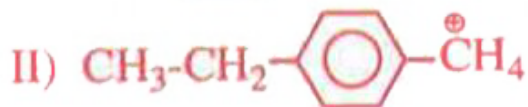
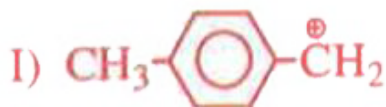
6. Which alcohol, when heated with H_2SO_4 will undergo dehydration more rapidly?



Answer: D



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7.

Stability order of these benzyl carbonocations is

A. I gt II gt III

B. III gt II gt I

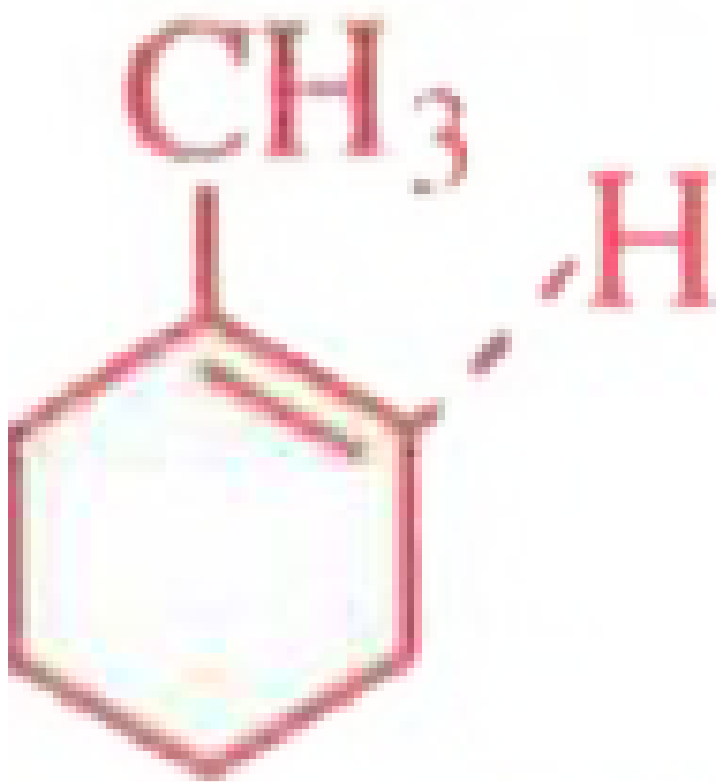
C. II gt III gt I

D. III gt I gt II

Answer: A



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8. _____ is subjected to hydroboration oxidation of the resulting structure is

A. cis

B. trans

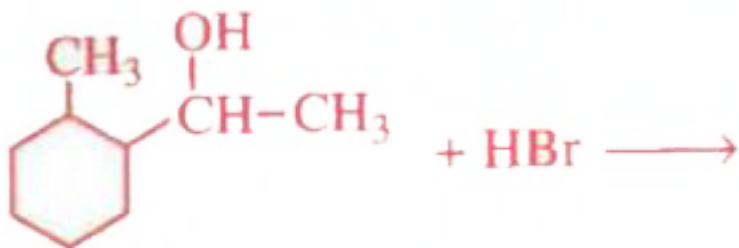
C. meso

D. mixture of 1 and 2

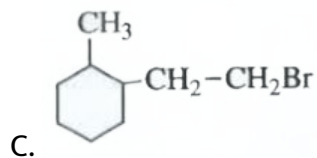
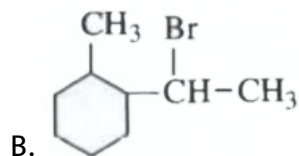
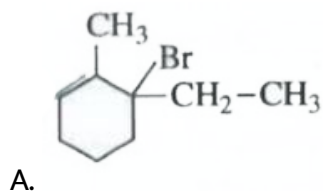
Answer: B



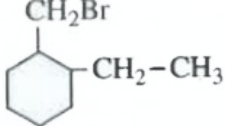
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The major product of this reaction is



D.

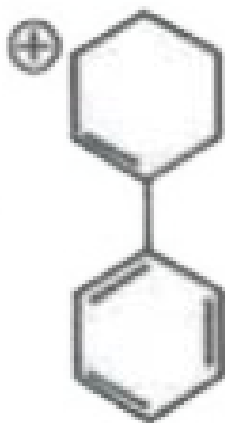


Answer: A



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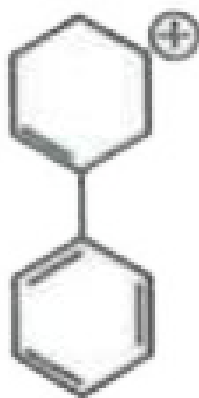
10. Most stable carbocation among the following is



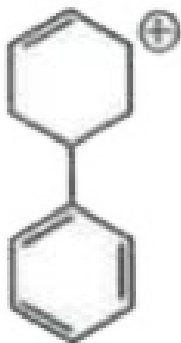
A.



B.



C.

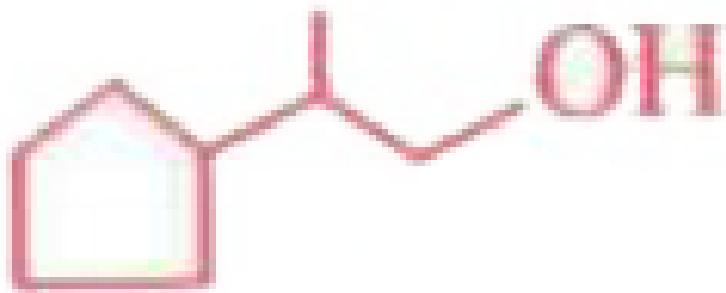


D.

Answer: A



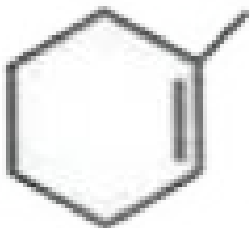
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11.

on the

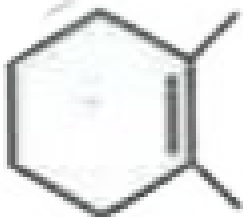
dehydration gives



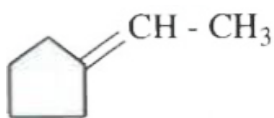
A.



B.



C.



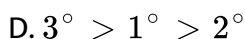
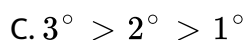
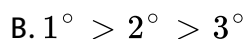
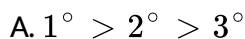
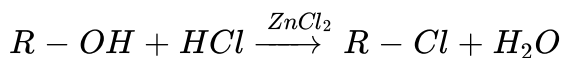
D.

Answer: C



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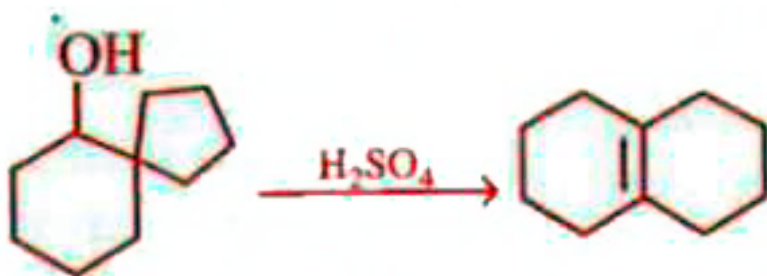
12. Which is the correct order of reactivity of alcohols in the following reaction



Answer: C



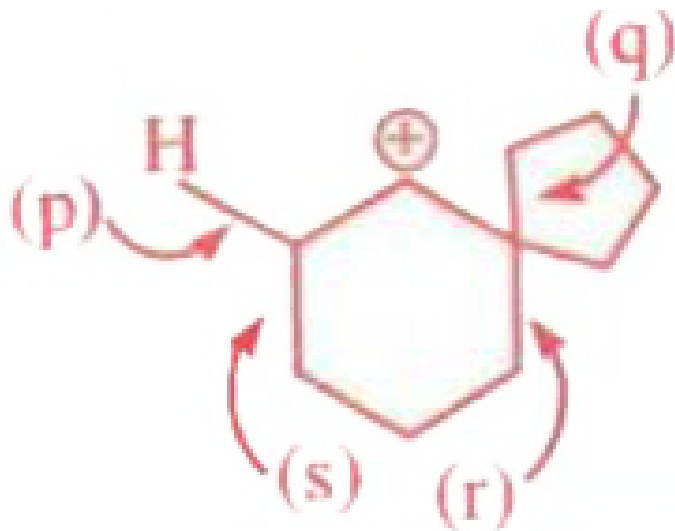
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13.

In the above reaction the major product is shown, which is formed

through the intermediate (carbocation given below:



Which bond will migrate to form above product ?

A. p

B. q

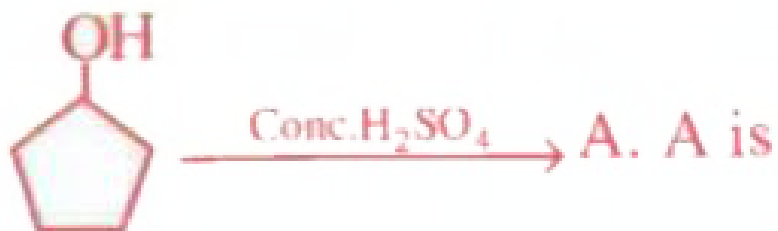
C. r

D. s

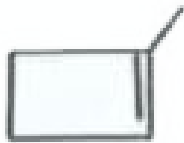
Answer: B



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D.



Answer: B



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15. The stability order of following carbocation is



A. i gt ii gt iv gt iii

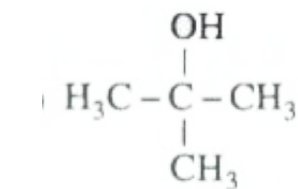
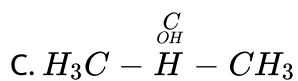
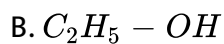
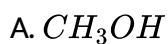
B. iii gt i gt ii gt iv

C. iv gt ii gt iii gt i

D. ii gt iv gt iii gt i

Answer: D

16. Which of the following is most reactive towards Na metal



Answer: A

17.



A.



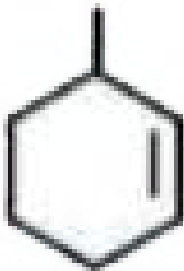
B.



C.



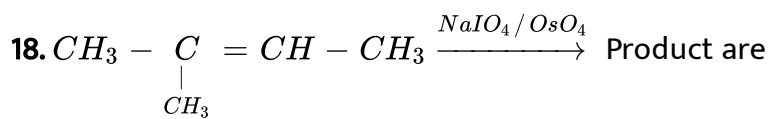
D.



Answer: C



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- A. Bromine water
- B. HCO_3H followed by H_3O^+
- C. Cold alkaline $KMnO_4$
- D. all of the above

Answer: C



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PHENOLS (OBJECTIVE EXERCISE - 1)

1. Phenol can be prepared from
- A. Benzene diazonium chloride
 - B. Chlorobenzene
 - C. Sodium benzene sulfonate
 - D. All

Answer: D



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2. Benzene diazonium chloride on boiling with dilute H_2SO_4 gives

- A. Cresol
- B. Xylene
- C. Phenol
- D. Toulene

Answer: C



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3. Sodium salt of benzene sulphonic acid on fusion with caustic soda followed by acidification gives

- A. Benzene
- B. Phenol
- C. Thiophenol
- D. Benzenesulfonic acid

Answer: B



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4. On heating with soda-lime, salicylic acid gives

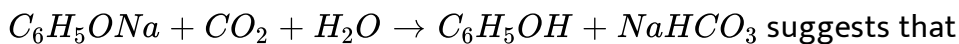
- A. Phenol
- B. Benzoic acid
- C. Sodium salicylate
- D. Benzene

Answer: A



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5. The reaction,



- A. Phenol is a stronger acid than carbonic acid
- B. Carbonic acid is a stronger acid than phenol
- C. Water is a stronger acid than phenol
- D. None of the above

Answer: B



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6. Phenol can be prepared by the reaction between

- A. Aniline and HNO_3 at 373 K
- B. C_6H_5MgBr and CO_2 followed by hydrolysis
- C. C_6H_5Cl and NaOH at 373 K

D. $C_6H_5SO_3Na$ and NaOH at 573-623K followed by acidification

Answer: D



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7. Phenol is prepared commercially from

A. Ethylbenzene

B. Isopropylbenzene

C. n- Propylbenzene

D. Toluene

Answer: B



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8. Phenol is converted to 2,4,6-trinitrophenol using

A. Dil. HNO_3

B. conc. HNO_3

C. $NaNO_2$, $25^\circ C$

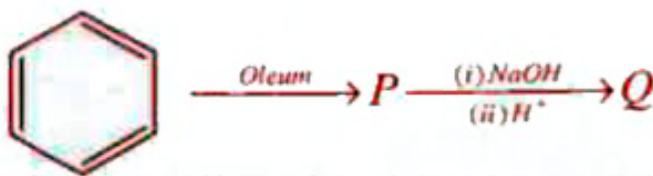
D. $NaNO_2$, $5^\circ C$

Answer: B



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9. In the following sequence of reactions



The compound Q formed will be

A. aniline

B. phenol

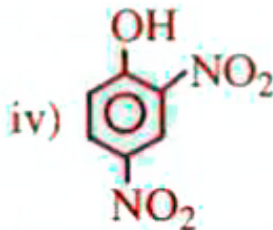
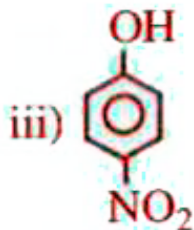
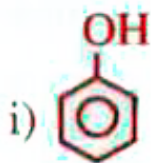
C. benzaldehyde

D. benzene sulphonic acid

Answer: B

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10. The correct order of strength of acidity of the following compounds is



A. (ii) gt (i) gt (iii) gt (iv)

B. (i) gt (ii) gt (iii) gt (iv)

C. (iv) gt (iii) gt (ii) gt (i)

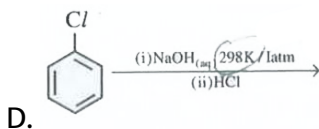
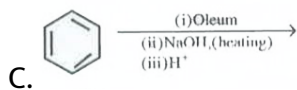
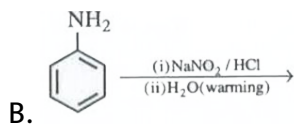
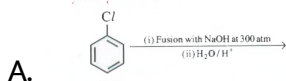
D. (iv) gt (iii) gt (i) gt (ii)

Answer: D



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11. Which of the following reactions will not yield phenol ?



Answer: D



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12. Benzoquinone, is prepared by reaction of phenol with

A. $Na_2Cr_2O_7, H_2SO_4$

B. $KMnO_4, H_2SO_4$

C. Na_2CrO_4, HCl

D. K_2MnO_4, H_2SO_4

Answer: A



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13. The acidic character of phenol is due to

A. Greater resonance stabilization of phenoxide ion over phenol

B. Greater resonance stabilization of phenol over phenoxide ion

C. Because of tautomerism occurring in phenol

D. Because oxygen is more electronegative than hydrogen

Answer: A



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14. The correct order of relative acidic strength of phenol, ethyl alcohol and water is

- A. Phenol gt Water gt Ethyl alcohol
- B. Ethyl alcohol gt Water gt Phenol
- C. Ethyl alcohol gt Phenol gt Water
- D. Water gt Phenol gt Ethyl alcohol

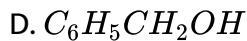
Answer: A



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15. Which of the following compounds will react with sodium hydroxide?

- A. CH_3OH
- B. $\text{CH}_3\text{CH}_2\text{OH}$
- C. $\text{C}_6\text{H}_5\text{OH}$

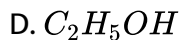
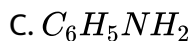
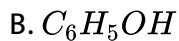
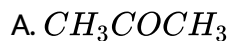


Answer: C



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16. Which of the following compounds when dissolved in water, gives a solution with pH less than seven?



Answer: B



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17. Regarding phenol the correct statements are

- A) It reacts with B_2/CS_2 to give a mixture of o-bromophenol and p-bromophenol
- B) In Rieme-Tiemann reaction with $CHCl_3$ a substituted benzalchloride intermediate is formed
- C) In Kolbe's reaction gives salicylic acid
- D) On oxidation with it gives a conjugated diketone

A. A, B, C only

B. B, C, D only

C. A, B, C, D

D. C, D only

Answer: C



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18. The major product obtained by the reaction of phenol and carbondioxide with NaOH and is

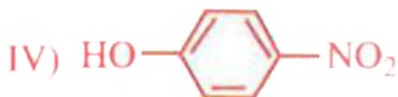
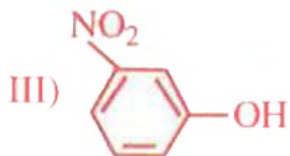
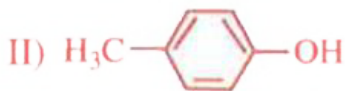
- A. salicylaldehyde
- B. salicyclic acid
- C. phthalic acid
- D. benzoic acid

Answer: B



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19. The correct order of acidity of the following compounds is



A. III gt IV gt I gt II

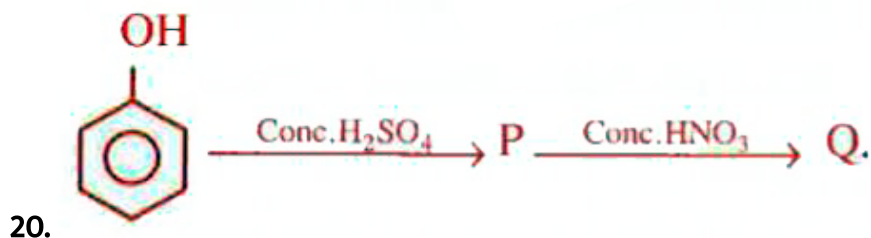
B. I gt IV gt III gt II

C. II gt I gt III gt IV

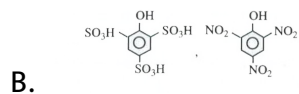
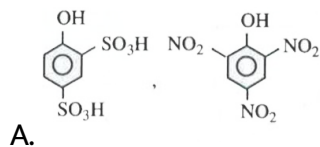
D. IV gt III gt I gt II

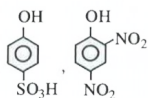
Answer: D

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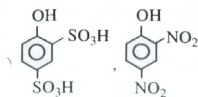


The structural formulae of P and Q are.





C.



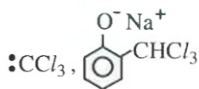
D.

Answer: A

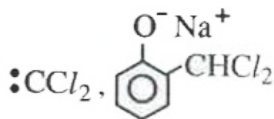


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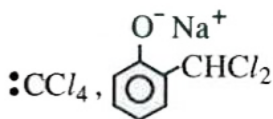
21. Write the electrophile and intermediate in Reimer-Tiemann reaction.



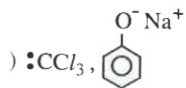
A.



B.



C.



D.

Answer: B



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22. The best method to separate the mixture of ortho and para nitrophenol (1:1) is

A. Crystallization

B. Solubility

C. Sublimation

D. Steam distillation

Answer: D



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23. The increasing order of boiling points of below mentioned alcohols is

(a) 1,2 - dihydroxy benzene

(b) 1,3- dihydroxy benzene

(c) 1,4- dihydroxy benzene

(d) hydroxy benzene

A. a lt b lt c lt d

B. a lt b lt d lt c

C. d lt a lt b lt c

D. d lt b lt a lt c

Answer: C



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24. Phenols are more acidic than alcohols due to

(a) In phenols, - OH is attached to sp^2 hybridised carbon but in alcohols , - OH is attached to sp^3 hybridised carbon

(b) Phenoxide ion is more stable than alkoxide due to resonance

(c) Phenoxide ion is more stable than phenol

A. only a

B. only b

C. only c

D. a,b and c

Answer: D



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25. Arrange the following compounds in the descending order of their

pK_a values

a) 2,4,6-trinitrophenol b) 3,4-dinitrophenol c) m-nitrophenol d) p-cresol e) phenol

A. $a > b > c > e > d$

B. $d > e > c > b > a$

C. $a > b > c > d > e$

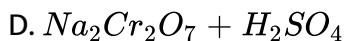
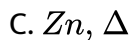
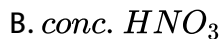
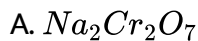
D. $e > d > c > b > a$

Answer: B



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26. When phenol reacts with which one of the following reagents, a conjugate diketone will be formed ?



Answer: D



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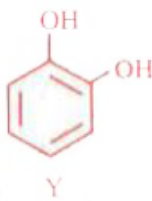
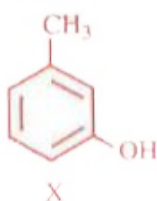
27. Phenol is heated with a mixture of KBr and KBrO_3 . The major product obtained in the above reaction is:

- A. 2-Bromophenol
- B. 3-Bromophenol
- C. 4-Bromophenol
- D. 2, 4, 6-Tribromophenol

Answer: D



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Identify X, Y and Z.

X	Y	Z
1) m-Cresol	Catechol	Quinol
2) Resorcinol	Catechol	o-Cresol
3) o-Cresol	Resorcinol	Catechol
4) Catechol	Resorcinol	Quinol

28.



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29. Which of the following order is true regarding the acidic nature of phenol ?

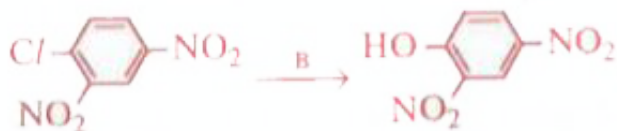
- A. phenol lt o-cresol lt o-nitrophenol
- B. phenol gt o-cresol gt o-nitrophenol
- C. phenol lt o-cresol gt o-nitrophenol
- D. o-cresol lt phenol lt o-nitrophenol

Answer: D



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30. Identify the reaction conditions for the following reactions



A

- 1) i) NaOH/443K
- ii) $\text{H}^{\oplus}$

- 2) i) NaOH/443K
- ii) $\text{H}^{\oplus}$

- 3) i) NaOH/368K
- ii) $\text{H}^{\oplus}$

- 4) i) NaOH/623K
- ii) $\text{H}^{\oplus}$

B

- i) NaOH/623K
- ii) $\text{H}^{\oplus}$

- i) NaOH/368K
- ii) $\text{H}^{\oplus}$

- i) NaOH/443K
- ii) $\text{H}^{\oplus}$

- i) NaOH/368K
- ii) $\text{H}^{\oplus}$



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1. Increasing pK_a values of o-, and p- cresols is

A. o lt p lt m

B. m lt p = o

C. m lt o lt p

D. p lt o lt m

Answer: B



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2. Which of the following compounds would not evolve CO_2 when treated with aq. $NaHCO_3$ solution?

A. Phenol

B. Benzoic acid

C. 2,4- Dinitrophenol

D. 2,4,6-Trinitrophenol

Answer: A



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3. Phenol is

A. Kolbe's reaction

B. Cannizaro reaction

C. Reimer - Tiemann reaction

D. Kolbe Schmidt reaction

Answer: C



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4. Rate of electrophilic substitution reaction in phenol is

- A. Equal to that to benzene
- B. Faster than that of benzenes
- C. Slower than that of benzene
- D. Very slower than that of nitrobenzene

Answer: B



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5. m-Dihydroxybenzene is called as

- A. Resorcinol
- B. Catechol
- C. Quinol
- D. Cresol

Answer: A



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6.2 - Methyl phenol is

A. m - cresol

B. o - cresol

C. m - xylene

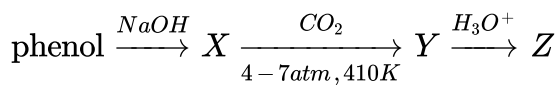
D. o - xylene

Answer: B



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



- A. Aspirin
- B. Salicylaldehyde
- C. Benzoic acid
- D. Salicylic acid

Answer: D



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8. Phenol on heating with aq. KOH and chloroform undergoes

- A. Kolbe reaction
- B. Rosenmund reaction
- C. Reimer Tiemann reaction
- D. Cannizzaro reaction

Answer: C



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9. Electrophilic substitution in phenol takes place at

- A. ortho and para-positions
- B. meta-position
- C. ortho-position only
- D. para-position only

Answer: A



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10. Alcohols can be distinguished from ethers by

- A. Action of HCl
- B. Action of ammonia
- C. Action with neutral $FeCl_3$ solution

D. Action of acetic acid

Answer: C



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11. Which of the following is the major product formed when phenol is treated with dilute nitric acid at 293 K?

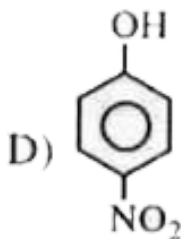
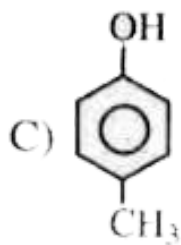
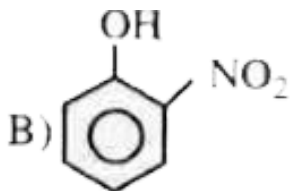
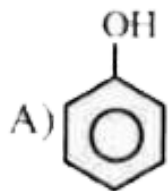
- A. m-Nitrophenol
- B. p-Nitrophenol
- C. 2,4,6-Trinitrophenol
- D. o-Nitrobenzene

Answer: B



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12. Which of the following has the least value of pK_a ?



A. A

B. B

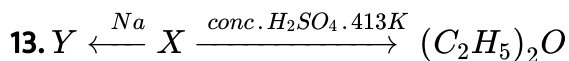
C. C

D. D

Answer: D



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What are X and Y in the above reactions ?



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14. Br_2 dissolved in CS_2 reacts with phenol at 273K to give as the major product

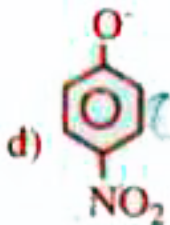
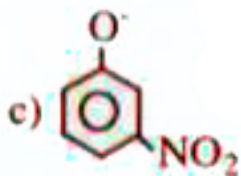
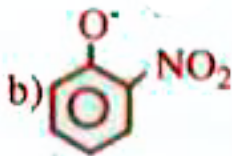
- A. o - Bromophenol
- B. m - Bromophenol
- C. p - Bromophenol
- D. 2, 4, 6 – Tribromophenol

Answer: C



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15. The descending order of k_b values of the following compounds is



A. d gt b gt c gt a

B. a gt c gt b gt d

C. b gt d gt c gt a

D. a gt c gt d gt b

Answer: B



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16. Phenol $\xrightarrow{\text{conc. } H_2SO_4}$ A $\xrightarrow{\text{Conc. } HNO_3}$ B Here A and B are respectively.

- A. P-Hydroxybenzenesulphonic acid, P-nitrophenol
- B. 4-Hydroxybenzene-1,3-disulphonic acid, picric acid
- C. 4-Hydroxybenzene-1,3-disulphonic acid, 2,4-dinitrophenol
- D. 3-Hydroxybenzenesulphonic acid, picric acid

Answer: B



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17. Phenol $\xrightarrow{NaOH}$ A $\xrightarrow[(2) H^+]{(i) CO_2}$ B $\xrightarrow{(CH_3CO)_2O, H^+}$ C Incorrect statement

among the following is

- A. Preparation of 'B' from phenol is called Kolbe's reaction
- B. 'B' is steam volatile
- C. 'C' has a free -OH group of 'B'

D. 'C' can be used as antiinflammatory, analgesic and antipyretic.

Answer: C



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18. One mole of Phenols is warmed with sodium metal. If we assume 100% yield, volume of H gas liberated at S.T.P is

A. 11.2L

B. 22.4L

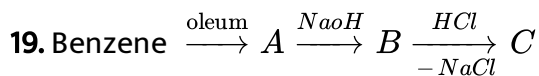
C. 33.6L

D. 44.8L

Answer: A



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Incorrect statement among the following is

- A. Aqueous solutions of B is acidic.
- B. 'A' is Benzene sulphonic acid
- C. 0.2% of 'C' can be used as antiseptic
- D. 'C' is more acidic than water.

Answer: A



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20. If we use carbon tetrachloride in Reimer Tiemann reaction in place of chloroform, the product formed is

- A. Salicylic acid
- B. Salicylaldehyde
- C. Cyclohexanol

D. Phenolphthalein

Answer: A



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21. From amongst the following alcohols, the one that would react fastest with conc.HCl and anhydrous ZnCl is

A. 1-Butanol

B. 2-Butanol

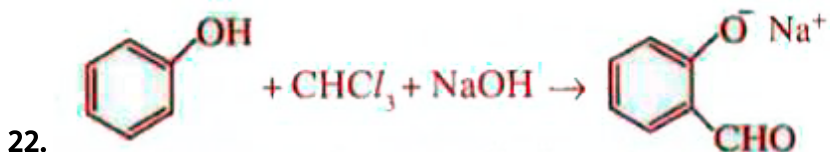
C. 2-Methylpropan-2-ol

D. 2-Methylpropanol-1

Answer: C



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The electrophile involved in the above reaction is

- A. dichloromethyl cation
- B. dichlorocarbene
- C. trichloromethyl anion
- D. formyl cation

Answer: B



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23. The reaction $C_6H_5OH \xrightarrow[\text{Pyridine}]{CH_3COCl} C_6H_5OCOCH_3$ is called

- A. Reimer-Tiemann reaction
- B. Schotten-Baumann reaction

C. Alkylation

D. Benzoylation

Answer: C



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24. Ortho -Nitrophenol is less soluble in water than p-and m- Nitrophenol because

A. o-Nitrophenol is more volatile to steam than those of m- and p- isomers

B. o-Nitrophenol shows Intramolecular H-bonding

C. o-Nitrophenol shows Intermolecular H-bonding

D. Melting point of o-Nitrophenol is lower than those of m- and p- isomers

Answer: B



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25. When benzene sulfonic acid and p-nitrophenol are treated with $NaHCO_3$, the gases released respectively are

A. SO_2 , NO_2

B. SO_2 , NO

C. SO_2 , CO_2

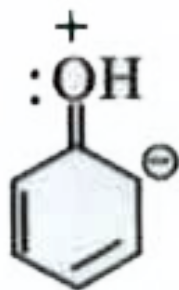
D. CO_2 , CO_2

Answer: D



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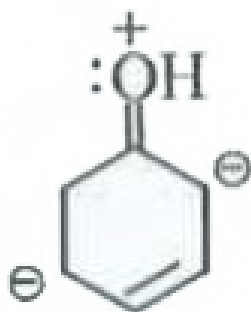
26. Which of the following is the most stable structure of phenol



A.



B.



C.



D.

Answer: A



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27. Match the following

List-I

(Name of the reaction)

a) Reimer-Tiemann reaction

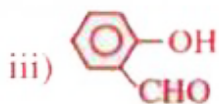
b) Fitting reaction

c) Etard reaction

d) Sandmeyer reaction

List-II

(Major product)



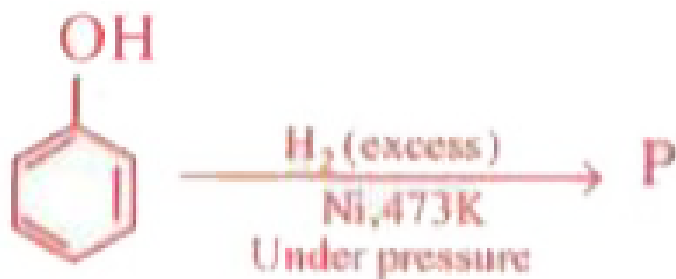
The correct answer is

- | | a | b | c | d | | a | b | c | d |
|----|----|----|-----|-----|----|-----|----|----|---|
| 1) | iv | ii | iii | i | 2) | iii | ii | i | v |
| 3) | ii | i | iv | iii | 4) | iii | i | ii | v |



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28. The product formed in the following reaction is



A.



B.



C.



D.

Answer: C



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29. Phenol can be distinguished from ethanol by the reagent

A. Bromine water

B. Sodium metal

C. Iron metal

D. Chlorine water

Answer: A



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30. Which one of the following reactins gives phenol as a major product ?

A. Reaction of benzene with conc. HNO_3 and conc. H_2SO_4

B. Reaction of Aniline with $NaNO_2 / HCl$ in warm water

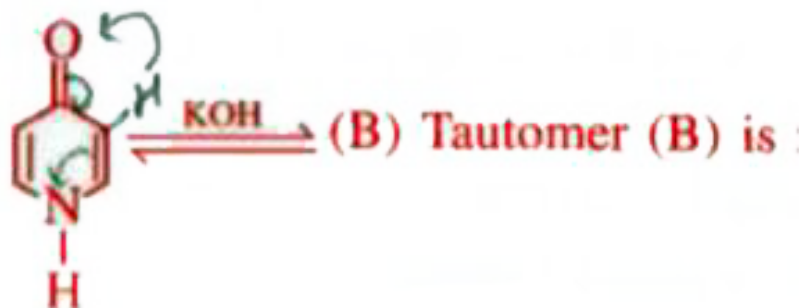
C. Reaction of benzene with Hot water

D. Sodium salt of benzoic acid with soda lime reaction

Answer: A



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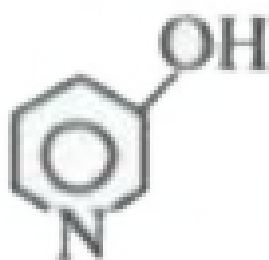
1.



A.



B.



C.

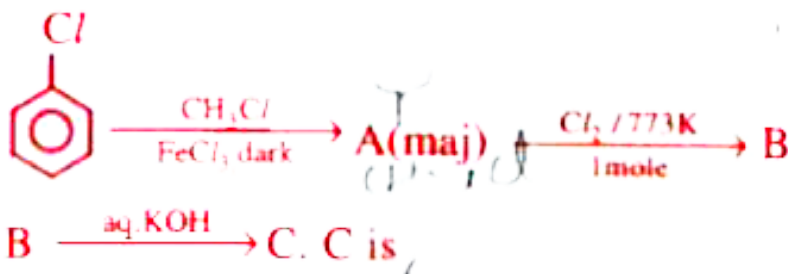


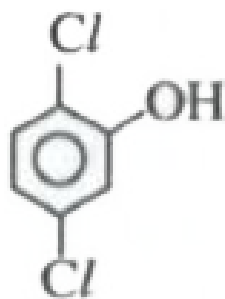
D.

Answer: A

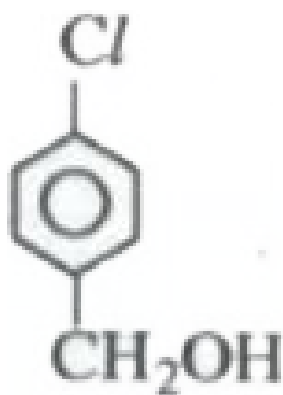


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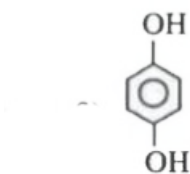




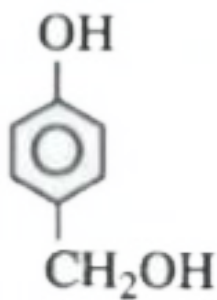
A.



B.



C.



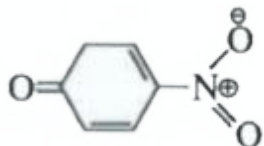
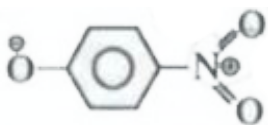
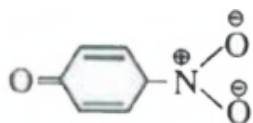
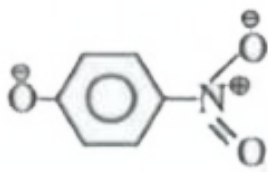
D.

Answer: B



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3. The most unlikely representation of resonance structure of P-nitrophenoxide .



Answer: C



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4. Which one of the following is most acidic?

- A. phenol
- B. 2 - chlorophenol
- C. 3 - chlorophenol
- D. 4 - chlorophenol

Answer: B



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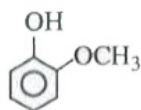
5. Among the following the pK_a is minimum for



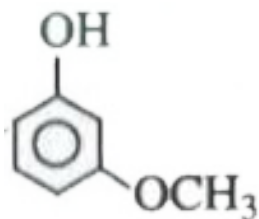
A.



B.



C.



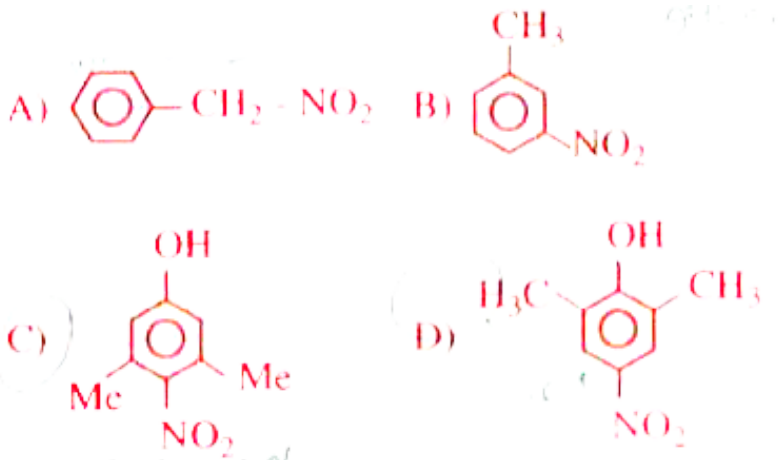
D.

Answer: D



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6. In which of the following molecules - NO_2 group shows only I effect



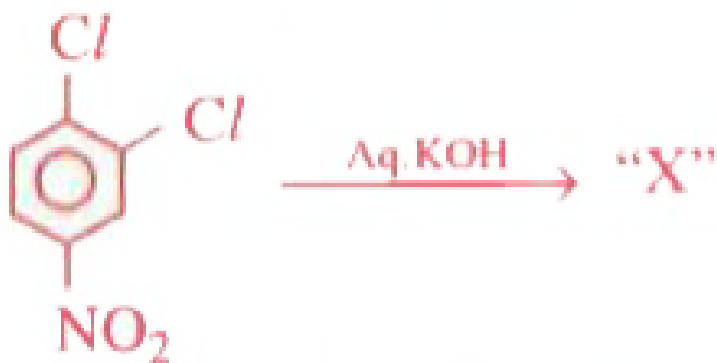
A. A,B only

B. A only

C. A,B,C only

D. A,B,C,D

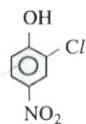
Answer: C



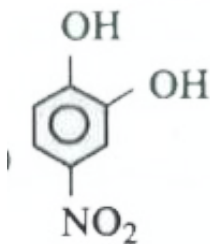
7.

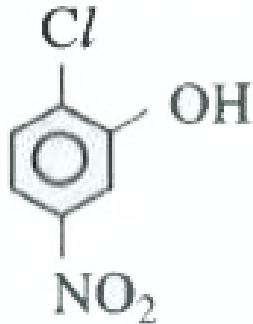
The major product X is

A.

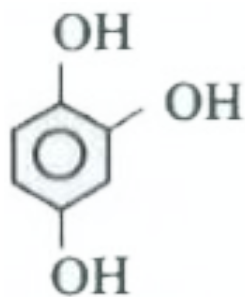


B.





C.



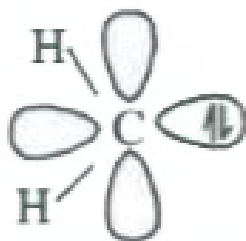
D.

Answer: A

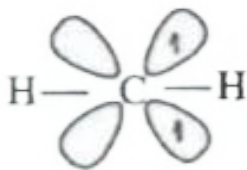


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8. The correct representation of single carbene is

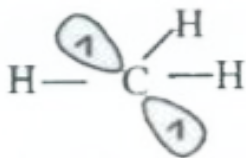


A.



B.

C. both a and b



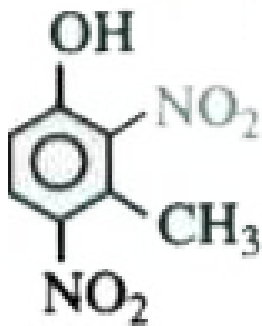
D.

Answer: A

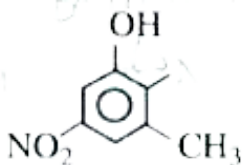


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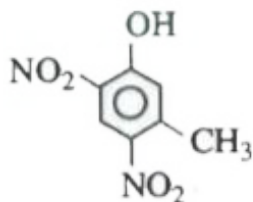
9. Dinitration of 3-methyl-phenol gives the following major product.



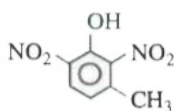
A.



B.



C.



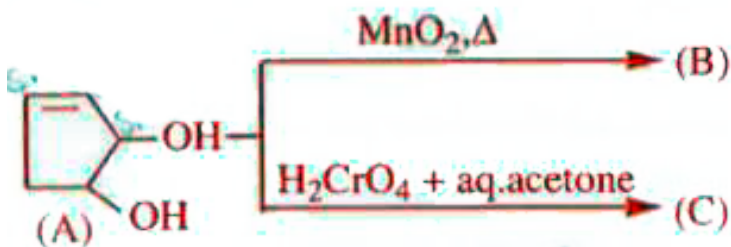
D.

Answer: C

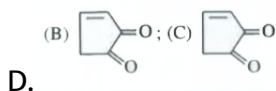
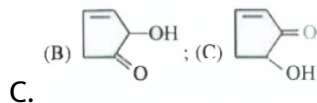
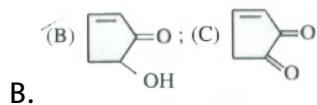
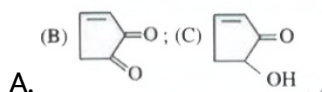


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10.



The compounds B and C , respectively are



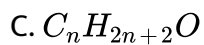
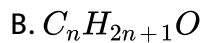
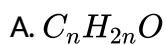
Answer: B

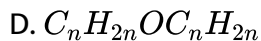


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ETHERS (OBJECTIVE EXERCISE-1 (INTRODUCTION AND PREPARATIONS))

1. The general formula of ethers is





Answer: C



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2. The IUPAC name of an unsymmetrical ether with the molecular formula, $C_4H_{10}O$ is

A. Ethoxypropane

B. Methoxyethane

C. Ethoxyethane

D. Methoxypropane

Answer: D



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3. Hybridisation of oxygen in diethyl ether is

A. sp

B. sp^2

C. sp^3

D. sp^3d

Answer: C



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4. The reaction, $RX + R - ONa \rightarrow R - O - R + NaX$ is called

A. Wurtz reaction

B. Williamson's synthesis

C. Kolbe's reaction

D. Hofmann bromamide reaction

Answer: B



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5. Williamson synthesis is an example of

- A. Nucleophilic addition
- B. Electrophilic addition
- C. Electrophilic substitution
- D. Nucleophilic substitution reaction

Answer: D



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6. Ethyl chloride reacts with sodium ethoxide to form a compound A.

Which of the following reactions also yields A?

A. C_2H_5Cl , $KOH(alc)$, Δ

B. $2C_2H_5OH$, *conc.* H_2SO_4 , $140^\circ C$

C. C_2H_5Cl , Mg (dry ether)

D. C_2H_2 , dil, H_2SO_4 , $HgSO_4$

Answer: B



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7. When vapours of ethyl alcohol are passed over Al_2O_3 , at 533 K, it forms

A. 1,2-Ethanediol

B. ethene

C. Ethoxyethane

D. Ethanal

Answer: C



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8. Consider the following reaction $C_2H_5I \xrightarrow[X]{\Delta}$ (Pleasant smelling liqluid),

X is

- A. Sodium
- B. Dry silver oxide
- C. Ethyl chloride
- D. Dry silver powder

Answer: B



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9. When vapours of ethyl alcohol are passed over Al_2O_3 , at 533 K, it forms

- A. 1, 2 - ethanediol
- B. Ethene
- C. Ethanal

D. Ethoxy ethane

Answer: D



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10. Anisole is

A. an ether

B. an alcohol

C. an aldehyde

D. a phenol

Answer: A



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11. tert-Butyl chloride on treatment with sodium alkoxide yields

- A. an ether
- B. an alkene
- C. an alcohol
- D. an alkane

Answer: B



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12. Which of the reaction can be employed for the preparation of unsymmetrical ether?

- A. Dehydration of alcohols
- B. Williamson's synthesis
- C. Dehydration of carboxylic acid
- D. Dehydrogenation of alcohols

Answer: B

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13. Williamson synthesis is an example of

- A. Nucleophilic addition
- B. Electrophilic addition
- C. Electrophilic substitution
- D. Nucleophilic substitution

Answer: D

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14. The IUPAC name of $C_2H_5 - O - CH(CH_3)_2$

- A. Ethoxy propane
- B. 1,1-dimethyl ether
- C. 2-Ethoxy isopropane

D. 2-Ethoxy propane

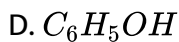
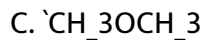
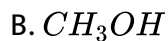
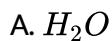
Answer: D



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ETHERS (OBJECTIVE EXERCISE-1 (PROPERTIES))

1. Which of the following is the strongest Lewis base ?



Answer: C



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2. Grignard reagents are prepared in

- A. Benzene
- B. Chloroform
- C. Alcohol
- D. Ether

Answer: D



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3. When diethyl ether is heated with sulphuric acid it forms

- A. Propanoic acid
- B. Acetic acid
- C. Ethyl alcohol only
- D. Ethyl hydrogen sulphate and ethanol

Answer: D



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4. When phenolic ether is heated with HI, it yields .

- A. alkyl halide + phenol
- B. alcohol + aryl halide
- C. alkyl halide + aryl halide + water
- D. none of the above

Answer: A



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5. Williamson's synthesis of ethers is an example of

- A. nucleophilic substitution reaction

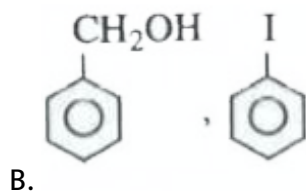
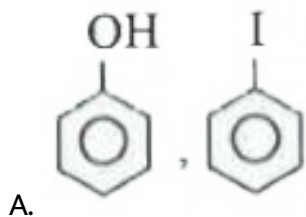
- B. nucleophilic addition reaction
- C. electrophilic addition reaction
- D. electrophilic substitution reaction

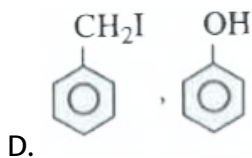
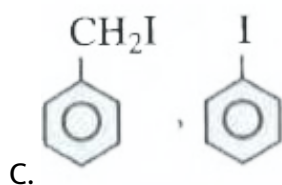
Answer: A

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The products P and Q are

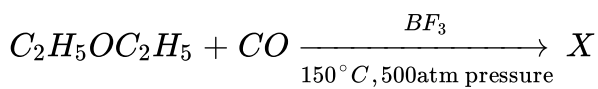




Answer: D

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7. In the reaction,



What is X?

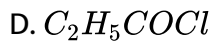
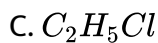
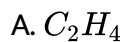
- A. Ethyl propionate
- B. Ethyl carbonate
- C. Diethyl peroxide
- D. Ethylpropanoate

Answer: D



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8. The gas liberated by treating diethylether with PCI_5 is

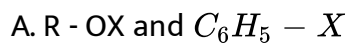


Answer: C



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9. $C_6H_5 - O - R$ when treated with hydrogen halide gives

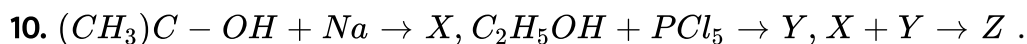




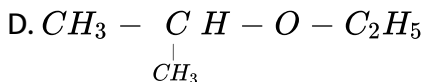
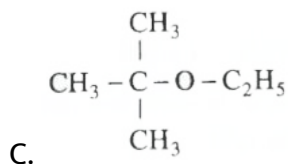
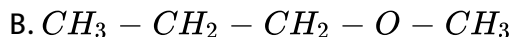
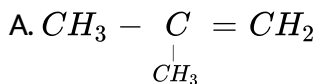
Answer: D



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What is Z

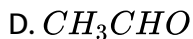
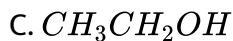
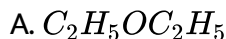


Answer: C



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11. The organic compound which evaporates easily on exposure to atmospheric air



Answer: A



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12. An unknown compound dissolves in conc. sulphuric acid, but does not decolourise bromine water and does not react with sodium. Which of the following classes of molecules would behave in this manner ?

- A. Alkene
- B. Alcohol
- C. Ether
- D. Phenol

Answer: C



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13. Boiling point of diethyl ether is less than that of

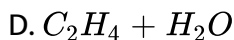
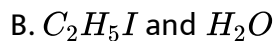
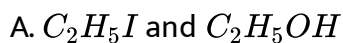
- A. Ethane
- B. Butane
- C. Ethyl alcohol
- D. Dimethyl ether

Answer: C



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14. $C_2H_5 - O - C_2H_5 + HI \xrightarrow{\Delta} X + Y$. Here X and Y are (if excess HI is used)



Answer: B



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ETHERS (OBJECTIVE EXERCISE-2A)

1. Regarding diethyl ether, the wrong statement is

A. It is slightly soluble in water

- B. In cold condition, it does not react with alkali and dilute acids
- C. It has active hydrogen
- D. It does not react with Na metal

Answer: C



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2. Alcohols can be distinguished from ethers by

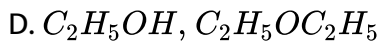
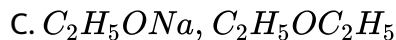
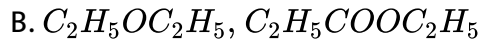
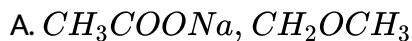
- A. Sodium metal
- B. Ester formation
- C. Iodoform test
- D. All the above

Answer: A



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3. 'A' reacts with C_2H_5I giving 'B' and NaI . Here 'A' and 'B' respectively are

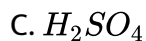


Answer: C



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4. Which of the following can not form oxonium salts with diethyl ether?

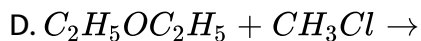
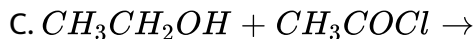
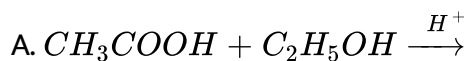


Answer: D



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5. Ester is not formed in the following reaction. Identify the suitable reaction

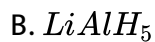


Answer: D



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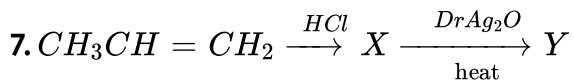
6. C-O-C bond in ethers can be cleaved by



Answer: D



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the product Y in the above sequence is

A. Di isopropyl ether

B. Di n - propyl ether

C. 2 - Propanol

D. 1, 2, Epoxypropane

Answer: A



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8. When ethyl hydrogen sulphate is heated with excess alcohol at 410 K, the product obtained is

- A. Ethane
- B. Ethylene
- C. Diethyl ether
- D. Diethyl sulphate

Answer: C



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9. The major product obtained on interaction of phenol with sodium hydroxide and carbon dioxide is :

- A. salicylaldehyde

B. salicylic acid

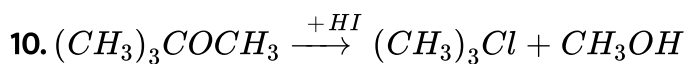
C. phthalic acid

D. benzoic acid

Answer: B



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It follows which mechanism ?

A. SN^1

B. SN^2

C. E_1

D. E_2

Answer: A



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11. Anisole with HNO_3 and conc H_2SO_4 gives

- A. Phenol
- B. Nitrobenzene
- C. o and p-nitro anisoles
- D. o- nitro anisole

Answer: C



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

- A. dipolar character of ethers
- B. alcohols having resonance structures
- C. inter-molecular hydrogen bonding in ethers

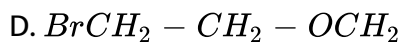
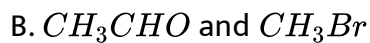
D. inter-molecular hydrogen bonding in alcohols

Answer: D



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13. HBr reacts with $CH_2 = CH - OCH_3$ under anhydrous conditions at $25^\circ C$ to give



Answer: A



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14. To prepare tert-butyl ethyl ether by Williamson synthesis, the reactants needed are

- A. Sodium ethoxide and sodium tert butoxide
- B. Sodium ethoxide and tert-butyl bromide
- C. Sodium tert-butoxide and ethyl bromide
- D. Ethyl alcohol and tert-butyl alcohol

Answer: C



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15. The major product obtained when tert-butyl bromide is heated with sodium ethoxide is

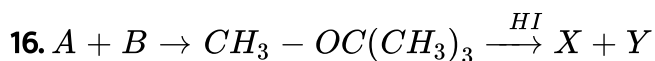
- A. 2-Methylpropene
- B. Ethene
- C. tert-Butylmethylether

D. Diethyl ether

Answer: A



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Correct statement among the following is

A. A and B are CH_3ONa and $(CH_3)_3CBr$

B. X and Y are CH_3I and $(CH_3)_3COH$

C. X and Y are CH_3OH and $(CH_3)_3Cl$

D. A and B are CH_3OH and $(CH_3)_3COH$

Answer: C



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Correct statement among the following is

A. P and Q are C_6H_5ONa and C_2H_5Cl

B. R and S are C_6H_5I and CH_3OH

C. R and S are C_6H_5OH and CH_3I

D. P and Q are C_6H_5Cl and CH_3ONa

Answer: C



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18. Regarding diethyl ether, the wrong statement is

A. It is slightly soluble in water

B. In cold condition, it does not react with alkali and dilute acids

C. It has active hydrogen

D. It does not react with Na metal

Answer: C



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19. Which of the following can not form oxonium salts with diethyl ether?

A. HCl

B. HBr

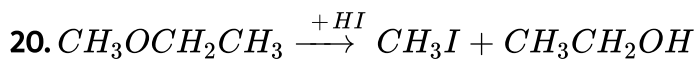
C. H_2SO_4

D. HCN

Answer: D



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It follows which mechanism ?

A. SN^1

B. SN^2

C. E_1

D. E_2

Answer: B



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21. Which one of the following reagents will form diethyl ether from ethanol ?

A. H_2SO_4 at 413K

B. Cold HI solution

C. H_2SO_4 at 443K

D. *Dil.* H_2SO_4 solution

Answer: A

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22. Which one of the following reagents will reduce diethyl ether to ethane and ethanol ?

A. $Na / liq. NH_3$

B. Cold HI

C. H_2SO_4

D. Al_2O_3 / heat

Answer: A

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23. Ice cold hydrochloric acid is added to dimethyl ether. The product formed is

A. Dimethoxy methane

- B. Dimethoxy oxonium chloride
- C. Methyl chloride
- D. Methanol and methyl chloride

Answer: B



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24. Tert -Butyl methyl ether on heating with HI of one molar concentration gives

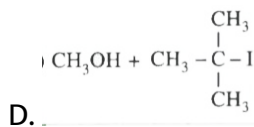
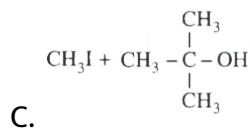
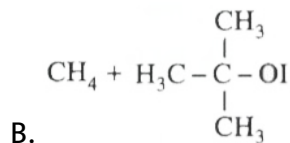
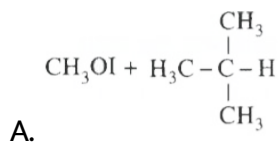
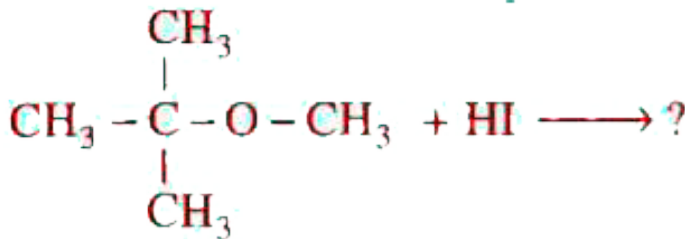
- A. Isobutane and Methyl Iodine
- B. Isobutanol and Methanol
- C. Tertiary Butyl Iodide and Methanol
- D. Tertiary Botyl Iodide and Methyl Iodide

Answer: C



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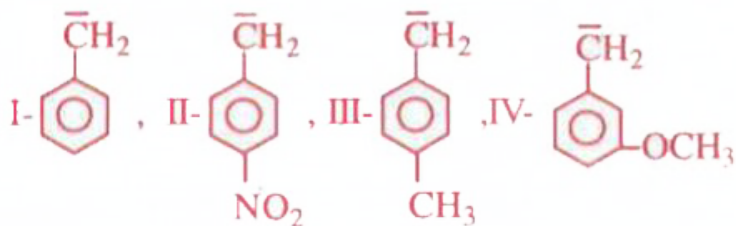
25. The product formed during the following reaction are



Answer: D



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1.

Correct increasing order of stability

A. IV,II,I,II

B. III,IV,I,II

C. II,IV,I,III

D. III,I,IV,II

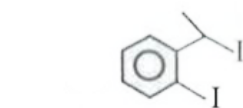
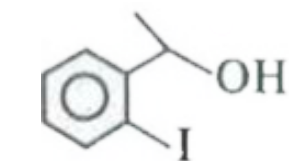
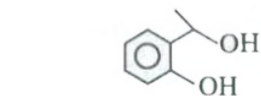
Answer: D



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2.

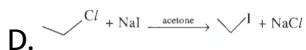
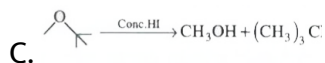
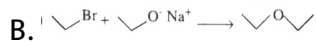


Answer: B



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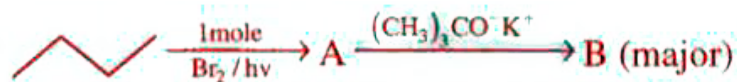
3. All the following reactions are SN^2 reactions except



Answer: C

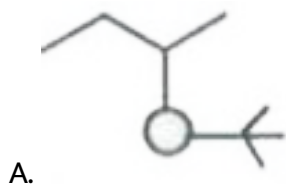


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B is

4.

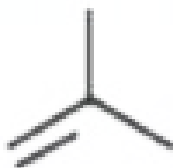




B.



C.



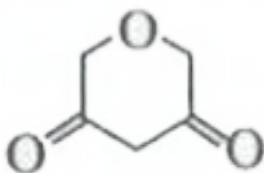
D.

Answer: C

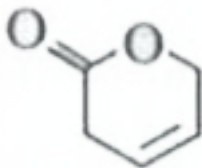


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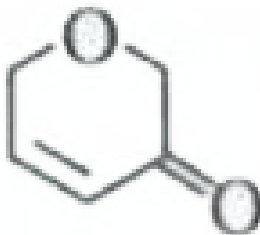
5. Which of the following does not exhibit resonance



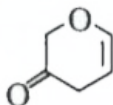
A.



B.



C.

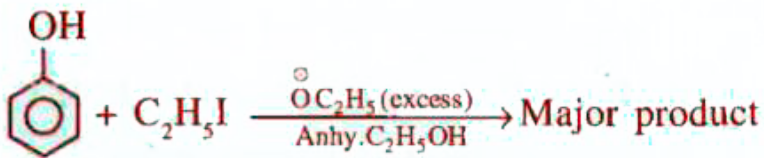


D.

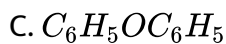
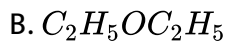
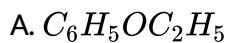
Answer: A

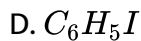


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6.



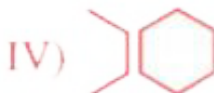
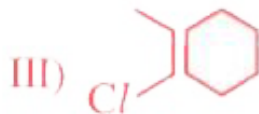
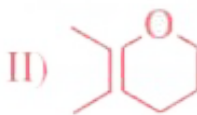
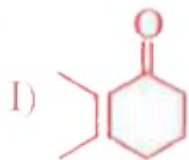


Answer: B



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7. The correct relative rate of reaction of the given alkenes for any given electrophiles is



A. I gt IIgt IV gt III

B. II gt III gt IV gt I

C. II gt IV gt III gt I

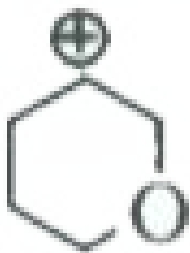
D. IV gt I gt III gt II

Answer: B



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8. Most stable carbocation among the following is



A.



B.



C.



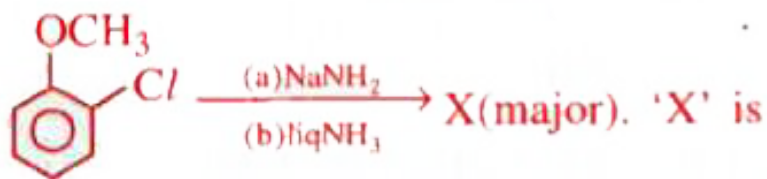
D.

Answer: D



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9.



A. ortho methoxy aniline

B. meta methoxy aniline

C. para methoxy aniline

D. benzene 1, 2 diamine

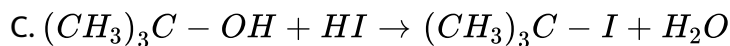
Answer: B



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10. Which of the following reaction takes place through SN^2 mechanism ?

A.



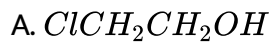
D. both 1 and 2

Answer: D

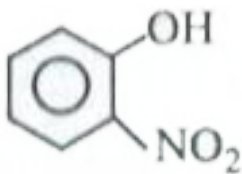


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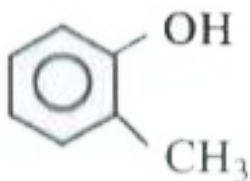
1. Which one of the following compounds is most acidic?



B.



C.

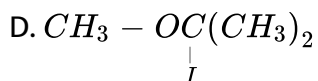
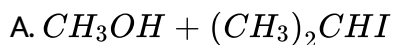
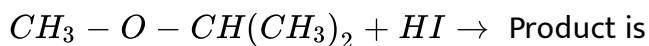


D.

Answer: C

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2. The major organic product in the reaction

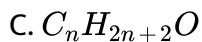
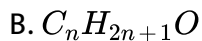


Answer: B

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3. The general molecular formula which represents the homologous series of alkanol is



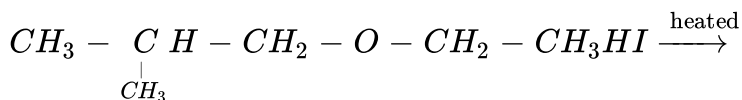


Answer: C

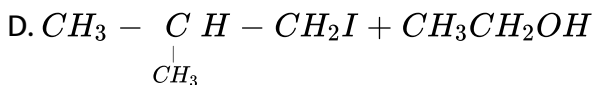
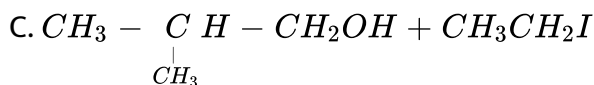
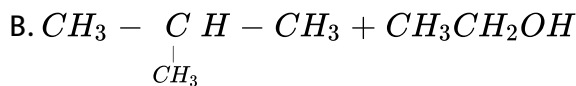
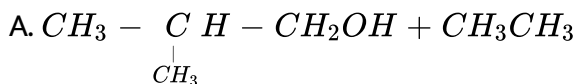


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4. In the reaction



Which of the following compounds will be formed

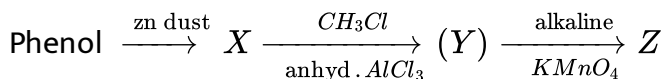


Answer: C



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5. Consider the following reaction

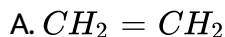
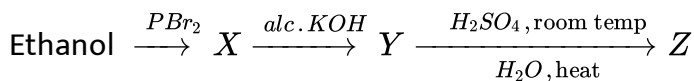


The product Z is



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6. Identify (z) in the following reaction series



Answer: B



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7. The compound formed by reaction of ethylene glycol and periodic acid (HIO_4) is

- A. carbondioxide
- B. formic acid
- C. formaldehyde
- D. glyoxal

Answer: C



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

A. II gt III gt IV gt I

B. II gt III gt I gt IV

C. III gt II gt IV gt I

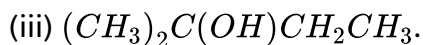
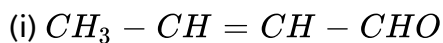
D. III gt IV gt II gt I

Answer: C



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9. Write the common and IUPAC names of



A. i and ii

B. i, iii and iv

C. only ii

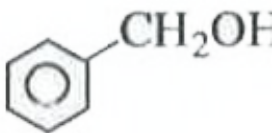
D. i, ii and iii

Answer: D

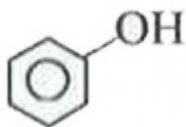


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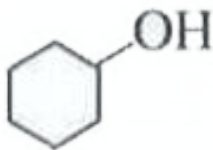
10. Which of the following compounds has the most acidic nature



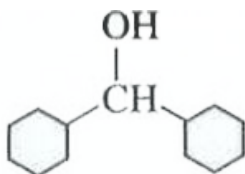
A.



B.



C.



D.

Answer: B



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

A. Methyl alcohol

B. Glycol

C. Nitrophenol

D. Phenol

Answer: B



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12. Arrange the following in the increasing acidic strength:

Phenol, o-chlorophenol, m-chlorophenol and p-chlorophenol.

A. IV gt III gt I gt II

B. III gt IV gt I gt II

C. I lt IV lt III lt II

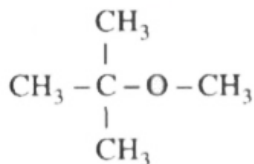
D. II gt I gt III gt IV

Answer: A

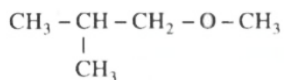


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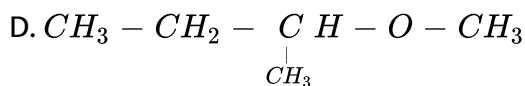
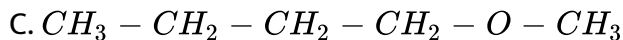
13. Among the following ethers, which one will produce methyl alcohol on treatment with hot concentrated HI



A.



B.

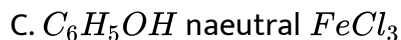


Answer: A



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



Answer: B



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15. Among the following ethers, which one will not be soluble in $NaHCO_3$?

A. 2,4,6 - Trinitrophenol

B. Benzoic acid

C. O - Nitrophenol

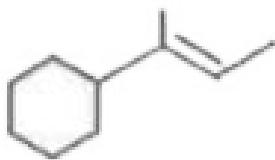
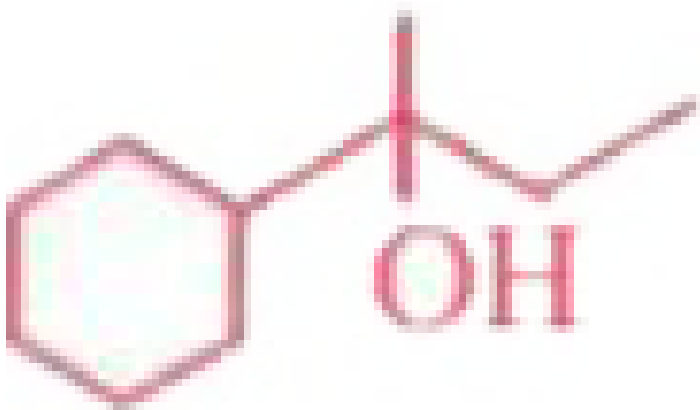
D. Benzene sulphonic acid

Answer: C



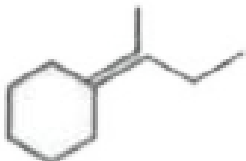
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16. Which of the following is not the product of dehydration of

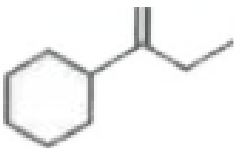


A.

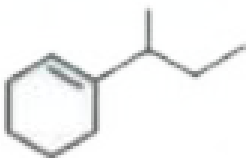
B.



C.



D.



Answer: D



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

A. $-CHCl_2$

B. $-CHO$

C. $-CH_2Cl$

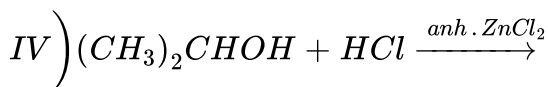
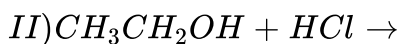
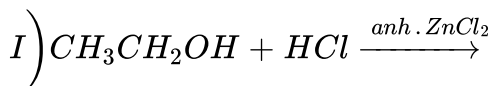
D. $-COOH$

Answer: B



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



A. IV only

B. III and IV only

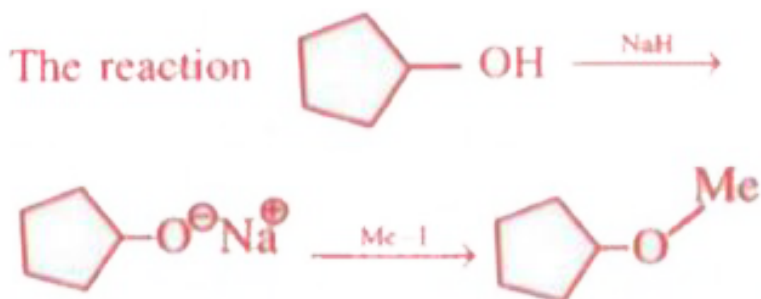
C. I, III and IV only

D. I and II only

Answer: C



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19. 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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20. Which of the following reagents would distinguish cis-cyclopenta-1, 2-diol from the trans-isomer ?

- A. Aluminium isopropoxide
- B. MnO_2
- C. Acetone
- D. Ozone

Answer: C



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

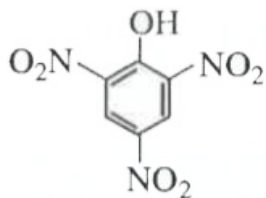
- A. Benzene
- B. Ethyl chlorides
- C. Iodobenzene
- D. Phenol

Answer: D

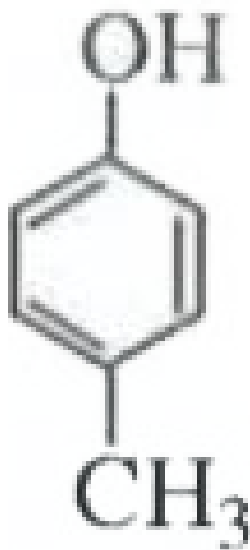


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22. Which one is the most acidic compound ?



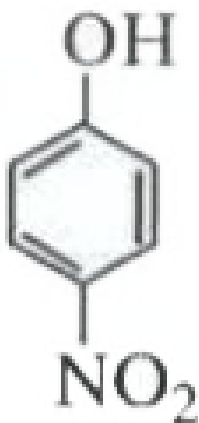
A.



B.



C.



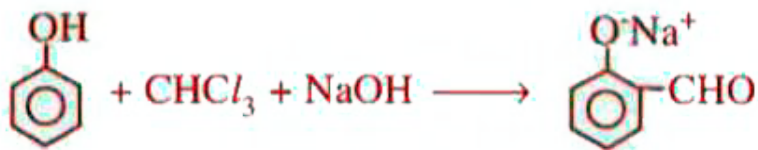
D.

Answer: A



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23. In the reaction



the electrophile involved is

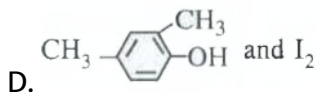
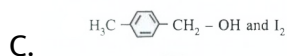
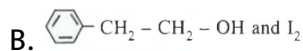
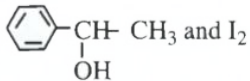
- A. dichloromethyl anion
- B. formyl cation
- C. dichloromethyl cation
- D. dichlorocarbene

Answer: D



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24. Compound A , $\text{C}_8\text{H}_{10}\text{O}$ is found to react with NaOI (produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell. A and Y are respectively



Answer: A



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ETHERS (OBJECTIVE EXERCISE-4)

1. (A): Alcoholic fermentation involves conversion of sugar into ethanol by the action of yeast.

(R): Fermentation involves the liberation of CO_2 gas.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: B



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2. (A) Sodium can't be used for drying ethyl alcohol.

(R) Sodium displaces hydrogen from ethyl alcohol.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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3. (A) Ethyl alcohol is soluble in organic solvents

(R) Ethyl alcohol is having non polar ethyl group.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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4. (A) The boiling point of C_2H_5OH is less than that of H_2O , though the molecular weight of C_2H_5OH is more than that of water.

(R) C_2H_5OH molecules are not highly associated through hydrogen bonding as in water.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

5. (A) Addition of C_2H_5OH to CH_3MgI gives methane.

(R) C_2H_5OH is more acidic than CH_4

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



Watch Video Solution

6. (A): Oxidation of tertiary alcohols requires strong oxidising agent and elevated temperature.

(R): Oxidation of tertiary alcohols involves cleavage of C - C bond.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

7. (A) Acetone and propenol-2 are tautomers.

(R) Propanone and propenol-2 contain different functional groups.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



Watch Video Solution

8. (A) Alcohols act as Bronsted - Lowry bases.

(R) In alcohols the lone pair of electrons on oxygen forms dative bond by accepting a proton

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

9. (A) Anhydrous $ZnCl_2$ is used in reaction of alcohols with HCl.

(R) $ZnCl_2$ forms a complex with oxygen of alcohol and converts - OH into a much better leaving group.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



Watch Video Solution

10. (A) Alcohols can act as nucleophiles

(R) Alcohols form salts with alkali metals

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



Watch Video Solution

11. (A) Tertiary alcohols are more reactive for nucleophilic substitution reactions

(R) The C-O bond is weak in tertiary alcohol

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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12. (A) Reactivity of primary alcohol is more than secondary alcohols towards sodium metal

(R) Primary alcohol is more acidic than secondary alcohol

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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13. (A) The bond angle C-O-H in alcohol is less than in phenols

(R) In phenols -OH group attached to the sp^2 carbon atom. While in alcohols OH group attached to sp^3 carbon atom

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: B



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14. (A) In ethers, bond angle C-O-C is more than tetrahedral angle
- (R) Steric repulsive inter action between two bulky alkyl groups is more than 1p-1p repulsions around oxygen atom
- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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15. (A) n-propyl alcohol is prepared from propene by the action of B_2H_6 followed by oxidation with H_2O_2 in basic medium

(R) In Hydroboration oxidation reaction, rearranged products are not formed because it involves the formation of cyclic transition state

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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16. (A) During acid catalysed esterification, oxygen atom of alcohol is present in ester molecule

(R) Alcohol acts as a nucleophile

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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17. (A) Lucas reagent is used to distinguish 1° , 2° and 3° alcohols

(R) The role of anhyd. $ZnCl_2$ in the Lucas reagent is to weaken the bond

between C-O by accepting electron pair from oxygen atom of alcohol

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



Watch Video Solution

18. (A) Addition of water to $(CH_3)_2 - C = CH - CH_3$ gives $(CH_3)_2 - COH - CH_2 - CH_3$ as major product

(R) 3° carbocation is more stable than 2° carbocation

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)

- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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19. (A) 1-propanol & 2-propanol can be distinguished by haloform test

(R) The trihalomethyl group ($-CX_3$) of $CH_3 - \overset{\overset{O}{||}}{C} - CX_3$ is a good leaving group for nucleophilic substitution reaction

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



Watch Video Solution

20. (A) Alcohols are acidic in nature but donot react with NaOH solution

(R) Alkoxide is stronger base than hydroxide ion

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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21. (A) The acidity of alcohols follow the order $1^\circ > 2^\circ > 3^\circ$

(R) The +I effect of alkyl groups ($3^\circ > 2^\circ > 1^\circ$) favour the dissociations of - O - H bond

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: C



Watch Video Solution

22. (A) For the reduction of esters in to alcohols Ni/H_2 is preferred than $LiAlH_4$

(R) $LiAlH_4$ is more expensive than Ni/H_2

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



Watch Video Solution

23. (A) Dichloro carbene acts as electrophile in Reimer-Tiemann reaction.

(R) Dichloro carbene has two electrons on carbon atom.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



Watch Video Solution

24. (A) : Phenols are more acidic than alcohols.

(R): Phenoxide ion is more stable than alkoxide ion due to resonance.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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25. (A) In methanol C-O bond length is $1.42\text{\AA}$, but in phenol, it is $1.36\text{\AA}$.

(R) In methanol carbon atom is sp^3 hybridised and in phenol, carbon atom bearing the hydroxyl group is sp^2 hybridised.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

26. (A) o-Nitrophenol is less soluble in water than the m- and p-isomers of nitrophenol.

(R) o-Nitrophenol exist as associated molecules.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: C



Watch Video Solution

27. (A) Phenol undergoes Kolbe's reaction but not ethanol.

(R) Phenoxide ion is a weaker base than ethoxide ion.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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28. (A) Phenols are acidic & react with alkalies like NaOH but do not react with Na_2CO_3 and $NaHCO_3$ solutions

(R) CO_3^{2-} & HCO_3^- ions are less basic than phenoxide ion

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

29. (A) Presence of electron withdrawing groups at p-position, increases the acidic strength of phenols

(R) Presence of electron withdrawing groups at ortho and para position stabilises the phenoxide ion formed

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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30. (A) Both phenol and phenoxide ion exhibit resonance, phenoxide ion is more stable than phenol

(R) In phenoxide ion two equivalent resonating structures, and in phenol four equivalent resonating structures are present

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: C



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31. (A) Phenol and benzoic acid are distinguished with $NaHCO_3$ solution

(R) Benzoic acid is more basic than phenol

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)

- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: C



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32. (A) O and p nitro phenols are separated by steam distillation

(R) O-isomer is steam volatile due to intra molecular H-bond

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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33. (A) Reimer Tiemann reactions of phenol with chloroform in alkali produce salicylaldehyde as major product

(R) The reaction involves in the formation of dichloro carbene as intermediate

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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34. (A): Ethers behave as bases in the presence of mineral acids.

(R): Oxygen atom in ether is having lone pair electrons.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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35. (A): Ethers are relatively inert when compared to C_2H_5OH .

(R): In ethyl alcohol both carbon and oxygen undergo sp^3 hybridisation.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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36. (A): $(CH_3)_3C - ONa$ and CH_3Br react together to form $(CH_3)_3C - O - CH_3$

(R): Good yields are obtained when sodium tert.alkoxide is treated with 1° alkyl halide

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

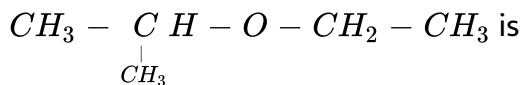
D. Both (A) and (R) are false

Answer: A



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37. (A) IUPAC name of the compound



(R) In IUPAC nomenclature, ether is regarded as hydrocarbon derivative in which a hydrogen atom is replaced by -OR or-OAr group [where R = alkyl group and Ar = aryl group]

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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38. (A) Ditertiarybutyl ether cannot be prepared by Williamson's synthesis
(R) Ter.butylbromide on reaction with tertiary butoxide preferably undergo elimination

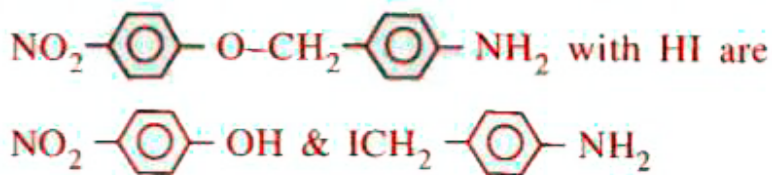
- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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39. (A) The major products formed by heating



(R) Para amino benzyl carbocation is more stable

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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40. (A) Anisole undergoes electrophilic substitution reaction at ortho & para position

(R) Anisole is less reactive than phenol towards electrophilic aromatic substitution reaction

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: B



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41. (A) Phenetole on cleavage with HI gives phenol & ethyl iodide

(R) Phenetole is a mixed aromatic ether

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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42. (A) IUPAC name of



is 2-ethoxy1,1-dimethyl cyclohexane

(R) According to IUPAC, ethoxy group is a functional group and named in the above compound by giving priority to the ethoxy group

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: C



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43. (A) Formation of ether from alcohol is an example of bimolecular nucleophilic substitution reaction (SN^2)

(R) Alkyl groups of alcohol are preferably 1° alkyl groups

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)

- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: B



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44. (A) To prepare ter.butylethylether, the reactants used are ter.butylbromide and ethoxide solution

(R) Williamson's synthesis is an electrophilic substitution reaction of RX with alkoxide ion

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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45. (A) Ethers are not generally prepared by acid dehydration of 2° and 3° alcohols (R) dehydration of 2° and 3° alcohols gives alkenes by elimination

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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46. (A) Methoxy benzene can be prepared by the reaction of C_6H_5ONa and CH_3Br but not by the reaction of C_6H_5Br with CH_3ONa

(R) $C_6H_5 - Br$ is not a good substrate for SN^2 reaction because attack of nucleophile from back side of leaving group is hindered by the ring and also double bond character will be developed between carbon and bromine

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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47. (A) Reaction of HI with ter-butylethylether produces ter.butyl iodide & ethyl alcohol

(R) It follows SN^1 reaction

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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48. (A) Anisole is more reactive than phenol towards electrophilic aromatic substitution reactions

(R) $-OCH_3$ group is more ring activating than $-OH$ group present on benzene ring

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: D



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49. (A) With excess HI anisole gives a mixture of iodobenzene and methyl iodide

(R) The reaction between anisole and HI takes place via SN^2 mechanism.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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50. (A) Diethyl ether is used as general anaesthetic

(R) Diethyl ether produces unconsciousness without affecting lungs.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of

(A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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